WYCSF
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Response Action Contract
Contract No. 68-W-98-228

EPA United States Environmental Protection Agency

REGION 10

FINAL DESIGN SUBMITTAL

- ☐ BASIS OF DESIGN REPORT
- ☐ DESIGN DRAWINGS
- ☐ SPECIFICATIONS
- ☐ CONSTRUCTION QUALITY ASSURANCE PLAN FOR RA1 THROUGH RA4

Pacific Sound Resources Superfund Site
Marine Sediment Unit
Seattle, Washington

URS
in association with
CH2M HILL
White Shield, Inc.

USEPA SF
1271293

Part II

PART II

DESIGN DRAWINGS

Drawings are provided under separate cover.

Part III

PART III

SPECIFICATIONS

BIDDING SCHEDULE
Pacific Sound Resources Superfund Site

Item No.	Description of Item	Quantity	Unit	Unit Price	Amount
BASE CONTRACT - Capping in RA1, Dredging, and Outfall Extension					
0001	All Work for Mobilization and Demobilization	1	JOB	LS	$_____
0002	Remedial Action Management Plan	1	JOB	LS	$_____
0003	All Work for PSR Marine Sediments Unit Remedial Action - Capping in RA1, Dredging, and Outfall Extension, except for Item Nos. 0001, 0002, and 0004 through 0018, including site preparation and development	1	JOB	LS	$_____
0004	Dredging and Disposal at Subtitle "D" Landfill	10,000	CY	$_____	$_____
0005	Sand Cap Mix	25,500	TON	$_____	$_____
0006	Gravel Mix	85,300	TON	$_____	$_____
0007	Filter Material No. 1	700	TON	$_____	$_____
0008	Filter Material No. 2	2,900	TON	$_____	$_____
0009	Riprap	12,200	TON	$_____	$_____
0010	Beach Sand	1,000	TON	$_____	$_____
0011	Habitat Mix	6,900	TON	$_____	$_____
0012	Shoreline Restoration	1	JOB	LS	$_____
0013	Water Quality Monitoring	1	JOB	LS	$_____
0014	Cap Verification Sampling and Analysis	1	JOB	LS	$_____
0015	Longfellow Creek Outfall Extension and Outfall Grouting	1	JOB	LS	$_____
0016	Pre-Construction Multi-Beam Hydrographic Survey	1	JOB	LS	$_____
0017	Land Surveying and Single-Beam Hydrographic Surveys	1	JOB	LS	$_____
0018	Record Drawing and Closeout Documentation	1	JOB	LS	$_____
GENERAL OPTION ITEMS					
0019	Disposal at Subtitle "C" Landfill				
0019A	Disposal at Subtitle "C" Landfill, 1-10 Tons	10	TON	$_____	$_____
0019B	Disposal at Subtitle "C" Landfill, 11-100 Tons	90	TON	$_____	$_____
0020	Additional Cap Verification Sampling and Analysis	30	EACH	$_____	$_____
0021	Standby for Site Access	10	DAY	$_____	$_____
0022	All Work for Additional Demobilization and Remobilization	1	JOB	LS	$_____

BIDDING SCHEDULE
Pacific Sound Resources Superfund Site

Item No.	Description of Item	Quantity	Unit	Unit Price	Amount
OPTION ITEM - Capping in RA2a and RA3					
0023	All Work for PSR Marine Sediments Unit Remedial Action - Capping in RA2a and Capping in RA3, except for Item Nos. 0024 through 0030, including site preparation and development	1	JOB	LS	$_____
0024	Sand Cap Mix	36,000	TON	$_____	$_____
0025	Coarse Sand	30,500	TON	$_____	$_____
0026	Gravel Mix	5,500	TON	$_____	$_____
0027	Water Quality Monitoring	1	JOB	LS	$_____
0028	Cap Verification Sampling and Analysis	1	JOB	LS	$_____
0029	Single-beam Hydrographic Surveys	1	JOB	LS	$_____
0030	Record Drawing and Closeout Documentation	1	JOB	LS	$_____
OPTION ITEM - Capping in RA2b and RA4					
0031	All Work for PSR Marine Sediments Unit Remedial Action - Capping in RA2b and Capping in RA4, except for Item Nos. 0032 through 0037, including site preparation and development	1	JOB	LS	$_____
0032	Sand Cap Mix	248,000	TON	$_____	$_____
0033	Water Quality Monitoring	1	JOB	LS	$_____
0034	Cap Verification Sampling and Analysis	1	JOB	LS	$_____
0035	Single-beam Hydrographic Surveys	1	JOB	LS	$_____
0036	Sediment Profile Imaging Surveys				
0036A	Sediment Profile Imaging Surveys	5	EACH	$_____	$_____
0036B	Additional Sediment Profile Imaging Surveys	5	EACH	$_____	$_____
0037	Record Drawing and Closeout Documentation	1	JOB	LS	$_____
OPTION ITEM - Post-Construction Multi-Beam Hydrographic Survey					
0038	Post-Construction Multi-Beam Hydrographic Survey	1	JOB	LS	$_____

BIDDING SCHEDULE
Pacific Sound Resources Superfund Site

Item No.	Description of Item	Quantity	Unit	Unit Price	Amount
OPTION ITEM - Capping in RA2a and RA3					
0023	All Work for PSR Marine Sediments Unit Remedial Action - Capping in RA2a and Capping in RA3, except for Item Nos. 0024 through 0030, including site preparation and development	1	JOB	LS	$_____
0024	Sand Cap Mix	38,600	TON	$_____	$_____
0025	Coarse Sand	32,800	TON	$_____	$_____
0026	Gravel Mix	5,500	TON	$_____	$_____
0027	Water Quality Monitoring	1	JOB	LS	$_____
0028	Cap Verification Sampling and Analysis	1	JOB	LS	$_____
0029	Single-beam Hydrographic Surveys	1	JOB	LS	$_____
0030	Record Drawing and Closeout Documentation	1	JOB	LS	$_____
OPTION ITEM - Capping in RA2b and RA4					
0031	All Work for PSR Marine Sediments Unit Remedial Action - Capping in RA2b and Capping in RA4, except for Item Nos. 0032 through 0037, including site preparation and development	1	JOB	LS	$_____
0032	Sand Cap Mix	266,100	TON	$_____	$_____
0033	Water Quality Monitoring	1	JOB	LS	$_____
0034	Cap Verification Sampling and Analysis	1	JOB	LS	$_____
0035	Single-beam Hydrographic Surveys	1	JOB	LS	$_____
0036	Sediment Profile Imaging Surveys				
0036A	Sediment Profile Imaging Surveys	5	EACH	$_____	$_____
0036B	Additional Sediment Profile Imaging Surveys	5	EACH	$_____	$_____
0037	Record Drawing and Closeout Documentation	1	JOB	LS	$_____
OPTION ITEM - Post-Construction Multi-Beam Hydrographic Survey					
0038	Post-Construction Multi-Beam Hydrographic Survey	1	JOB	LS	$_____

BIDDING SCHEDULE
Pacific Sound Resources Superfund Site

Item No.	Description of Item	Quantity	Unit	Unit Price	Amount
TOTAL FOR BASE ITEMS 0001 THROUGH 0018					$_____
	SUBTOTAL OPTION ITEM 0019A				$_____
	SUBTOTAL OPTION ITEM 0019B				$_____
	SUBTOTAL OPTION ITEM 0020				$_____
	SUBTOTAL OPTION ITEM 0021				$_____
	SUBTOTAL OPTION ITEM 0022				$_____
	SUBTOTAL OPTION ITEMS 0023 THROUGH 0030				$_____
	SUBTOTAL OPTION ITEMS 0031 THROUGH 0037				$_____
	SUBTOTAL OPTION ITEM 0038				$_____
TOTAL FOR OPTION ITEMS 0019 THROUGH 0038					$_____
TOTAL FOR ALL ITEMS 0001 THROUGH 0038					$_____

Notes:
CY - cubic yards
EA - each
LS - lump sum

Summary of Design Specifications
Pacific Sound Resources Superfund Site

Section No.	Section Title
Division 1 - General Requirements	
01000	Abbreviations and Acronyms
01110	Summary of Work
01115	Site Description
01140	Supplementary Requirements
01145	Site-Specific Supplementary Requirements
01240	Cost and Performance Report
01270	Measurement and Payment
01320	Project Schedule
01330	Submittal Procedures
01351	Safety, Health, and Emergency Response
01355	Environmental Protection
01400	Remedial Action Management Plan
01450	Chemical Data Quality Control
01451	Contractor Quality Control
01500	Temporary Construction Facilities
01720	Surveying
01780	Record Drawings
01788	Project Closeout
Division 2 - Site Work	
02120	Transportation and Disposal of Hazardous and Non-Hazardous Materials
02325	Dredging
02483	Sediment Cap
02630	Storm Drainage
02940	Shoreline Restoration

SECTION 01000

ABBREVIATIONS AND ACRONYMS

ABIH	American Board of Industrial Hygiene
ACPA	American Concrete Pipe Association
ACGIH	American Conference of Governmental Industrial Hygienist
AGC	Associated General Contractors
ANSI	American National Standards Institute
APP	Accident Prevention Plan
ASTM	American Society for Testing and Materials
BMP	Best Management Practice
CD	compact disc
CDFR	Chemical Data Final Report
CDQC	Chemical Data Quality Control
CERCLA	Comprehensive Environmental Resource, Conservation, and Liability Act
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CO	Contracting Officer
COC	chemical of concern
CPM	critical path method
CQC	Contractor Quality Control
CQAP	Construction Quality Assurance Plan
CRZ	contaminant reduction zone
CSL	Cleanup Screening Level
CWA	Clean Water Act
cy	cubic yard
°C	degrees Celsius
°F	degrees Fahrenheit
DGPS	differential global positioning system
DO	dissolved oxygen
DOD	U.S. Department of Defense
DOT	U.S. Department of Transportation
Ecology	Washington State Department of Ecology
EEO	equal employment opportunity
EM	Engineering Manual
EP	Engineering Pamphlet
EPA	U.S. Environmental Protection Agency
EPS	electronic positioning system
ER	Engineering Regulation
ES	Early Start
EZ	exclusion zone
FAR	Federal Acquisition Regulation
$FEV^{1.0}$	forced expiratory volume in one second
FIO	for information only

FS	feasibility study
FSP	Field Sampling Plan
FVC	forced vital capacity
GA	Government approval
GFCI	ground fault circuit interrupters
GSA	U.S. General Services Administration
hr	hour
HTRW	hazardous, toxic, and radioactive waste
LDR	Land Disposal Restrictions
LF	late finish
LFL	lower flammable limit
MB	megabyte
mg/kg	milligram per kilogram
mg/L	milligram per liter
min	minimum
MLLW	mean lower low water
mph	miles per hour
MSDS	material safety data sheets
MSU	Marine Sediments Unit
MTCA	Model Toxics Control Act
µg/L	microgram per liter
NA	not applicable
NAD	North American Datam
NAPL	nonaqueous phase liquid
NARA	U.S. National Archives and Records Administration
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NOAA	National Oceanic and Atmospheric Administration
NTE	not to exceed
NTP	notice to proceed
NTU	Nephelometric turbidity unit
O&M	operation and maintenance
OP	occupational physician
OPA	Oil Pollution Act
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
OU	operable unit
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCP	pentachlorophenol
PE	performance evaluation
POC	point of contact
PPE	personal protective equipment
ppm	parts per million
ppt	parts per thousand
PSEP	Puget Sound Estuary Program

PSR	Pacific Sound Resources
PSRMP	Pacific Sound Resources Management Plan
PVC	polyvinyl chloride
QA	quality assurance
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
QC	quality control
RA	Remediation Area
RAMP	Remedial Action Management Plan
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
RMS	root-mean-square
ROD	Record of Decision
RSPA	Research and Special Programs
RTK	real-time kinematic
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SMS	Sediment Management Standards
SPI	sediment profile imaging
SQS	Sediment Quality Standards
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SVOCs	semivolatile organic compounds
SZ	support zone
TCLP	toxicity characteristics leachate procedure
TDC	Transportation and Disposal Coordinator
TIN	Triangulated Irregular Network
TOC	total organic carbon
TSCA	Toxic Substances Control Act
TSD	treatment, storage, and disposal
TSS	total suspended solids
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
VOA	volatile organic analysis
VOCs	volatile organic compounds
VTS	Vessel Traffic Service
WAC	Washington Administrative Code
WMP	Waste Management Plan
WQC	Water Quality Certification
WSDOT	Washington State Department of Transportation

END OF SECTION

SECTION 01110

SUMMARY OF WORK

PART 1 GENERAL

1.1 SUMMARY

This section provides a comprehensive summary of the various contract work elements and their relationship to each other. This summary does not provide the technical detail of the referenced sections for the particular work activities, but describes the work as a whole, providing overall perspective to the separate tasks and their interrelationships. Background on Site conditions and previous investigations are also included. This section shall be used in conjunction with all the other sections and the Drawings to establish the total work requirements.

The Contractor is advised that the contract work will consist of remediation of the Marine Sediments Operable Unit (MSU) of the Pacific Sound Resources (PSR) Superfund Site (Site), located in King County, Seattle, Washington. The remediation will be conducted under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and will implement the selected cleanup alternative specified in the Record of Decision (ROD), dated September 30, 1999. All applicable Federal, State, and local regulations shall be adhered to by the Contractor.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

1.2.1 Project Description

The Work includes labor, materials, tools, equipment, supplies, testing, transportation, services, and superintendence for the Contractor to perform dredging and sediment capping at the PSR MSU. The MSU is divided into several remediation areas (RAs). The following RAs are included in the Work: RA1; RA2a; RA2b; RA3; and RA4.

The Base Items of this Contract include the following work:

a. Dredging in RA1 and RA3
b. Extension of the Longfellow Creek Outfall
c. Capping in RA1

Additional Option Items that may be awarded by the Contracting Officer (CO) include capping in RA2a, RA2b, RA3, and RA4 and conducting a post-construction multi-beam hydrographic survey.

1.2.2 Location

The Site, formerly known as the Wyckoff West Wood Treating Facility, is located on the south shore of Elliott Bay in Puget Sound, in Seattle, Washington.

1.2.3 Work Required By Contract

The Work includes, but is not limited to, the following activities:

a. Compliance with General Conditions of the Contract, including field supervision and management; administration and home office support; purchasing; site security and emergency services; health and safety supplies; and temporary facilities (office, equipment, supplies, incidentals) and utilities for the construction period (phone, electric, water).

b. Submittals/implementation plans required by the Contract, including the Remedial Action Management Plan (RAMP), in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN.

c. Mobilization, site work, and temporary facilities including mobilization of personnel and equipment; site preparation; meetings; temporary facilities such as trailers, sanitary facilities, utilities (e.g., electrical, phones), and temporary access; traffic controls; dust, erosion, fugitive emissions, and security controls; and survey controls.

d. Dredging of sediments as required to maintain a navigation area near Crowley Marine Services (in RA1 and RA3) and to make room for the sediment cap. Additional dredging in this area is required for the extension of the former Longfellow Creek outfall. An estimated total of 10,000 cubic yards (cy) of material requires dredging in this area.

e. Extension of the Longfellow Creek Overflow outfall as specified in Section 02630 STORM DRAINAGE.

f. Placement of a sediment cap in the intertidal area using upland sources of capping material at least as clean or cleaner than the Sediment Quality Standards (SQS) as specified in Section 01450 CHEMICAL DATA QUALITY CONTROL, Section 02483 SEDIMENT CAP, and Section 02940 SHORELINE RESTORATION.

g. Placement of a sediment cap in offshore areas of the MSU with capping material at least as clean or cleaner than the SQS using upland materials as specified in Section 01450 CHEMICAL DATA QUALITY CONTROL and Section 02483 SEDIMENT CAP.

h. Monitoring and verification of construction activities as specified in Section 01451 CONTRACTOR QUALITY CONTROL.

i. Coordination of in-water work with the U.S. Army Corps of Engineers (USACE), U.S. Coast Guard (USCG), Port of Seattle Police, Crowley Marine Services, tribal fishing operations, other remediation contractors, and other oversight contractors. All such coordination will be handled through the CO.

j. Preparation of Record Drawings and other construction documentation.

k. Demobilization of personnel, equipment, and materials at the completion of construction awarded by the CO; the Work includes demobilization of temporary facilities, utilities, and close-out reporting.

1.2.4 Work Sequence

The expected work sequence is as follows:

a. The CO awards base bid items; optional bid items as necessary may be awarded for execution.

b. The Contractor shall perform the Work of the base bid items and award optional bid items in accordance with the Contract and applicable laws, regulations, and standards. The Contractor shall provide prompt written notice to the CO of changes in the Work, contract amount, contract time, or contract terms due to Site conditions, quantities, or nature of the Work.

c. The CO awards optional bid items as required which may be awarded for execution at the same time as the Work.

d. The Contractor shall perform the Work of awarded optional bid items within the Contract and in accordance with applicable laws, regulations, and standards. The Contractor shall provide prompt written notice to the CO of changes in the Work, contract amount, contract time, or contract terms due to Site conditions, quantities, or nature of the Work.

e. The CO and authorized representatives evaluate the remedy's attainment of performance requirements.

f. The Contractor shall prepare project documents, reports, and close-out submittals required by the Contract at the completion of Work for approval by the CO.

g. The CO will issue Final Acceptance to the Contractor when requirements of the Contract are completed.

1.3 EXISTING WORK (NOT USED)

1.4 GOVERNMENT-FURNISHED MATERIAL AND EQUIPMENT (NOT USED)

1.5 GOVERNMENT-INSTALLED WORK

Piling removal activities will be performed by Port of Seattle to facilitate placement of the sediment cap in the MSU. These activities are scheduled to be completed prior to starting Work under this Contract. However, if there is any overlap in the schedule, the Contractor shall coordinate Work with the CO and Port of Seattle. During the Work, other contractors may be placing dredged material in RA5, as directed by USACE.

1.6 CONTRACTOR'S USE OF PROJECT SITE

The Contractor shall control use of the Site; comply with laws, regulations, standards, and requirements of the Contract; allow inspection and verification of the Work by the CO; and control access of the staging areas and active work areas by the public. Coordinate work activities and utility outages/shutdowns with the CO, utility providers, the USCG, Port of Seattle Police, and other authorized contractors or agencies performing work at the Site. Health and safety is the responsibility of the Contractor.

1.7 SUBCONTRACTORS

The Contractor shall ensure compliance with the Drawings and Specifications by all subcontractors.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01115

SITE DESCRIPTION

PART 1 GENERAL

1.1 SUMMARY

This Section provides the project location, history, physical setting, and other Site background information and a listing of the documents containing background information for Work conducted under the Contract at the Pacific Sound Resources (PSR) Superfund Site (Site).

1.2 PROJECT LOCATION

The Drawings contain a vicinity map for the Site. The Site is located in West Seattle on the shore of Elliott Bay and Puget Sound at the mouth of the Duwamish River. The Site is divided into two operable units: the Upland Unit and the Marine Sediments Operable Unit (MSU). The Upland Unit consists of the former wood treating facility and occupied an area of approximately 25 acres; the cap design limits within the MSU encompass approximately 58 acres of Elliott Bay along approximately 2,000 feet of shoreline.

1.3 SITE HISTORY

From 1909 to 1994 wood treating operations were performed at the Site. The wood treating facility was originally a pile-supported facility over the Duwamish River estuary. The shoreline and intertidal area were filled in at various times throughout the last 100 years and the facility was eventually entirely located on approximately 25 acres of fill material that created an upland. This in-filling resulted in a steep riprap bank on the shoreline between the upland and off-shore area.

The southern portion of the facility (10 acres) was used primarily for treated wood storage and the northern part of the facility (15 acres) was used for processing. All retorts, product storage tanks and piping were located on the northern portion of the facility. Wood treating chemicals used at the Site included creosote, pentachlorophenol, and various metals-based wood preservation solutions.

A remedial investigation/feasibility study (RI/FS) was completed at the Site in April 1998. For investigation purposes, the Site was divided into two operable units: the Upland Unit and the MSU. Active cleanup has been completed in the Upland Unit. The MSU has been contaminated by discharge of used and waste creosote and wood treating chemicals from the former wood treating operations on the upland portion of the Site.

The primary chemicals of concern in the MSU are polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs). PAHs have been detected in excess of screening levels to depths of 20 feet below the mudline at the Site. Downward and lateral migration of nonaqueous-phase liquids (NAPLs), transport of contaminated groundwater, and erosion of

contaminated soils by stormwater runoff from the Upland Unit represent other historical sources and transport pathways to the MSU. In addition, the former Longfellow Creek outfall historically contributed PCB contamination to the MSU, and mercury contamination appears to have migrated from a source to the east of the Site. Flow from Longfellow Creek has since been rerouted to the West Waterway of the Duwamish River, although the outfall remains functional and receives local storm drainage.

As a result of cleanup actions in the Upland Unit, there are only three likely contaminant migration pathways to Elliott Bay remaining: (1) transport of dissolved contaminants via groundwater with subsequent partitioning to sediment; (2) dissolution of sediment-bound contaminants to the waters of Elliott Bay; and (3) long shore or downslope migration of contaminated surface sediment in the MSU. The transport of free- and dissolved-phase NAPL in shallow groundwater to Elliott Bay has been inhibited by the slurry wall and light NAPLs (LNAPL) recovery trench that were constructed as part of the upland source control activities. However, some dense NAPL (DNAPL) is present seaward of and deeper than the slurry wall. The DNAPL constitutes an ongoing, however minor, source to the bay via dissolved phase groundwater transport.

1.4 SITE LAYOUT AND EXISTING STRUCTURES

Site layout and the location of structures existing within or adjacent to the Site are shown on the Drawings. See Section 01500 TEMPORARY CONSTRUCTION FACILITIES for information on utility usage.

1.5 REMEDIATION AREAS

The MSU cap area was subdivided into "remediation areas" (RAs) according to specific site conditions and operational considerations that require different cap designs, cap materials specifications, or construction methods.

1.5.1 RA1: Intertidal/Shallow Subtidal Area

The RA1 boundaries are defined to extend from the top of the bank, onshore, extending offshore a sufficient distance to construct the required grade transitions to the adjacent offshore RAs.

1.5.2 RA2: Shallow Nearshore Area

RA2 consists of two discrete nearshore areas - RA2a and RA2b, that extend from approximately -15 to -50 feet mean lower low water (MLLW). RA2a and RA2b are characterized by relatively flat areas or shallow slopes, with localized steepened areas.

1.5.3 RA3: Crowley Marine Services Area

It is necessary to maintain navigational depths in this area for barges, tugs, and other vessels. Given that sediment contamination in this area extends to depths of 8 to 10 feet below the mudline and because of the need to maintain navigational access, a cap cannot be constructed in the area of Crowley Marine Services without first removing materials through dredging.

The cap in this area must also resist erosive forces from propeller wash. The dredging limits cover approximately 1.5 acres, with mudline elevations ranging from -5 to -30 feet MLLW.

1.5.4 RA4: Sloping Offshore Area

This area extends from approximately -50 to -140 feet MLLW and includes relatively steep slopes with approximately 15 to 25 percent grades. Stability of these soft/loose sediment slopes and the potential for failure during cap placement requires specific controlled cap placement methods.

1.6 TOPOGRAPHY AND SURFACE WATER DRAINAGE

PSR is located on the south shore of Elliott Bay in Puget Sound. Historic filling of tidelands resulted in a steep riprap bank separating the upland and off-shore areas. Two current or former stormwater outfalls have been identified as entering Elliott Bay at PSR, as shown on the Drawings.

1.6.1 Longfellow Creek Overflow Outfall

The outfall serves as a local stormwater drain, receiving drainage from as far south as the former Birmingham Steel property. This outfall is approximately 140 feet east of the Crowley Marine Services pier. Based on survey information, the outfall is situated with approximately half of its diameter below the shoreline surface. Based on field observations, the outfall appears to be anchored in place with chains and concrete blocks. As-builts of this outfall have been obtained and indicate it is constructed of 84-inch (7-foot) diameter, 8-inch thick, reinforced concrete pipe (RCP), with the invert of the pipe at approximately –7.6 feet MLLW. An engineered extension of this pipe is required to accommodate the cap in this area in accordance with Section 02630 STORM DRAINAGE.

1.6.2 Unidentified East Outfall

This outfall is a dilapidated 12-inch steel pipe at approximately +8 feet MLLW, on the eastern portion of the shoreline near the elevated bench. No flow has been observed from this pipe. The outfall shall be plugged and abandoned.

1.7 GEOLOGIC SETTING

1.7.1 Regional Geology

The Site lies near the center of the Puget Sound Basin of western Washington State between the Cascade Mountain Range and the Olympic Mountains. The geomorphology of the Puget Sound Basin has been shaped by several episodes of Pleistocene glaciation, which have resulted in a westward-sloping, gently rolling drift plain cut by many wide, steep-sided troughs.

These north-south trending troughs have been glacially scoured and are filled with marine water (i.e., Puget Sound) or large freshwater lakes (e.g., Lake Washington) or have been alluviated by streams and rivers (e.g., Duwamish Valley).

The Duwamish River is a major drainage of the western slope of the Cascade Mountain range, and enters Puget Sound from the south at Elliott Bay, a protected, deep-water harbor. The MSU cap design limits encompass approximately 58 acres of Elliott Bay adjacent to and offshore of the Upland Unit. The Elliott Bay shoreline has been extensively developed for urban, port, and industrial land uses; the area surrounding the Site is principally used for water-dependant industries. The mouth of the Duwamish River's West Waterway is located approximately 0.3 mile east of the Site.

Unconsolidated sediments dominate the project vicinity. The sedimentary bedrock of the Blakely Formation outcrop at Alki Point, about 1 mile west of the Site, and at the west side of Beacon Hill, approximately 2 miles east of the Site. No deep borehole explorations (past or current) have encountered bedrock at the Site, but the Blakely Formation is expected to underlie the Site at approximately 340 to 680 feet based on regional data from geophysical surveys and nearby soil borings.

1.7.2 Upland Site Soils

The upland area of the Site lies in an estuary that was filled to create usable land for industrial development. The upland fill is variable in nature and underlain by, in lithological sequence, native estuarine deposits, deltaic deposits, and glacial deposits. The fill in the upland area is typically 20 to 45 feet thick and consists of dredged sand and silt, construction debris and predominantly granular sediment, riprap, and wooden bulkhead debris. Estuarine deposits consist of silty sand and sandy silt with interbedded silt, clay and sand, and minor peat, wood, organic fragments and shells. The lower deltaic unit is medium dense to dense sand, and silty sand with some silt interbeds. Silt and clay lenses up to 10 feet thick have been observed and indicate a seaward dip of about 5 to 10 degrees. Dense glacial deposits were not encountered in the upland borings, which penetrated approximately 100 feet below ground surface (bgs), nor were they encountered in sediment explorations installed through depths of 80 feet below the mudline.

1.7.3 Marine Sediments Unit Soils

Sediments in the MSU are classified as one of the following:

a. organic silts
b. sand and silt mixtures with high fines content (typically around 70 percent fines)
c. sand and silt mixtures with low fines content (typically around 30 percent fines)
d. sand and silt mixtures with equal proportions of the two constituents

Surface deposits of anthropogenic contaminated fill material overlie native sediments throughout the MSU. For consistency with the Record of Decision (ROD) for the Site, this contaminated fill material in the MSU is referred to as the "Marine Sediments Unit Fill," or simply "fill." Side-scan sonar and core samples indicate as much as 20 feet of fill consisting of contaminated sand and silty sand with organics and occasional wood debris.

The presence of thin layers of contaminated sediments in water depths up to 200 feet suggest that some fill material may have flowed down the submarine slopes due to uncontrolled placement. Bathymetric data indicate that landslides have also historically occurred as

subaqueous landslide features are observable. Settling of turbidity plumes may also have contributed to the thin deposits of contaminated sediments. Ongoing sediment resuspension and transport during storm events could also explain the occurrence of contaminated sediments in deeper offshore areas.

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1.7.4 Bathymetry

The sea-bottom slopes at the Site are generally steeper near-shore and become flatter further offshore. The bottom slopes are variable, with nominal slopes up to about 20 to 25 percent (5H:1V to 4H:1V) from the shore to about -120 feet MLLW, 15 percent (7H:1V) from –20 to –150 feet MLLW, and about 6 to 15 percent (16H:1V to 7H:1V) below -150 feet MLLW. A flat embayment area is present at the Crowley Marine Services pier at about –40 feet MLLW.

1.8 INFORMATION AVAILABLE TO BIDDERS

1.8.1 General

The documents listed in paragraph 1.8.3 Other Documents contain background information on the Site, including information on site topography, geologic setting, site history, previous investigations, site contamination, and previous remedial actions. These documents are available at the U.S. Environmental Protection Agency (EPA) Region 10 Superfund Records Center (Administrative Record), located at 1200 6th Avenue, Seattle, Washington, telephone: (206) 553-4494, for the Contractor's use and information.

1.8.2 Technical Exhibit Document

Information for the Contractor has been compiled into the Technical Exhibit for Remedial Action at Pacific Sound Resources Superfund Site, Marine Sediments Unit, Seattle, Washington. The information contained in the Technical Exhibit (under separate cover) includes:

a. Subsurface sediment coring logs from the Remedial Investigation

b. Boring and cone penetration testing (CPT) logs from the Pre-Design Investigation

c. Geotechnical laboratory data from the Remedial Investigation and Pre-Design Investigation

d. Vibracore logs and porewater extraction report from the Pre-Design Investigation

e. Groundwater discharge and currents data from the Pre-Design Investigation

f. Analytical data for samples from dredge area and capping area sediments, surface sediments, shallow subsurface sediments, and capping area porewater from the Pre-Design Investigation

The information compiled in the Technical Exhibit is selected information from the documents listed at the end of this Section and is not a complete representation of Site

conditions. The Contractor is encouraged to refer to the listed documents for additional information that may assist in bidding this project. No warranties or guarantees are made regarding the completeness or the accuracy of the information provided in the documents referenced in this Section.

1.8.3 Other Documents

A listing of documents available to the Contractor follows:

a. RETEC. 1998. *Final Upland Groundwater Remedial Investigation and Feasibility Report. Pacific Sound Resources Superfund Site Remediation Area 4, Southwest Harbor Project.* Prepared by Remediation Technologies, Inc. for the Port of Seattle. November 1998.

b. U.S. Environmental Protection Agency (USEPA). 2002. Draft Technical Memorandum #1—Pre-Design Investigation Data Summary, Pacific Sound Resources Superfund Site, Marine Sediments Unit. Prepared by URS Greiner, Inc. for EPA Region 10. Seattle, Washington. February, 2002.

c. USEPA. 2002. *Technical Memorandum #2—Conceptual Site Design, Pacific Sound Resources Superfund Site, Marine Sediments Unit.* Prepared by URS Greiner, Inc. for EPA Region 10. Seattle, Washington. June 12, 2002.

d. USEPA. 2001. *Final Field Sampling Plan, Pacific Sound Resources Superfund Site, Marine Sediments Unit, Seattle, Washington.* Prepared by URS Greiner, Inc. for EPA Region 10. Seattle, Washington. June 13, 2001.

e. USEPA. 1999. *Pacific Sound Resources (PSR), Superfund Site, Seattle, Washington, Record of Decision*, September 30, 1999.

f. USEPA. 1998. *Remedial Investigation Report, PSR, Marine Sediments Unit, Seattle, Washington.* Prepared by Roy F. Weston, Inc. for EPA Region 10. Seattle, Washington. January 1998.

g. USEPA. 1998. *Feasibility Study, PSR, Marine Sediments Unit, Seattle, Washington.* Prepared by Roy F. Weston, Inc. for EPA Region 10. Seattle, Washington. November 1998.

h. U.S. Geological Survey (USGS). 1996. *Interpretation of Side-Scan Sonar, Seismic Reflection and Bathymetric Data Obtained Over the Pacific Sound Resources Superfund Site.* West Seattle, Washington. USGS Report 96-01.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01140

SUPPLEMENTARY REQUIREMENTS

PART 1 GENERAL

1.1 DEFINITIONS

"SUPPLEMENTARY REQUIREMENTS" shall be read to pertain to any of the sections of the DIVISION 1 as required by the content of the section or paragraph containing the reference.

1.2 CONSTRUCTION SCHEDULING

Refer to Section 01320 PROJECT SCHEDULE.

1.3 PRE-CONSTRUCTION CONFERENCE

1.3.1 Within 10 working days after Notice to Proceed (NTP), and prior to general mobilization of the Contractor equipment and personnel to the project site, the Contractor shall meet with the Contracting Officer (CO) for the Pre-Construction Conference. The Contractor shall be prepared to discuss the following subjects, as a minimum:

a. Phasing of the Work
b. Remedial Action Management Plan (RAMP) requirements
c. Required schedules, including progress schedule and schedule of values
d. Sequencing of critical path work items
e. Project changes and clarification procedures
f. Use of site, access, office, and storage areas, security and temporary facilities
g. Major priorities
h. Coordination with adjoining commercial or port operations, other contractors, and tribal fishing activities
i. Contractor's Site Safety and Health Plan and representative
j. Progress payment procedures

1.3.2 The Pre-Construction Conference will be held at the Site. The Contractor will be given at least 72 hours advance notice of the specific date and time of the conference by the CO.

1.3.3 During the conference, the Contractor will be given a tour of the Site by the CO. Major site features will be noted.

1.3.4 Attendees shall include, but not be limited to:

a. CO and/or representatives
b. U.S. Army Corps of Engineer's (USACE) Site Manager

c. USACE Project Manager
d. U.S. Environmental Protection Agency's (EPA's) Project Manager
e. Contractor's Project Manager
f. Contractor's Site Superintendent or Site Manager
g. Contractor's Quality Control System Manager
h. Contractor's Safety and Health Manager
i. Representatives of any subcontractor whom Contractor may desire or CO may request to attend
j. Others as appropriate

1.4 CORRESPONDENCE

1.4.1 All correspondence shall be addressed to the CO, shall be serially numbered commencing with Number 1, with no numbers missing or duplicated and shall be forwarded in an original and one copy. All copies provided shall be legible. Enclosures attached or transmitted with the correspondence shall also be furnished with the original and copy. Each serial letter shall make reference to the contract name, contract number and shall have only one subject.

1.4.2 For submission of Contractor payment requests, see Section 01270 MEASUREMENT AND PAYMENT.

1.5 CONTRACTOR'S FILES

Contractor shall maintain "Approved (Action Code "A") and "Approved Except as Noted (Action Code "B") submittals at the Site for Government use.

1.6 SPECIAL SAFETY REQUIREMENTS

In addition to Safety and Health Requirements Manual EM 385-1-1, dated September 3, 1996, the Contractor shall comply with the requirements listed below. Paragraph numbers refer to EM 385-1-1 or are added thereto.

a. Paragraph 01.A.12: Add new paragraph: Safety Personnel. The Contractor shall designate a person on his staff to manage the Contractor's safety and accident prevention program. This person will provide a point of contact for the CO on matters of job safety, and shall be responsible for ensuring the health and safety of on site personnel.

b. Paragraph 01.D.02, revise as follows:

i. Replace paragraph 01.D.02c with the following:

"c. Property damage in excess of $2,000.00."

ii. Add new paragraph d as follows:

"An injury resulting in a lost workday, not including the day of injury."

1.7 COMPLIANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL REQUIREMENTS

In performing Work under this Contract, the Contractor shall comply with all relevant Federal, State, and local statutes, ordinances, laws and regulations.

1.8 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER (ER 415-1-15)

This paragraph specifies the procedure for the determination of time extensions for unusually severe weather in accordance with the Contract Clause entitled "Default (Fixed Price Construction)." In order for the CO to award a time extension under this clause, the following conditions must be satisfied:

1.8.1 The weather experienced at the Site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

1.8.2 The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

1.8.3 The following schedule of monthly anticipated adverse weather days is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather days in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON (5) DAY WORK WEEK

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
10	7	7	4	4	3	1	2	3	6	8	10	Seattle, WA

1.8.4 Upon acknowledgement of the NTP and continuing throughout the Contract, the Contractor will record on the daily Contractor Quality Control (CQC) report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled work day.

1.8.5 The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph 1.8.3 above, the CO will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a

modification in accordance with the Contact Clause entitled "Default (Fixed Price Construction)".

1.9 MOBILIZATION AND DEMOBILIZATION, PAYMENT ITEM NOS. 0001 AND 0022

1.9.1 All costs connected with mobilization and demobilization will be paid for at the Contract lump sum price for this item. Sixty percent (60%) of the lump sum price will be paid to the Contractor upon completion of mobilization, at the worksite. The remaining forty percent (40%) will be included in the final payment for Work under this Contract, including any options awarded. All costs connected with any CO directed interim demobilization and remobilization will also be paid in accordance with the specified sixty/forty percentage.

1.9.2 In the event the CO considers that the amount in this item which represents mobilization, does not bear a reasonable relation to the cost of the Work in this Contract, the CO may require the Contractor to produce cost data to justify this portion of the bid. Failure to justify such price to the satisfaction of the CO will result in payment of actual mobilization costs, as determined by the CO at the completion of mobilization, and payment of the remainder of this item in the final payment under this Contract. The determination of the CO is not subject to appeal.

1.10 ENVIRONMENTAL LITIGATION

1.10.1 If the performance of all or any part of the Work is suspended, delayed, or interrupted due to an order of a court of competent jurisdiction as a result of environmental litigation, as defined below, the CO, at the request of the Contractor, shall determine whether the order is due in any part to the acts or omissions of the Contractor or a subcontractor at any tier not required by the terms of this contract. If it is determined that the order is not due in any part to acts or omissions of the Contractor or a Subcontractor at any tier other than as required by the terms of this contract, such suspension, delay, or interruption shall be considered as if ordered by the CO in the administration of this Contract under the terms of the "Suspension of Work" clause of this Contract. The period of such suspension, delay or interruption shall be considered unreasonable, and an adjustment shall be made for any increase in the cost of performance of this Contract (excluding profit) as provided in that clause, subject to all the provisions thereof.

1.10.2 The term "environmental litigation", as used herein, means a lawsuit alleging that the Work will have an adverse effect on the environment or that the Government has not duly considered, either substantially or procedurally, the effect of the Work on the environment.

1.11 COMPLIANCE WITH DAVIS-BACON ACT

This clause applies to all work subject to the "Construction" Contract Clauses, whether specifically identified on the Price schedule or as determined by the CO.

1.11.1 Contractor POC

Within 14 days after award of the Contract, the Contractor shall designate a point of contact (POC) within their organization who will be responsible for the Davis-Bacon Act Labor Program for the Contractor and all subcontractors under this Contract as required by the Contract Clauses and FAR 52.222 (reference also www.nws.usace.army.mil/davisbacon/davis.htm).

1.11.2 Responsibilities

The designated Contractor POC shall be responsible for Davis-Bacon Act Labor Program activities including, but not limited to:

a. Documentation and record keeping
b. Submittal and accuracy of certified payrolls
c. Submittal of required labor forms including requests for additional classifications and rates, Statements and Acknowledgement, etc.
d. Posting of the wage determination, approved additional classifications and rates, labor and equal employment opportunity (EEO) posters
e. Coordination with the CO's Labor Program POC

Prior to submittal to the Government, payrolls shall be reviewed for compliance to all applicable labor standards, to include, but not be limited to the following items: correct wage rates, correct overtime classification and pay, misclassification of workers for work actually performed, apprentice to journeyman ratios, and registration of apprentice. Corrective actions shall be taken as necessary to ensure Contractor compliance with applicable Contract and Federal Acquisition Regulation (FAR) clauses.

1.11.3 Certification

The Contractor POC shall provide a signed certification stating the following: "I certify that the submitted items being forwarded have been reviewed in detail and are correct and in strict conformance with the Labor Standards of the Contract except as otherwise stated."

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01145

SITE-SPECIFIC SUPPLEMENTARY REQUIREMENTS

PART 1 GENERAL

1.1 CONDUCT OF WORK

1.1.1 Coordination

Coordination with the U.S. Coast Guard (USCG), the Port of Seattle and on-site contractors shall be made through the Contracting Officer (CO) to assist the Contractor in performing the Work with a minimum of interference and inconvenience. The Contractor is responsible for site security, and there is a possibility that other contractors could be on-site for some of the work period. See paragraph 1.3 COORDINATION AND COOPERATION WITH OTHER CONTRACTORS AND USERS.

1.1.2 Key

The Contractor shall be responsible for Government-owned keys issued for access to facilities or areas pertinent to this Contract.

Upon completion of the Work in an area, or upon request of the CO, the key or keys relevant to the completed areas shall be returned.

Should the Contractor lose a key:

a. The CO shall be notified, in writing, within 3 working days after the loss is discovered; and

b. Should the key not be found before final acceptance, the final contract payment shall be reduced by $100 for each key not returned.

1.1.3 Work and Material Delivery Hours

Except as noted in paragraph 1.4.2 Constraints, normal work hours in the project area shall be 7:00 a.m. to 6:00 p.m., Monday through Saturday, excluding holidays. Requests for alternate work schedules may be considered, but must be approved by the CO at least 48 hours in advance. Alternate work schedules may not be approved if a Government quality assurance inspector is not available to be on Site during the proposed work hours.

1.2 GENERAL ACCESS REQUIREMENTS

The project Site area is presently secured by fences and limited-access gates. The Contractor's work site includes stockpile and staging areas and other locations as needed to suit work force needs. Utilities will not be supplied by the Government. The Site may be accessed by water from Elliott Bay and by road from Harbor Avenue via Florida Street or from Spokane Street via the fire lane, as shown on the Drawings.

1.2.1 Entry Gate

The upland Site is within a fenced area. The Contractor shall coordinate with the CO to gain entrance during working hours.

1.2.2 Irregular or Non-routine Access

Access on a regular basis and during other than established working hours will require prior approval by the CO. Irregular or non-routine access of Contractor personnel to the controlled areas during non-duty hours may be granted by the CO's designated representative.

1.2.3 Maintenance of Access

Except as required and approved by the CO, the Contractor shall not obstruct or interfere with access by others to existing facilities adjacent to the Site during Work conducted under this Contract.

1.2.4 Vehicles

Vehicles shall park only in approved areas in accordance with the parking plan submitted as part of the Remedial Action Management Plan (RAMP) in accordance with Section 01400.

1.3 COORDINATION AND COOPERATION WITH OTHER CONTRACTORS AND USERS

1.3.1 Work by Others

Work by others is anticipated to be performed in the vicinity or adjacent to the Site in concurrence with the scheduled performance of Work under these Contract Documents.

The USACE may be directing other contractors to place dredged material in RA5 during the Work conducted under this Contract.

The Port of Seattle will contract for removal of wooden piling at the Site, with work anticipated in July - August 2004. The Port of Seattle and their tenants, including Crowley Marine Services, have ongoing operations around and within the Work area. The Contractor shall coordinate the Work with the CO to minimize conflicts and to maintain a cooperative effort in completion of the Work.

Tribal fishing is known to occur in and around the Work area. The CO will coordinate with the Tribal Fisheries departments to identify and resolve potential access conflicts. The CO may direct the Contractor to standby as described in paragraph 1.4.2 Constraints.

1.4 CONSTRUCTION SCHEDULE REQUIREMENTS

The Work shall be planned, scheduled, and performed in phases to complete the work within the requirements of these Contract documents. The phases are:

a. RAMP preparation and approval;
b. Mobilization;
c. Dredging in RA1 and RA3;
d. Nearshore work for RA1 (outfall extensions);
e. Capping of RA1; and
f. Demobilization within the first construction season.

If awarded, option items to be completed in the second construction season are capping in RA2a, RA2b, RA3, and RA4.

Of particular importance is the timely identification, testing, and approval of sediment cap material products following NTP. Following submission of the draft RAMP, the CO may direct the Contractor to proceed with testing and analysis of cap materials in accordance with Section 01450 CHEMICAL DATA QUALITY CONTROL and Section 02483 SEDIMENT CAP.

1.4.1 Milestones

The Contractor shall incorporate the following milestones into the work sequence, using as the basis for the timeline the number of calendar days:

Base Items	Completion
a. Draft RAMP Submittal following Notice To Proceed (NTP):	Not to Exceed (NTE) 45 days following NTP
b. Pre-Construction Testing Report, following approval by CO	NTE 45 days
c. Final RAMP Submittal following comments on Draft RAMP	NTE 25 days
d. Begin Site mobilization following approval of RAMP	NTE 7 days following approval of RAMP
e. Completion of pre-construction multi-beam survey, land survey and pre-dredge survey	NTE 14 days following approval of RAMP
f. Initiation of construction	NTE 21 days following approval of RAMP
g. Dredging in RA1 and RA3, including associated transportation and disposal	Complete by February 14, 2004

h. Shoreline restoration in RA1 and outfall extension	Complete by February 14, 2004
i. Capping in RA1	Complete by February 14, 2004
j. Completion of all in-water construction	Complete by February 14, 2004
k. Completion of all final surveying and sampling activities	Complete by March 15, 2004
l. Record Drawing and closeout documentation, following completion of awarded Work	NTE 90 days
Option Items	
m. Capping in RA2a and RA3	Complete by February 14, 2005
n. Capping in RA2b and RA4	Complete by February 14, 2005
o. Completion of all in-water construction	Complete by February 14, 2005
p. Completion of all final surveying and sampling activities	Complete by March 15, 2005
q. Post-construction multi-beam hydrographic survey, following completion of capping	NTE 30 days
r. Record Drawing and closeout documentation, following completion of awarded Work	NTE 90 days

1.4.2 Constraints

The following special constraints have been identified as having an impact on the performance of the Work. This is not intended to be a comprehensive list of constraints that will result from the execution of the Work, but as an aid to the Contractor in development of schedules and in executing the Work. Additional constraints may exist or develop as a result of required work execution or Contractor's proposed work methods or sequence. In any event, the Contractor is responsible for compliance with the requirements of the various specification sections and the work procedures and protection requirements contained therein and establishing all constraints associated with the work execution and incorporating them into work schedules and proposed construction activities.

a. No dredging will be permitted within the fish window of February 14 to August 16. Capping will not be permitted within the fish window of February 14 to July 16. No additional payment items are included for fish windows.

b. The CO will coordinate the construction schedule with tribal fisheries departments. Based on this coordination, there shall be no night placement of cap material should a conflict with tribal treaty fishing occur. Up to 5 days of standby each construction season may be required as directed by the CO. This standby is in addition to (and outside of) the fish windows in part a, above. This standby is a separate pay item.

c. Contractor shall incorporate allowances for downtime or decreased productivity due to adverse weather conditions into the work schedule. No additional payment items are included for delays due to adverse weather. Requests for time extensions due to unusually severe weather shall conform to the requirements in Section 01140 SUPPLEMENTARY REQUIREMENTS.

d. Underwater stockpiling of material will not be permitted.

1.5 PROTECTION OF PROPERTY

In addition to requirements of the Contract Clauses, the Contractor shall protect all property, Government or private, within or in the vicinity of the work Site. The Contractor shall ensure that it is not removed, damaged, destroyed, or prevented from its normal use unless so designated in the Contract Documents. All property adjacent to the Work shall be protected including, but not limited to, protection from construction generated dust, debris, water, and vibration. Property includes land, utilities, landscaping, markers and monuments, buildings, structures, site and drainage improvements, whether shown on the Drawings or not.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01240

COST AND PERFORMANCE REPORT

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. The most recent revision of the reference applies.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EP 1110-1-19	(2001) A Guide to Preparing and Reviewing Remedial Action Reports of Cost and Performance

This publication is available at the following web address:
http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep1110-1-19/toc.htm

ER 1110-3-1301	(1999) Engineering and Design Hazardous, Toxic and Radioactive Waste (HTRW) Cost Engineering

This publication is available at the following web address:
http://www.usace.army.mil/inet/usace-docs/eng-regs/er1110-3-1301/toc.htm

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 540-R-98-016	(2000) Close Out Procedures for National Priorities List Sites
EPA 542-B-98-007	(1998) Guide to Documenting and Managing Cost and Performance Information for Remediation Projects

1.2 DESCRIPTION OF WORK

A cost and performance report is a USACE requirement for hazardous, toxic, and radioactive wastes (HTRW) projects. This work shall consist of the preparation of a report containing contract-related cost and performance data from the PSR Superfund Site remediation project. Note that information cited in Section 01115 SITE DESCRIPTION and the references therein are to be used in compiling some of the data for the report. The recommended format for the Cost and Performance Report is included in Chapter 4 of EP 1110-1-19, and shall be utilized to comply with this specification. (Example reports are provided in Appendices B and C of EP1110-1-19.) Only those requirements in this Section that relate to actual work performed on this project are applicable. The Contracting Officer (CO) will make final determinations on which items of the Work must be reported.

1.2.1 Report Format

The cost and performance report shall be prepared in accordance with EP 1110-1-19 and EPA 540-R-98-016 (OSWER Directive 9320.2-09A-P). The presentation requirements of the report shall be:

a. Word processing format: Microsoft Word 97 or 2000, 12 point font size, typeface Times New Roman

b. Page layout: 8-1/2 x 11 inch size paper, 1-inch margins, portrait or landscape orientation, bold headings, footnotes, page numbering

c. Tables and charts software: spreadsheets, modeling results

d. Computer file: the document shall also be presented electronically in its native format and in .pdf format; PostScript drawings shall be linked to document text

1.2.2 Drawing Format

Drawings shall follow the same format, including software, as that used in the investigative and design phases of the project. Drawings shall be in Postscript ™ format.

1.2.3 Quality Control

A project-specific quality control program shall be developed to detail the procedures for preparation of the report and for correction of deficiencies. The Contractor shall arrange for conferences to coordinate the Work or to sequence related work for sensitive and complex items as needed and as requested by the CO.

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-09 Reports

Cost and Performance Reports; GA.

Three copies of the report upon completion of each of the following stages: Outline, Draft Report, and Final Report. The report shall be provided to CO.

SD-18 Records

Report Format; GA.

ASCII and Microsoft Word file of report. File shall be provided to CO.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 REPORT OUTLINE

The report outline shall be in accordance with EP 1110-1-19 and EPA 540-R-98-016.

3.1.1 Abstract

The Abstract shall contain the following information as applicable and shall be in tabular format as shown in EP 1110-1-19, Exhibit 4-1:

a. Site name and operable unit

b. Regulatory oversight

c. Contractor oversight

d. Remedial action contractor

e. Waste source

f. Contaminants

g. Technology

h. Cleanup type (full-scale, etc)

i. Purpose/significance of application

j. Type/quantity of media treated

k. Period of operation

l. Regulatory requirements/cleanup goals

m. Results

n. Costs

o. Description

3.1.2 Introduction

The introduction should include a brief description of the location, size, environmental setting, and history of the Site. The site history should describe the operations and waste management practices that contributed to the contamination of the Site, and the regulatory

and enforcement activities that have occurred. The introduction should also discuss the major findings and results of remedial investigation (RI) activities.

The information for the introduction can be taken from reports prior to the remedial design (RD) or remedial action (RA), such as the RI/FS or Record of Decision (ROD).

3.1.3 Site Background

Operable Unit (OU) Background. This section should summarize the requirements specified in the ROD for the subject OU. It should include information on the cleanup goals, institutional controls, monitoring requirements, operation and maintenance (O&M) requirements, and other parameters applicable to the design, construction, operation, and performance of the RA. Additional information regarding the basis for establishing the cleanup goals/remediation objectives, including planned future land use, should be provided. A summary of the RD, including any significant regulatory or technical considerations or events occurring during the preparation of the RD, should also be included in this section. Any ROD amendments, explanation of significant differences, or technical impracticability waivers should also be identified and briefly discussed.

3.1.4 Installation Activities

This section should provide a step-by-step description of the activities undertaken to construct and implement the RA (e.g., mobilization and site preparatory work; associated site work, such as fencing and surface water collection and control; system operation and monitoring; and sampling activities).

3.1.5 Chronology of Events

This section shall provide a tabular summary that lists the major events for the OU, and associated dates of those events, starting with the ROD signature. The table shall include significant milestones and dates, including: RD submittal and approval; ROD amendments; mobilization and construction of the remedy; monitoring and sampling events; variances or non-compliance situations; final sampling and confirmation-of-performance results; required inspections; demobilization; and RA completion or startup of post-RA O&M activities.

3.1.6 Performance Standards and Installation Quality Control

3.1.6.1 Performance Standards

This section shall describe the overall performance of the remedial technology in terms of a comparison to cleanup goals/remediation objectives. For treatment remedies, this section should identify the quantity of material treated, the strategy used for collecting and analyzing samples, and the overall results from the sampling and analysis effort. More detailed information on documenting performance is provided in Section 5 of EP-1110-1-19

3.1.6.2 Installation Quality Control

An explanation of the approved installation quality assurance (QA) and quality control (QC) requirements shall be provided. An explanation of any substantial problems or deviations from these requirements shall be included. An assessment of the performance data quality and of the overall analytical data quality shall be provided, including a brief discussion of the QA/QC procedures followed, the quality assurance project plan (QAPP) used, and the data quality objectives (DQOs) to which the analytical data were compared.

3.1.7 Final Inspections and Certifications

This section shall report the results of the various RA contract inspections, and shall identify any noted deficiencies. Adherence to health and safety requirements while implementing the RA shall be described briefly. Any substantial problems or deviations shall be explained. This section shall summarize details of the institutional controls, if implemented, (e.g., the type of institutional control, who will maintain the control, and who will enforce the control).

3.1.8 Maintenance Activities (Not Used)

3.1.9 Summary of Project Costs

This section should present the total costs incurred for the remedial action.

3.1.10 Observations and Lessons Learned

3.1.10.1 Cost Observations and Lessons Learned

Observations or lessons learned concerning cost for the remedial action shall be summarized. Key factors that affected project costs, and major items that caused final costs to differ from initial Contractor's bid shall be considered. Issues that are to be discussed shall include change orders, reclarifications, liquidated damages, variations in quantities, and unforeseen conditions. The narrative shall include recommendations for cost savings in future procurements of similar systems.

This section should discuss observations and lessons learned, highlighting successes, problems and their resolutions. The discussion of the problems and their resolutions will be included in the useful technical information that will be extracted by the government and compiled for use in future remedy selections. The information presented should be technical in nature and specific to the Site. Observations or lessons learned relating to both cost and performance of the remedial action are important to note.

3.1.10.2 Performance Observations and Lessons Learned

Observations or lessons learned concerning performance of the remedial action for this contract shall be summarized. Key factors that caused performance variations from contract requirements/cleanup standards shall be considered. Recommendations for improved performance in future applications shall be discussed.

3.1.11 Contact Information

The primary contact names, addresses, and telephone numbers shall be listed for the major design and remediation contractors and subcontractors, oversight contractors, regulatory agencies, and the respective project managers for the Government as detailed in Section 4 of EP 1110-1-19. Contract numbers shall also be listed.

3.1.12 References

This section shall include all references used in preparation of the cost and performance report. Examples of documents to reference include regulatory documents, remedial design documents, key correspondence/deliverables, etc.

3.1.13 Appendix A: Cost and Performance Factors

This appendix shall list the factors that can affect the cost or performance of the remedial action. A list of factors that can affect the cost and performance are provided in EPA 542-B-98-007 and Section 5 of EP 1110-1-19.

3.1.14 Appendix B: Project Costs

The Contractor shall use the work breakdown structure specified in ER 1110-3-1301 as updated in 1999 to the second (system) level, in conjunction with the standard descriptions, to document costs for activities directly attributed to the remedial actions; however, utilizing lower levels for each work breakdown structure is optional. The second (system) level of detail shall be used for capturing the costs of remedial actions. Documentation of costs for before remedial activities shall be identified separately in the appropriate second-level remedial action work breakdown structure categories, i.e. Monitoring, Sampling, Testing, and Analysis. The documentation shall identify unit costs and number of units for each cost element, as specified in ER 1110-3-1301. Cost for activities directly attributed to the remedial action shall be shown as a total cost and as a calculated cost on a per unit basis, as applicable. The second (system) level cost elements for activities directly associated with the project are shown in the same referenced documents.

END OF SECTION

SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 CONTRACT LINE ITEMS

Payment items for the Work of this Contract for which contract lump sum payments and unit price payment will be made are listed in the BIDDING SCHEDULE and described below. All costs for items of work that are not specifically mentioned to be included in a particular lump sum or unit price payment item shall be included in the listed lump sum item most closely associated with the work involved. The lump sum price and payment made for each item listed shall constitute full compensation for furnishing all plans, labor, materials, and equipment; performing any associated Contractor quality control, environmental protection, and safety requirements; preparing tests and reports; and performing all work required for which separate payment is not otherwise provided.

1.1.1 Item 0001, All Work for Mobilization and Demobilization (Base Item)

1.1.1.1 Payment

Payment will be made for all work required to mobilize to the Site for items awarded under this Contract and to demobilize from the Site at the completion of the Work, including any option items awarded, under this Contract. This item includes, but is not limited to: initial mobilization of all personnel and equipment; site preparation; meetings; temporary facilities such as trailers, sanitary facilities, and utilities, security controls; cleanup; and final demobilization of all personnel and equipment at the completion of the Work. Payment will be made at 60 percent of the lump sum item cost for mobilization when complete and at 40 percent of the lump sum item cost for demobilization when complete, as defined in Section 01140 SUPPLEMENTARY REQUIREMENTS, payment of which shall constitute full compensation for Item 0001.

1.1.1.2 Unit of Measure

Unit of measure: lump sum

1.1.2 Item 0002, Remedial Action Management Plan (Base Item)

1.1.2.1 Payment

Payment will be made for all work required to prepare the Remedial Action Management Plan (RAMP) in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN and related sections. The Contract Price shall include, but not be limited to: all costs to prepare and produce a Draft RAMP and Final RAMP that meets Government approval; address Government comments to the satisfaction of the Government for all work plans listed in Section 01400; all reproduction and costs associated with submitting the required number of copies; attend all required conferences and meetings and produce minutes required in the

Specifications; and all other work described in Section 01400 of the Specifications to produce a RAMP approved by the Contracting Officer (CO) within the specified time frame. No additional payment will be made to the Contractor for delays or additional costs incurred due to the Contractor's failure to meet the criteria and schedule specified for preparation of a complete RAMP.

1.1.2.2 Unit of Measure

Unit of measure: lump sum

1.1.3 Item 0003, All Work for PSR Marine Sediments Unit Remedial Action, except for Item Nos. 0001, 0002, and 0004 through 0018 (Base Item)

1.1.3.1 Payment

Payment will be made for all work required in the Base Item tasks for Pacific Sound Resources (PSR) Marine Sediments Unit (MSU) Remedial Action, except for Item Nos. 0001, 0002, and 0004 through 0018. The Contract Price shall include, but not be limited to: incidentals not related to other base items; site preparation, temporary access roads and staging, and erosion control; all survey work not incidental to other base items; administration and home office support; health and safety supplies; and all other work not included in other base items in this Section.

1.1.3.2 Unit of Measure

Unit of measure: lump sum

1.1.4 Item 0004, Dredging and Disposal at Subtitle "D" Landfill (Base Item)

1.1.4.1 Payment

Payment will be made for all work required to dredge and dispose of sediments as indicated on the Drawings and in accordance with Section 02325 DREDGING, Section 02120 TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS, and related sections. The Contract Price shall include, but not be limited to: dredging, coordination and offloading, and transportation and disposal including characterization of dredged material.

1.1.4.2 Measurement

The volume of dredged material will be measured by hydrographic surveys prior to dredging and following completion of dredging. The total amount of material removed will be measured by computing the volume between the bottom surface elevation indicated by the soundings of the pre-dredge survey and the bottom surface elevation indicated by soundings of the post-dredge survey. Final quantity will be subject to deductions or corrections of deductions previously made due to excessive overdepth, dredging outside of authorized areas, or disposal of material in an unauthorized manner. Measurement and payment shall be based on completed work performed in accordance with the Drawings and Specifications.

Payment for dredging, as so measured, shall constitute full payment for all equipment, labor, and materials, and disposal of material. This shall also include all incidentals necessary to complete the Work required by this Section.

1.1.4.3 Unit of Measure

Unit of measure: cubic yards in place

1.1.5 Item 0005, Sand Cap Mix (Base Item)

1.1.5.1 Payment

Payment will be made for all costs associated with the procurement, import, handling, transport, and placement of sand cap mix in accordance with the Drawings, Section 02483 SEDIMENT CAP, and related sections.

1.1.5.2 Measurement of Imported Cap Material

The tonnage shall be based on displacement of the hauling barge (for materials delivered by water) or by actual weight in the hauling vehicle (for materials delivered by truck). For each barge or truckload delivered to the Site, the Contractor shall furnish the CO with a weight ticket from the material supplier, and a certified weight certificate for each truckload. Weight tickets shall include, but not be limited to, the tonnage, date, Bid Item No., and material description. Documentation of certification shall be provided for each certified scale used.

Measurement and payment shall be based on completed work performed in accordance with the Drawings and Specifications. Final quantity will be subject to deductions or corrections of deductions previously made due to placement outside of authorized areas or placement in an unauthorized manner.

1.1.5.2.1 Vehicle Measurement

All material delivered to the Site by vehicle shall be weighed on public scales. The scales shall be certified by a public weighmaster and shall be of sufficient capacity to permit weighing the transporting vehicle both empty and full. Types of material shall not be mixed in any given load. All costs for providing acceptable weight measurement shall be borne by the Contractor and included in the applicable unit prices for the material.

1.1.5.2.2 Barge Measurement

Material delivered by barge shall have its weight calculated by the displacement method. All gauges necessary, in the opinion of the CO, for measuring displacement, shall be placed on barges, to the CO's satisfaction, by and at the expense of the Contractor. All barges shall be loaded as nearly as practicable uniformly over their entire deck area. The Contractor may place more than one class of rock material on any barge load, provided that during the loading period the weight of the total of each class of rock removed is determined by the displacement method. If weight displacement, as determined by the CO, cannot be properly

made on a partial, non-uniformly loaded barge, the load shall be redistributed by the Contractor so that weight calculation by the displacement method can be made. All barges shall be free from internal water when measured.

No barge shall be used in the Work until a tonnage displacement table certified by a registered professional engineer or naval architect has been furnished by the Contractor and approved by the CO. Each barge shall be plainly marked by a distinctive number, letter, or name that shall not be changed or given to any other barge during the period of the Contract. A barge load data sheet shall be furnished to the CO for each barge load. Information on the data sheet shall include light and loaded draft readings at each corner of the barge, the resulting gross, tare, and net tonnages, resulting net volume, and times when the loading began and was completed. The data sheet, when completed, shall be signed and dated by the Contractor.

Displacement measurements shall be made at point of delivery immediately prior to unloading, during unloading (as specified above), and immediately upon completion of unloading. All measurements shall be made in the presence of the CO. The Contractor shall give the CO at least one working day advance notice of barge deliveries. The CO will record barge measurements for payment quantity purposes before unloading starts.

Should another method for measuring weight of material on barges be necessary, the method shall be approved by the CO prior to use.

1.1.5.3 Unit of Measure

Unit of measure: ton

1.1.6 Item 0006, Gravel Mix (Base Item)

1.1.6.1 Payment

Payment will be made for all costs associated with the procurement, import, handling, transport, and placement of gravel mix in accordance with the Drawings, Section 02483 SEDIMENT CAP, and related sections.

1.1.6.2 Measurement

Measurement of gravel mix shall conform to the requirements in paragraph 1.1.5.2 Measurement of Imported Cap Material.

1.1.6.3 Unit of Measure

Unit of measure: ton

1.1.7 Item 0007, Filter Material No. 1 (Base Item)

1.1.7.1 Payment

Payment will be made for all costs associated with the procurement, import, handling, transport, and placement of filter material No. 1 in accordance with the Drawings, Section 02483 SEDIMENT CAP, and related sections.

1.1.7.2 Measurement

Measurement of filter material No. 1 shall conform to the requirements in paragraph 1.1.5.2 Measurement of Imported Cap Material.

1.1.7.3 Unit of Measure

Unit of measure: ton

1.1.8 Item 0008, Filter Material No. 2 (Base Item)

1.1.8.1 Payment

Payment will be made for all costs associated with the procurement, import, handling, transport, and placement of filter material No. 2 in accordance with the Drawings, Section 02483 SEDIMENT CAP, and related sections.

1.1.8.2 Measurement

Measurement of filter material No. 2 shall conform to the requirements in paragraph 1.1.5.2 Measurement of Imported Cap Material.

1.1.8.3 Unit of Measure

Unit of measure: ton

1.1.9 Item 0009, Riprap (Base Item)

1.1.9.1 Payment

Payment will be made for all costs associated with the procurement, import, handling, transport, and placement of riprap in accordance with the Drawings, Section 02483 SEDIMENT CAP, and related sections.

1.1.9.2 Measurement

Measurement of riprap shall conform to the requirements in paragraph 1.1.5.2 Measurement of Imported Cap Material.

1.1.9.3 Unit of Measure

Unit of measure: ton

1.1.10 Item 0010, Beach Sand (Base Item)

1.1.10.1 Payment

Payment will be made for all costs associated with the procurement, import, handling, transport, and placement of beach sand in accordance with the Drawings, Section 02483 SEDIMENT CAP, and related sections.

1.1.10.2 Measurement

Measurement of beach sand shall conform to the requirements in paragraph 1.1.5.2 Measurement of Imported Cap Material.

1.1.10.3 Unit of Measure

Unit of measure: ton

1.1.11 Item 0011, Habitat Mix (Base Item)

1.1.11.1 Payment

Payment will be made for all costs associated with the procurement, import, handling, transport, and placement of habitat mix in accordance with the Drawings, Section 02483 SEDIMENT CAP, and related sections.

1.1.11.2 Measurement

Measurement of habitat mix shall conform to the requirements in paragraph 1.1.5.2 Measurement of Imported Cap Material.

1.1.11.3 Unit of Measure

Unit of measure: ton

1.1.12 Item 0012, Shoreline Restoration (Base Item)

1.1.12.1 Payment

Payment will be made for all materials, equipment, and labor associated with shoreline restoration, in accordance with the Drawings, Section 02940 SHORELINE RESTORATION, and related sections. Shoreline restoration shall include, but not be limited to: procurement, import, handling, transport, and placement of timber logs, including backfill and anchor assemblies.

1.1.12.2 Unit of Measure

Unit of measure: lump sum

1.1.13 Item 0013, Water Quality Monitoring (Base Item)

1.1.13.1 Payment

Payment will be made for all materials, equipment, and labor associated with water quality monitoring, in accordance with Section 01355 ENVIRONMENTAL PROTECTION and related sections, during dredging, capping, and associated in-water construction activities. This item shall include, but not be limited to: collection of monitoring data including temperature, dissolved oxygen, turbidity, total suspended solids, and visual presence of sheens, measurement by direct-reading meter or by laboratory analysis, as specified; documentation and reporting of data; and field supervision and management.

1.1.13.2 Unit of Measure

Unit of measure: lump sum

1.1.14 Item 0014, Cap Verification Sampling and Analysis (Base Item)

1.1.14.1 Payment

Payment will be made for all materials, equipment, and labor associated with cap verification sampling and analysis for capping in RA1 in accordance with the Drawings, Section 02483 SEDIMENT CAP, Section 01450 CHEMICAL DATA QUALITY CONTROL, and related sections. This item shall include, but not be limited to: collection of samples at the specified times and locations, laboratory analysis of required samples, documentation and reporting of data; and field supervision and management.

1.1.14.2 Unit of Measure

Unit of Measure: lump sum

1.1.15 Item 0015, Longfellow Creek Outfall Extension and Outfall Grouting (Base Item)

1.1.15.1 Payment

Payment will be made for all materials, equipment, and labor associated with extension of the 84-inch Longfellow Creek Outfall and abandonment of a 12-inch steel outfall by grouting in accordance with Section 02630 STORM DRAINAGE and related sections. This item shall include, but not be limited to: procurement, delivery, and installation of Longfellow Creek outfall extension pipe, and abandonment of the 12-inch steel outfall.

1.1.15.2 Unit of Measure

Unit of measure: lump sum

1.1.16 Item 0016, Pre-Construction Multi-Beam Hydrographic Survey (Base Item)

1.1.16.1 Payment

Payment will be made for all materials, equipment, and labor necessary to conduct the pre-construction hydrographic survey by multi-beam echosounding. Surveying shall be in accordance with Section 01720 SURVEYING and related sections.

1.1.16.2 Unit of Measure

Unit of measure: lump sum

1.1.17 Item 0017, Land Surveying and Single-Beam Hydrographic Surveys (Base Item)

1.1.17.1 Payment

Payment will be made for all materials, equipment, labor, and reporting associated with topographic surveying and hydrographic surveying by single-beam echosounding. Surveying shall be in accordance with Section 01720 SURVEYING and related sections.

1.1.17.2 Unit of Measure

Unit of measure: lump sum

1.1.18 Item 0018, Record Drawing and Closeout Documentation (Base Item)

1.1.18.1 Payment

Payment will be made for costs associated with preparing, addressing Government comments to the Government's satisfaction, and finalizing the Project Closeout Report, including, but not limited to: copies of all analytical results in chronological order; copies of the weekly and monthly operations reports; copies of waste management records; copies of Contractor Quality Control records; electronic files; and reproduction, delivery, and preparation of the Record Drawings, the Cost and Performance Report, Safety and Health Phase-Out Report, and the Chemical Data Final Report. The Project Closeout Report shall meet the requirements of Section 01788 PROJECT CLOSEOUT. The Cost and Performance Report shall be prepared in accordance with Section 01240 COST AND PERFORMANCE REPORT. Payment will be made for all work required to produce Preliminary and Final Record Drawings in accordance with Section 01780 RECORD DRAWINGS, including, but not be limited to: record keeping; deliverables; reproduction; electronic files; and other work required for Record Drawings in the Specifications.

1.1.18.2 Unit of Measure

Unit of measure: lump sum

1.1.19 Item 0019, Disposal at Subtitle "C" Landfill (Option Item - General)

1.1.19.1 Payment Items 0019A and 0019B

Payment will be made for costs associated with disposal of dredged sediments or other waste materials encountered that require disposal at a Subtitle "C" Landfill in accordance with in accordance with Section 02120 TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS, and related sections. This item includes, but is not limited to, testing associated with appropriate disposal, preparing documentation and reporting; and handling, transportation, and off-site disposal. Payment for this item will be made for the actual quantity only. This item not subject to the Special Clause "VARIATION IN ESTIMATED QUANTITIES – SUBDIVIDED ITEMS".

1.1.19.2 Measurement

Measurement will be based on weight disposed, as indicated on the certificates of disposal.

1.1.19.3 Unit of Measure

Unit of measure: ton

1.1.20 Item 0020, Additional Cap Verification Sampling and Analysis (Option Item - General)

1.1.20.1 Payment

Payment will be made for costs associated with offset sampling (if required) and/or any additional cap verification sampling (not shown on the Drawings) and analysis at the contract unit price for Item 0020, payment of which shall constitute full compensation for Item No. 0020, complete. This item shall include, but not be limited to: CO-approved collection of offset samples, and/or any additional verification samples at the specified times and locations (in any of the RAs), laboratory analysis of required samples, documentation and reporting of data; and field supervision and management in accordance with Section 02483 SEDIMENT CAP, Section 01450 CHEMICAL DATA QUALITY CONTROL, and related sections. This item does not include collection of additional samples without CO approval. Payment for this item will be made for the actual quantity only. This item not subject to the Contract Clause "VARIATION IN ESTIMATED QUANTITIES".

1.1.20.2 Measurement

Measurement will be based on each sample collected in accordance with an approved RAMP and with CO approval, and analyzed by the off-site laboratory, without rejection.

1.1.20.3 Unit of Measure

Unit of measure: each

1.1.21 Item 0021, Standby for Site Access (Option Item – General)

1.1.21.1 Payment

Payment will be made for costs associated with standby time approved by the CO due to unforeseen delays other than those anticipated in Section 01145 SITE-SPECIFIC SUPPLEMENTARY REQUIREMENTS. This item includes, but is not limited to: standby time due to tribal fisheries departments or other access issues identified by the CO. The Contractor will receive notification from the Government for such delays. This item does not include delays due to weather. Payment for this item will be made for the actual quantity only. This item not subject to the Contract Clause "VARIATION IN ESTIMATED QUANTITIES."

1.1.21.2 Measurement

Measurement will be based on the total number of days that standby time was in effect, based on CO notification and approval.

1.1.21.3 Unit of Measure

Unit of measure: day

1.1.22 Item 0022, Additional Work for Demobilization and Remobilization (Option Item – General)

1.1.22.1 Payment

Payment will be made for all work required to demobilize from and remobilize to the Site, if directed by the CO due to unforeseen circumstances. This item includes, but is not limited to: demobilization and remobilization of all personnel and equipment; meetings; temporary facilities such as trailers, sanitary facilities, and utilities, security controls; and cleanup. This item does not include the constraints identified in Section 01145 SITE-SPECIFIC SUPPLEMENTARY REQUIREMENTS.

1.1.22.2 Unit of Measure

Unit of measure: lump sum

1.1.23 Item 0023, All Work for PSR Marine Sediments Unit Remedial Action – Capping in RA2a and Capping in RA3, except for Item Nos. 0024 through 0030 (Option Item – Capping n RA2a and RA3)

1.1.23.1 Payment

Payment will be made for all work required for the PSR Marine Sediments Unit Remedial Action – Capping in RA2a and RA3, except for Item Nos. 0022 and 0024 through 0030. The Contract Price shall include, but not be limited to: incidentals not related to other option items; site preparation including setting-up and maintaining a local reference grid, temporary

access roads and staging, and erosion control; all survey work not incidental to other Capping in RA2a and RA3 option items; administration and home office support; health and safety supplies; and all other work not included in other option items in this Section.

1.1.23.2 Unit of Measure

Unit of measure: lump sum

1.1.24 Items 0024, Sand Cap Mix (Option Item – Capping in RA2a and RA3)

1.1.24.1 Payment

Payment will be made for all costs associated with the procurement, import, handling, transport, and placement of sand cap mix in accordance with the Drawings, Section 02483 SEDIMENT CAP, and related sections.

1.1.24.2 Measurement

Measurement of sand cap mix shall conform to the requirements in paragraph 1.1.5.2 Measurement of Imported Cap Material.

1.1.24.3 Unit of Measure

Unit of measure: ton

1.1.25 Items 0025, Coarse Sand (Option Item – Capping in RA2a and RA3)

1.1.25.1 Payment

Payment will be made for all costs associated with the procurement, import, handling, transport, and placement of coarse sand in accordance with the Drawings, Section 02483 SEDIMENT CAP, and related sections.

1.1.25.2 Measurement

Measurement of coarse sand shall conform to the requirements in paragraph 1.1.5.2 Measurement of Imported Cap Material.

1.1.25.3 Unit of Measure

Unit of measure: ton

1.1.26 Item 0026, Gravel Mix (Option Item – Capping in RA2a and RA3)

1.1.26.1 Payment

Payment will be made for all costs associated with the procurement, import, handling, transport, and placement of gravel mix in accordance with the Drawings, Section 02483 SEDIMENT CAP, and related sections.

1.1.26.2 Measurement

Measurement of gravel mix shall conform to the requirements in paragraph 1.1.5.2 Measurement of Imported Cap Material.

1.1.26.3 Unit of Measure

Unit of measure: ton

1.1.27 Item 0027, Water Quality Monitoring (Option Item – Capping in RA2a and RA3)

1.1.27.1 Payment

Payment will be made for all materials, equipment, and labor associated with water quality monitoring, in accordance with Section 01355 ENVIRONMENTAL PROTECTION and related sections, during capping and associated in-water construction activities. This item shall include, but not be limited to: collection of monitoring data including temperature, dissolved oxygen, turbidity, total suspended solids, and visual presence of sheens, measurement by direct-reading meter or by laboratory analysis, as specified; documentation and reporting of data; and field supervision and management.

1.1.27.2 Unit of Measure

Unit of measure: lump sum

1.1.28 Item 0028, Cap Verification Sampling and Analysis (Option Item – Capping in RA2a and RA3)

1.1.28.1 Payment

Payment will be made for all materials, equipment, and labor associated with cap verification sampling and analysis for Capping in RA2a and RA3 in accordance with the Drawings, Section 02483 SEDIMENT CAP, Section 01450 CHEMICAL DATA QUALITY CONTROL, and related sections. This item shall include, but not be limited to: collection of samples at the specified times and locations, laboratory analysis of required samples, documentation and reporting of data; and field supervision and management.

1.1.28.2 Unit of Measure

Unit of measure: lump sum

1.1.29 Item 0029, Single-Beam Hydrographic Surveys (Option Item – Capping in RA2a and RA3)

1.1.29.1 Payment

Payment will be made for all materials, equipment, labor, and reporting associated with hydrographic surveying by single-beam echosounding for Capping in RA2a and RA3. Surveying shall be in accordance with Section 01720 SURVEYING and related sections.

1.1.29.2 Unit of Measure

Unit of measure: lump sum

1.1.30 Item 0030, Record Drawing and Closeout Documentation (Option Item – Capping in RA2a and RA3)

1.1.30.1 Payment

Payment will be made for costs associated with preparing, addressing Government comments to the Government's satisfaction, and finalizing the Project Closeout Report for Capping in RA2a and RA3, including, but not limited to: copies of all analytical results in chronological order; copies of the weekly and monthly operations reports; copies of waste management records; copies of Contractor Quality Control records; electronic files; and reproduction, delivery, and preparation of the Record Drawings, the Cost and Performance Report, Safety and Health Phase-Out Report, and the Chemical Data Final Report. The Project Closeout Report shall meet the requirements of Section 01788 PROJECT CLOSEOUT. The Cost and Performance Report shall be prepared in accordance with Section 01240 COST AND PERFORMANCE REPORT. Payment will be made for all work required to produce Preliminary and Final Record Drawings in accordance with Section 01780 RECORD DRAWINGS, including, but not be limited to: record keeping; deliverables; reproduction; electronic files; and other work required for Record Drawings in the Specifications.

1.1.30.2 Unit of Measure

Unit of measure: lump sum

1.1.31 Item 0031, All Work for PSR Marine Sediments Unit Remedial Action – Capping in RA2b and Capping in RA4, except for Item Nos. 0032 through 0037 (Option Item – Capping in RA2b and RA4)

1.1.31.1 Payment

Payment will be made for all work required for the PSR Marine Sediments Unit Remedial Action – Capping in RA2b and RA4, except for Item Nos. 0032 through 0037. The Contract

Price shall include, but not be limited to: incidentals not related to other option items; site preparation including setting-up and maintaining a local reference grid, temporary access roads and staging, and erosion control; all survey work not incidental to other Capping in RA2b and RA4 option items; administration and home office support; health and safety supplies; and all other work not included in other option items in this Section.

1.1.31.2 Unit of Measure

Unit of measure: lump sum

1.1.32 Item 0032, Sand Cap Mix (Option Item – Capping in RA2b and RA4)

1.1.32.1 Payment

Payment will be made for all costs associated with the procurement, import, handling, transport, and placement of sand cap mix in accordance with the Drawings, Section 02483 SEDIMENT CAP, and related sections.

1.1.32.2 Measurement

Measurement of sand cap mix shall conform to the requirements in paragraph 1.1.5.2 Measurement of Imported Cap Material.

1.1.32.3 Unit of Measure

Unit of measure: ton

1.1.33 Item 0033, Water Quality Monitoring (Option Item – Capping in RA2b and RA4)

1.1.33.1 Payment

Payment will be made for all materials, equipment, and labor associated with water quality monitoring, in accordance with Section 01355 ENVIRONMENTAL PROTECTION and related sections, during capping and associated in-water construction activities. This item shall include, but not be limited to: collection of monitoring data including temperature, dissolved oxygen, turbidity, total suspended solids, and visual presence of sheens, measurement by direct-reading meter or by laboratory analysis, as specified; documentation and reporting of data; and field supervision and management.

1.1.33.2 Unit of Measure

Unit of measure: lump sum

1.1.34 Item 0034, Cap Verification Sampling and Analysis (Option Item – Capping in RA2b and RA4)

1.1.34.1 Payment

Payment will be made for all materials, equipment, and labor associated with cap verification sampling and analysis for Capping in RA2b and RA4 in accordance with the Drawings, Section 02483 SEDIMENT CAP, Section 01450 CHEMICAL DATA QUALITY CONTROL, and related sections. This item shall include, but not be limited to: collection of samples at the specified times and locations, laboratory analysis of required samples, documentation and reporting of data; and field supervision and management.

1.1.34.2 Unit of Measure

Unit of measure: lump sum

1.1.35 Item 0035, Single-Beam Hydrographic Surveys (Option Item – Capping in RA2b and RA4)

1.1.35.1 Payment

Payment will be made for all materials, equipment, labor, and reporting associated with hydrographic surveying by single-beam echosounding for Capping in RA2b and RA4. Surveying shall be in accordance with Section 01720 SURVEYING and related sections.

1.1.35.2 Unit of Measure

Unit of measure: lump sum

1.1.36 Item 0036, Sediment Profile Imaging Surveys (Option Item – Capping in RA2b and RA4)

1.1.36.1 Payment Items 0036A and 0036B

Payment will be made for costs associated with sediment profile imaging surveys for Capping in RA4 performed in accordance with Section 02483 SEDIMENT CAP, Section 01720 SURVEYING, and related sections.

1.1.36.2 Measurement

Measurement for the imaging surveys shall be per sediment profile image survey complete. Each survey shall meet the requirements of Section 02483 SEDIMENT CAP.

1.1.36.3 Unit of Measure

Unit of measure: each

1.1.37 Item 0037, Record Drawing and Closeout Documentation (Option Item – Capping in RA2b and RA4)

1.1.37.1 Payment

Payment will be made for costs associated with preparing, addressing Government comments to the Government's satisfaction, and finalizing the Project Closeout Report for Capping in RA2b and RA4, including, but not limited to: copies of all analytical results in chronological order; copies of the weekly and monthly operations reports; copies of waste management records; copies of Contractor Quality Control records; electronic files; and reproduction, delivery, and preparation of the Record Drawings, the Cost and Performance Report, Safety and Health Phase-Out Report, and the Chemical Data Final Report. The Project Closeout Report shall meet the requirements of Section 01788 PROJECT CLOSEOUT. The Cost and Performance Report shall be prepared in accordance with Section 01240 COST AND PERFORMANCE REPORT. Payment will be made for all work required to produce Preliminary and Final Record Drawings in accordance with Section 01780 RECORD DRAWINGS, including, but not be limited to: record keeping; deliverables; reproduction; electronic files; and other work required for Record Drawings in the Specifications.

1.1.37.2 Unit of Measure

Unit of measure: lump sum

1.1.38 Item 0038, Post-Construction Multi-Beam Hydrographic Survey and Topographic Land Survey (Option Item)

1.1.38.1 Payment

Payment will be made for all materials, equipment, and labor necessary to conduct the post-construction topographic land survey and hydrographic survey by multi-beam echosounding. Surveying shall be in accordance with Section 01720 SURVEYING and related sections.

1.1.38.2 Unit of Measure

Unit of measure: lump sum

1.2 CLEANUPS/REMOVALS OF SPILLS AND CONTAMINATION

No payment will be made for materials, equipment, and labor for cleanups/removals of spills and contamination due to Contractor negligence or failure to follow proper work operations, Contractor equipment failures, or booms and containment equipment required as a general operating constraint for routine contract operations under this Contract. Control of sheens released from contaminated sediments during capping or dredging operations is considered a general operating constraint under this Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01320

PROJECT SCHEDULE

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of the specification to the extent referenced. The publications are referenced in the text by basic designation only. The most recent version of the reference applies.

ENGINEERING REGULATIONS (ER)

ER 1-1-11 (1995) Progress, Schedules, and Network Analysis Systems

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. Timing of the Project Schedule submittals shall conform to paragraph 3.4 PROJECT SCHEDULE SUBMISSIONS. Project Schedule submittals, including electronic file submittals, shall conform to paragraph 3.5 SUBMISSION REQUIREMENTS. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-07 Schedules

Preliminary Project Schedule; GA.

Two copies of schedule submitted 20 calendar days after Notice to Proceed (NTP).

Initial Project Schedule; GA.

Schedule submitted with the RAMP, as described in Section 01400 REMEDIAL ACTION MANAGEMENT PLAN.

Periodic Schedule Updates; FIO.

Two copies of schedule updates, submitted monthly.

SD-08 Statements

Qualifications; GA.

Documentation showing qualifications of personnel preparing schedule reports.

SD-09 Reports

Narrative Report; GA.
Schedule Reports; GA.

Five copies of the reports showing numbers, descriptions, dates, float, starts, finishes, durations, sequences, etc., as required.

1.3 QUALIFICATIONS

The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports. This person shall have previously created and reviewed computerized schedules. Qualifications of this individual shall be submitted to the Contracting Officer (CO) for review with the Preliminary Project Schedule submission.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

A Project Schedule shall be prepared. The scheduling of construction shall be the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate Project Schedule. For special requirements for this project, see Section 01145 SITE-SPECIFIC SUPPLEMENTARY REQUIREMENTS. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments.

3.2 BASIS FOR PAYMENT

The Project Schedule shall be the basis for measuring contractor progress. Lack of an approved schedule or scheduling personnel shall result in an inability of the CO to evaluate Contractor progress for the purposes of payment. Failure of the Contractor to provide all information, as specified below, shall result in the disapproval of the entire Project Schedule submission and the inability of the CO to evaluate Contractor progress for payment purposes. In the case where Project Schedule revisions have been directed by the CO and those revisions have not been included in the Project Schedule, then the CO may hold retainage up to the maximum allowed by contract, each payment period, until revisions to the Project Schedule have been made.

3.3 PROJECT SCHEDULE

The computer software system utilized by the Contractor to produce the Project Schedule shall be capable of providing all requirements of this specification. Failure of the Contractor

to meet the requirements of this specification shall result in the disapproval of the schedule. Manual methods used to produce any required information shall require approval by the CO.

3.3.1 Use of the Critical Path Method

The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The Contractor shall provide the Project Schedule in Precedence Diagram Method (PDM).

3.3.2 Level of Detail Required

With the exception of the initial and preliminary schedule submission, the Project Schedule shall include an appropriate level of detail. Failure to develop or update the Project Schedule or provide data to the CO at the appropriate level of detail, as specified by the CO, shall result in the disapproval of the schedule. The CO will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule.

3.3.2.1 Activity Durations

Contractor submissions shall follow the direction of the CO regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods (usually less than 2 percent of all non-procurement activities' Original Durations shall be greater than 20 days).

3.3.2.2 Procurement Activities

Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. Long lead materials and equipment are those materials that have a procurement cycle of over 90 days. Examples of procurement process activities include, but are not limited to: submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing.

3.3.2.3 Critical Activities

The following activities shall be listed as separate line activities on the Contractor's project schedule:

a. Submission and approval of the RAMP in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN

b. Submission and approval of the Project Closeout Report in accordance with Section 01788 PROJECT CLOSEOUT

c. Prefinal inspection

d. Correction of punchlist from prefinal inspection

e. Final inspection

3.3.2.4 Government Activities

Government and other agency activities that could impact progress shall be shown. These activities include, but are not limited to: approvals, inspections, utility tie-in, Government Furnished Equipment (GFE) and notice to proceed for phasing requirements.

3.3.2.5 Workers Per Day

All activities shall have an estimate of the average number of workers per day that are expected to be used during the execution of the activity. If no workers are required for an activity, in the case of activities related to procurement, for example, then the activity shall be identified as using zero workers per day. The workers per day information for each activity shall be identified by the Workers Per Day Code.

3.3.2.6 Responsibility

All activities shall be identified in the project schedule by the party responsible to perform the work. Responsibility includes, but is not limited to, the subcontracting firm, contractor work force, or government agency performing a given task. Activities shall not belong to more than one responsible party. The responsible party for each activity shall be identified by the Responsibility Code.

3.3.2.7 Work Areas

All activities shall be identified in the project schedule by the work area in which the activity occurs. Activities shall not be allowed to cover more than one work area. The work area of each activity shall be identified by the Work Area Code. The project schedule shall specifically identify the periods and locations where commercial navigation around the Crowley Marine Services pier will need to be limited or curtailed to implement the Work.

3.3.2.8 Modification or Claim Number

Any activity that is added or changed by contract modification or used to justify claimed time shall be identified by a mod or claim code that changed the activity. Activities shall not belong to more than one modification or claim item. The modification or claim number of each activity shall be identified by the Mod or Claim Number.

3.3.2.9 Bid Item

All activities shall be identified in the project schedule by the Bid Item to which the activity belongs. An activity shall not contain work in more than one bid item. The bid item for each appropriate activity shall be identified by the Bid Item Code.

3.3.2.10 Phase of Work

All activities shall be identified in the project schedule by the phases of work in which the activity occurs. Activities shall not contain work in more than one phase of work. The project phase of each activity shall be by the unique Phase of Work Code.

3.3.2.11 Category of Work

All Activities shall be identified in the project schedule according to the category of work which best describes the activity. Category of work refers, but is not limited, to the procurement chain of activities including such items as submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing. The category of work for each activity shall be identified by the Category of Work Code.

3.3.2.12 Feature of Work

All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to a work breakdown structure for the project. The feature of work for each activity shall be identified by the Feature of Work Code.

3.3.3 Scheduled Project Completion

The schedule interval shall extend from NTP to the Contract completion date.

3.3.3.1 Project Start Date

The schedule shall start no earlier than the date that the NTP was acknowledged. The Contractor shall include as the first activity in the project schedule an activity called "Start Project". The "Start Project" activity shall have: an "Early Start" ("ES") constraint, a constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.3.2 Constraint of Last Activity

Completion of the last activity in the schedule shall be constrained by the contract completion date. Calculation on project updates shall be such that if the early finish of the last activity falls after the contract completion date, then the float calculation shall reflect a negative float on the critical path. The Contractor shall include as the last activity in the project schedule an activity called "End Project". The "End Project" activity shall have: a "Late Finish" ("LF") constraint, a constraint date equal to the completion date for the project, and a zero-day duration.

3.3.3.3 Early Project Completion

In the event the project schedule shows completion of the project prior to the contract completion date, the Contractor shall identify those activities that have been accelerated and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. Contractor shall specifically address each of the activities noted at every project schedule update period to assist the CO in evaluating the Contractor's ability to actually complete prior to the contract period.

3.3.4 Interim Completion Dates

Contractually specified interim completion dates shall also be constrained to show negative float if the early finish date of the last activity in that phase falls after the interim completion date.

3.3.4.1 Start Phase

The Contractor shall include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have: a "ES" constraint, a constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.4.2 End Phase

The Contractor shall include as the last activity in a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have: a "LF" constraint, a constraint date equal to the completion date for the project, and a zero day duration.

3.3.4.3 Phase X

The Contractor shall include a hammock type activity for each project phase called "Phase X" where "X" refers to the phase of work. The "Phase X" activity shall be logically tied to the earliest and latest activities in the phase.

3.3.5 Default Progress Data Disallowed

Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual Start and Finish dates on the CPM schedule shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the Actual Start and Finish dates on the Daily Quality Control report for every in-progress or completed activity and ensure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's schedule and the inability of the CO to evaluate Contractor progress for payment purposes.

3.3.6 Out-Of-Sequence Progress

Activities that have posted progress without predecessors being completed (Out-of-Sequence Progress) will be allowed only on a case-by-case approval of the CO. The CO may direct that changes in schedule logic be made to correct any or all out-of-sequence work.

3.3.7 Extended Non-Work Periods

Designation of Holidays to account for non-work periods of over 5 consecutive days will not be allowed. Non-work periods of over 5 consecutive days shall be identified by addition of activities that represent the delays. Modifications to the logic of the project schedule shall be

made to link those activities that may have been impacted by the delays to the newly added delay activities.

3.3.8 Negative Lags

Lag durations contained in the project schedule shall not have a negative value.

3.4 PROJECT SCHEDULE SUBMISSIONS

The Contractor shall provide the submissions as described below. The data disk, reports, and network diagrams required for each submission are contained in paragraph 3.5 SUBMISSION REQUIREMENTS.

3.4.1 Preliminary Project Schedule Submission

The Preliminary Project Schedule, defining the Contractor's planned operations for the first 60 calendar days shall be submitted for approval within 20 calendar days after NTP is acknowledged. The approved preliminary schedule shall be used for payment purposes not to exceed 60 calendar days after NTP.

3.4.2 Initial Project Schedule Submission

The Initial Project Schedule shall be submitted for approval within 45 calendar days after Notice to Proceed. The schedule shall provide a reasonable sequence of activities which represent work through the entire project and shall be at a reasonable level of detail.

3.4.3 Periodic Schedule Updates

Based on the result of progress meetings, specified in paragraph 3.6 PERIODIC PROGRESS MEETINGS, the Contractor shall submit periodic schedule updates. These submissions shall enable the CO to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgment of the CO or authorized representative, is necessary for verifying the contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

3.4.4 Standard Activity Coding Dictionary

The Contractor shall submit, with the Initial Project Schedule, a coding scheme that shall be used throughout the project for all activity codes contained in the schedule. The coding scheme submitted shall list the values for each activity code category and translate those values into project specific designations. For example, a Responsibility Code Value, "ELE", may be identified as "Electrical Subcontractor." Activity code values shall represent the same information throughout the duration of the contract. Once approved with the Initial Project Schedule submission, changes to the activity coding scheme must be approved by the CO.

3.5 SUBMISSION REQUIREMENTS

The following items shall be submitted by the Contractor for the initial submission, and every periodic project schedule update throughout the life of the project:

3.5.1 Data Disks

Two data disks containing the project schedule shall be provided. Data on the disks shall be in the format specified.

3.5.1.1 File Medium

Required data shall be submitted on ISO-9660 CD-ROM.

3.5.1.2 Disk Label

A permanent exterior label shall be affixed to each disk submitted. The label shall indicate the type of schedule (Preliminary, Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number of person responsible for the schedule, and the MS-DOS version used to format the disk.

3.5.1.3 File Name

Each file submitted shall have a name related to either the schedule data date, project name, or contract number. The Contractor shall develop a naming convention that will ensure that the names of the files submitted are unique. The Contractor shall submit the file naming convention to the CO for approval.

3.5.2 Narrative Report

A Narrative Report shall be provided with each update of the project schedule. This report shall be provided as the basis of the Contractor's progress payment request. The Narrative Report shall include: a description of activities along the 4 most critical paths, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken.

3.5.3 Approved Changes Verification

Only project schedule changes that have been previously approved by the CO shall be included in the schedule submission. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4 Schedule Reports

The format for each activity for the schedule reports listed below shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date,

Early Finish Date, Late Start Date, Late Finish Date, and Total Float. Actual Start and Actual Finish Dates shall be printed for those activities in progress or completed.

3.5.4.1 Activity Report

A list of all activities sorted according to activity number or "I-NODE" AND "J-NODE" and then sorted according to Early Start Date. For completed activities the Actual Start Date shall be used as the secondary sort.

3.5.4.2 Logic Report

A list of Preceding and Succeeding activities for every activity in ascending order by activity number and then sorted according to Early Start Date. For completed activities the Actual Start Date shall be used as the secondary sort.

3.5.4.3 Total Float Report

A list of all activities sorted in ascending order of total float. Activities which have the same amount of total float shall be listed in ascending order of Early Start Dates.

3.5.4.4 Earnings Report

A compilation of the Contractor's Total Earnings on the project from the Notice to Proceed until the most recent Monthly Progress Meeting. This report shall reflect the Earnings of specific activities based on the agreements made in the field and approved between the Contractor and CO at the most recent Monthly Progress Meeting. This report shall serve as the basis of determining Contractor Payment. Activities shall be grouped by bid item and sorted by activity numbers. This report shall: sum all activities in a bid item and provide a bid item percent; and complete and sum all bid items to provide a total project percent complete. The printed report shall contain, for each activity: Activity Number or "I-NODE" and "J-NODE", Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost), Earnings to Date.

3.5.5 Network Diagram

The network diagram shall be required on the initial schedule submission and on monthly schedule update submissions. The network diagram shall depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The CO will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1 Continuous Flow

Diagrams shall show a continuous flow from left to right with no arrows from right to left. The activity or event number, description, duration, and estimated earned value shall be shown on the diagram.

3.5.5.2 Project Milestone Dates

Dates shall be shown on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3 Critical Path

The critical path shall be clearly shown.

3.5.5.4 Banding

Activities shall be grouped to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility.

3.5.5.5 S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.6 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss payment shall include a monthly onsite meeting or other regular intervals mutually agreed to at the preconstruction conference. During this meeting the Contractor shall describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project. The CO will approve activity progress, proposed revisions, and adjustments as appropriate.

3.6.1 Meeting Attendance

The Contractor's Project Manager and Scheduler shall attend the regular progress meeting.

3.6.2 Update Submission Following Progress Meeting

A complete update of the project schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, shall be submitted not later than 4 working days after the monthly progress meeting.

3.6.3 Progress Meeting Contents

Update information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost-to-Date shall be subject to the approval of the CO. The following minimum set of items which the Contractor shall address, on an activity by activity basis, during each progress meeting.

3.6.3.1 Start and Finish Dates

The Actual Start and Actual Finish dates for each activity currently in-progress or completed activities.

3.6.3.2 Time Completion

The estimated Remaining Duration for each activity in-progress. Time-based progress calculations must be based on Remaining Duration for each activity.

3.6.3.3 Cost Completion

The earnings for each activity started. Payment will be based on earnings for each in-progress or completed activity. Payment for individual activities will not be made for work that contains quality defects. A portion of the overall project amount may be retained based on delays of activities.

3.6.4 Logic Changes

All logic changes pertaining to NTP on change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, lag durations, and other changes that have been made pursuant to contract provisions shall be specifically identified and discussed.

3.6.5 Other Changes

Other changes required due to delays in completion of any activity or group of activities include: 1) delays beyond the Contractor's control, such as strikes and unusual weather. 2) delays encountered due to submittals, Government Activities, deliveries or work stoppages which make re-planning the work necessary, and 3) a schedule which does not represent the actual prosecution and progress of the work.

3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor requests an extension of the contract completion date, he shall furnish such justification, project schedule data and supporting evidence as the CO may deem necessary for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract. Submission of proof of delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is obligatory to any approvals.

3.7.1 Justification Of Delay

The Project Schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The CO's determination as to the number of allowable days of contract extension shall be based upon the Project Schedule updates in effect for the time period in question, and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, will not be a cause for a time extension to the contract completion date.

3.7.2 Submission Requirements

The Contractor shall submit a justification for each request for a change in the contract completion date of under 2 weeks based upon the most recent schedule update at the time of the NTP or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

a. A list of affected activities, with their associated Project Schedule activity number.

b. A brief explanation of the causes of the change.

c. An analysis of the overall impact of the changes proposed.

d. A sub-network of the affected area.

Activities impacted in each justification for change shall be identified by a unique activity code contained in the required data file.

3.7.3 Additional Submission Requirements

For any requested time extension of over 2 weeks, the CO may request an interim update with revised activities for a specific change request. The Contractor shall provide this disk within 4 calendar days of the CO's request.

3.8 DIRECTED CHANGES

If NTP is issued for changes prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the CO within 2 weeks of the NTP being issued. The proposed revisions to the schedule will be approved by the CO prior to inclusion of those changes within the Project Schedule. If the Contractor fails to submit the proposed revisions, the CO may furnish the Contractor suggested revisions to the Project Schedule. The Contractor shall include these revisions in the Project Schedule until revisions are submitted, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the CO, the Contractor shall advise the CO within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the CO's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the CO's proposed revisions, the Contractor will be deemed to have concurred with the CO's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the Work.

3.9 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

3.10 NETWORK ANALYSIS SYSTEM DATA

The Contractor shall provide the CO with the means to electronically transfer all required network analysis system (NAS) data into the Resident Management System (RMS) program using the Standard Data Exchange Format (SDEF). The Contractor may use network analysis software different from that used by the CO in the Resident Office. However, the Contractor shall also furnish the following:

a. NAS data that comply with the SDEF. This is a standard ASCII format for exchanging scheduling data and is compatible with the USACE resident management system. Many software developers provide the capability to convert and export schedule data to the SDEF at no additional cost. The SDEF specification is included as the appendix to the USACE engineering regulation ER 1-1-11, available from the internet at http://www.usace.army.mil/publications.

END OF SECTION

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 CONTROL AND SCHEDULING OF SUBMITTALS

1.1.1 Submittal Coordination Meeting

After the preconstruction conference and before any submittals with the exception of Division 1 submittals are sent to the Contracting Officer (CO), the Contractor shall meet with the CO and provide and further develop an approved preliminary submittal register, ENG Form 4288. During the meeting all required items will be identified and grouped into three categories:

a. Government Approved (GA)
Government approval is required for extensions of design, critical materials, variations/deviations, an "or equal" decision, equipment whose compatibility with the entire system must be checked, architectural items such as Color Charts/Patterns/ Textures, and other items as designated by the CO.

b. For Information Only (FIO)
Submittals not requiring Government approval will be for information only. These are items such as Installation Procedures, Certificates of Compliance, Samples, Qualifications, etc.

c. Those items that can be visually inspected by the Contractor's Quality Control Representative (CQC) on Site or are provided to the Government other than with the attached ENG Form 4025 at the end of this section. The items that fall into this category shall remain on the register but shall not be submitted to the CO. For these items, the "Classification" column on the submittal register shall remain blank.

1.1.2 Final Submittal Register

The final submittal register shall be coordinated with the progress schedule and submitted within 30 calendar days of Notice to Proceed (NTP). In preparing the final document, adequate time (minimum of 30 days) shall be allowed for review and approval, and possible resubmittal of each item on the register.

1.1.3 Submittal Register Updates

The Contractor's quality control representative shall review the listing at least every 30 calendar days and take appropriate action to maintain an effective system. Copies of updated or corrected listings shall be submitted to the CO at least every 30 calendar days in the quantity specified.

1.2 SUBMITTAL TYPES

Throughout these specifications submittals may be identified with the prefix "SD" (submittal data) followed by a number (category, i.e., data, drawings, reports, etc.). This is for bookkeeping and record sorting in the system:

1.2.1 SD-01 Data

Submittals which provide calculations, descriptions, or documentation regarding the work.

1.2.2 SD-04 Drawings

Submittals which graphically show relationship of various components of the work, schematic diagrams of systems, details of fabrication, layouts of particular elements, connections, piping drawings, and other relational aspects of the work.

1.2.3 SD-06 Instructions

Preprinted material describing installation of a product, system or material, including special notices and material safety data sheets, if any, concerning impedances, hazards, and safety precautions.

1.2.4 SD-07 Schedules

Tabular lists showing location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work.

1.2.5 SD-08 Statements

A document, required of the Contractor, or through the Contractor from a subcontractor, supplier, installer, or manufacturer to confirm the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other quality verifications.

1.2.6 SD-09 Reports

Reports of inspections or tests, including analyses and interpretation of test results. Each report shall be properly identified. Test methods used shall be identified and test results shall be recorded. Contractor shall submit all reports in draft and final versions with ten paper copies and on CD in PDF and native formats.

1.2.7 SD-13 Certificates

Statement signed by an official authorized to certify on behalf of the manufacturer that a product, system or material meets specified requirements. The statement must be dated after the award of this contract and state the Contractor's name and address, project and location, and list specific requirements which are being certified.

1.2.8 SD-14 Samples

Fabricated and/or unfabricated physical examples of materials, products, and/or units of work as complete units or as portions of units.

1.2.9 SD-18 Records

Documentation to record compliance with technical or administrative requirements.

Submittals required by the Contract Clauses and other non-technical parts of the contract are not necessarily included in this section. These types of submittals can be added to the register before or during the submittal coordination meeting.

1.3 APPROVED SUBMITTALS

The approval of submittals by the CO shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist. The Contractor, under the CQC requirements of this Contract, is responsible for the dimensions and design of adequate connections, details, and satisfactory construction of all Work. After submittals have been approved by the CO, no resubmittal for the purpose of substituting materials or equipment will be given consideration.

1.4 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the CO and promptly furnish a corrected submittal in the format and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, written notice, as required under the Contract Clause entitled "Changes," shall be given to the CO.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

Prior to submittal, all items shall be checked and approved by the Contractor's CQC System Manager and each item of the submittal shall be stamped, signed, and dated. Each respective transmittal form (ENG Form 4025) shall be signed and dated by the CQC System Manager certifying that the accompanying submittal complies with the Contract requirements. This procedure applies to all submittals. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including, but not limited to, catalog cuts, diagrams; operating charts or curves; test reports; test cylinders; samples; operation and maintenance (O&M) manuals including parts lists; certifications; warranties and other such required items. Units of weights and measures used on all submittals shall be

the same as the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with Contract requirements. GA submittals shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. The CO may request submittals in addition to those listed when deemed necessary to adequately describe the work covered in the respective sections. The Contractor shall maintain a complete and up-to-date file of all submittals/items on Site for use by both the Contractor and the Government.

3.2 SUBMITTAL REGISTER (ENG FORM 4288)

The submittal register - ENG Form 4288 – for Divisions 1 and 2 shall be developed by the Contractor prior to the submittal coordination meeting and shall list each item of equipment and material for which submittals are required in the Technical Specifications. (See paragraph SUBMITTALS at the beginning of each specification section.) A blank ENG Form 4288 is attached at the end of this specification section. The Contractor shall approve all items listed on the submittal register. During the submittal coordination meeting, a preliminary submittal register will be created by annotating this ENG Form 4288. When the final submittal register is submitted for approval, the Contractor shall complete the column entitled "Item No." and all data under "Contractor Schedule Dates" and return five completed copies to the CO for approval. The Contractor shall review the list to ensure its completeness and may expand general category listings to show individual entries for each item. The numbers in column "Item No." are to be assigned sequentially starting with "1" for each specification section. DO NOT preassign transmittal numbers when preparing the submittal register. When a conflict exists between the submittal register and a submittal requirement in the technical sections, other than those submittals referenced in paragraph 3.9 FIELD TEST REPORTS, the approved submittal register shall govern. The preliminary, and then the final approved submittal register, will become the scheduling documents and will be updated monthly and used to control submittals throughout the life of the Contract. Names and titles of individuals authorized by the Contractor to approve shop drawings shall be submitted to CO with the final ENG Form 4288. Supplier or subcontractors certifications are not acceptable as meeting this requirement.

3.3 SCHEDULING

Submittals covering component items forming a system, or items that are interrelated, shall be coordinated and submitted concurrently. Certifications shall be submitted together with other pertinent information and/or drawings. The Contractor shall reserve 30 days for Government review of all GA submittals in the schedule. Additional processing time beyond 30 calendar days, or number of copies, may be shown by the CO on the submittal register attached in the "Remarks" column, or may be added by the CO during the coordination meeting. No delays damages or time extensions will be allowed for time lost due to the Contractor not properly scheduling and providing submittals.

3.4 TRANSMITTAL FORM (ENG FORM 4025)

Transmittal Form 4025 (sample at end of this section) shall be used for submitting both GA and FIO submittals in accordance with the instructions on the reverse side of the form.

Transmittal numbers shall be assigned sequentially. Electronic generated copies of ENG Form 4025 transmittals shall be printed on carbonless paper and be a reasonable facsimile of the original. If electronic forms are not used, the originals of the ENG Form 4025 shall be used (do not photo copy) and will be furnished by the CO. These forms shall be filled in completely prior to submittal. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the Contract drawings pertinent to the data submitted for each item. Each submittal item shall be listed separately on the form, naming subcontractor, supplier, or manufacturer, applicable specification paragraph number(s), drawing/sheet number, pay item number, and any other information needed to identify the item, define its use, and locate it in the work. One or more ENG Form 4025 transmittals may be used per specification section, however, DO NOT include more than one specification section per transmittal.

3.5 CROSS-REFERENCE (ENG FORM 4288/ENG FORM 4025)

To provide a cross-reference between the approved submittal register and transmittal forms, the Contractor shall record the "transmittal numbers" assigned when submitting items in column "Transmittal No." of the ENG Form 4288. The item numbers in column "Item No." of submittal register shall correspond to the item numbers on ENG Form 4025.

3.6 SUBMITTAL PROCEDURE

3.6.1 General

Shop drawings with ENG Form 4025 transmittals shall be submitted in the number of copies specified in paragraph 3.11 GOVERNMENT APPROVED SUBMITTALS and paragraph 3.12 INFORMATION ONLY SUBMITTALS, or as indicated on the submittal register in the "Remarks" column. Submit a complete collated "reviewers copy" with one ENG Form 4025 and attachments (not originals). The remaining copies (4 for GA, 2 for FIO) of ENG Form 4025 and attachments shall not be collated. This would not apply to a series of drawings.

3.6.2 Approval of Submittals by the Contractor

Before submittal to the CO, the Contractor shall review and correct drawings prepared by subcontractors, suppliers, and itself, for completeness and compliance with plans and specifications. The Contractor shall not use red markings for correcting material to be submitted. Red markings are reserved for CO's use. Approval by the Contractor shall be indicated on each shop drawing by an approval stamp containing information as shown in this section. Submittals not conforming to the requirements of this section will be returned to the Contractor for correction and resubmittal.

3.6.3 Variations

For submittals which include proposed variations requested by the Contractor, column "h" of ENG Form 4025 shall be checked and the submittal shall be classified as GA, and submitted accordingly. The Contractor shall set forth in writing the justification for any variations and annotate such variations on the transmittal form in the REMARKS block. Variations are not

approved unless there is an advantage to the Government. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted variations.

3.6.4 Drawings

Each drawing shall be not more than A1 size, 28 inches high by 40 inches wide, with a title block in lower right hand corner and a 3 inches by 4 inches clear area adjacent. The title block shall contain the subcontractor's or fabricator's name, contract number, description of item(s), bid item number, and a revision block. Provide a blank margin of 3/4 inch at bottom, 2 inches at left, and 1/2 inch at top and right. Where drawings are submitted for assemblies of more than one piece of equipment or systems of components dependent on each other for compatible characteristics, complete information shall be submitted on all such related components at the same time. The Contractor shall ensure that information is complete and that sequence of drawing submittal is such that all information is available for reviewing each drawing. Drawings for all items and equipment, of special manufacture or fabrication, shall consist of complete assembly and detail drawings. All revisions after initial submittal shall be shown by number, date, and subject in revision block.

3.6.4.1 Submittals Containing Drawings Larger than A3 11 Inches by 17 Inches

For GA submittals containing drawings larger than A3 (11 inches by 17 inches), one reproducible and one copy will be required to be submitted with five copies of the ENG Form 4025. The marked-up reproducible (and/or any review comments contained on the page-size comment sheet(s) at the Government's option) will be returned to the Contractor upon review. The Contractor shall provide three copies of drawings (generated from the reviewed reproducible) to the Government within 10 calendar days of Contractor's receipt of the reviewed reproducible. The Contractor shall not incorporate approved work into the project until the Government has received the three copies. The Contractor shall use the marked-up reproducible to make any additional copies as needed. For FIO submittals, one reproducible and two copies shall be submitted with the appropriate number of copies of ENG Form 4025.

3.6.5 Printed Material

All requirements for shop drawings shall apply to catalog cuts, illustrations, printed specifications, or other data submitted, except that the 3 inch by 4 inch clear area adjacent to the title block is not mandatory. Inapplicable portions shall be marked out and applicable items such as model numbers, sizes, and accessories shall be indicated by arrow or highlighted.

3.7 SAMPLES REQUIRING LABORATORY ANALYSIS

See Section 01450 CHEMICAL DATA QUALITY CONTROL and 01451 CONTRACTOR QUALITY CONTROL for procedures and address for samples requiring Government testing.

3.8 SAMPLES REQUIRING VISUAL INSPECTION

Samples requiring only physical inspection for appearance and suitability shall be coordinated with the CO.

3.9 FIELD TEST REPORTS

Routine tests shall be delivered to the QAR with the daily CQC reports. See Section 01450 CHEMICAL DATA QUALITY CONTROL and 01451 CONTRACTOR QUALITY CONTROL.

3.10 CONTROL OF SUBMITTALS

The Contractor shall carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

3.11 GOVERNMENT APPROVED SUBMITTALS (GA)

The Contractor shall submit 5 copies of GA submittals with 5 corresponding ENG Form 4025 unless extra copies are specified in a specific section. Upon completion of GA submittal review, copies as specified below will be marked with an action code, dated, and returned to the Contractor. See paragraph 3.6.4 Drawings for special instructions if drawings larger than size A3, 11 inch by 17 inch, are used.

3.11.1 Processing of GA Submittals

Submittals will be reviewed and processed as follows:

a. Approved as Submitted (Action Code "A"): Shop drawings which can be approved without correction will be stamped "Approved" and two copies will be returned to the Contractor. No resubmittal required.

b. Approved Except as Noted (Action Code "B"): Shop drawings which have only minor discrepancies will be annotated in red to indicate necessary corrections. Marked material will be stamped "Approved Except as Noted" and two copies returned to the Contractor for correction. No resubmittal required.

c. Approved Except as Noted (Action Code "C"): Shop drawings which are incomplete or require more than minor corrections will be annotated in red to indicate necessary corrections. Marked material will be stamped "Approved Except as Noted - Resubmission Required" and two copies returned to the Contractor for correction. Resubmittal of only those items needing correction required.

d. Disapproved (Action Code "E"): Shop drawings which are fundamentally in error, cover wrong equipment or construction, or require extensive corrections, will be returned to the Contractor stamped "Disapproved." An explanation will be furnished on the submitted

material or on ENG Form 4025 indicating reason for disapproval. Complete resubmittal required.

e. Resubmittal will not be required for shop drawings stamped "A" or "B" unless subsequent changes are made by Contractor or a contract modification. For shop drawings stamped "C" or "E," Contractor shall make corrections required, note any changes by dating the revisions to correspond with the change request date, and promptly resubmit the corrected material. Resubmittals shall be associated with the "parent" by use of sequential alpha characters (for example, resubmittal of transmittal 8 will be 8A, 8B, etc). Government costs incurred after the first resubmittal may be charged to the Contractor.

3.12 INFORMATION ONLY SUBMITTALS (FIO)

The Contractor shall submit three copies of data and four copies of ENG Form 4025. FIO submittals will not be returned. Government approval is not required on FIO submittals. These submittals will be used for information purposes. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the Contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications and will not prevent the CO from requiring removal and replacement if nonconforming material is incorporated in the work. This does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or check testing by the Government in those instances where the technical specifications so prescribe.

3.12.1 Processing of FIO Submittals

FIO submittals shall be submitted prior to delivery of the material or equipment to the job Site. ENG Form 4025 shall be marked with the words "contractor approved - information copy only" in the REMARKS block of the form. Submittals will be monitored and spot checks made. When such checks indicate noncompliance, the Contractor will be notified by the same method used for GA submittals. Resubmittal of nonconforming FIO submittals shall be reclassified GA and shall be in five copies.

3.13 CONTRACTOR APPROVAL STAMP

The stamp used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

CONTRACTORS REVIEW STAMP
MAXIMUM SIZE:

3 INCHES BY 3 INCHES

CONTRACTOR: _____
CONTRACT NUMBER _____

TRANSMITTAL NUMBER _____
ITEM NUMBER _____
SPECIFICATION SECTION _____
PARAGRAPH NUMBER _____
_____ APPROVED AS SUBMITTED
_____ APPROVED WITH CORRECTIONS AS NOTED

SIGNATURE: _____
TITLE: _____
DATE: _____

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE *(Read instructions on the reverse side prior to initiating this form)*	DATE	TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS *(This section will be initiated by the contractor)*

TO:	FROM:	CONTRACT NO.	CHECK ONE: ☐ THIS IS A NEW TRANSMITTAL ☐ THIS IS A RESUBMITTAL OF TRANSMITT/_____
SPECIFICATION SEC. NO. *(Cover only one section with each transmittal)*	PROJECT TITLE AND LOCATION		CHECK ONE: THIS TRANSMITTAL IS FOR ☐ FIO ☐ GOV'T. APPROVAL

ITEM NO. a.	DESCRIPTION OF ITEM SUBMITTED *(Type size, model number/etc.)* b.	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. *(See instruction no. 8)* c.	NO. OF COPIES d.	CONTRACT REFERENCE DOCUMENT: SPEC. PARA. NO. e.	CONTRACT REFERENCE DOCUMENT: DRAWING SHEET NO. f.	FOR CONTRACTOR USE CODE g.	VARIATION *(See instruction No. 6)* h.	FOR CE USE CODE i.

REMARKS

I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.

NAME AND SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED *(List by Item No.)*	NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY	DATE

ENG FORM 4025-R, MAR 95 *(ER 415-1-10)* EDITION OF SEP 83 IS OBSOLETE. SHEET ___ OF ___ (Reverse) CEWPCD

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.

2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.

3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4 288-R for each entry on this form.

4. Submittals requiring expeditious handling will be submitted on a separate form.

5. Separate transmittal form will be used for submittals under separate sections of the specifications.

6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".

7. Form is self-transmittal, letter of transmittal is not required.

8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.

9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

A	-- Approved as submitted.	E	-- Disapproved (See attached).
B	-- Approved, except as noted on drawings.	F	-- Receipt acknowledged.
C	-- Approved, except as noted on drawings. Refer to attached sheet resubmission required.	FX	-- Receipt acknowledged, does not comply as noted with contract requirements.
D	-- Will be returned by separate correspondence.	G	-- Other *(Specify)*

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

(Reverse of ENG Form 4025-R)

SUBMITTAL REGISTER

(ER 415-1-10)

CONTRACT NUMBER

TITLE AND LOCATION: Pacific Sound Resources Superfund Site, Marine Sediment Unit, Seattle, Washington

CONTRACTOR

SPECIFICATION SECTION

				TYPE OF SUBMITTAL									CLASSIFICATION			CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		
TRANS MITTAL NO	ITEM NO	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	DATA	DRAWINGS	INSTRUCTIONS	SCHEDULES	STATEMENTS	REPORTS	CERTIFICATES	SAMPLES	RECORDS	OPERATION AND MAINTENANCE	INFORMATION ONLY	GOVERNMENT APPROVED	REVIEWER	SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE	SUBMIT TO GOVERNMENT	CODE	DATE	REMARKS
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.	r.	s.	t.	u.	v.	w.	x.	y.	z.

EDITION OF AUG 89 IS OBSOLETE

ENG FORM 4288, MAY 91

END OF SECTION

SECTION 01351

SAFETY, HEALTH, AND EMERGENCY RESPONSE

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. The most recent version of the reference applies.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

ACGIH-0100	(1998) Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z358.1	(1998) Emergency Eyewash and Shower Equipment

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1904	Recording and Reporting Occupational Injuries and Illnesses
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual
ER 385-1-92	(2000) Safety and Occupational Document Requirement for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH Pub No. 85-115	(1999) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

1.2 DESCRIPTION OF WORK

This section describes the practices and procedures for working safety and in compliance with Occupational Safety and Health Administration (OSHA), USACE, and State regulations while performing Work at the Site. This section also provides additional requirements for implementing the accident prevention provisions of EM 385-1-1, and provides specifications for the Contractor's Site Safety and Health Plan (SSHP) which shall satisfy the requirements for submission of a separate Accident Prevention Plan (APP) as required by EM 385-1-1. The Contractor must prepare and submit a SSHP to provide protective procedures for its employees and subcontractors performing Work at the Site. Site contaminants that could harm employees' health are listed in the Technical Exhibit and a list of Permissible Exposure Limits is displayed as Table 01351-1.

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-04 Drawings

Work Zones and Decontamination Facilities; GA

Drawings shall include initial work zone boundaries: Exclusion Zone (EZ), including restricted and regulated areas; Contamination Reduction Zone (CRZ); and Support Zone (SZ). Drawings shall also show the layout of the personnel and equipment decontamination areas. More information concerning the boundaries of these areas can be found in paragraph 1.19 SITE CONTROL MEASURES and 1.20 PERSONAL HYGIENE AND DECONTAMINATION. These drawings will be provided in the SSHP produced by the Contractor.

SD-09 Reports

Contractor's SSHP; GA.

The Contractor shall submit an SSHP with the RAMP in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN. The content of the required Contractor's SSHP is described in paragraph 1.7 SITE SAFETY AND HEALTH PLAN (SSHP) of this section.

Monitoring/Sampling Results; FIO

Personnel exposure monitoring/sampling results shall be submitted as part of the daily Contractor Quality Control (CQC) reports. Personnel exposure monitoring/sampling (if any) shall be in accordance with the Exposure Monitoring/Air Sampling Program. In addition, these results are to be submitted formally monthly with a summary provided of the samples collected, monitoring performed, and results. Each monthly submittal shall be included as an attachment to the Safety and Health Phase-Out Report discussed in paragraph 1.26 SAFETY AND HEALTH PHASE-OUT REPORT. If any personal protective equipment (PPE) upgrades or downgrades have been initiated based on sample results, describe what action was taken and any associated follow-up.

Site Control Log; FIO

Record of each individual's entry and exit into the Site, as specified. The site control log will be submitted daily with the CQC reports.

Construction Safety Conference Minutes; FIO

Minutes of pre-construction and construction safety conferences attended by Contractor and government representatives.

Safety and Health Phase-Out Report; GA

A report which summarizes health and safety issues encountered and resolved during the course of the project shall be prepared by the Contractor. Any areas of potential improvement and "lessons learned" related to health and safety should be noted in this report, as well as any pertinent accident/incident reports. The content of this report is described in paragraph 1.26 SAFETY AND HEALTH PHASE-OUT REPORT.

SD-13 Certificates

HAZWOPER Qualifications Certificates; FIO

A certificate for each worker performing cleanup operations with potential for unacceptable occupational exposure signed by the Safety and Health Manager indicating the workers meet the training and medical surveillance requirements of this Contract.

1.4 REGULATORY REQUIREMENTS

Work performed under this Contract shall comply with EM 385-1-1, as well as applicable Federal, State, and local safety and occupational health laws and regulations. This includes, but is not limited to, OSHA standards, 29 CFR 1910, especially Section .120, "Hazardous Waste Site Operations and Emergency Response" and the equivalent in 29 CFR 1926, especially Section .65, "Hazardous Waste Site Operations and Emergency Response." This also includes the corresponding Washington State Department of Labor and Industries regulations WAC 296-24, WAC 296-62, and WAC 296-155. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting Work. Where the requirements of this specification, applicable laws, criteria,

ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

1.5 PRECONSTRUCTION SAFETY CONFERENCE

The Contractor shall conduct a preconstruction safety conference before on-site work begins. All the Contractor's safety-related issues shall be presented at the conference. The Contractor will take minutes of this meeting.

1.6 SAFETY AND HEALTH PROGRAM

OSHA Standards 29 CFR 1910, Section .120 (b) and 29 CFR 1926, Section .65 (b) require employers to develop and implement a written Safety and Health Program for employees involved in hazardous waste operations. The site-specific program requirements of the OSHA Standards shall be integrated into one site-specific document, the Site Safety and Health Plan (SSHP). The SSHP shall interface with the employer's overall Safety and Health Program. Any portions of the overall Safety and Health Program that are referenced in the SSHP shall be included as appendices to the SSHP.

1.7 SITE SAFETY AND HEALTH PLAN (SSHP)

The Contractor shall develop and implement a Site Safety and Health Plan (SSHP) meeting the requirements of Section 01.A.10 of EM 385-1-1 and 29 CFR 1910.120 and 29 CFR 1926.65 (b)(4). At a minimum, the SSHP shall address each element in Appendix C of ER 385-1-92 and shall an Activity Hazard Analysis meeting the requirements of 01.a.10 and Figure 1-1 of EM 385-1-1.

1.7.1 Preparation and Implementation

The SSHP shall be prepared as a part of the RAMP (see Section 01400 REMEDIAL ACTION MANAGEMENT PLAN), covering on-site work to be performed by the Contractor and all its subcontractors. The Contractor's Safety and Health Manager shall be responsible for the development, implementation, and oversight of the SSHP. The SSHP shall establish, in detail, the protocols necessary for the anticipation, recognition, evaluation, and control of hazards associated with each task performed. The SSHP shall address Site-specific safety and health requirements and procedures based upon Site-specific conditions. The level of detail provided in the SSHP shall be tailored to the type of work, complexity of operations to be performed, and hazards anticipated. Details about some activities may not be available when the initial SSHP is prepared and submitted. Therefore, the SSHP shall address, in as much detail as possible, anticipated tasks, their related hazards, and anticipated control measures.

1.7.2 Acceptance and Modifications

Prior to submittal, the SSHP shall be signed and dated by the Safety and Health Manager and the Site Superintendent. The SSHP shall be submitted in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN. Deficiencies in the SSHP will be discussed at the Preconstruction Safety Conference. The SSHP shall be revised to correct the

deficiencies and resubmitted for acceptance. On-site work shall not begin until the plan has been accepted. A copy of the written SSHP shall be maintained on Site.

As work proceeds, the SSHP shall be adapted to new situations and new conditions. Changes and modifications to the accepted SSHP shall be made with the knowledge and concurrence of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer (CO). Should any unforeseen hazards become evident during the performance of the work, the Site Safety and Health Officer (SSHO) shall bring any such hazards to the attention of the Safety and Health Manager, the Site Superintendent, and the CO, both verbally and in writing, for resolution as soon as possible. In the interim, necessary actions shall be taken to re-establish and maintain safe working conditions to safeguard on-site personnel, visitors, the public, and the environment. Disregard for the provisions of this specification or the accepted SSHP shall cause the government to order a stopping of Work until the matter has been rectified.

1.7.3 Availability

The SSHP shall be made available to all Site employees, subcontractors, and Site visitors in accordance with 29 CFR 1910, Section .120 (b)(1)(v) and 29 CFR 1926, Section .65 (b)(1)(v). All individuals receiving a copy of the SSHP, or directed to read the SSHP, will sign the Certificate of Worker/Visitor Acknowledgment, described in paragraph 1.24 CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGMENT.

1.7.4 Elements

Topics required by 29 CFR 1910, Section .120 (b)(4) 29 CFR 1926, Section .65 (b)(4), the Accident Prevention Plan as described in Appendix A of EM 385-1-1, and the paragraph below of this section shall be addressed in the SSHP. Where the use of a specific topic is not applicable to the project, the SSHP shall include a statement to justify its omission or reduced level of detail and establish that adequate consideration was given the topic.

1.8 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

A brief description of the Site is given in Section 01115 SITE DESCRIPTION. Information on Site contaminants is available in the Technical Exhibit.

1.8.1 SSHP Requirements

The SSHP shall include a Site description and contamination characterization section that addresses the following elements:

a. Description of Site location, topography, size, and past uses of the Site; and

b. A list of contaminants which may present occupational health and safety hazards during Site remedial activities. This list shall be created by researching sources of information from past Site investigation activities. Chemical names, concentration ranges, media in which found, locations on Site, and estimated quantities/volumes to be impacted by Site

work shall be included, if known. The contamination characterization shall be reviewed and revised if new chemicals are identified as work progresses.

1.9 SAFETY AND HEALTH HAZARD/RISK ANALYSIS

The SSHP shall include a safety and health hazard/risk analysis for each Site task and operation to be performed. The hazard/risk analysis shall provide information necessary for determining safety and health procedures, equipment, and training to protect on-site personnel, the environment, and the public. Available Site information shall be reviewed when preparing this section of the SSHP.

The format shall be in accordance with EM 385-1-1, Figure 1-1. The analysis shall define the activities to be performed and identify the sequence of work, the specific hazards anticipated, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level. The analysis shall be continuously reviewed, and when appropriate, modified to address changing Site conditions or operations, with the concurrence of the Safety and Health Manager, the Site Superintendent, and the CO. The analysis and any modifications will be integrated into the SSHP.

1.9.1 Site Tasks and Operations

The SSHP shall include a comprehensive section that addresses the tasks and objectives of the Site operations and the logistics and resources required to achieve those tasks and objectives.

Site tasks and operations are described fully elsewhere in these specifications.

1.9.2 Hazards

The inherent hazards associated with working around contaminated sediments, as well as importing and placement of capping material, shall be addressed in the SSHP. The following potential hazards may be encountered during Site work. These are not complete lists; therefore, they shall be expanded and/or revised as necessary during preparation of the SSHP.

1.9.2.1 Chemical Hazards.

Potential chemical hazards that may be encountered during Site work include dermal contact or ingestion of contaminated sediments during Site work. The Hazard/Risk Analysis section of the SSHP shall describe the chemical, physical, and toxicological properties of contaminants, sources and pathways of employee exposures, anticipated on-site and off-site exposure level potentials, and regulatory (including federal, state, and local) or recommended protective exposure standards. The SSHP shall also address employee exposure to hazardous substances brought onsite, and shall comply with the requirements of 29 CFR 1910, Section .1200 and 29 CFR 1926, Section .59, Hazard Communication.

1.9.2.1.1 Respiratory Exposure

a. Potential Exposure to Vapors. PAHs, aromatic oil, PCP, and arsenic likely do not pose a vapor phase health risk at the temperatures found on this Site unless conditions occur to create aerosols. Dredging of sediment in RA3 could generate vapors from materials normally found in the sediments. When the sediments are anoxic, this could include generation of hydrogen sulfide. Also, handling dry sandy or silty sand cap material could pose a dust hazard. Table 01351-1 shows a number of possible criteria for respiratory protection.

b. Potential Exposure to Dust. If the cap materials are handled dry, it is possible that a dusty condition might occur and potential for exposure to crystalline silica could exist. Standard construction methods for controlling dusts (water spray across dusty surfaces) are possible engineering controls to alleviate dust, and respiratory protection is an extreme engineering control. Potential airborne emissions from the remedial activities must not adversely affect the staff or operations of the adjacent facilities.

Table 01351-1
TYPICAL RESPIRATORY PROTECTION STANDARDS AND OTHER CRITERIA

Constituent	OSHA TWA mg/m^3	OSHA Ceiling mg/m^3	Potential Effects	Marine Sediment Maximum Detected Concentration (mg/kg)
Arsenic (Inorg. 29 CFR 1910.1018)	0.01	--	Ulcers of skin, nose, kidney and liver damage	24
Cadmium (29 CFR 1910.1027)	0.005	--	Respiratory irritant, lung and kidney damage	2.7
Chromium (Ceiling Value - chromates)	--	0.1	Ulcers of skin and nose, lung and kidney damage	251
Copper (Dust)	1.0	--	Respiratory and eye irritant	410
Lead (29 CFR 1910.1025)	0.05	--	GI and CNS effects, nausea	192
Mercury (Ceiling Value - Inorganics)	--	0.1	Eye and skin irritant, CNS, lung, kidney effects	4.2
Nickel	1.0	--	Skin and respiratory irritant	26
Benzo(a)pyrene (Coal tar pitch volatiles)	0.2	--	Respiratory and skin irritant	114
Naphthalene	50	--	Respiratory and skin irritant	3310
Chrysene (Coal tar pitch volatiles)	0.2	--	Respiratory and skin irritant	526
Total PCBs	0.5 Skin	--	Skin irritant	1.3

Notes:
OSHA permissible exposure limits (PELs) are time-weighted average (TWA) inhalation exposure concentrations for an 8-hour day.
OSHA Skin - danger of cutaneous absorption.
OSHA Ceiling - Concentration that shall not be exceeded during any part of work exposure.
mg/m^3 – milligram per cubic meter
mg/kg - milligram per kilogram
-- - not applicable

1.9.2.1.2 Direct Contact and Indirect Ingestion of Site Contaminants

Work associated with the construction involves direct handling of contaminated debris or dredged sediment.

1.9.2.2 Physical Hazards.

Several Site Specific Health and Safety Plans will be available from former site work. These will be available for viewing at the EPA Region 10 Superfund Records Center (Administrative Record) located in Seattle, Washington. The more common physical hazards that may be encountered include slip-trip fall hazards, marine hazards, musculoskeletal injury hazards, equipment hazards, and buried/underground utilities. Site debris present at the Site consists of portions of piers, intact dolphins, and demolished and intact stormwater outfalls.

Principal known physical hazards associated with this work include (but are not necessarily limited to) the following:

a. Handling clean sandy, silty, or gravelly materials, riprap, and heavy debris removed from the nearshore RA1 and dredged materials from RA3

b. Falling hazards from work on/near unstable banks containing debris

c. Use of equipment such as cranes, lifters, excavators etc., which provide an overhead hazard

d. Any equipment which may require special deactivation measures, or (if energized) lockout/tagout procedures

e. Work over water, where man-overboard procedures may be appropriate to prevent drowning

f. Outdoor work with potential for exposure to sun, temperature extremes, and adverse weather

g. Hazards due to navigation in areas of boat traffic should barges be used to import cap material, potentially including tribal fishing boats and nets

1.9.2.3 Biological Hazards

The Contractor is advised that aquatic life may be present which could pose a safety or health threat to workers on the Site. Direct contact with biological hazards should be avoided. The Contractor shall include in the SSHP methods to protect workers from all biological hazards that may be present.

1.9.2.4 Marine Safety Hazards

A significant portion of the work may be performed offshore in a marine vessel. Hazards associated with this activity include falls on slippery terrain, hypothermia, fires/explosion, and drowning. At a minimum, the marine vessel shall be equipped with a fire extinguisher, first aid kit, one ring buoy with 90 feet of rope, and cellular phone or ship-to-shore radio.

A safe means of boarding or leaving the vessel shall be provided to prevent slipping and falling. The boat/barge must be equipped with adequate railing. An orientation shall be provided to each employee assigned to work on a vessel; issues such as emergency signals, warnings regarding pinch points, rope burn/entanglement shall also be covered.

The boat/barge shall be operated in accordance with all applicable USCG regulations (speed, lighting, right-of-way, personal flotation devices, etc.).

1.10 CONFINED SPACE ENTRY

It is not anticipated that confined spaces will be encountered on Site. If entry into and work in a confined space becomes necessary, a Confined Space Entry Program shall be submitted to the Government for review prior to beginning any such work. In no case may Contractor allow entry when oxygen readings are less than 19.5 percent or greater than 23.5 percent, or if the Lower Flammable Limit (LFL) reading is greater than 10 percent, unless protective measures for these conditions are adequately addressed in the Confined Space Entry Program. In addition, action levels for toxic atmospheres shall be determined.

1.11 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

An organizational structure shall be developed that sets forth lines of authority (chain of command), responsibilities, and communication procedures concerning Site safety, health, and emergency response. This organizational structure shall cover management, supervisors, and employees of the Contractor and subcontractors. The structure shall include the means for coordinating and controlling work activities of subcontractors and suppliers. The SSHP shall include a description of this organizational structure as well as qualifications and responsibilities of each of the following individuals. The Contractor shall obtain CO's acceptance before replacing any member of the Safety and Health Staff. Requests shall include the names, qualifications, duties, and responsibilities of each proposed replacement.

1.11.1 Site Superintendent

A Site Superintendent, who has responsibility to implement the SSHP, the authority to direct work performed under this contract and verify compliance, shall be designated.

1.11.2 Safety And Health Manager

1.11.2.1 Qualifications

The services of an Industrial Hygienist certified by the American Board of Industrial Hygiene shall be utilized. The name, qualifications (education summary and documentation,

ABIH certificate), and work experience summary shall be included in the SSHP. The Safety and Health Manager shall have the following additional qualifications:

a. A minimum of 3 years experience in developing and implementing safety and health programs at hazardous waste Sites

b. Documented experience in supervising professional and technician level personnel

c. Documented experience in developing worker exposure assessment programs and air monitoring programs and techniques

d. Documented experience in the development of personal protective equipment (PPE) programs, including programs for working in and around potentially toxic, flammable and combustible atmospheres and confined spaces

e. Working knowledge of state and federal occupational safety and health regulations

1.11.2.2 Responsibilities

The Safety and Health Manager shall:

a. Be responsible for the development, implementation, oversight, and enforcement of the SSHP

b. Sign and date the SSHP prior to submittal of original and all subsequent revisions

c. Prepare and supervise implementation of Site-specific training

d. Be present on Site during the first three days of remedial activities and at the startup of each new major phase

e. Visit the Site as needed and at least once per month for the duration of activities, to audit the effectiveness of the SSHP

f. Be available for emergencies

g. Provide on Site consultation as needed to ensure the SSHP is fully implemented

h. Coordinate any modifications to the SSHP with the Site Superintendent, the SSHO, and the CO

i. Provide continued support for upgrading/downgrading of the level of PPE

j. Be responsible for collection and evaluation of air monitoring data and recommending changes to engineering controls, work practices, and PPE

k. Review accident reports and results of daily inspections

l. Serve as a member of the Contractor's quality control staff

1.11.3 Site Safety And Health Officer (SSHO)

1.11.3.1 Qualifications of SSHO

An individual and one alternate shall be designated the Site Safety and Health Officer (SSHO). The name, qualifications (education and training summary and documentation), and work experience of the Site Safety and Health Officer and alternate shall be included in the SSHP. The SSHO shall have the following qualifications:

a. A minimum of 2 years experience in implementing safety and health programs at hazardous waste Sites where Level C PPE was required

b. Documented experience in construction techniques and construction safety procedures

c. Working knowledge of federal and state occupational safety and health regulations

d. Specific training in personal and respiratory protective equipment program implementation, confined space program oversight, and in the proper use of air monitoring instruments, and air sampling methods

1.11.3.2 Responsibilities of SSHO

The Site Safety and Health Officer shall:

a. Assist and represent the Safety and Health Manager in on-site training and the day to day on-site implementation and enforcement of the accepted SSHP

b. Be assigned to the Site on a full-time basis for the duration of field activities. If operations are performed during more than 1 work shift per day, a Site Safety and Health Officer shall be present for each shift.

c. Have authority to ensure Site compliance with specified safety and health requirements, federal, state, and OSHA regulations and all aspects of the SSHP including, but not limited to, activity hazard analyses, air monitoring, use of PPE, decontamination, Site control, standard operating procedures used to minimize hazards, safe use of engineering controls, the emergency response plan, confined space entry procedures, spill containment program, and preparation of records by performing a daily safety and health inspection and documenting results on the Daily Safety Inspection Log

d. Have authority to stop work if unacceptable health or safety conditions exist, and take necessary action to re-establish and maintain safe working conditions

e. Consult with and coordinate any modifications to the SSHP with the Safety and Health Manager, the Site Superintendent, and the CO

f. Serve as a member of the Contractor's quality control staff on matters relating to safety and health

g. Conduct accident investigations and prepare accident reports

h. Review results of daily quality control inspections and document safety and health findings into the Daily Safety Inspection Log

i. In coordination with Site management and the Safety and Health Manager, recommend corrective actions for identified deficiencies and oversee the corrective actions

1.11.4 Occupational Physician (OP) (Not Used)

1.11.5 Persons Certified in First Aid and CPR

At least two persons who are currently certified in first aid and CPR by the American Red Cross or other approved agency shall be on Site at all times during Site operations. They shall be trained in universal precautions and the use of PPE as described in the Bloodborne Pathogens Standard of 29 CFR 1910, Section .1030. These persons may perform other duties but shall be immediately available to render first aid when needed.

1.11.6 Safety and Health Technicians (Not Used)

1.11.7 Certified Health Physicist (CHP) (Not Used)

1.11.8 Certified Safety Professional (CSP) (Not Used)

1.12 TRAINING

Personnel shall receive training in accordance with the Contractor's written safety and health training program and, as appropriate, 29 CFR 1910 Section .120, 29 CFR 1926 Section .65, and 29 CFR 1926 Section .21. The SSHP shall include a section describing training requirements.

1.12.1 General Hazardous Waste Operations Training

Personnel entering the exclusion or contamination reduction zones shall have successfully completed 40 hours of hazardous waste instruction off the Site; 3 days actual field experience under the direct supervision of a trained, experienced supervisor; and 8 hours refresher training within 12 months after completion of 40-hour initial training, or within 12 months of time of entry onto Site. On-site supervisors shall have completed the above training and 8 hours of additional, specialized training covering at least the following topics: the employer's safety and health program, personal protective equipment program, spill containment program, and health hazard monitoring procedures and techniques. Copies of current training certification statements shall be submitted prior to initial entry onto the work Site.

1.12.2 Site-Specific Training

Site-specific training sessions shall be documented in accordance with Section 01.B.03.b of EM 385-1-1.

1.12.2.1 Initial Session (Pre-entry Briefing)

Prior to commencement of on-site field activities, all Site employees, including those assigned only to the Support Zone (SZ), shall attend a Site-specific safety and health training session of at least 4 hours duration. This session shall be conducted by the Safety and Health Manager and the Site Safety and Health Officer to ensure that all personnel are familiar with requirements and responsibilities for maintaining a safe and healthful work environment. Procedures and contents of the accepted SSHP and Sections 01.B.02 and 28.D.03 of EM 385-1-1 shall be thoroughly discussed. The CO shall be notified at least 5 days prior to the initial Site-specific training session so government personnel involved in the project may attend.

1.12.2.2 Periodic Sessions

Periodic on-site training shall be conducted by the SSHO at least weekly during Site work for personnel assigned to work at the Site during the following 5 to 7 days. The training shall address safety and health procedures, work practices, any changes in the SSHP, activity hazard analyses, work tasks, or schedule; results of previous week's air monitoring, review of safety discrepancies and accidents. Should an operational change affecting on-site fieldwork be made, a meeting prior to implementation of the change shall be convened to explain safety and health procedures. Site-specific training sessions for new personnel, visitors, and suppliers shall be conducted by the SSHO using the training curriculum outlines developed by the Safety and Health Manager.

1.12.2.3 Other Training and Safety Meetings

All work positions in the exclusion and contamination reduction zones will be staffed with personnel who have successfully completed a classroom occupational hazards training program and other training (including annual refresher training) that meets or exceeds the requirements of 29 CFR 1910.120. Required training includes a minimum of three days actual field experience under supervision of a trained and experienced supervisor and 8-hour training for supervisors. For those persons wearing respirators, annual respirator training will be provided as required by WAC 296-62-07109.

Joint Health and Safety meetings will be held once work begins on Site with all Contractors participating. The Contractor and the COR may request Joint Health and Safety meetings when deemed necessary. The Contractor will take minutes of all Joint Health and Safety Conferences.

1.13 PERSONAL PROTECTIVE EQUIPMENT (PPE)

1.13.1 General

In accordance with 29 CFR 1910 Section .120 (g)(5) and 29 CFR 1926 Section .65 (g)(5), a written Personal Protective Equipment (PPE) program which addresses the elements listed in that regulation, and which complies with respiratory protection program requirements of 29 CFR 1910 Section .134, is to be included in the employer's Safety and Health Program. The

Site Safety and Health Plan shall detail the minimum PPE ensembles (including respirators) and specific materials from which the PPE components are constructed for each Site-specific task and operation to be performed, based upon the hazard/risk analysis. Components of levels of protection (B, C, D, and modifications) must be relevant to Site-specific conditions, including heat and cold stress potential and safety hazards. Only respirators approved by NIOSH shall be used. On-site personnel shall be provided with appropriate PPE. Protective equipment and clothing shall be kept clean and well-maintained. The PPE section of the SSHP shall include Site-specific procedures to determine PPE program effectiveness and for on-site fit-testing of respirators, cleaning, maintenance, inspection, and storage of PPE.

1.13.2 Levels of Protection

The Safety and Health Manager shall establish appropriate levels of protection for each work activity based on review of historical Site information, existing data, an evaluation of the potential for exposure (inhalation, dermal, ingestion, and injection) during each task, past air monitoring results, and a continuing safety and health monitoring program. The Safety and Health Manager shall also establish action levels for upgrade or downgrade in levels of PPE from the following specified minimum levels of protection. Protocols and the communication network for changing the level of protection shall be described in the SSHP. The PPE reassessment protocol shall address air monitoring results, potential for exposure, changes in Site conditions, work phases, job tasks, weather, temperature extremes, individual medical considerations, etc.

1.13.2.1 Components of Levels of Protection

The following items constitute minimum protective clothing and equipment ensembles to be utilized during this project:

Level A Not anticipated for this Site.

Level B Not anticipated for this Site.

Level C Not anticipated for this Site.

Level D Level D shall be used for most Site work, including, at a minimum, coveralls or similar work clothing, chemical-resistant safety boots, safety glasses, and hard hat. Work gloves shall be worn as necessary to avoid skin contact with sharp objects or rough edges on equipment.

In addition, modified Level D shall be worn as necessary to prevent skin contact with sediment or wet, contaminated debris. Modified Level D includes chemical resistant gloves and other splash protection (e.g., rain gear). All field personnel shall wear U.S. Coast Guard (USCG) approved personal flotation devices (PFDs—e.g., life jackets) when performing any task while on a boat. PFDs shall be inspected before and after each use. Defective equipment shall not be used.

1.13.2.2 Initial Minimum Levels of PPE by Task

Based on available information, the initial minimum protective equipment requirements for each major task and operation are listed in Table 01351-2. Available Site information shall be reviewed and the list of tasks and operations and these levels of protection shall be expanded and/or revised during preparation of the SSHP.

Table 01351-2
INITIAL PPE LEVELS BY TASK

Task/Operation	Initial Level of Protection
Handling and decontamination of debris and sediment	Modified Level D
Placement of cap over surficial sediments exceeding cleanup levels	Level D
Work with negligible chance of splashing of wet sediment	Level D

1.13.3 PPE for Government Personnel

Three clean sets of PPE and clothing (excluding safety shoes, which will be provided by individual visitors), as required for entry into the Exclusion Zone and/or Contamination Reduction Zone, shall be available for use by the CO or official visitors. The items shall be cleaned and maintained by the Contractor and stored as to provide adequate protection from contaminants and clearly marked: "FOR USE BY GOVERNMENT ONLY." The Contractor shall provide basic training in the use and limitations of the PPE provided, and institute administrative controls to check prerequisites prior to issuance. Such prerequisites include meeting minimum training requirements for the work tasks to be performed and medical clearance for Site hazards and respirator use.

1.14 MEDICAL SURVEILLANCE

The Safety and Health Manager, in conjunction with the Occupational Physician, shall detail, in the employer's Safety and Health Program and the SSHP, the medical surveillance program that includes scheduling of examinations, certification of fitness for duty, compliance with OSHA requirements, and information provided to the physician. Examinations shall be performed by or under the supervision of a licensed physician, preferably one board certified or eligible in occupational medicine, and shall be provided without cost to the employee, without loss of pay and at a reasonable time and place. Medical surveillance protocols and examination and test results shall be reviewed by the Occupational Physician. The medical surveillance program shall contain the requirements specified below. Personnel working in the EZ and CRZ shall have been examined as prescribed in 29 CFR 1910 Section .120, and 29 CFR 1926 Section .65, and determined medically fit to perform their duties.

1.14.1 Frequency of Examinations

Employees shall have been provided with medical examinations as specified, within the past 12 months and shall receive exams annually thereafter (if Contract duration exceeds 1 year); on termination of employment; reassignment in accordance with 29 CFR 1910 Section .120 (f)(3)(i), and 29 CFR 1926 Section .65 (f)(3)(i)(C); if the employee develops signs or symptoms of illness related to workplace exposures; if the physician determines examinations need to be conducted more often than once a year; and when an employee develops a lost time injury or illness during the period of this contract. The supervisor shall be provided with a written statement signed by the physician prior to allowing the employee to return to the work Site after injury or illness resulting in a lost workday, as defined in 29 CFR 1904 Section .12 (f).

1.14.2 Content of Examinations

The following elements shall be included in the medical surveillance program. Additional elements may be included at the discretion of the occupational physician responsible for reviewing the medical surveillance protocols.

a. Complete medical and occupational history (initial exam only)

b. General physical examination of major organ systems

c. Pulmonary function testing including forced vital capacity (FVC) and forced expiratory volume in one second (FEV1.0)

d. CBC with differential

e. Blood chemistry screening profile (e.g., SMAC 20/25)

f. Urinalysis with microscopic examination

g. Audiometric testing (as required by Hearing Conservation Program)

h. Visual acuity

i. Chest x-ray (This test is optional and should only be performed for specific individuals if so directed by Occupational Physician.)

j. Electrocardiogram (optional, as directed by Occupational Physician)

k. Urine heavy metals (arsenic, cadmium, chromium, and mercury)

l. Serum lead

m. Zinc protoporphyrin

1.14.3 Information Provided to the Occupational Physician

The physician shall be furnished with the following:

a. The SSHP

b. Information on each employee's anticipated or measured exposure

c. Description of any PPE used or to be used, by employee

d. Description of the employee's duties as they relate to the employee's potential or actual exposures (including physical demands on the employee and heat/cold stress)

e. Copy of 29 CFR 1910 Section .120, or 29 CFR 1926 Section .65

f. Information from previous examinations not readily available to the examining physician

g. Copy of Section 5.0 of NIOSH Pub No. 85-115

h. Information required by 29 CFR 1910 Section .134

1.14.4 Physician's Written Opinion

Before work begins, a copy of the physician's written opinion for each employee shall be obtained and furnished to the Safety and Health Manager and the employee. The opinion shall address the employee's ability to perform hazardous remediation work and shall contain the following:

a. The physician's recommended limitations upon the employee's assigned work and/or PPE usage

b. A statement that the employee has been informed and advised about the results of the examination

1.14.5 Medical Records

Documentation of medical exams shall be provided as part of the Certificate of Worker or Visitor Acknowledgment. Medical records shall be maintained in accordance with 29 CFR 1910 Section .120, and 29 CFR 1926 Section .65.

1.15 RADIATION DOSIMETRY (NOT USED)

1.16 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

The Safety and Health Manager shall prepare and implement an exposure monitoring/air sampling program to identify and quantify safety and health hazards and airborne levels of hazardous substances to assure proper selection of engineering controls, work practices and PPE for affected Site personnel. Available Site information shall be reviewed and the

exposure monitoring/air sampling program shall be expanded and/or revised for submittal as part of the SSHP.

1.17 HEAT AND COLD STRESS MONITORING

The Safety and Health Manager shall develop a heat stress and cold stress monitoring program for on-site activities. Details of the monitoring program, including schedules for work and rest, and physiological monitoring requirements, shall be described in the SSHP. Personnel shall be trained to recognize the symptoms of heat and cold stress. The SSHO and an alternate person shall be designated, in writing, to be responsible for the heat and cold stress monitoring program.

1.17.1 Heat Stress

Physiological monitoring shall commence when the ambient temperature is above 21.1 degrees C (70 degrees F). Monitoring frequency shall increase as the ambient temperature increases or as slow recovery rates are observed. Shaded rest areas and an adequate supply of cool drinking water shall be provided for the workers. NIOSH Pub No. 85-115 shall be consulted for guidance in determining protocols for prevention of heat stress.

1.17.2 Cold Stress

To guard against cold injury, appropriate clothing and warm shelter for rest periods shall be provided. Procedures to monitor and avoid cold stress shall be followed in accordance with the current TLVs for Cold Stress as recommended in ACGIH-0100.

1.18 SAFETY PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES

The SSHP shall describe the standard operating safety procedures, engineering controls, and safe work practices to be implemented for the work covered. These shall include, but not be limited to, the following:

1.18.1 General Site Rules/Prohibitions

Personnel must sign in and out each time they enter or leave the Site. Personnel must use the buddy system when in designated work zones. Eating and drinking are only allowed in the offices. Smoking is not allowed on vessels, within the property boundaries or within 50 feet of buildings, fuel, and propane tanks. Chewing gum or tobacco is only allowed in the SZ.

1.18.2 Work Permit Requirements

The Contractor is responsible for obtaining any permits necessary for work at this Site.

1.18.3 Material Handling Procedures

Materials shall be handled in a manner to reduce the production of airborne contaminants and dust.

1.18.3.1 Spill and Discharge Control.

Written spill and discharge containment/control procedures shall be developed and implemented. These procedures shall describe prevention measures, spill control measures and material to be used (e.g., booms, vermiculite); location of the spill control material; PPE required to cleanup spills; disposal of contaminated material; and who is responsible to report the spill. Storage of contaminated material or hazardous materials shall be appropriately bermed, diked, and/or contained to prevent any spillage of material on uncontaminated soil. If the spill or discharge is reportable, and/or human health or the environment are threatened, the National Response Center, the Washington State Department of Ecology, the United States Coast Guard (USCG), and the CO shall be notified as soon as possible.

1.18.4 Confined Space Entry Procedures

Confined space entry is not anticipated, however, the Contractor shall determine whether confined space entry procedures are required. If necessary, the Contractor shall include procedures for confined space entry in the SSHP.

1.18.5 Hot Work

No hot work is anticipated for this project. However, if Contractor must use welding or cutting equipment to perform specific work tasks, hot work safety procedures will be included in the SSHP.

1.18.6 Ignition Sources

No ignition sources are anticipated or permitted to be present at this Site. See paragraph 1.18.5 Hot Work if hot work becomes necessary. This includes smoking, open flames or fires.

1.18.7 Fire Protection And Prevention

Appropriate measures regarding housekeeping and other activities to reduce or eliminate the risk of fires shall be covered in the SSHP.

1.18.8 Electrical Safety

Electrical extension cords shall not be used except for temporary job Site requirements. Approval for any other use must be obtained from the SSHO.

All temporary electrical equipment used on the job Site will be listed by an approved testing laboratory for the specific application. All temporary electrical installations must conform to the National Electric Code.

a. Splices in electrical cords must retain the mechanical dielectric strength of the original cable

b. All generators and electrical equipment must be properly grounded

c. Ground fault circuit interrupters (GFCI) will be used on electrical equipment

1.18.9 Excavation and Trench Safety

Site personnel will be cautioned to stand clear of all powered equipment and open excavations. Routine entry into excavations for any reason is not anticipated. Site personnel shall not enter any excavations of 4 feet or greater depth without proper shoring or sloping.

1.18.10 Guarding Of Machinery and Equipment

Proper guarding of moving parts of machinery is not necessary for special attention in the SSHP. If any machine guard on equipment is removed, it must be replaced prior to restarting the equipment.

1.18.11 Lockout/Tagout

No lockout/tagout requirements for Site utilities are anticipated for this project. Contractor must maintain its own Lockout/Tagout program for equipment it brings to the Site.

1.18.12 Fall Protection

It is not anticipated that working from heights will be required for this project.

1.18.13 Hazard Communication

It is not anticipated that any chemicals or products requiring special hazard communication training will be brought on Site during this project. However, if the Contractor needs to bring any such products on Site, appropriate Hazard Communication Program will be included in the SSHP.

1.18.14 Illumination

Sufficient lighting for all areas of the Site shall be provided to meet the requirements specified in EM 385-1-1, Table 7-1 and provide safe access when walking within the work area at night. Lights used to illuminate work areas shall have shields directing the light downward to reduce glare. All marine equipment shall be equipped with lights in accordance with Section 01500 TEMPORARY CONSTRUCTION FACILITIES.

1.18.15 Sanitation

The Contractor shall provide sanitation facilities on the work Site, as well as decontamination facilities and trash removal. Sanitation shall meet the requirements of EM 385-1-1, Section 2.

1.18.16 Engineering Controls

Use of Engineering Controls to minimize generation of dust shall be specified in the SSHP.

1.18.17 Process Safety Management

The Contractor shall evaluate process safety management with regard to the requirements of 29 CFR 1910, Section .119.

1.18.18 Signs and Labels

To protect workers, materials, which could pose threat of exposure, shall be clearly labeled as to their hazard and (if appropriate) waste categorization.

1.18.19 Waste Disposal

Waste disposal shall be in accordance with Section 02120 TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS.

1.19 SITE CONTROL MEASURES

To prevent the spread of contamination and control the flow of personnel, vehicles, and materials into and out of work areas, Site control measures shall be established and described in the SSHP. The SSHP shall describe the methodology to be used by the Safety and Health Manager and SSHO in determining work zone designations and their modifications, and procedures to limit the spread of contamination. The SSHP shall include procedures for the implementation and enforcement of safety and health rules for all persons on the Site, including employers, employees, outside Contractors, government representatives, and visitors.

1.19.1 Work Zones

Initial anticipated work zone boundaries are shown on the Drawings. Utilizing this guidance, work zone boundaries (EZ, including restricted and regulated areas; CRZ; and SZ) and access points shall be established and the boundary delineations shall be included on figures in the SSHP. Delineation of work zone boundaries shall be based on the contamination characterization data and the hazard/risk analysis to be performed as described in paragraph 1.9 SAFETY AND HEALTH HAZARD/RISK ANALYSIS. As work progresses and field conditions are monitored, work zone boundaries may be modified with approval of the CO. Work zones shall be clearly identified and marked in the field (using fences, tape, signs, etc.). A Site map, showing work zone boundaries and locations of decontamination facilities, shall be posted in the Site office. Work zones shall consist of the following:

a. Exclusion Zone (EZ). The exclusion zone is the area where hazardous contamination is either known or expected to occur and the greatest potential for exposure exists. Entry into this area shall be controlled and exit may only be made through the CRZ.

b. Contamination Reduction Zone (CRZ). The CRZ is the transition area between the Exclusion Zone and the Support Zone. The personnel and equipment decontamination areas shall be separate and unique areas located in the CRZ.

c. Support Zone (SZ). The Support Zone is defined as areas of the Site, other than exclusion zones and contamination reduction zones, where workers do not have the potential to be exposed to hazardous substances or dangerous conditions resulting from hazardous waste operations. The Support Zone shall be secured against active or passive contamination. Site offices, parking areas, and other support facilities shall be located in the Support Zone.

1.19.2 Site Control Log

A log of personnel visiting, entering, or working on the Site shall be maintained. The log shall include the following: date, name, agency or company, time entering and exiting Site, time entering and exiting the exclusion zone (if applicable), and PPE utilized. Before visitors are allowed to enter the CRZ or EZ, they shall show proof of current training, medical surveillance, and respirator fit testing (if respirators are required for the tasks to be performed) and shall fill out the Certificate of Worker or Visitor Acknowledgment. This visitor information, including date, shall be recorded in the log.

1.19.3 Communication

An employee alarm system that has adequate means of on- and off-site communication shall be provided and installed in accordance with 29 CFR 1910 Section .165. The means of communication shall be able to be perceived above ambient noise or light levels by employees in the affected portions of the work place. The signals shall be distinctive and recognizable as messages to evacuate or to perform critical operations. This includes the use of walkie talkies, radios, and telephones.

1.19.4 Site Security

Only authorized individuals will be allowed to enter the Exclusion Zone. Control measures to exclude the public and unauthorized visitors will be established. Signs shall be printed in bold large letters on contrasting backgrounds in English and/or where appropriate, in the predominant language of workers unable to read English. Signs shall be visible from all points where entry might occur and at such distances from the restricted area that employees may read the signs and take necessary protective steps before entering.

1.20 PERSONAL HYGIENE AND DECONTAMINATION

Personnel entering the EZ or CRZ or otherwise exposed or subject to exposure to hazardous chemical vapors, liquids, or contaminated solids shall adhere to the following personal hygiene and decontamination provisions. Decontamination shall be performed in the CRZ prior to entering the Support Zone from the Exclusion Zone. Chapter 10.0 of NIOSH Pub No. 85-115 shall be consulted when preparing decontamination procedures. A detailed discussion of personal hygiene and decontamination facilities and procedures to be followed by Site workers shall be submitted as part of the SSHP. Employees shall be trained in the procedures and the procedures shall be enforced throughout Site operations. Persons disregarding these provisions of the SSHP shall be barred from the Site.

1.20.1 Decontamination Procedures

Minimum decontamination procedures shall be specified in the SSHP. Available Site information shall be reviewed and these procedures shall be expanded and/or revised for submittal as part of the SSHP, as necessary.

1.21 EQUIPMENT DECONTAMINATION

Vehicles and equipment used in the EZ shall be decontaminated in the CRZ prior to leaving the Site. The procedures for decontamination of vehicles and equipment shall be addressed in the SSHP.

1.21.1 Decontamination Facilities

A vehicle/equipment decontamination station shall be provided so that the Contractor decontaminates vehicles and equipment prior to leaving the Site. During the preconstruction meeting, the CO and the Contractor will walk the Site to determine an appropriate location for this facility.

1.21.2 Decontamination Procedures

Procedures for equipment decontamination shall be developed and utilized to prevent the spread of contamination into the SZ and off-site areas. These procedures shall address disposal of contaminated products and spent materials used on the Site, including containers, fluids, oils, etc. Any item taken into the EZ shall be assumed to be contaminated and shall be inspected and/or decontaminated before the item leaves the area. Vehicles, equipment, and materials shall be cleaned and decontaminated prior to leaving the Site. Construction material shall be handled in such a way as to minimize the potential for contaminants being spread and/or carried off Site. Prior to exiting the Site, vehicles and equipment shall be monitored to ensure the adequacy of decontamination. Seawater may be used for decontamination of equipment on-site and returned to the Bay. Other decontamination fluids shall be allowed to evaporate on Site or properly containerized and disposed of off-site. Solid waste shall be disposed off-site at a facility in compliance with the CERCLA Off-Site Rule.

1.22 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

The SSHP shall describe the emergency and first aid equipment to be available onsite. The following items, as a minimum, shall be maintained onsite and available for immediate use:

a. First aid equipment and supplies approved by the consulting physician

b. Emergency eyewashes and showers which comply with ANSI Z358.1

c. Emergency-use respirators. The SSHP shall provide a rationale for whether emergency respirators are needed. If needed, the Contractor shall provide the respirators onsite. These shall be dedicated for emergency use only and maintained onsite in the CRZ

d. Fire extinguishers shall be provided at Site facilities and in all vehicles and at any other Site locations where flammable materials present a fire risk

1.23 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

An Emergency Response Plan, that meets the requirements of 29 CFR 1910 Section .120 (l) and 29 CFR 1926 Section .65 (l), shall be developed and implemented as a section of the SSHP. In the event of any emergency associated with remedial action, the Contractor shall, without delay, alert all on-site employees that there is an emergency situation; take action to remove or otherwise minimize the cause of the emergency; alert the CO; and institute measures necessary to prevent repetition of the conditions or actions leading to, or resulting in, the emergency. Employees that are required to respond to hazardous emergency situations shall be trained in how to respond to such expected emergencies. The plan shall be rehearsed regularly as part of the overall training program for Site operations. The plan shall be reviewed periodically and revised as necessary to reflect new or changing Site conditions or information. Copies of the accepted SSHP and revisions shall be provided to the affected local emergency response agencies. The following elements, as a minimum, shall be addressed in the plan:

a. Pre-emergency planning. The local emergency response agencies shall be contacted and met with during preparation of the Emergency Response Plan. Agencies to be contacted include Seattle Fire Department, Seattle Police Department, Port of Seattle port police, the USCG, and rescue authorities with jurisdiction and nearby medical facilities that may be utilized for emergency treatment of injured personnel. At these meetings, the agencies shall be notified of upcoming Site activities and potential emergency situations. The response agencies' capabilities shall be ascertained and written response commitments obtained. The Contractor shall ensure the Emergency Response Plan for the Site is compatible and integrated with the disaster, fire and/or emergency response plans of local, state, and federal agencies

b. Personnel roles, lines of authority, communications for emergencies

c. Emergency recognition and prevention

d. Site topography, layout, and prevailing weather conditions

e. Criteria and procedures for Site evacuation (emergency alerting procedures, employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, Site security and control)

f. Specific procedures for decontamination and medical treatment of injured personnel

g. Route maps to nearest prenotified medical facility. Site-support vehicles shall be equipped with maps. At the beginning of project operations, drivers of the support vehicles shall become familiar with the emergency route and the travel time required

h. Emergency alerting and response procedures including posted instructions and a list of names and telephone numbers of emergency contacts (physician, nearby medical facility,

fire and police departments, ambulance service, Federal, state, and local environmental agencies; as well as Safety and Health Manager, the Site Superintendent, the CO and/or their alternates)

i. Criteria for initiating community alert program, contacts, and responsibilities

j. Procedures for reporting incidents to appropriate government agencies. In the event that an incident such as an explosion or fire, or a spill or release of toxic materials occurs during the course of the project, the appropriate government agencies shall be immediately notified. In addition, the CO shall be verbally notified immediately and receive a written notification within 24 hours. The report shall include the following items:

(1) Name, organization, telephone number, and location of the Contractor

(2) Name and title of the person(s) reporting

(3) Date and time of the incident

(4) Location of the incident, i.e., Site location, facility name

(5) Brief summary of the incident giving pertinent details including type of operation ongoing at the time of the incident

(6) Cause of the incident, if known

(7) Casualties (fatalities, disabling injuries)

(8) Details of any existing chemical hazard or contamination

(9) Estimated property damage, if applicable

(10) Nature of damage, effect on contract schedule

(11) Action taken to ensure safety and security

(12) Other damage or injuries sustained, public or private

k. Procedures for critique of emergency responses and follow-up

1.24 CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGMENT

A copy of a Contractor-generated certificate of worker/visitor acknowledgment shall be completed and submitted for each visitor allowed to enter contamination reduction or exclusion zones, and for each employee, following the example certificate at the end of this section.

1.25 INSPECTIONS

The SSHO shall perform daily inspections of the job Site and the work in progress to ensure compliance with EM 385-1-1, the Safety and Health Program, the SSHP, and other occupational health and safety requirements of the contract, and to determine the effectiveness of the SSHP. Procedures for correcting deficiencies (including actions, timetable, and responsibilities) shall be described in the SSHP. Follow-up inspections to ensure correction of deficiencies shall be conducted and documented. Daily safety inspection logs shall be used to document the inspections, noting safety and health deficiencies, deficiencies in the effectiveness of the SSHP, and corrective actions taken. The SSHO's Daily Inspection Logs shall be attached to and submitted with the Daily CQC reports. Each entry shall include the following: date, work area checked, employees present in work area, PPE and work equipment being used in each area, special safety and health issues and notes, and signature of preparer. In the event of an accident, the CO shall be notified according to EM 385-1-1. Within 2 working days of any reportable accident, an Accident Report shall be completed on ENG Form 3394 and submitted.

1.26 SAFETY AND HEALTH PHASE-OUT REPORT

A Safety and Health Phase-Out Report shall be submitted within 10 working days following completion of the work, prior to final acceptance of the work. The following minimum information shall be included:

a. Summary of the overall performance of safety and health (accidents or incidents including near misses, unusual events, lessons learned, etc.)

b. Final decontamination documentation including procedures and techniques used to decontaminate equipment, vehicles, and on-site facilities

c. Summary of exposure monitoring and air sampling accomplished during the project

d. Signatures of Safety and Health Manager and SSHO

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

Attachment 01351-A
EXAMPLE CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGMENT

PROJECT NAME
CONTRACT NO.
PROJECT ADDRESS
CONTRACTOR'S NAME
[EMPLOYEE'S][VISITOR'S] NAME

The contract for the above project requires the following: that you be provided with and complete formal and Site-specific training; that you be supplied with proper personal protective equipment including respirators; that you be trained in its use; and that you receive a medical examination to evaluate your physical capacity to perform your assigned work tasks, under the environmental conditions expected, while wearing the required personal protective equipment. These things are to be done at no cost to you. By signing this certification, you are acknowledging that your employer has met these obligations to you.

I HAVE READ, UNDERSTAND AND AGREE TO FOLLOW THE SITE SAFETY AND HEALTH PLAN FOR THIS SITE.

Name Date

--- ---

FORMAL TRAINING: I have completed the following formal training courses that meet OSHA's requirements:

Date Completed

40 hour: _____
8 hour supervisory: _____
8 hour refresher: _____

SITE-SPECIFIC TRAINING: I have been provided and have completed the Site-specific training required by this Contract. The Site Safety and Health Officer conducted the training.

_____

RESPIRATORY PROTECTION: I have been trained in accordance with the criteria in [the Contractor's] [my Employer's] Respiratory Protection program. I have been trained in the proper work procedures and use and limitations of the respirator(s) I will wear. I have been trained in and will abide by the facial hair policy. _____

RESPIRATOR FIT-TEST TRAINING: I have been trained in the proper selection, fit, use, care, cleaning, and maintenance, and storage of the respirator(s) that I will wear. I have been fit-tested in accordance with the criteria in [the Contractor's] [my employer's] Respiratory Program and have received a satisfactory fit. [I have been assigned my individual respirator.] I have been taught how to properly perform positive and negative pressure fit-check upon donning negative pressure respirators each time._____

MEDICAL EXAMINATION: I have had a medical examination within the last twelve months, which was paid for by my employer. The examination included: health history, pulmonary function tests and may have included an evaluation of a chest x-ray. A physician made determination regarding my physical capacity to perform work tasks on the project while wearing protective equipment including a respirator. I was personally provided a copy and informed of the results of that examination. My employer's industrial hygienist evaluated the medical certification provided by the physician and checked the appropriate blank below. The physician determined that there:

___were no limitations to performing the required work tasks;
___were identified physical limitations to performing the required work tasks.

Date medical exam completed

[Employee's][Visitor's] Signature _____

Date _____ Printed Name _____

Social Security Number _____

Contractor's Site Safety and Health Officer Signature _____

Date _____ Printed Name _____

Social Security Number _____

END OF SECTION

SECTION 01355

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. The most recent version of the reference applies.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
CODE OF FEDERAL REGULATIONS (CFR)

33 CFR 328	Definitions
40 CFR 68	Chemical Accident Prevention Provisions
40 CFR 141	National Primary Drinking Water Regulations
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 279	Standards for the Management of Used Oil
40 CFR 300.440	Procedures for Planning and Implementing Off-Site Response Actions
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 355	Emergency Planning and Notification
49 CFR 171 - 178	Hazardous Materials Regulations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(1996) U.S. Army Corps on Engineers Safety and Health Requirements Manual
WETLAND MANUAL	U.S. Army Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1

WASHINGTON STATE ADMINISTRATIVE CODE (WAC)

WAC 173-60	Maximum Environmental Noise Levels
WAC 173-62	Motor Vehicle Noise Performance Standards
WAC 173-216	State Waste Discharge Permit Program
WAC 173-201A-070	Water Quality Standards for Surface Water of the State of Washington
WAC 173-220	Point Source Discharges to Surface Water
WAC 173-303	Dangerous Waste Regulations
WAC 173-304	Minimum Functional Standards for Solid Waste Handling
WAC 173-340	Model Toxics Control Act Cleanup Regulation

WASHINGTON STATE DEPARTMENT OF ECOLOGY (ECOLOGY)

ECOLOGY 99-11 through 99-15	(August 2001) Stormwater Management Manual for Western Washington

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 4439	(2002) Standard Terminology for Geosynthetics
ASTM D 4491	(1999) Water Permeability of Geotextiles by Permittivity
ASTM D 4533	(1991; R 1996) Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	(1991; R 1996)) Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	(1999) Determining Apparent Opening Size of a Geotextile
ASTM D 4873	(2002) Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples

1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; as well as other pollutants.

1.2.3 Contractor-Generated Hazardous Waste

Contractor-generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on Site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e., methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents, lubricants, fuels, and antifreeze.

1.2.4 Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor shall discharge water at a rate which allows the water to percolate into the soil. No runoff, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" shall occur. Land Application shall be in compliance with all applicable Federal, State, and local laws and regulations.

1.2.5 Surface Discharge

The term "Surface Discharge" implies that the water is discharged with possible runoff and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "waters of the United States" and would require a permit to discharge water from the governing agency. (On-site discharges would not require a permit but would need to meet substantive permit requirements). "Surface Discharge" does not include dewatering liquids from dredged material, provided the dewatering liquids are return water from the dredging operation and are returned to the site waters during the course of dredging. "Surface Discharge" does not include surface water used to hydraulically wash cap materials off a barge.

1.2.6 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.3 GENERAL REQUIREMENTS

The Contractor shall perform the Work minimizing environmental pollution and damage as the result of construction operations. The control of environmental pollution and damage requires consideration of land, water, and air and includes management of visual aesthetics, emissions, dust, noise, solid waste, liquid waste, as well as other pollutants. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this Contract. The Contractor shall comply with all applicable environmental Federal, State, and local laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations.

1.4 SUBCONTRACTORS

The Contractor shall ensure compliance with this Section by subcontractors.

1.5 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-01 Data

Filter Fabric Fence, FIO

The Contractor shall provide Manufacturer's product data.

SD-09 Reports

Environmental Protection Plan; GA

The Contractor shall submit an Environmental Protection Plan with the RAMP in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN.

SD-13 Certificates

Mill Certificate or Affidavit, GA

A mill certificate or affidavit shall be provided attesting that the fabric and factory seams meet chemical, physical, and manufacturing requirements specified herein.

1.6 ENVIRONMENTAL PROTECTION PLAN

The Contractor shall submit an Environmental Protection Plan as part of the RAMP in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN, for review and approval by the Contracting Officer (CO). The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during remedial action construction. Issues of concern shall be defined within the Environmental Protection Plan as outlined in this Section. The Contractor shall address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Approval of the Contractor's plan will not relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures including Spill Response. The Environmental Protection Plan shall be current and maintained on Site by the Contractor.

1.6.1 Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During construction, the Contractor shall be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

1.6.2 Contents

Contents of the Environmental Protection Plan are described in Section 01400 REMEDIAL ACTION MANAGEMENT PLAN.

1.7 PROTECTION FEATURES (PRECONSTRUCTION SURVEY)

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, the Contractor and the CO shall make a joint condition survey. Immediately following the survey, the Contractor shall prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the Drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the Site of Work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report shall be signed by both the Contractor and the CO upon mutual agreement as to its accuracy and completeness. The Contractor shall protect those environmental features included in the survey report and any indicated on the Drawings, regardless of interference with which their preservation may cause to the Contractor's work under the Contract.

1.8 SPECIAL ENVIRONMENTAL REQUIREMENTS (NOT USED)

1.9 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the Drawings and/or Specifications which may have an environmental impact will be subject to approval by the CO and may require an extended review, processing, and approval time. The CO reserves the right to disapprove alternate methods, even if they are more cost effective, if the CO determines that the proposed alternate method will have an adverse environmental impact.

1.10 NOTIFICATION

The CO will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. The Contractor shall, after receipt of such notice, inform the CO of the proposed corrective action and take such action when approved by the CO. The CO may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the CO may take under the Contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

1.11 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW) PERIMETER AIR MONITORING (NOT USED)

PART 2 PRODUCTS

2.1 COMPONENTS FOR SILT FENCES

2.1.1 The Contractor shall select filter fabric, silt fence stakes and posts, if required, to prevent violations of any applicable water quality standards.

2.1.2 Filter Fabric

The geotextile shall comply with the requirements of ASTM D 4439, and shall consist of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. The filament shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of ester, propylene, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultraviolet and heat exposure. The filter fabric shall meet the requirements in Table 01355-1.

Table 01355-1
FILTER FABRIC FOR SILT SCREEN FENCE

Physical Property	Test Procedure	Strength Requirement
Grab Tensile	ASTM D 4632	100 pounds minimum
Elongation (%)	ASTM D 4632	30% maximum
Trapezoid Tear	ASTM D 4533	55 pounds minimum
Permittivity	ASTM D 4491	0.2 $second^{-1}$
AOS (U.S. Std Sieve)	ASTM D 4751	20-100

2.1.3 Silt Fence Stakes and Posts

The Contractor may use wooden stakes, steel posts, concrete barriers, or other suitable means for fence installation.

2.1.4 Mill Certificate or Affidavit

A mill certificate or affidavit shall be provided attesting that the fabric and factory seams meet chemical, physical, and manufacturing requirements specified above. The mill certificate or affidavit shall specify the actual Minimum Average Roll Values and shall identify the fabric supplied by roll identification numbers. The Contractor shall submit a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the filter fabric.

2.1.5 Identification Storage and Handling

Filter fabric shall be identified, stored and handled in accordance with ASTM D 4873.

2.2 COMPONENTS FOR STRAW BALES

Straw bales shall not be used.

2.3 OIL SPILL CONTAINMENT PRODUCTS

The Contractor shall select booms, sorbent pads, and other oil spill containment products, as required, and in accordance with applicable Federal, State, and local regulations.

PART 3 EXECUTION

3.1 ENVIRONMENTAL PERMITS AND COMMITMENTS

The Contractor shall comply with requirements of all regulatory approvals, permits, certifications, or licenses. The CO will not obtain any on-site permits for this project; see contract clause PERMITS AND RESPONSIBILITIES. Permits for on-site work are not required for this project; however, the Contractor must comply with substantive portions of applicable regulations. The Contractor shall be responsible for providing all information needed to obtain regulatory approvals from Federal, State, and local agencies for on-site work where substantive permit requirements must be met. The Contractor shall be responsible for implementing the terms and requirements of the appropriate permits and

regulatory approvals. The Contractor shall be responsible for obtaining all approvals required for off-site transportation and disposal of dredged material in accordance with Section 02120 TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS.

3.2 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the Drawings and Specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, wetlands, and land forms without approval. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. The Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, soil, or other materials displaced into uncleared areas shall be removed by the Contractor.

3.2.1 Work Area Limits

Prior to commencing construction activities, the Contractor shall mark the areas that need not be disturbed under this Contract. Isolated areas within the general work area which are not to be disturbed shall be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.2.2 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the Drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.2.3 Erosion and Sediment Controls

The Contractor shall be responsible for providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. The Contractor shall construct or install temporary and permanent erosion and sediment control best management practices (BMPs) as specified in the Environmental Protection Plan in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN and approved by the CO. BMPs may include, but are not limited to, stockpile covers, bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels,

sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. Any temporary measures shall be removed after the area has been stabilized.

3.2.3.1 Stabilization Practices

The stabilization practices may include, but are not limited to, temporary seeding, mulching, geotextiles, sod stabilization, erosion control mats, protection of trees, and preservation of mature vegetation. On the daily Contractor Quality Control (CQC) Report, in accordance with Section 01451 CONTRACTOR QUALITY CONTROL, the Contractor shall record the dates when major land-disturbing activities occur; when remediation activities temporarily or permanently cease on a portion of the Site; and when stabilization practices are initiated. Stabilization practices shall be initiated as soon as practicable, but no more than 14 calendar days after remediation activities have temporarily or permanently ceased, except where the remediation activity will resume with 21 calendar days from when activities ceased or unsuitable conditions exist on the Site caused by weather. In the case where stabilization practices have not been initiated due to unsuitable weather conditions, stabilization practices shall be initiated as soon as practicable after conditions become suitable.

3.2.3.2 Structural Practices

Structural practices shall be implemented to divert flows from exposed soils; temporarily store flows; or otherwise limit runon, runoff, and discharge of pollutants from exposed areas of the Site. Structural practices shall be implemented in a timely manner during the installation process to minimize erosion and sediment runoff. The structural practices shall include grading, silt fences, and straw bales. The Contractor shall perform grading to minimize surface water runon onto exposed soils. The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion. Final removal of silt fence barriers shall be upon approval by the CO.

3.2.4 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated in the Site Plan, Section 01500 TEMPORARY CONSTRUCTION FACILITIES, or as directed by the CO. Temporary movement or relocation of Contractor facilities shall be made only when approved by the CO. Erosion and sediment controls shall be provided for on-site stockpile, borrow, and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.2.5 Installation of Silt Fences

The Contractor shall install silt fences, as required, to prevent violations of any water quality standards.

3.2.6 Maintenance of Silt Fence

The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures.

3.2.7 Inspections of Silt Fence

The Contractor shall inspect disturbed areas of the Site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and area where vehicles exit the Site at least once every 7 calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the Site. Where sites have been finally stabilized, such inspection shall be conducted at least once every month.

3.3 WATER QUALITY MONITORING

The Contractor shall obtain and analyze water quality samples. Samples shall be collected to monitor short-term water quality impacts from dredging, capping, and associated in-water construction activities, and to invoke corrective actions or modify dredging or capping procedures, if necessary, to bring construction activities into compliance with water quality criteria.

3.3.1 Objectives of Water Quality Monitoring

The overall objective of water quality monitoring is to provide ongoing assessment of water quality impacts during dredging, capping, and construction activities. Specific objectives are as follows:

a. To document water quality conditions during construction activities and ambient conditions prior to construction activities

b. To ensure that water quality parameters (dissolved oxygen, turbidity, temperature, and total suspended solids) in the vicinity of the construction sites do not exceed prescribed limits

c. To guide the Contractor to modify construction operation activities as necessary to protect the receiving water environment

d. To provide continuous visual monitoring during construction for the presence of oily sediment, sheen, and the presence of distressed or dying fish

3.3.2 Monitoring Parameters and Performance Criteria

Performance criteria for water quality monitoring are designed to fulfill the substantive requirements of the Clean Water Act (CWA) Section 401 water quality compliance

certification. Compliance with the CWA is identified as an Applicable or Relevant and Appropriate Requirement (ARAR) in the Record of Decision (ROD) for this project.

Consistent with this requirement, the Contractor shall ensure that all project activities comply with the Water Quality Standards for Surface Waters of the State of Washington (WAC 173-201A), a delegated state authority for CWA regulation. In addition, the Contractor shall ensure that all project activities comply with the Section 401 Water Quality Certification (WQC), as issued by EPA for this project. The WQC may contain provisions in addition to those listed herein. If the requirements of the WQC conflict with any requirements of these Specifications, the WQC shall take precedence.

The Contractor shall monitor impacts to water quality in the vicinity of dredging and other construction activities (including but not limited to cap placement and outfall extension construction) for the following parameters:

a. Dissolved oxygen (DO)
b. Turbidity
c. Temperature
d. Total suspended solids (TSS)
e. Sheens

Remediation areas for this project are situated in Class A waters of the State, per WAC 173-201A. Water quality compliance criteria for Class A water are listed in Table 01355-2.

Table 01355-2
WATER QUALITY PARAMETERS AND COMPLIANCE CRITERIA

Parameter	Compliance Criteria	Basis	Point of Compliance
Dissolved Oxygen	No less than 6 mg/L; if the DO is already below 6 mg/L, then the project shall not cause DO to decrease by 0.2 mg/L.	WAC 173-201A	Compliance boundary
	No less than 4 mg/L	Acute effects	"Early Warning" location
Turbidity	No greater than 5 NTU over background when background is 50 NTUs or less; no greater than 10% increase when background is >50 NTUs.	WAC 173-201A	Compliance boundary
Temperature	<16°C; and no incremental increase >0.3°C allowed when background temperature naturally exceeds 16°C.	WAC 173-201A	Compliance boundary
Total Suspended Solids	For informational purposes (no criteria available)	–	–
Sheens	No visible sheens allowed outside the work area. Sheens shall be contained with booms or other appropriate controls.	WAC 173-201A	All surface water outside of containment booms

Notes:
°C - degrees Celsius
DO - dissolved oxygen
mg/L - milligram per liter
NTU - Nephelometric turbidity unit
WAC - Washington Administrative Code
< - less than
> - greater than

3.3.3 Monitoring Locations

The Contractor shall perform water quality monitoring in the vicinity of dredging and in-water construction operations, including, but not limited to, sediment capping.

Monitoring will occur only when the listed activity is in progress and at specified times and frequencies during the listed activity. Monitoring shall be performed at the water quality compliance boundary at the edge of the mixing zone, and at an "early warning" location inside the mixing zone, as described in paragraph 3.3.4 Points of Compliance and Monitoring Locations.

3.3.4 Points of Compliance and Monitoring Locations

Currents at the Site are weak and variable, and generally in response to tidal fluctuation. Three down-current locations and one up-current location will be monitored as shown on the Drawings.

Compliance boundaries shall be established based on a mixing zone length of 300 feet, unless otherwise specified in the WQC. Mixing zones shall be oriented radially around each construction activity, and shall migrate with the activity.

Two of the down-current monitoring locations shall be at the mixing zone boundary. The third down-current monitoring location shall be at the midpoint of the mixing zone to provide an "early warning" of water quality impacts. This midpoint location shall comply with the minimum requirement for dissolved oxygen (see Table 01355-2); however, this location is not a point of compliance for other water quality criteria.

The monitoring locations may shift laterally along the compliance boundary to intercept any visible turbidity plumes emanating from construction activities. Monitoring locations shall be adjusted to target the turbidity plume, which shall be tracked hydro-acoustically if required by the WQC. If no distinct turbidity plume can be identified, monitoring locations shall be in the area immediately down current of the dominant tidal flow. If more than one construction activity is taking place in close proximity, such that the mixing zones for the activities overlap, the construction zone may be treated as one contiguous area for monitoring purposes. In such cases, the CO shall be consulted to determine how best to modify the compliance boundaries and monitoring stations.

3.3.5 Depth of Sampling

Water quality parameters shall be averaged over the depth of the water column, based on discrete measurements at three water depths. Measurements shall be adjusted within the depth range to target the turbidity plume, which shall be tracked hydro-acoustically. If no distinct turbidity plume can be identified, measurements shall be obtained at the standard depths (i.e., surface, mid-depth, and near bottom). At each sampling station, three depth-specific measurements shall be collected at shallow, intermediate, and deep water levels. The shallow measurements shall be collected approximately 2 feet below the water surface. The deep measurements shall be collected within 6 feet of the mudline, and the intermediate measurements shall be collected near the midpoint of the water column.

No portion of the monitoring instrument (e.g. an anchor on the end of the wire line) shall touch the sea floor during monitoring, especially during collection of the deep-water measurement. This will prevent operator-induced disturbance of seafloor sediments that could cause spurious and elevated turbidity measurements. Monitoring instruments shall be calibrated daily or more frequently.

TSS samples shall be collected using a "discrete" type water column sampler from the mid-point of the water column.

3.3.6 Monitoring Schedules

Water quality monitoring shall be performed according to three schedules: intensive, routine, and limited. Ambient monitoring shall be performed in conjunction with the three schedules as reference and background checks on water quality outside of the construction area and before construction activities, respectively. The types of monitoring and schedules are shown in Table 01355-3.

Table 01355-3
WATER QUALITY MONITORING SCHEDULE

Monitoring	Schedule	Initiation Conditions for Schedule
Ambient	• Background collected 24-48 hours prior to initiation of construction • Reference (outside of the influence of activity) collected with all other water quality monitoring events	• Background: on-site measurements prior to any in-water construction activity • Reference: in conjunction with all other water quality monitoring events (intensive, routine, or limited)
Intensive	• Minimum twice daily for 2 days following any initiation condition for intensive monitoring.	• Startup of any in-water construction activity • In response to any major modification to construction procedures • In response to an exceedance of any water quality performance criteria at the compliance boundary
Routine	• Once daily	• No performance criteria are exceeded at the compliance boundary during intensive monitoring for 2 days; requires CO approval
Limited	• Once weekly	• No performance criteria are exceeded at the compliance boundary during routine monitoring for 1 week; requires CO approval

3.3.6.1 Ambient Monitoring

The Contractor shall implement an ambient water quality monitoring program that includes background and reference monitoring locations. The procedures of this program shall be summarized in the Environmental Protection Plan in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN. The objective of the ambient water quality monitoring program is to determine ambient background values for the water quality parameters listed in Table 01355-2.

3.3.6.1.1 Preconstruction Background Monitoring

Preconstruction background water quality measurements will be collected at a total of three reference station locations as shown on the Drawings. The background monitoring measurements shall be collected at depths in accordance with paragraph 3.3.5 Depth of Sampling. Background monitoring measurements shall be collected 24 to 48 hours prior to initiation of any in-water construction.

3.3.6.1.2 Reference Monitoring During Construction

In addition to pre-construction monitoring, at least one of the seaward reference station locations shall be monitored concurrently with the monitoring of construction activities, to check for unusual excursions of ambient conditions. The selection of the reference monitoring location during construction activities shall be rotated as necessary to ensure that the reference monitoring location is beyond the influence of construction activities. Background values shall be recalculated monthly to incorporate additional measurements collected during construction.

3.3.6.1.3 Background Calculation

The background values for turbidity and temperature shall be established as the upper 90th percentile values of ambient water quality measurements. The background value for DO shall be established as the lower 10th percentile value of ambient water quality measurements. Percentiles shall be calculated based on a nonparametric ranking of the data.

3.3.6.2 Intensive Monitoring

Intensive Monitoring shall be performed at a minimum frequency of twice daily and shall be initiated at the following times:

a. During startup of any in-water construction activity

b. In response to any major modification to construction procedures

c. In response to an exceedance of any water quality performance criteria at the compliance boundary (see Paragraph 3.3.9 Determination of Compliance for exceedance criteria)

Intensive Monitoring shall continue for a period of two days following any of the triggering conditions listed above. If performance criteria have not been exceeded at the water quality compliance boundary within the 2-day startup period, then Routine Monitoring may be initiated with CO approval.

3.3.6.3 Routine Monitoring

Routine Monitoring shall be performed at a minimum frequency of once daily. Routine Monitoring shall be conducted if no performance criteria are exceeded during the Intensive Monitoring period. If the Routine Monitoring performance criteria have not been exceeded

at the water quality compliance boundary during 5 consecutive days, then Limited Monitoring may be initiated with CO approval, as described below.

3.3.6.4 Limited Monitoring

Limited Monitoring shall be performed at a minimum frequency of once per week. Limited Monitoring may be conducted during such operations if no performance criteria are exceeded during Routine Monitoring for one week.

Upon review of the monitoring records, the CO may increase the monitoring frequency and/or add sample locations to provide additional assurance that water quality impacts are being controlled, or decrease the monitoring frequency if records indicate little risk of adverse impacts.

3.3.7 Timing of Monitoring Activities

During all work activities, the water surface shall be continually visually monitored for sheens or distressed fish or wildlife. Occurrence of sheens beyond containment areas shall be reported to the CO immediately and corrective action shall be taken to contain and remove the sheen.

During Intensive Monitoring (twice daily), the first and second round of measurements shall be separated by a minimum 3-hour period. One of these measurements shall occur during strong ebb or flood tidal conditions. During Routine Monitoring (once per day) and Limited Monitoring (once per week), water quality measurements will be conducted during strong ebb or flood tidal conditions.

3.3.8 Sampling and Analysis Requirements

TSS samples shall be analyzed by EPA Method 160.2 with a 5-day turnaround time for laboratory results. Temperature, turbidity, and DO shall be measured by direct-reading meter. Instrument precision shall be within the following limits:

a. DO: ±0.5 mg/L
b. Turbidity: ±0.5 NTU
c. Temperature: ±0.1°C

3.3.9 Determination of Compliance

Compliance shall be determined at the boundary of the mixing zone by comparing water quality measurements to the performance criteria listed in Table 01355-2. Monitoring performed at the mid-point of the mixing zone shall also be evaluated for compliance with the acute effects dissolved oxygen criterion. However, the mid-point location shall not be used to determine compliance with any other parameters.

If a water quality criterion is exceeded, the instrument calibration shall be checked and a second group of measurements shall be collected immediately at all monitoring locations associated with the activity of concern. An exceedance of the water quality criterion shall be

confirmed if the criterion is exceeded for a second time at the compliance boundary. The exceedance need not be confirmed at the same location as the original exceedance, because currents and tides may cause the construction-induced plume to shift its orientation.

3.3.10 Corrective Action

Two types of corrective action shall be implemented depending on the nature of the water quality impact(s):

a. Modification of Operations: If water quality criteria for turbidity are exceeded, the Contractor shall immediately take appropriate steps to correct the exceedance and improve water quality conditions. Such steps may include modified construction management practices, engineering controls, and other measures, as appropriate. If sheens are observed at any time, the Contractor shall contain the sheens with containment booms. The Contractor shall remove any sheens with sorbent materials. If corrective actions do not result in attaining water quality compliance criteria at the compliance boundary, construction activities may be stopped at the direction of the CO.

b. Cessation of Operations: Construction activities shall cease as a result of the following conditions:

   i. The first indication of significant oil sheen migrating outside of containment booms;

   ii. DO levels fall below 4.0 mg/L at any location; or

   iii. The first indication of distressed or dying fish or wildlife in the vicinity of construction activities.

   When such conditions occur, operations shall cease and the Contractor shall take all necessary steps to alleviate the problem. Water quality parameters shall be measured immediately at the location of the problem. The CO shall be immediately notified of the condition. Operations may resume under the direction of the CO when the problem has been rectified, and water quality parameters are in compliance with performance criteria.

3.3.11 Daily Reports

The Contractor shall submit all water quality monitoring results from measurements taken during the previous day with each Daily Contractor Quality Control Report in accordance with Section 01451 CONTRACTOR QUALITY CONTROL.

3.3.12 Water Quality Monitoring SAP

The Contractor shall submit a Water Quality Monitoring Sampling and Analysis Plan (SAP) that includes a Field Sampling Plan and Quality Assurance Project Plan (FSP/QAPP) for approval as an appendix to the Environmental Protection Plan, in accordance with Section

01400 REMEDIAL ACTION MANAGEMENT PLAN. The Water Quality Monitoring SAP shall explain in detail the methods to be employed by the Contractor, as required, to comply with the Specifications.

3.3.13 Monthly Water Quality Report

The Contractor shall submit a monthly Water Quality Report. The report shall contain a summary of all in-water construction activities during the month, Contractor performance relative to the water quality compliance criteria (Table 01355-2), any exceedance of the compliance criteria and the corrective actions taken, and updated background water quality values.

3.4 AIR RESOURCES

Equipment operation, activities, or processes performed by the Contractor in accomplishing the specified construction shall be in accordance with all Federal and State air emission and performance laws and standards.

3.4.1 Particulates

Dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, shall be controlled at all times, including weekends, holidays, and hours when work is not in progress. The Contractor shall maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. The Contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The Contractor shall comply with all State and local visibility regulations.

3.4.2 Odors

Odors from construction activities shall be controlled at all times. The odors shall not cause a health hazard and shall be in compliance with State regulations and/or local ordinances.

3.4.3 Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise. The Contractor shall comply with the provisions of the State of Washington rules and City of Seattle regulations.

3.4.4 Burning

Burning will not be allowed on the Site.

3.5 HTRW AIR EMISSION CONTROL (NOT USED)

3.6 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes shall be as specified in Section 02120 TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS. Management of dredged sediments and free liquids drained from dewatered sediment shall be in accordance with Section 02325 DREDGING.

3.7 RECYCLING AND WASTE MINIMIZATION

The Contractor shall participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project.

3.8 NON-HAZARDOUS SOLID WASTE DIVERSION REPORT (NOT USED)

3.9 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Previous investigations during the remedial design phase did not identify any resources that require mitigation. A potential still exists, however, that subsurface excavation could encounter cultural resources associated with ethnohistoric and/or prehistoric use by Native American inhabitants of Puget Sound. If, during excavation or other construction activities, any previously unidentified or unanticipated resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rocks or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other prehistoric human activities. Pilings are not covered by this paragraph. Upon such discovery or find, the Contractor shall immediately notify the CO. While waiting for instructions the Contractor shall record, report, and preserve the finds in accordance with the National Historic Preservation Act and 43 Code of Federal Regulations (CFR) Subtitle A Part 7, Protection of Archaeological Resources and State laws (RCW 27.44 Indian Graves and Records and RCW 27.53 Archaeological Sites and Resources).

3.10 INTEGRATED PEST MANAGEMENT (NOT USED)

3.11 PREVIOUSLY USED EQUIPMENT

The Contractor shall thoroughly clean all previously used construction equipment prior to bringing it onto the Site. The Contractor shall ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. The Contractor shall consult with the U.S. Department of Agriculture (USDA) jurisdictional office for additional cleaning requirements.

3.12 MAINTENANCE OF POLLUTION CONTROL FACILITIES

The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant. These include, but are not limited to, oil spill containment booms, sorbent materials, and erosion and sediment control devices and filters for overflow of free-draining liquids from dredged sediment dewatering.

3.13 MILITARY MUNITIONS (NOT USED)

3.14 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Meetings shall be conducted, at a minimum, (1) prior to commencing construction activities, (2) for new personnel, and (3) when Site conditions change. The training and meeting agenda shall include: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.15 CONTAMINATED MEDIA MANAGEMENT

Contaminated environmental media consisting of, but not limited to, dredged sediments and drained free-liquids from dewatering of sediments shall be managed in accordance with Section 02325 DREDGING and Section 02120 TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS.

3.16 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". The Contractor shall, unless otherwise instructed in writing by the CO, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the Work. The disturbed area shall be graded, filled and the entire area seeded unless otherwise indicated.

END OF SECTION

SECTION 01400

REMEDIAL ACTION MANAGEMENT PLAN

PART 1 GENERAL

1.1 SCOPE

This section provides, in conjunction with other referenced sections, general requirements for the Contractor's Remedial Action Management Plan (RAMP). The RAMP refers to a set of plans and designs to be submitted by the Contractor before commencement of the site work. The RAMP provides detailed and specific designs, procedures, methods, and layouts for accomplishment of the Work as specified and delineated in the Contract documents.

The RAMP documents shall supplement the Drawings and Specifications during execution of the Work. The RAMP is intended to ensure that site remediation meets all required cleanup levels, while being accomplished by means that are protective of worker safety and health, the public, and the environment. The RAMP shall demonstrate to the Contracting Officer (CO) and reviewing Governmental agencies that the Contractor is well prepared and capable of completing the site remediation on schedule and in accordance with the Contract.

The RAMP shall cover all portions of the Work described in the Specifications, including Base Items and Option Items of the Contract.

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-09 Reports

RAMP; GA

The Contractor shall prepare and submit a Draft RAMP and a Final RAMP for Government review and approval. The RAMP shall consist of the individual plans listed below. Principal sections discussing plan requirements are also listed; however, the Contractor shall review all sections of the Contract for complete RAMP document requirements and content. The Final RAMP shall require approval by the CO before commencing site mobilization and field work. The CO may allow the Contractor to begin limited or conditional work based on approvals of sections of the RAMP.

PLAN	RELATED SECTION
Site Work Plan	Section 01500 TEMPORARY CONSTRUCTION FACILITIES
	Section 02325 DREDGING
	Section 02483 SEDIMENT CAP
	Section 02630 STORM DRAINAGE
Initial Project Schedule	Section 01320 PROJECT SCHEDULE
Site Safety and Health Plan	Section 01351 SAFETY, HEALTH, AND EMERGENCY RESPONSE
Environmental Protection Plan	Section 01355 ENVIRONMENTAL PROTECTION
Sampling and Analysis Plan	Section 01450 CHEMICAL DATA QUALITY CONTROL
Contractor Quality Control Plan	Section 01451 CONTRACTOR QUALITY CONTROL
Waste Management Plan	Section 02120 TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS
Vessel Management Plan	Section 02325 DREDGING

1.3 RAMP SUBMITTAL SCHEDULE

1.3.1 Draft RAMP

Within 45 calendar days after Notice to Proceed (NTP) and prior to starting on-site construction activities, the Contractor shall submit 15 copies of the Draft RAMP to the CO for review and comment. The RAMP shall be submitted in three-ring binders with tabulation pages for each of the plans and designs listed above. A minimum of 30 calendar days, exclusive of mailing time, will be required for Government review of the Draft RAMP. The complete set of review comments will then be forwarded by the CO to the Contractor for preparation of a response to the comments. No adjustment for time or money will be made if resubmittals of the RAMP are required due to deficiencies in the Plan.

1.3.2 Review Conference

The Contractor shall submit to the CO written responses to the Draft RAMP review comments within 10 working days following receipt of the comments. A Draft RAMP Review Conference shall then be held within 15 calendar days after receipt of Contractor's written responses, if deemed necessary by the Government. The purpose of the review conference will be to resolve any remaining conflicts with the RAMP document and to obtain agreement on the scope of required revisions and modifications to be incorporated in the

Final RAMP. The review conference will be held on Site or at the U.S. Army Corps of Engineers (USACE) Seattle District offices, if the CO directs. The CO will notify the Contractor of the date and time of the conference.

1.3.3 Final RAMP

The Contractor shall make all revisions required by the CO and resubmit 25 copies of the Final RAMP and written responses to review comments for review and approval within 25 calendar days following receipt of comments on the Draft RAMP. A minimum of 10 calendar days will be required for Final RAMP review and approval by the CO.

1.4 CONFERENCE ATTENDANCE

1.4.1 Personnel Attendance

The following personnel shall attend the Draft RAMP Review Conference:

a. CO

b. Contractor's Project Manager

c. Contractor's Site Superintendent or Site Manager

d. Contractor's Quality Control Supervisor

e. Contractor's Safety and Health Manager (Certified Industrial Hygienist)

f. Representative of any Subcontractor with significant involvement in preparation of the RAMP or as required by the CO

1.4.2 Conference Minutes

The Contractor shall be responsible for recording the minutes of the review conference and shall include any significant proceedings and decisions. Details on the resolution of all review comments shall be addressed. Within 5 working days following the conference, the Contractor shall prepare and submit three original typed copies of the minutes to the CO. On approval by the CO, the Contractor shall incorporate the minutes in the final RAMP.

1.5 SITE WORK PLAN

1.5.1 Purpose

The Site Work Plan shall describe the proposed methods for the Contractor's execution of the remedial action including dredging, sediment capping, outfall extension, and temporary facilities required for completion of the Work in accordance with the Contract documents.

1.5.2 Content

The Site Work Plan shall include, but shall not be limited to, the following:

a. A site plan showing locations of all temporary facilities including on-site equipment and material storage areas, temporary utilities, access and haul routes, Site trailers, trash dumpsters, and temporary sanitary facilities, in accordance with Section 01500 TEMPORARY CONSTRUCTION FACILITIES.

b. Contractor's dredging plan, including dredging equipment and methods proposed for use to minimize the dispersion of resuspended sediments during dredging, including a plan for dewatering dredged sediments, in accordance with Section 02325 DREDGING.

c. Contractor's capping plan, including capping equipment and methods proposed for use to minimize resuspension of bottom sediments in accordance with Section 02483 SEDIMENT CAP. The capping plan shall discuss capping sequencing and methods by each Remediation Area (RA). The capping plan shall discuss methods for verifying placement of cap material in each RA. The capping plan should include the specific proposed sources of capping material, including supplier name, quarry or borrow location, description of any amendments, loading location, and any available product specifications.

d. Contractor's outfall extension plan, including materials, equipment, and methods proposed to extend the existing 84-inch outfall, in accordance with Section 02630 STORM DRAINAGE.

1.6 PROJECT SCHEDULE

The project schedule shall be prepared in accordance with Section 01320 PROJECT SCHEDULE. The initial project schedule shall be submitted as part of the Draft RAMP. The schedule provided in the Final RAMP shall be periodically updated as required in Section 01320.

1.7 SITE SAFETY AND HEALTH PLAN

1.7.1 Purpose

The Site Safety and Health Plan (SSHP) shall be prepared in accordance with the requirements of Section 01351 SAFETY, HEALTH, AND EMERGENCY RESPONSE. The SSHP shall be a detailed, site-specific plan which:

a. Delineates project responsibilities and controls for site safety.

b. Assesses the physical, chemical, and environmental hazards of the project.

c. Defines the protective measures to prevent or limit worker exposure to Site contaminants, including delineation of work and support zones, protective equipment, and decontamination procedures.

d. Establishes personal and area air monitoring requirements for worker safety and health.

e. Details the emergency response procedures, training requirements, and medical surveillance programs provided by the Contractor.

f. Complies with applicable regulatory requirements.

1.7.2 Content

The SSHP shall be prepared in accordance with Section 01351 SAFETY, HEALTH, AND EMERGENCY RESPONSE.

1.8 ENVIRONMENTAL PROTECTION PLAN

1.8.1 Purpose

The Environmental Protection Plan shall execute the requirements of Section 01355 ENVIRONMENTAL PROTECTION. This plan governs site activities relating to pollution prevention and minimization, spill control and reporting, stormwater management, noise and dust control, and compliance with State and Federal water, wastewater, air, and solid waste regulations.

1.8.2 Content

The Environmental Protection Plan shall include, but shall not be limited to, the following:

a. Name(s) of person(s) within the Contractor's organization who is (are) responsible for ensuring adherence to the Environmental Protection Plan.

b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the Site, if applicable.

c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

d. Description of the Contractor's environmental protection personnel training program.

e. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan shall include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, State, and local laws and regulations.

f. Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the Site.

g. Traffic control plan including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. The plan shall identify all haul routes, anticipated traffic volume and timing, and include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.

h. The work area plan shall show the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. The plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas. The work area plan shall highlight the proposed periods in which the Work will or may affect commercial navigation or moorage at Crowley Marine Services, and the sequencing strategy that will be used to minimize these disruptions. This plan shall be coordinated with the project schedule developed under Section 01320 PROJECT SCHEDULE.

i. The spill control plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The spill control plan shall also address containment and cleanup of sheens that may be released from contaminated sediments during capping or dredging. The spill control plan supplements the requirements of EM 385-1-1. This plan shall include as a minimum:

1. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the CO and the local Fire Department in

addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.

2. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

3. Training requirements for Contractor's personnel and methods of accomplishing the training.

4. A list of materials and equipment to be immediately available at the Site, tailored to cleanup work of the potential hazard(s) identified.

5. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

6. The methods and procedures to be used for expeditious contaminant cleanup.

j. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris. The plan shall include schedules for disposal. The Contractor shall identify any subcontractors responsible for the transportation and disposal of solid waste. Licenses or permits shall be submitted for solid waste disposal sites that are not a commercial operating facility. Evidence of the disposal facility's acceptance of the solid waste shall be attached to this plan during the construction. The Contractor shall attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. The report shall be submitted on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted and shall be for the previous quarter (e.g. the first working day of January, April, July, and October). The report shall indicate the total amount of waste generated and total amount of waste diverted in cubic yards or tons along with the percent that was diverted.

k. A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. The plan shall detail the Contractor's actions to comply with and to participate in Federal, State, Regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

l. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project Site.

m. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job Site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with

Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be on Site at any given time shall be included in the contaminant prevention plan. As new hazardous materials are brought on Site or removed from the Site, the plan shall be updated.

n. A historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on the project Site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. The plan shall include methods to assure the protection of known or discovered resources and shall identify lines of communication between Contractor personnel and the CO.

o. Copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications (including the 401 water quality certification issued by EPA), reports, and termination documents shall be attached as an appendix, to the Environmental Protection Plan.

p. A Water Quality Monitoring Sampling and Analysis Plan (SAP) in accordance with Section 01355 ENVIRONMENTAL PROTECTION.

1.9 SAMPLING AND ANALYSIS PLAN

1.9.1 Purpose

The Sampling and Analysis Plan (SAP) shall execute the requirements of Section 01450 CHEMICAL DATA QUALITY CONTROL. The SAP shall address the analytical testing procedures used for compliance monitoring, including quality assurance and quality control (QA/QC). The SAP shall describe sampling and analytical objectives of the project, sampling methods, the methods and procedures for laboratory analyses, and analytical QA/QC protocols for the project.

1.9.2 Content

The SAP shall be prepared in accordance with Section 01450 CHEMICAL DATA QUALITY CONTROL.

1.10 CONTRACTOR QUALITY CONTROL PLAN

1.10.1 Purpose

The Contractor Quality Control (CQC) Plan implements the requirements of Section 01451 CONTRACTOR QUALITY CONTROL. The CQC Plan shall be the framework for ensuring that planning and quality are integrated into every aspect of the project.

1.10.2 Content

The CQC Plan shall be prepared in accordance with Section 01451 CONTRACTOR QUALITY CONTROL.

1.11 WASTE MANAGEMENT PLAN

1.11.1 Purpose

The Waste Management Plan (WMP) shall implement the requirements of Section 02120 TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS. The plan shall address the handling, storage, transportation, and disposal of non-hazardous and hazardous wastes generated at the Site. The plan shall comply with regulations administered by the U.S. Environmental Protection Agency (EPA), the U.S. Department of Transportation (DOT), and the Washington State Department of Ecology (Ecology).

1.11.2 Content

The WMP shall include, but shall not be limited to, the following:

a. Waste stream identification and characterization procedures.

b. On-site management practices for non-hazardous and hazardous wastes, including types and volumes of wastes anticipated, inventory controls, and waste minimization methods.

c. On-site and off-site treatment, storage, and disposal methods and facilities to be used for the project including compliance with the CERCLA Off-Site Rule.

d. Packaging, labeling, and manifesting of wastestreams generated and managed by the Contractor.

e. Documentation that facilities used for off-site disposal or regeneration of hazardous and non-hazardous materials are in compliance with the CERCLA Off-Site Rule.

f. Transportation means and providers for the Contractor's off-site waste management, including procedures for arranging selection and approval of treatment, storage, and disposal providers.

g. "Cradle to grave" documentation of all wastes generated at the project Site.

h. Certification that the waste will be handled in accordance with all applicable RCRA, Toxics Substances Control Act (TSCA), and Hazardous Materials Transportation Act (HMTA) laws and regulations.

i. Documentation of any additional sampling and analysis that may be required by the disposal facility, should oily sediments be encountered during dredging.

1.12 VESSEL MANAGEMENT PLAN

1.12.1.1 Purpose

The Contractor's Vessel Management Plan shall describe the methods for controlling vessel traffic during the Work, in accordance with Section 02325 DREDGING.

1.12.2 Content

The Vessel Management Plan shall include, but shall not be limited to, the following:

a. Methods for monitoring navigation activities of others near dredging and capping activities

b. Vessel traffic plan indicating proposed navigation routes

c. Measures to coordinate with other waterway users

d. Proposed vessels, including signal lighting

e. Moorage, anchoring, and tie-off areas

f. Certified tonnage displacement table, for each vessel to be used for transporting imported cap materials to the Site, in accordance with Section 01270 MEASUREMENT AND PAYMENT

g. Communication procedures

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01450

CHEMICAL DATA QUALITY CONTROL

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification. The publications are referred to in the text by basic designation only. The most recent version of the reference applies. The U.S. Army Corps of Engineers' (USACE's) requirements are mostly available at the following URL. http://www.environmental.usace.army.mil/info/technical/chem/chemguide/chemusac/chemusac.html

CODE OF FEDERAL REGULATIONS (CFR)

40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 268	Land Disposal Restrictions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 178	Specifications for Packagings

PUGET SOUND ESTUARY PROGRAM (PSEP)

PSEP	(1997) Recommended Guidelines for Sampling Marine Sediment, Water Column, and Tissue in Puget Sound. In "Puget Sound Protocols and Guidelines"

U.S. ARMY CORPS OF ENGINEERS (USACE) ENGINEERING MANUALS (EM)

EM 200-1-1	(1994) Validation of Analytical Chemistry Laboratories
EM 200-1-3	(2001) Requirements for the Preparation of Sampling and Analysis Plans

"Analytical Shell"	(Appendix to EM 200-1-3) (2001) USACE Shell for Analytical Chemistry. URL follows. (http://www.usace.army.mil/inet/usace-docs/eng-manuals/em200-1-3/a-i.pdf)
EM 200-1-6	(1997) Chemical Quality Assurance
ER 1110-1-263	1998) Chemical Data Quality Management for Hazardous, Toxic, Radioactive Waste Remedial Activities

U.S. DEPARTMENT OF DEFENSE (DOD)

DOD QSM	(2000) Department of Defense Quality Systems Manual for Environmental Laboratories (https://www.denix.osd.mil/denix/Public/Library/Compliance/EDQW/qsm1.html)

ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 540/R 94-012	(1994) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review
EPA 540/R 99-008	(1999) Contract Laboratory Program National Functional Guidelines for Organic Data Review
EPA QA/G-5	(2002) Guidance for Quality Assurance Project Plans, EPA 240/R-02/009
EPA SW-846	(Rev O; updates I, II, IIA, IIB, III, and IIIA) Test Methods for Evaluating Solid Waste (Vol IA, IB, IC, and II)

1.2 ACRONYMS

The definition of acronyms used by the Contractor that pertain to chemical data quality control shall be clearly defined for all Contract-related products and communications.

CDFR	Chemical Data Final Report
CDQC	Chemical Data Quality Control
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CO	Contracting Officer
COC	chemical of concern
CQAR	Chemical Quality Assurance Report
CQC	Contractor Quality Control
DOD	Department of Defense

DQO	data quality objective
EM	Engineering Manual
EPA	U. S. Environmental Protection Agency
ER	Engineering Reference
FSP	Field Sampling Plan
HTRW	Hazardous, Toxic, and Radioactive Waste
LCS	laboratory control sample
MCL	maximum concentration limit
MQO	measurement quality objective
MS	matrix spike
MSD	matrix spike duplicate
NELAP	National Environmental Laboratory Accreditation Program
PE	performance evaluation
PT	Proficiency Testing
QA	quality assurance
QALAN	QA Laboratory Advanced Notification
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
QC	quality control
QSM	Quality Systems Manual
RAMP	Remedial Action Management Plan
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SOP	standard operating procedure
TAL	target analyte list
TCLP	toxicity characteristic leachate procedure
USACE	U.S. Army Corps of Engineers
VOA	volatile organic analysis
VOC	volatile organic compound

1.3 CHEMISTRY REQUIREMENTS

Chemical Data Quality Control (CDQC) shall be as defined in ER 1110-1-263; this ER, which integrates USACE guidance on the subject, shall be supplemented by EM 200-1-6 for detail technical guidance on CDQC. Tables and charts defining specific chemistry shall be according to or consistent with EM 200-1-3. Analyses shall be in accordance with the "Analytical Shell" or "Shell." The "Shell" provides necessary clarification to the EPA, Office of Solid Waste Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 Third Edition and subsequent updates and is designed to keep pace with the rapidly developing regulatory and industry move toward performance based measurement systems. The "Shell" asks that project-specific data quality requirements be achievable by the laboratory to be used and if not the differences are resolved or corrected. For the method in use, the laboratory must demonstrate the ability to detect the chemical of concern in the matrix of concern at a level of concentration below the action level for that chemical in order that when concentrations of that chemical are reported near the action level, action decisions are made reliably with minimum of error. The "Shell" outlines general procedures for most

methods to be used for the laboratory to follow in order to demonstrate that preparation, subsampling and measurement procedures used in generating the data were in control. It also requires that corrective action procedures be detailed. By using the "Shell" to specify performance expectations, the quality of the laboratory product will be improved. The "Shell" will be available to the Contractor at his request at the Seattle District Office.

1.3.1 Site History

A brief Site history is provided in Section 01115 SITE DESCRIPTION. Selected chemical data information is available for the Contractor in the Technical Exhibit.

1.3.2 Data Quality Objectives (DQO)

Sample acquisition, chemical analysis, and chemical parameter measurements shall be performed so that the resulting data meet and support data use requirements. The chemical data shall be acquired, documented, verified, and reported to ensure that the specified precision, accuracy, representativeness, comparability, completeness, and sensitivity requirements as specified in the shell for analytical chemistry are achieved. Sensitivity requirements specified in text below shall be met.

Final decisions regarding DQOs, analytical Measurement Quality Objectives (MQOs), and QC protocols will be made by the Contractor and Government after completing the systematic planning process for analytical and sampling design during the RAMP development discussed in Section 1400 REMEDIAL ACTION MANAGEMENT PLAN.

1.3.3 Sampling, Analysis, and Measurement

For each type of sample, the Contractor shall provide tables that identify the number of samples, including Quality Control (QC) samples, extraction and analytical methods, precision, accuracy, representativeness, comparability, completeness, and sensitivity for analytical determinations.

1.3.3.1 Surface Water Samples

Water quality monitoring for total suspended solids shall be performed in accordance with Section 01355 ENVIRONMENTAL PROTECTION.

1.3.3.2 Waste Characterization Samples

All concrete, asphalt, and other debris from the dredging of sediment in RA3 and from stormwater outfall work shall be taken off Site in accordance with Section 02120 TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS. It is not anticipated that sampling will be required, however if the disposal facility requires sampling, only those tests required by the disposal facility shall be performed. Material shipping manifesting shall be in accordance with 40 CFR 261, 40 CFR 262, 40 CFR 268, 49 CFR 172, and 49 CFR 178.

1.3.3.3 Import Cap Materials Testing

Cap chemical testing shall be performed to support a decision for import cap material suitability. Cap material shall be tested at the frequencies indicated in Section 02483 SEDIMENT CAP. Table 01450-2 shows the acceptance criteria for all required analytes. Samples shall be analyzed using the methods shown in Table 01450-1. The method reporting limit shall not exceed the acceptance criteria shown. The Contractor shall include the costs for import materials testing in the unit price bid for those materials, including only the methods and analytes shown in Tables 01450-1 and 01450-2. The CO may require additional analytes be tested. If additional analytes are required, this will be considered a change order.

Table 01450-1
ANALYTICAL METHODS

Matrix	Analytes	Analytical Method[a]	Extraction/ Cleanup Methods
Surface Water	TSS	SW-846 160.2	--
Waste (including dredged sediments)	As required by disposal facility		
Import Materials (sand cap mix, coarse sand, habitat mix, beach sand, filter material No. 2)	SVOCs	SW-846 8270	3541/GPC-3640 silica gel (PAH only 3630)
	Inorganics	SW-846 6000/7000	3050 (digestion)
	Chlorinated Pesticides	SW-846 8081	3541/GPC-3640 sulfur 3660
	PCBs	SW-846 8082	3541/GPC-3640 sulfur 3660 sulfuric acid 3665
	TOC	9060/PSEP	--
Final Cap Surface	SVOCs	SW-846 8270	3541/GPC-3640 silica gel (PAH only 3630)
	Inorganics	SW-846 6000/7000	3050 (digestion)
	PCBs	SW-846 8082	3541/GPC-3640 sulfur 3660 sulfuric acid 3665
	TOC	9060/PSEP	--

[a]SW-846 Methods are described in EPA SW-846 (Test Methods for Evaluating Solid Waste). All analyses shall be in accordance with PSEP protocols (PSEP 1997).

Notes:
GPC – gel permeation chromatography
PCBs – polychlorinated biphenyls
PSEP – Puget Sound Estuary Program
SVOCs – semivolatile organic compounds
TOC – total organic carbon
TSS – total suspended solids
-- – Not applicable

1.3.3.4 Final Cap Surface Testing

Testing of placed cap material shall be performed to support a decision for final acceptance of a completed cap surface. Samples of the emplaced cap shall be tested at the frequencies indicated in Section 02483 SEDIMENT CAP. Samples shall be analyzed using the methods

shown in Table 01450-1 for all required analytes that are shown in Table 01450-2. The method reporting limit shall not exceed the acceptance criteria shown.

1.3.3.5 Turnaround Times

The turnaround time for any of the laboratory samples analyzed under this Contract shall not exceed 30 calendar days, unless otherwise specified. Results must be available prior to acceptance of import material. The Contractor may specify faster turnaround times to meet overall project schedules.

Table 01450-2
SEDIMENT MANAGEMENT STANDARDS AND REQUIRED METHOD REPORTING LIMITS

Chemical Parameter	Required for Imported Materials	Required for Cap Verification	Sediment Management Standards SQS[f]	Dry Weight Analogs of SMS Criteria Dry Weight Equivalent[g]	Analytical Method	Method Reporting Limit
Metals			mg/kg dry wt	mg/kg dry wt		mg/kg dry wt
Arsenic	X		57	57	EPA Method 6000/7000	20
Cadmium	X		5.1	5.1	EPA Method 6000/7000	2
Chromium	X		260	260	EPA Method 6000/7000	20
Copper	X	X	390	390	EPA Method 6000/7000	20
Lead	X		450	450	EPA Method 6000/7000	20
Mercury	X	X	0.41	0.41	EPA Method 6000/7000	0.1
Silver	X		6.1	6.1	EPA Method 6000/7000	2
Zinc	X	X	410	410	EPA Method 6000/7000	20
Nonionizable Organic Compounds						
Polynuclear Aromatic Hydrocarbons			mg/kg organic carbon[a,e]	µg/kg dry wt[a]		µg/kg dry wt
Total LPAH[b]	X	X	370	5200	EPA Method 8270	10
Naphthalene	X	X	99	2100	EPA Method 8270	10
Acenaphthylene	X	X	66	1300	EPA Method 8270	10
Acenaphthene	X	X	16	500	EPA Method 8270	10
Fluorene	X	X	23	540	EPA Method 8270	10
Phenanthrene	X	X	100	1500	EPA Method 8270	10
Anthracene	X	X	220	960	EPA Method 8270	10
2-Methylnaphthalene	X	X	38	670	EPA Method 8270	10
Total HPAH[c]	X	X	960	12000	EPA Method 8270	10
Fluoranthene	X	X	160	1700	EPA Method 8270	10
Pyrene	X	X	1000	2600	EPA Method 8270	10
Benz[a]anthracene	X	X	110	1300	EPA Method 8270	10
Chrysene	X	X	110	1400	EPA Method 8270	10
Total benzofluoranthenes[d]	X	X	230	3200	EPA Method 8270	10
Benzo[a]pyrene	X	X	99	1600	EPA Method 8270	10
Indeno[1,2,3-c,d]pyrene	X	X	34	600	EPA Method 8270	10
Dibenz[a,h]anthracene	X	X	12	230	EPA Method 8270	10
Benzo[g,h,i]perylene	X	X	31	670	EPA Method 8270	10

Table 01450-2 (Continued)
SEDIMENT MANAGEMENT STANDARDS AND REQUIRED METHOD REPORTING LIMITS

Chemical Parameter	Required for Imported Materials	Required for Cap Verification	Sediment Management Standards	Dry Weight Analogs of SMS Criteria	Analytical Method	Method Reporting Limit
			SQS[f]	Dry Weight Equivalent[g]		
Chlorinated Benzenes			mg/kg organic carbon[a,e]	µg/kg dry wt[a]		µg/kg dry wt
1,2-Dichlorobenzene	X		2.3	35	EPA Method 8270	10
1,3-Dichlorobenzene	X		--	--	EPA Method 8270	10
1,4-Dichlorobenzene	X		3.1	110	EPA Method 8270	10
1,2,4-Trichlorobenzene	X		0.81	31	EPA Method 8270	10
Hexachlorobenzene	X		0.38	22	EPA Method 8270	10
Phthalate Esters						
Dimethyl phthalate	X		53	71	EPA Method 8270	10
Diethyl phthalate	X		61	200	EPA Method 8270	10
Di-n-butyl phthalate	X		220	1400	EPA Method 8270	10
Butyl benzyl phthalate	X		4.9	63	EPA Method 8270	10
Bis[2-ethylhexyl]phthalate	X		47	1300	EPA Method 8270	10
Di-n-octyl phthalate	X		58	6200	EPA Method 8270	10
Miscellaneous						
Dibenzofuran	X	X	15	540	EPA Method 8270	10
Hexachlorobutadiene	X		3.9	11	EPA Method 8270	10
N-nitrosodiphenylamine	X		11	28	EPA Method 8270	10
Pesticides/PCBs						
PCBs	X	X	12	130	EPA Method 8082	10
Ionizable Organic Compounds			µg/kg dry wt	µg/kg dry wt		µg/kg dry wt
Phenol	X	X	420	420	EPA Method 8270	10
2-Methylphenol	X	X	63	63	EPA Method 8270	10
4-Methylphenol	X	X	670	670	EPA Method 8270	10
2,4-Dimethylphenol	X	X	29	29	EPA Method 8270	50
Pentachlorophenol	X	X	360	360	EPA Method 8270	50
Benzyl alcohol	X		57	57	EPA Method 8270	10
Benzoic acid	X		650	650	EPA Method 8270	10
Conventional Parameters						Percent dry wt
Total Organic Carbon	X	X			EPA Method 9060/PSEP	0.1%

Table 01450-2 (Continued)
SEDIMENT MANAGEMENT STANDARDS AND REQUIRED METHOD REPORTING LIMITS

[a]Where chemical criteria in this table represent the sum of individual compounds or isomers, the following methods shall be applied: (i) Where chemical analyses identify an undetected value for every individual compound/isomer then the single highest detection limit shall represent the sum of the respective compounds/isomers; and (ii) Where chemical analyses detect one or more individual compound/isomers, only the detected concentrations will be added to represent the group sum.

[b]The total LPAH criterion represents the sum of the following low molecular weight polynuclear aromatic compounds: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene. 2-Methylnaphthalene is not included in the LPAH definition. The LPAH criterion is not the sum of criteria values for the individual LPAH compounds listed.

[c]The total HPAH criterion represents the sum of the following high molecular weight polynuclear aromatic compounds: fluoranthene, pyrene, benz[a]anthracene, chrysene, total benzofluoranthenes, benzo[a]pyrene, indeno[1,2,3-cd]pyrene, dibenz[a,h]anthracene, and benzo[ghi]perylene. The HPAH criterion is not the sum of criteria values for the individual HPAH compounds listed.

[d]The total benzofluoranthenes criteria are to be compared to the sums of the concentrations of the b, j, and k isomers of benzofluoranthene.

[e]The listed values represent concentrations in parts per million "normalized" on a total organic carbon basis. To normalize to total organic carbon, the dry-weight concentration for each parameter is divided by the decimal fraction representing the percent total organic carbon content of the sediment.

[f]Use values in this column when sample TOC ≥ 0.5% and ≤ 4%.

[g]Use values in this column when sample TOC < 0.5% or > 4%.

Notes:
PCBs - polychlorinated biphenyls
SMS - sediment management standards
SQS - sediment quality standards
µg/kg - microgram per kilogram
mg/kg - milligram per kilogram

1.4 QUALITY ASSURANCE ELEMENTS

The Contractor shall be responsible for the following QA elements necessary to monitor and ensure the quality of chemical data produced.

1.4.1 Laboratory Validation Requirements

The Contractor shall propose the minimum number of laboratories that can attain or have attained USACE validation in accordance with EM 200-1-1 and consistent with Contract-required chemical data quality. Laboratories must be listed in the National Environmental Laboratory Accreditation Program (NELAP), be currently validated by the USACE for all methods to be used, or be proposed for validation and successfully validated by the USACE. Either NELAP accreditation or USACE validation shall be required for the full-term of this Contract. Current NELAP accredited laboratories are shown at the following URL: <http://www.epa.gov/ttn/nelac/accreditlabs.html>. Contact the CO for information on current USACE-accredited laboratory facilities and methods. The Contractor may propose laboratories that are not currently validated but may subsequently be validated by the USACE. This latter course is discouraged. If not currently validated, the USACE laboratory validation process requires a nominal 120-day process.

The Contractor shall identify all proposed project laboratories in the Sampling and Analysis Plan (SAP) in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN. If a proposed analytical laboratory cannot meet specified analytical requirements or achieve the required validation, the Contractor shall select another laboratory.

Whether NELAP- or USACE-accredited, throughout the term of this Contract appropriate Proficiency Testing (PT) samples from a NELAP accredited PT provider, shall be successfully analyzed by the laboratory within six months of the date of award, and continuously every six months thereafter.

The Contractor and/or the Contract Laboratory shall notify the CO immediately of any lapse in NELAP or USACE accreditation so that the proper action may be taken. Demonstration that a laboratory is NELAP- or USACE- accredited for all methods required by the Contract shall be submitted to the CO in the SAP, and shall consist of a letter of approval from the accrediting authority or other official documentation, such as reference to the USACE's listings.

In accordance with Army implementation policy (Department of Army letter dated 11 July 2001, Subject – "Army Implementation of DOD Quality Systems Manual for Environmental Laboratories"), all environmental laboratory services for this Contract shall be provided by a laboratory that can perform testing in accordance with the DOD Quality Systems Manual (QSM). Demonstration that environmental laboratories proposed for this Contract is provided by a letter of "self-declaration" which states that the laboratory has reviewed the manual and believes itself to be in compliance with this requirement. The laboratory is notified that review of its activities under the QSM may occur during this Contract.

1.4.2 Quality Assurance Sample Collection and Analysis

The Contractor shall be responsible for collection and transportation of field duplicate QA samples to the Contractor's laboratory. Field duplicate samples for all analyses shall be taken as splits of homogenized samples. Field duplicate samples shall be collected at a rate of 10 percent per matrix (minimum of one per sampling event for waste, import materials, and final cap surface). The Contractor's laboratory shall also prepare and analyze matrix spike/matrix spike duplicate (MS/MSD) QA samples. MS/MSD samples shall be analyzed at a rate of 5 percent per matrix (minimum of one per sampling event). MS/MSD samples are not required for TSS analyses. All QA samples shall be analyzed by the methods listed in Table 01450-1 and for the constituents listed in Table 01450-2. QA sample analyses shall be conducted using a turnaround time not to exceed the turnaround time for primary samples.

Where QA results are unacceptable due to Contractor negligence (e.g. improper sample collection and/or handling by the Contractor), or where QA sample results conflict with the Contractor's primary sample results, further sampling and testing shall be performed as directed by the CO. All costs for such additional sampling and testing due to Contractor negligence, including both QC and QA testing and analysis, and for any required remedial actions in the work, shall be borne by the Contractor. USACE acceptance of import materials, final cap surface, or disposition of any waste shall not occur until the Contractor's sampling and QC results have been confirmed by QA results. This includes all final stockpiling, wasting, cap material placement, and related construction.

1.4.3 Review of Primary Laboratory Data

The Contractor shall be responsible for the independent QA review on 100 percent of the primary data set. This review will be incorporated in a data quality report submitted to the CO within 30 days of data submittal by the laboratory and will include the following discussion:

a. Fulfillment of QC and sampling requirements

b. Analytical error determination shall be made for 100 percent of data generated, including reporting of precision, accuracy, and sensitivity. Total measurement error determination shall be made for 100 percent of data generated, including calculating linear regression correlation coefficient, and evaluation of representativeness, and completeness. For each matrix under investigation the QC parameters list above shall be calculated and compared against standard laboratory and project-specific performance requirements documented in the Shell.

c. Procedures to confirm the compliance with documentation requirements including field documentation, daily quality control reports, daily instrument and monitor outputs, standard form completion, authenticity of all document entries by signed or initialed entries, data reporting packages, QC documentation, and production of deliverables.

1.4.4 Evaluation of Data

Data evaluation shall be completed and results reported no later than 30 days after sample results receipt. The Contractor shall report all data reduction procedures including the methods or calculation of concentrations or other measurements, reporting units for concentrations, dilution factors, and the procedure for calculating precision and accuracy. All data shall be flagged as necessary based on the analytical error determination. An example data quality review report is included as Attachment 01450-A.

Independent data validation may be accomplished by the Government under a separate contract.

1.4.5 Electronic Tape Audits

These may be required if so deemed by the CO. The tapes shall be archived with the project number clearly indicated.

1.5 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-01 Data

Sampling and Analysis Plan; GA.

The SAP including the Field Sampling Plan (FSP) and the Quality Assurance Project Plan (QAPP), shall be submitted as part of the RAMP in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN no later than 45 days after receipt of Notice to Proceed (NTP).

SD-09 Reports

Chemistry Data Package; GA.

The chemistry data package shall be provided with the Contractor QA Review to the CO within 30 days after receipt from the analytical laboratory.

Chemical Data Final Report; GA.

The CDFR shall be provided within 30 days of completing work at the Site, before final payment. The CDFR will also be incorporated into the Closure Reports in accordance with Section 01788 PROJECT CLOSEOUT. Each report shall be labeled with the contract number, project name, and location.

1.6 QUALIFICATIONS

1.6.1 Chemical Quality Control Officer

As a minimum, the Contractor's Chemical Quality Control Officer shall have: a Bachelor's degree in Chemistry or related science; 3 years of experience related to investigations, studies, design, and remedial actions at HTRW Sites; and 3 field seasons (or one continuous calendar year experience) in standard analytical chemistry methods common for analyzing soil, water, air, and other materials for chemical contamination assessment, including hazardous waste manifesting. The Chemical Quality Control Officer shall ensure that all chemistry-related objectives including responsibilities for DQO definitions, sampling and analysis, project requirements for data documentation and validation, and final project reports are attained. The Chemical Quality Control Officer need not be present on Site during routine sampling, but shall be available for consultation with Government and Contractor personnel.

1.6.2 Project Chemist

As a minimum, the Contractor's Project Chemist shall have: a bachelor's degree in Chemistry, Chemical Engineering, Civil/Environmental Engineering, or Environmental Science; and 2 years of experience in and knowledge of EPA methods for analyzing environmental and hazardous waste, soil, water, air, and other materials for chemical contamination assessment, including data for hazardous waste manifesting. The Project Chemist shall ensure that all chemistry-related goals of the program are attained. The Project Chemist shall be available for consultation with Government personnel.

1.6.3 Environmental Sampler

As a minimum, the Contractor's Environmental Sampler shall have 2 years of experience in the development and preparation of SAP and work plans; and 2 years of experience in and knowledge of EPA methods for collecting environmental and hazardous waste samples. The Environmental Sampler shall collect all on-site samples. The Environmental Sampler shall review the sampling results, and provide recommendations for the Contractor's sampling program. The Environmental Sampler shall be on Site during any excavation and stockpiling operations involving contaminated soil or soil to be checked for contamination. The Environmental Sampler may perform other duties but must have sufficient time to conduct their primary assigned duties.

1.7 COORDINATION MEETING

After the pre-construction conference, before any sampling or testing, the Contractor and the CO will meet at the construction Site to discuss the Contractor Quality Control (CQC) Plan and the SAP. The coordination meeting will be simultaneous to any CQC coordination meeting required in Section 01451 CONTRACTOR QUALITY CONTROL unless otherwise indicated or directed. A list of definable features that involve chemical measurements shall be agreed upon. At a minimum, each matrix (water, air, containerized wastes, etc.) shall be a definable work feature. Management of the chemical data quality system including project

DQO, project submittals, chemical data documentation, chemical data assessment, required sampling and analysis protocols, and minimum data reporting requirements shall be agreed upon. The meeting will establish an interrelationship between the Contractor's chemical data quality management and Government chemical quality assurance requirements. Minutes of the meeting will be documented by the Contractor and shall be signed by both the Contractor and the CO. The minutes will include any or all unresolved chemical issues along with the conditions for resolution and will become a part of the Contract file.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor shall be responsible for chemical sample acquisition, sample analysis, instrumental measurements of chemical parameters, and for chemical data quality control. An effective chemical data quality control system shall be established that meets the requirements for the chemical measurement DQOs applicable to the project. The system shall cover chemical measurements pertaining to and required for Contractor- and subcontractor-produced chemical data. The Contractor shall control field screening, sampling, and testing in conjunction with remedial activities to meet all DQOs.

3.2 CONTRACTOR QUALITY CONTROL (CQC) PLAN

3.2.1 General

In addition to the quality control requirements specified in Section 01451 CONTRACTOR QUALITY CONTROL, the CQC Plan shall incorporate the qualifications, authority, and responsibilities of all chemical quality management and support personnel. Chemical measurements including sampling and/or chemical parameter measurement will not be permitted to begin until after production and acceptance of the CQC Plan, and Government approval of the SAP.

3.2.2 Chemistry Elements of the CQC Plan

To cover contract-related chemical measurements by the Contractor and all subcontractors, the CQC Plan shall include the following as a minimum.

3.2.2.1 Qualifications

Names, education, experience qualifications, authorities, and decision-making responsibilities of all chemical quality management and support personnel. The CQC Plan shall contain a copy of a letter from the project CQC System Manager designating and authorizing a Chemical Quality Control Officer and chemical quality control organization staff.

3.2.2.2 Authority and Responsibility

A diagram, flow chart, or figure clearly depicting the chemical data quality management and support staff, and the authority and responsibility of each for chemical sampling and analysis, procedures for corrective actions, deliverables and submittals, deviations and changes, chemical quality documentation, data validation, minimum data reporting requirements, and DQO for chemical parameter measurement by the Contractor and subcontractors. The contents of this section of the CQC Plan shall be included in the applicable "Project Organization" elements of the FSP and the QAPP.

3.3 SAMPLING AND ANALYSIS PLAN

The SAP shall be prepared in accordance with CDQC requirements, EM 200-1-3, and EPA QA/G-5. In the event of a conflict between EM 200-1-3 and EPA QA/G-5, EPA QA/G-5 shall take precedence. The SAP shall be a single document that contains two distinct elements: FSP and QAPP. Sections of the FSP and QAPP shall be cross-referenced. The SAP shall confirm the Contractor's understanding of the contract requirements for chemical data quality control, and shall describe procedures for field sampling and sample submittal for analysis, field chemical parameter measurement, data documentation, data assessment, and data reporting requirements. The SAP shall delineate the methods the Contractor intends to use to accomplish the chemical quality control items to assure accurate, precise, representative, complete, legally defensible, and comparable data. The SAP shall describe all chemical parameter measurements for all matrices for all phases of the remediation contract. As a single interrelated document, the SAP shall be provided to field and laboratory personnel. The SAP shall clearly identify the Contractor-obtained laboratories. The Contractor shall furnish copies of the Government-approved SAP to all laboratories and the Contractor's field sampling crew. The SAP shall address all levels of the investigation with enough detail to become a document, which may be used as an audit guide for field and laboratory work. The SAP shall include applicable PSEP guidelines (PSEP 1997).

3.3.1 Field Sampling Plan (FSP)

The FSP shall contain necessary technical detail and direction for the field personnel to understand sampling and field measurement requirements. The FSP shall provide a comprehensive description and full detail for personnel to perform all on-site activities required to attain project DQOs, including: locations of samples, sampling procedures for on-site and off-site chemical analysis, summaries of analyses to be performed on samples, shipment of samples for off-site analyses, performance of on-site and off-site instrumental parameter measurements, instrument calibration procedures, data documentation, and reporting requirements.

3.3.2 Quality Assurance Project Plan (QAPP)

The QAPP shall contain necessary technical detail and direction for field and laboratory personnel to understand project sample analysis, quality control and data reporting

requirements, analytical methods, required detection limits, QC requirements, and data validation and reporting requirements.

3.4 CHEMISTRY DATA PACKAGE

All data produced in the field shall be reported in an electronic spreadsheet format and provided in both paper and electronic copies.

The chemistry data package shall be produced and provided with the Contractor QA Review to the CO. The chemistry data package shall contain information to demonstrate that the project's DQOs have been fulfilled. Data packages for samples analyzed by SW-846 methods at fixed laboratories shall include all documentation necessary to perform full data validation in accordance with EPA 540/R94-012 and EPA 540/R99-008.

3.5 CONTROL OF CHEMICAL DATA QUALITY

Contractor chemical data quality control shall ensure that a quality control program is in place that assures sampling and analytical activities and the resulting chemical parameter measurement data comply with the DQOs and the requirements of the SAP. The Contractor shall utilize the three-phase control system that includes a preparatory, initial, and follow-up phase for each definable feature of work. The Contractor's three-phase chemical data control process shall ensure that data reporting requirements are achieved and shall be implemented according to Section 01451 CONTRACTOR QUALITY CONTROL. The three-phase chemical data control process shall be combined with that under Section 01451 CONTRACTOR QUALITY CONTROL.

3.6 ANALYTICAL TESTING LABORATORIES

The Contractor shall propose the analytical laboratories to be used for the primary samples analyses. Laboratory validation requirements shall be in accordance with paragraph 1.4.1 Laboratory Validation Requirements. The Contractor may utilize its own laboratory or utilize subcontract laboratories to achieve the primary required sample analyses.

3.6.1 Laboratory Analytical Requirements

The Contractor shall provide the specified chemical analyses by the Contractor's laboratory. The Contractor shall provide chemical analyses to achieve the project DQOs for all parameters specified by the methods. To give the USACE programs the greatest flexibility in the execution of its projects, the EPA SW-846 methods in accordance with the Shell for Analytical Chemistry are generally the methods employed for the analytical testing of environmental samples. These methods are flexible and can be adapted to individual project-specific requirements, as discussed in the Memorandum for Record. All method modifications must be agreed upon by the USACE Chemist.

3.6.2 Laboratory Performance

The Contractor shall provide continued acceptable analytical performance and shall establish a procedure to address data deficiencies noted by review and/or PE sample results. The Contractor shall provide and implement a mechanism for providing analytical laboratories with the SAP or QAPP portion of the SAP, for monitoring the laboratories performance, and for performing corrective action procedures. The Contractor shall acquire analytical services with another laboratory that meets the requirements of paragraph 1.4.1 Laboratory Validation Requirements, in the event the project laboratory loses its validation/accreditation status during the project.

3.7 CHEMICAL DATA FINAL REPORT (CDFR)

The CDFR shall be produced including a summary of quality control practices employed and all chemical parameter measurement activities after project completion. The CDFR will be included in the Closure Reports. As a minimum, the CDFR shall contain the following:

a. Summary of project scope and description.

b. Summary of any deviations from the design chemical parameter measurement specifications.

c. Summary of chemical parameter measurements performed as contingent measurements.

d. All analytical results, including a key to sample location, provided in a Microsoft Excel spreadsheet. Field and laboratory data shall be summarized and reported. Reporting limits for detected compounds will be provided. Reporting limits and Method Detection Limits will be provided for non-detected results. All samples will include qualifiers applied after data review.

e. Summary discussion of resulting data including achieving data reporting requirements.

f. Summary of achieving project-specific DQOs.

g. Presentation and evaluation of the data to include an overall assessment on the quality of the data for each method and matrix.

h. Internal QC data generated during the project, including tabular summaries correlating sample identifiers with all blank, matrix spikes, surrogates, duplicates, laboratory control samples, PE samples, and batch identifiers.

i. A list of the affected sample results for each analyte (indexed by method and matrix) including the appropriate data qualifier flag (J, B, R, etc.), where sample results are negatively impacted by adverse quality control criteria.

j. Summary of field and laboratory oversight activities, providing a discussion of the reliability of the data, QC problems encountered, and a summary of the evaluation of data quality for each analysis and matrix as indicated by the laboratory QC data and any other relevant findings.

k. Conclusions and recommendations.

l. Appendices containing: (1) Chemistry data package, and (2) the Contractor' s Chemical Quality Assurance Report. The Contractor's Data Quality Review Report will include review of all QC parameters such as holding times, detection limits, method blanks, surrogate recoveries, matrix spikes and duplicates, initial and continuing calibration, and PE sample results.

3.8 DOCUMENTATION

Documentation records shall be provided as factual evidence that required chemical data have been produced and chemical data quality has been achieved. The documentation shall comply with the requirements specified in paragraph 3.3 SAMPLING AND ANALYSIS PLAN, paragraph 3.4 CHEMISTRY DATA PACKAGE, and paragraph 3.7 CHEMICAL DATA FINAL REPORT. Documentation requirements shall be in accordance with Section 01240 COST AND PERFORMANCE REPORT.

3.9 NOTIFICATION OF NON-COMPLIANCE

The CO will notify the Contractor of any detected non-compliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice.

ATTACHMENT 01450-A
EXAMPLE DATA QUALITY REVIEW REPORT

PROJECT:	John Doe Groundwater Treatment Plant - M&O Phase
LABORATORY:	ABCD Corporation Field Laboratory, (John Doe Army Chemical Depot, WA) Data Review Report Number: 100
REVIEWER:	Rebecca Roe, ABCD Corporation (Pleasantville, WA)
ANALYSES:	RDX by Field Colorimetric Method TNT by Field Colorimetric Method
MATRIX:	11 Aqueous Field Samples
DATE:	April 16, 1999

The following is a data review of eleven field screening samples collected on March 15, 17, and 19, 1999. Water samples were collected from sample ports SP-E2, SP-W2, SPINF, and SPEFF, which are located in the water treatment plant. Samples were analyzed by the field colorimetric method. Splits of samples 13SP-E2W65, 13SP-W2W65, and 13SPEFFW48 were sent to Acme Analytical Services, Inc. (AAS) for analysis. AAS's results are in Report 79881. The data were reviewed for compliance with criteria specified in the RAMP, version 3. The samples were as follows:

Sample	Location	Date Sampled	Date Extracted	Date Analyzed	QA/QC
13SP-E2W63	east inter GAC	15-Mar-99	15-Mar-99	15-Mar-99	none
13SP-W2W63	west inter GAC	15-Mar-99	15-Mar-99	15-Mar-99	none
13SPEFFW46	effluent port	15-Mar-99	15-Mar-99	15-Mar-99	none
13SP-E2W64	east inter GAC	17-Mar-99	17-Mar-99	17-Mar-99	none
13SP-W2W64	west inter GAC	17-Mar-99	17-Mar-99	17-Mar-99	none
13SP-F2W19	west inter GAC	17-Mar-99	17-Mar-99	17-Mar-99	field duplicate
13SPEFFW47	effluent port	17-Mar-99	17-Mar-99	17-Mar-99	none
13SP-E2W65	east inter GAC	19-Mar-99	19-Mar-99	19-Mar-99	split
13SP-W2W65	west inter GAC	19-Mar-99	19-Mar-99	19-Mar-99	split
13SPEFFW48	effluent port	19-Mar-99	19-Mar-99	19-Mar-99	split
13SPINFW12	influent port	19-Mar-99	22-Mar-99	22-Mar-99	none

Representativeness: - Acceptable

Sample bottles were identified correctly. Samples were extracted and analyzed by the field colorimetric method immediately following collection, except for sample 13SPINFW12 which was stored in the refrigerator until analysis. No problems were reported for the analysis of samples associated with this sample delivery group (SDG).

Timeliness: - Acceptable

Samples must be extracted within seven days, and analyzed within 40 days of extraction.

All samples were extracted and analyzed within specified holding times.

Initial Calibration: - Acceptable

The initial absorbance background readings for the Hach meter must not be outside ±0.002.

The Hach meter initial absorbance reading for the RDX and TNT analysis for each analytical day was less than 0.002/0.002, except for the RDX analysis on March 19, 1999 when the Hach meter initial background reading was not recorded. No qualifiers were recommended based on initial calibration data.

Continuing Calibration: - Acceptable

An EnSys laboratory control is used for continuing calibration. A control sample must occur at 10% frequency, or at least one per batch. The acceptable absorbance range for TNT is 0.307 - 0.373, and for RDX is 0.174 - 0.274.

The absorbency of the control sample for the RDX analysis ranged from 0.187 to 0.201. The absorbency of the control sample for the TNT analysis was 0.351. All control samples were in range. No qualifiers were recommended based on continuing calibration data.

Method Blanks: - Acceptable

A method blank must be extracted and analyzed once per week. The maximum absorbencies for the method blanks are 0.012 for TNT and 0.040 for RDX. Method blanks must have no color.

The absorbency of the weekly RDX blanks was 0.009 and 0.010. The absorbency of the TNT blank was 0.000. All method blanks were colorless. No qualifiers were recommended based on these results.

Blank Spikes: - Acceptable

DI water is spiked with a Restak standard to 20 ppb TNT and 20 ppb RDX. A blank spike must occur once per week. The acceptable range for TNT and RDX recovery is 60 - 140%.

The blank spike recovery for RDX was 134 and 138 percent. The blank spike recovery for TNT was 106 percent. No qualifiers were recommended based on blank spike recovery.

Field Duplicates: - Acceptable

Duplicate sample goal is a relative percent difference (RPD) of ≤50%.

Sample 13SP-F2W19 was a field duplicate of sample 13SP-W2W64. For the RDX results, the RPD was calculated at 3.9 percent. No samples were scheduled for the analysis of TNT. No qualifiers were recommended based on field duplicate analysis.

Comparability: - Acceptable

The goal for field and fixed laboratory samples is a RPD of ≤50%.

Splits of samples 13SP-E2W65, 13SP-W2W65, and 13SPEFFW48 were sent to AAS Inc. for analysis. The RPD for the RDX results were 3.9 and 8.0 percent. Both AAS (0.5µg/L) and the field laboratory (1.0 µg/L) reported the results of RDX analysis for sample 13SPEFFW48 as nondetect, for an estimated of RPD of 0 percent. No qualifiers are recommended based on field split analysis.

Completeness: - Acceptable

Completeness goal is ≥95%.

All field samples were extracted and analyzed for a calculated completeness of 100%.

Overall Summary: - Acceptable

The overall quality of the data for this data set was acceptable. Results reported below PQL are quantified "U".

END OF SECTION

SECTION 01451

CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. The most recent version of the reference applies.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740	(2001) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E 329	(2000b) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-01 Data

Contractor Quality Control Plan; GA.

A plan detailing the manner in which QC of the work shall be managed, submitted as part of the Remedial Action Management Plan (RAMP) in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the contract clause "INSPECTION OF CONSTRUCTION." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product that complies with the contract

requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer (CO) for non-compliance with quality requirements specified in the contract. The project superintendent in this context shall mean the individual with the responsibility for the overall management of the project including quality and production. The project superintendent shall maintain a physical presence at the Site at all times, except as otherwise acceptable to the CO, and shall be responsible for all construction and construction related activities at the Site.

3.2 QUALITY CONTROL PLAN

3.2.1 General

The Contractor shall furnish for review by the Government, not later than 45 days after receipt of Notice to Proceed (NTP), the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the contract clause "INSPECTION OF CONSTRUCTION." The Contractor shall submit the CQC plan as part of the Remedial Action Management Plan (RAMP), in accordance with Section 01400. The plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used. The Government will consider an interim plan for the first 30 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.2 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the Project Superintendent.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm that describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities will require approval by the CO.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task that is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section. This list will be agreed upon during the coordination meeting.

3.2.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the CO in writing of any proposed change. Proposed changes are subject to acceptance by the CO.

3.3 COORDINATION MEETING

After the Pre-construction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the CO or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 14 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of

Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the CO. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures that may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 General

The requirements for the CQC organization are a CQC System Manager and sufficient numbers of additional qualified personnel to ensure safety and contract compliance. The Safety and Health Manager shall receive direction and authority from the CQC System Manager and shall serve as a member of the CQC staff. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC System Manager shall maintain a presence at the Site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be maintain a presence at the Site that is appropriate according to the nature and progress of the Work. CQC staff is subject to acceptance by the CO.

The Contractor shall provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Complete records of all letters, material submittals, shop drawing submittals, schedules, and all other project documentation shall be promptly furnished to the CQC organization by the Contractor. The CQC organization shall be responsible for maintaining these documents and records at the Site at all times, except as otherwise acceptable to the CO.

3.4.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be employed by the Contractor and have a minimum of 5 years experience in related work. An alternate for the CQC System Manager will be identified in the plan to serve in the event of the CQC System Manager's absence. Period of absence may not exceed 2 weeks at one time. The requirements for the alternate shall be the same as for the designated CQC System Manager.

3.4.3 CQC Personnel

In addition to CQC personnel specified elsewhere in the Contract, the Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: civil, environmental, and submittals clerk. These individuals shall be employees of the prime Contractor, unless waived in writing by the CO; be responsible to the CQC System Manager; be physically present at the construction Site during work on their areas of responsibility; have the necessary education and/or experience

to ensure Contract compliance. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the CQC Plan.

Table 01451-1
EXPERIENCE MATRIX

Area	Minimum Qualifications
Civil	Graduate Civil Engineer with 2 years experience in the type of work being performed on this project or technician with 5 years related experience
Environmental	Graduate Civil, Environmental, or Chemical Engineer with 3 years experience
Submittals	Submittal Clerk with 1 years experience

3.4.4 Additional Requirement

In addition to the above experience and/or education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors". For further information contact the CO. This course is periodically offered at Associated General Contractors (AGC) offices throughout the state of Washington.

3.4.5 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the CO for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals shall be made as specified in Section 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals are in compliance with the contract requirements. Contractor's forms for submitting test results are subject to approval by the CO.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the Contract. The controls shall be adequate to cover all construction operations, including both on-site and off-site fabrication, and will be keyed to the proposed construction sequence. The controls shall include at least three phases of control to be conducted by the CQC System Manager for all definable features of work, as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work Site. This phase shall include:

a. A review of each paragraph of applicable specifications. A copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field shall be made available by the Contractor at the preparatory inspection. These copies shall be maintained in the field and available for use by the CO until final acceptance of the work.

b. A review of the Drawings.

c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the Contract.

f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop Drawings or submitted data, and are properly stored.

g. A review of the appropriate activity hazard analysis to assure safety requirements are met.

h. Discussion of procedures for controlling quality of the Work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

i. A check to ensure that the portion of the plan for the Work to be performed has been accepted by the CO.

j. Discussion of the initial control phase.

k. The Government shall be notified at least 48 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet Contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government shall be notified at least 48 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-Up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work that may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory And Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if the quality of on-going work is unacceptable, if there are changes in the applicable CQC staff, onsite production supervision or work crew, if work on a definable feature is resumed after a substantial period of inactivity, or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product that conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a USACE-approved testing laboratory or establish an approved testing laboratory at the project Site. The Contractor shall perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If approved by the CO, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility shall be provided directly to the CO. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge of $500.00 plus travel costs to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.2.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.2.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials shall be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the laboratory designated by the CO.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Near the completion of all work or any increment thereof established by a completion time stated in the Special Clause entitled "COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK," or stated elsewhere in the Specifications, the CQC System Manager shall conduct an inspection of the work and develop a punch list of items which do not conform to the Drawings and Specifications. Such a list of deficiencies shall be included in the CQC documentation, as required by paragraph 3.9 DOCUMENTATION, and shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the Site is ready for the Government Pre-Final Inspection.

3.8.2 Pre-Final Inspection

The Government will perform this inspection. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government so that a Final inspection can be scheduled. Any items noted on the Pre-Final Inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the CO shall be in attendance at this inspection. Additional Government personnel may also be in attendance. The final acceptance inspection will be formally scheduled by the CO based upon results of the Pre-Final Inspection. Notice shall be given to the CO at least 14 calendar days prior to the final acceptance inspection. The notice shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the Contract, will be complete and acceptable by the date scheduled for the final acceptance

inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the CO to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "INSPECTION OF CONSTRUCTION."

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

a. Contractor/subcontractor and their area of responsibility.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and/or control activities performed with results and references to Specifications/Drawings requirements. The control phase should be identified (Preparatory, Initial, Follow-up). List deficiencies noted along with corrective action.

e. Quantity of materials received at the Site with statement as to acceptability, storage, and reference to Specifications/Drawings requirements.

f. Submittals reviewed, with contract reference, by whom, and action taken.

g. Off-site surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

i. Instructions given/received and conflicts in Drawings and/or Specifications.

j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the Contract. The original and one copy of these records in report form shall be furnished to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 consecutive days of no work (with the exception of fish windows) and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the Contract. The first report following a day of no work

shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.10 SAMPLE FORMS

Sample Forms are attached at the end of this section (Attachments 01451-A and 01451-B). The Contractor shall modify these forms or provide attachments as appropriate.

3.11 NOTIFICATION OF NONCOMPLIANCE

The CO will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work Site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the CO may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

Attachment 01451-A
SAMPLE OF DAILY QUALITY CONTROL REPORT

Contract Number: _____ Date: _____ Rpt. No._____

Contract Title: _____ Location: _____

Weather: Clear __ P. Cloudy __ Cloudy __ Rainfall __ (__% of workday)

Temperature during workday: High ____ degrees F. Low ___ degrees F.

1. WORK PERFORMED BY CONTRACTOR/SUBCONTRACTOR(S):

Contractor Name	No. of Workers	Crafts/Hours	Work performed

2. EQUIPMENT DATA:

Type, Size, Etc.	Owned/Rented	Hours Used	Hours Standby

3. QUALITY CONTROL INSPECTIONS AND RESULTS: (Include a description of preparatory, initial, and/or follow up inspections or meetings; check of subcontractors work and materials delivered to the Site compared to submittals and/or specifications; inventories (attach to report); comments on the proper storage of materials; include comments on corrective actions to be taken):

_____

_____

_____

_____

4. QUALITY CONTROL TESTING AND RESULTS (comment on tests and attach test reports):

_____

_____

_____

5. DAILY SAFETY INSPECTIONS (Include comments on new hazards to be added to the Hazard Analysis and corrective action of any safety issues):

_____

_____

6. REMARKS (Include conversations with or instructions from the Government representatives; delays of any kind that are impacting the job; conflicts in the contract documents; comments on change orders; environmental considerations; etc.):

_____

_____

_____

CONTRACTOR'S VERIFICATION: The above report is complete and correct. All material, equipment used, and work performed during this reporting period are in compliance with the contract documents except as noted above.

_____
CONTRACTOR QC REPRESENTATIVE

Attachment 01451-B
SAMPLE OF TEST REPORT

STRUCTURE OR BUILDING _____

CONTRACT NO. _____

DESCRIPTION OF ITEM, SYSTEM, OR PART OF SYSTEM TESTED:

_____

_____

DESCRIPTION OF TEST: _____

_____

_____

NAME AND TITLE OF PERSON IN CHARGE OF PERFORMING TESTS FOR THE CONTRACTOR:

NAME _____

TITLE _____

SIGNATURE _____

I HEREBY CERTIFY THAT THE ABOVE DESCRIBED ITEM, SYSTEM, OR PART OF SYSTEM HAS BEEN TESTED AS INDICATED ABOVE AND FOUND TO BE ENTIRELY SATISFACTORY AS REQUIRED IN THE CONTRACT SPECIFICATIONS.

SIGNATURE OF CONTRACTOR
QUALITY CONTROL INSPECTOR_____

DATE _____

REMARKS

_____

_____

_____

END OF SECTION

SECTION 01500

TEMPORARY CONSTRUCTION FACILITIES

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. The most recent version of the reference applies.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(1999) National Electrical Code
NFPA 241	(1996) Safeguarding Construction, Alteration, and Demolition Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-04 Drawings

Site Plan; GA

The Contractor shall submit a site plan in the Site Work Plan prepared in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN.

1.3 SITE PLAN

The site plan shall show locations of all temporary facilities including on-site equipment and material storage areas, temporary utilities, access and haul routes, site trailers, trash dumpsters, and temporary sanitary facilities. The site plan shall also indicate the proposed location and dimensions of any area to be fenced and used by the Contractor, avenues of ingress/egress to the fenced area, details of the fence installation, and employee parking

areas. Any areas that may have to be graveled to prevent the tracking of mud shall also be identified. The Contractor shall identify the areas to be used for stockpiling contaminated material and a separate Site for borrow material. Any decontamination areas shall also be identified. The Contractor shall also indicate if the use of a supplemental or other staging area is desired.

1.4 AVAILABILITY AND USE OF UTILITY SERVICES

1.4.1 Temporary Water and Electricity

The Contractor shall provide temporary water and electricity required for construction. Materials may be new or used and shall be adequate for the required usage, shall not create unsafe conditions, and shall not violate applicable codes and standards. All temporary power facilities shall be in accordance with the safety requirements of the National Electric Code NFPA No. 70. The Contractor shall coordinate electrical power requirements with the Contracting Officer (CO).

1.4.2 Sanitation

The Contractor shall provide and maintain within the construction area minimum field-type sanitary facilities approved by the CO. Government toilet facilities will not be available to Contractor's personnel.

1.4.3 Telephone

The Contractor shall make arrangements and pay all costs for telephone facilities desired.

1.4.4 Protection

The Contractor shall locate and mark existing utilities and protect them from damage. Damaged utilities shall be repaired at Contractor's expense.

1.5 BULLETIN BOARD AND PROJECT SIGN

1.5.1 Bulletin Board

Immediately upon beginning of Work, the Contractor shall provide a weatherproof glass-covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the Contract, Wage Rate Information poster, and other information approved by the CO. The bulletin board shall be located at the project Site in a conspicuous place easily accessible to all employees, as approved by the CO. Legible copies of the aforementioned data shall be displayed until work is completed. Upon completion of work the bulletin board shall be removed by and remain the property of the Contractor.

1.5.2 Project Sign

The Contractor shall furnish and install one project sign in accordance with the layout and schedule shown in Attachment 01500-A. U.S. Environmental Protection Agency (EPA) and USACE logos will be Government furnished. All letters shall be block type, upper case. Letters shall be painted as indicated using exterior-type paint. The sign shall be maintained in excellent condition throughout the life of job. The project sign shall be located as directed by the CO. The sign shall be erected within 15 calendar days after receipt of the Notice to Proceed (NTP). Upon completion of project, the sign shall be removed and shall remain the property of Contractor.

1.6 PROTECTION AND MAINTENANCE OF TRAFFIC

During construction the Contractor shall provide access and temporary relocated roads as necessary to maintain traffic. The Contractor shall maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the CO. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment and the Work, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by State and local authorities having jurisdiction. The traveling public shall be protected from damage to person and property. The Contractor's traffic on roads selected for hauling material to and from the Site shall interfere as little as possible with public traffic. The Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. The Contractor shall be responsible for the repair of any damage to roads caused by construction operations.

1.6.1 Haul Roads

The Contractor is notified that activities involving movement and storage of heavy equipment shall be done in such a manner as to minimize dust. The Contractor is responsible for meeting the requirement for no visible dust through use of engineering controls. For this reason, construction of a gravel-based road and use of a specific area of the Site for staging/stockpiling is required. Work involving the existing asphaltic cap and other areas of the Site shall be submitted for approval to the CO. The Contractor shall, at its own expense, construct access and haul roads necessary for proper execution of the Work under this Contract. Haul roads shall be constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided. The Contractor shall provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control shall be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads shall be subject to approval by the CO. Lighting shall be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations. Upon completion of the Work, haul roads designated by the CO shall be removed.

1.6.2 Barricades

The Contractor shall erect and maintain temporary barricades to limit public access to hazardous areas. Such barricades shall be required whenever safe public access to paved areas such as roads, parking areas, or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

1.6.3 Boat Traffic

The Contractor shall manage vessels and avoid interference with navigation in accordance with Section 02325 DREDGING.

1.7 CONTRACTOR'S TEMPORARY FACILITIES

1.7.1 Administrative Field Offices

The Contractor shall provide and maintain administrative field office facilities within the construction area at the designated Site. Government office and warehouse facilities will not be available to the Contractor's personnel.

1.7.2 Employee Parking

Contractor employees shall park privately owned vehicles in an area approved by the CO. This area shall be within reasonable walking distance of the Site. Contractor employee parking shall not interfere with existing and established parking requirements of the facilities.

1.7.3 Storage Area

The Contractor shall construct a temporary 6-foot-high security chain link fence around trailers and materials located in the Contractor's storage area, except where fencing that meets these requirements already exist. Fence posts may be driven, in lieu of concrete bases, where soil conditions permit (except for locations near the slurry wall as defined on the Drawings). Trailers, materials, or equipment shall not be placed or stored outside the fenced area unless such trailers, materials, or equipment are assigned a separate and distinct storage area by the CO away from the vicinity of the construction Site but within the adjacent areas. Materials shall not be stockpiled outside the fence in preparation for the next day's work. Mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment, shall be parked within the fenced area or secured on a work barge at the end of each work day.

1.7.4 Supplemental Storage Area (Not Used)

1.7.5 Appearance of Trailers

Trailers utilized by the Contractor for administrative or material storage purposes shall present a clean and neat exterior appearance and shall be in a state of good repair. Trailers

which, in the opinion of the CO, require exterior painting or maintenance will not be allowed on the Government controlled property.

1.7.6 Maintenance of Storage Area

Should the Contractor elect to traverse, with construction equipment or other vehicles, unpaved areas which are not established roadways, such areas shall be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways; gravel gradation shall be at the Contractor's discretion.

1.7.7 Security Provisions

Adequate outside security lighting shall be provided at the Contractor's temporary facilities. The Contractor shall be responsible for the security of its own equipment; in addition, the Contractor shall notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.

1.7.8 Navigation Aids and Lighting

Temporary navigation aids and lights for Contractor's marine equipment shall be installed and maintained as required by and in a manner satisfactory to CO and the U.S. Coast Guard. For each night, between sunset and sunrise and during periods of restricted visibility, the Contractor shall provide lights for floating plants, pipelines, ranges, and markers. Lights shall be provided for buoys that could endanger or obstruct navigation. When night work is in progress, lights shall be maintained from sunset to sunrise for the observation of operations.

1.7.9 Decontamination Facilities

The Contractor is responsible for installing and maintaining equipment and personnel decontamination areas in accordance with Section 01351 SAFETY, HEALTH, AND EMERGENCY RESPONSE.

1.8 GOVERNMENT FIELD OFFICE

The Contractor shall furnish a trailer, containing not less than 600 square feet, in a location designated by and for the use of the CO. The trailer shall be furnished with two desks. One desk shall be 5 feet long by 3 feet wide, with a side drawer and a center drawer that can be locked. The second desk shall be 3 feet by 4 feet minimum, suitable for laying out full-scale contract plans. Two chairs and one stool shall be furnished. A wall locker shall be furnished which is suitable for hanging coats and raingear and as general storage. It shall be 60 inches to 72 inches high, 18 inches to 24 inches wide, and 18 inches deep (minimum). The building shall have two windows and shall have a door with a lock set with two keys. Each window shall have not less than 6 square feet of glass area, and the door shall be 2 feet, 8 inches wide by 6 feet, 8 inches high. The Contractor shall provide a ten pound, multipurpose, dry chemical fire extinguisher, rated for type A, B, and C fires. Extinguisher shall be mounted at a strategic location, coordinated with the CO. The Contractor shall furnish and maintain adequate electric lights and wall outlets, heat, air-conditioning, and drinking water for the

building, and shall perform any necessary maintenance and disposal of waste to the building. Drinking water shall be either supplied and maintained daily in an insulated water can or be provided via piping to an indoor sink. Suitable enclosed sanitary toilet and lavatory facilities shall be furnished in the immediate vicinity of the building and kept clean by the Contractor. The Contractor shall be responsible for installing all utility hookups, tie downs, skirting, slabs, foundations, steps and landings as necessary to meet all local, county, State, and Federal codes and regulations. The trailer will remain property of the Contractor and shall be removed from the Site upon completion of the project. (As an alternative, the office space may be a lockable room within a larger structure. This office space shall meet all other requirements of this paragraph.)

1.9 PLANT COMMUNICATION (NOT USED)

1.10 NEARSHORE WORK AND UTILITIES REQUIREMENTS

1.10.1 Nearshore Work and Utility Clearance

Before beginning any intrusive nearshore work, the Contractor shall notify the CO and the appropriate local authorities as required to maintain clearances from all the various utilities. Copies of clearances shall be provided to the CO. Buried utility lines shall be marked in the field prior to the intrusive work. The locations of any utilities obtained from the clearances shall be verified on or added to the record drawings in accordance with Section 01780 RECORD DRAWINGS. The Contractor shall obtain the services of a commercial utility locator service.

1.10.2 Utilities Not Shown

All known offshore existing utility lines in the Marine Sediment Unit (MSU) of the Pacific Sound Resources (PSR) Superfund Site (Site) are identified on the Drawings. The Contractor shall verify, prior to excavation, the locations of all utilities, whether shown on the Drawings or not shown on the Drawings and not visible as to the date of this Contract. The types of utilities the Contractor may encounter are waterlines, sewer lines (storm and sanitary), gas lines, fueling lines, steam lines, buried fuel tanks, septic tanks, other buried tanks, communication lines, and power lines. These utilities may be active or abandoned utilities. If such utilities will interfere with site operations, the Contractor shall immediately notify the CO verbally and then in writing to enable a determination by the CO as to the necessity for removal or relocation. If such utilities are removed or relocated as directed, the Contractor shall be entitled to equitable adjustment for any additional work or delay.

1.11 TEMPORARY PROJECT SAFETY FENCING (NOT USED)

1.12 HOUSEKEEPING AND CLEANUP

Work will not be allowed in those areas that, in the opinion of the CO, have unsatisfactory cleanup and housekeeping at the end of the preceding day's normal work shift. At least once each day all areas shall be checked by the Contractor's Quality Control (QC) representative and the findings recorded on the Quality Control Daily Report in accordance with Section 01451 CONTRACTOR QUALITY CONTROL. In addition, the Contractor's QC

representative shall take immediate action to ensure compliance with this requirement. Housekeeping and cleanup shall be assigned by the Contractor to specific personnel. The name(s) of the personnel shall be available at the Site.

1.12.1 Additional Cleanup Conditions

Construction debris, waste materials, packaging material, and the like shall be removed from the work Site daily. Any dirt or mud which is tracked onto paved or surfaced roadways shall be cleaned away. Materials resulting from demolition activities which are salvageable shall be stored within the fenced area described above. Stored material not in trailers, whether new or salvaged, shall be neatly stacked when stored.

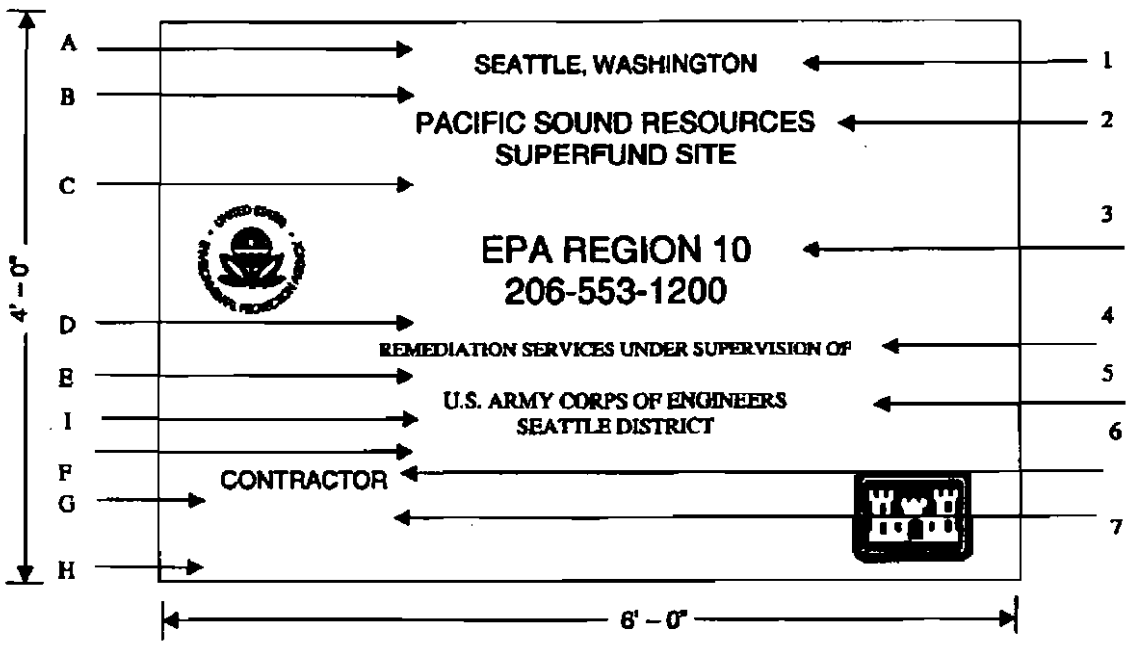
1.13 RESTORATION OF STORAGE AREA

Upon completion of the project and after removal of trailers, materials, and equipment from within the fenced area, the fence shall be removed and will become the property of the Contractor. Areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition. Gravel used to traverse grassed areas shall be removed and the area restored to its original condition, including topsoil and seeding, as necessary.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

Attachment 01500-A
PROJECT SIGN LAYOUT



SCHEDULE

SPACE	HT.	LINE	DESCRIPTION	LETTER HT.	STROKE
A	2"	1	LOCATION	2 3/8"	¼"
B	2 5/8"	2	PROJECT NOMENCLATURE	2 ¾"	3/8"
C	5 ¾"	3	CUSTOMER AND LOGO*	4"	3/8"
D	8"	4	REMEDIATION SERVICES UNDER SUPERVISION OF	1 ½"	½'
E	4"	5	GOVERNMENT OVERSIGHT AGENCY*	2 3/8"	1/8"
F	4"	6	CONTRACTOR	1 3/8"	¼"
G	1"	7	PRIME CONTRACTOR*	1 3/8"	3/16"
H	2 7/8"	7	CORPS CASTLE DECAL		
I	2"		(SPACE BETWEEN TEXT LINES)		
		*	WILL VARY TO SUIT PROJECT REQUIREMENTS		

NOTES:

1. Signboard 4' X 6' X 5/8" grade A-C, exterior type plywood with medium density overlay on both sides.

2. Paint both sides and edges with one prime coat and two coats of white color paint in accordance with FED. STD. 595a, color number 17886 exterior type enamel. Lettering shall be as shown on drawings and shall be black gloss, exterior type enamel.

3. Lettering shall be Helvetica medium.

4. Acceptable abbreviations may be used for Contractor's name.

5. USACE and EPA logos to be Government furnished.

6. No company logo shall be used.

7. Sign to be fastened securely to the perimeter fence where specified by CO.

8. Upon completion of work under this Contract, the project sign shall remain the property of the Government.

END OF SECTION

SECTION 01720

SURVEYING

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. The most recent version of the reference applies.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 1110-2-1003 (2002) USACE Hydrographic Surveying Engineering Manual

1.2 DESCRIPTION OF WORK

The Contractor shall provide all materials, items, operations, or methods specified, listed, or scheduled on the Drawings or in the Specifications, including all materials, labor, equipment, and incidentals necessary to conduct proper surveys required to determine seafloor and shore elevations within the area of the Work.

The Contractor shall perform hydrographic and topographic surveys for layout of the Work, to obtain data for final quantity for dredging, and to verify the grades of final "as-built" construction for acceptance of completed work. Hydrographic surveying shall be performed as a way of accurately monitoring dredging and capping activities in the MSU. Topographic surveys shall be performed to tie in the hydrographic survey to the top of slope and provide verification of hydrographic survey data.

1.3 QUALIFICATIONS

All survey, layout, and related work shall be performed and signed by a professional land surveyor registered in the State of Washington. The surveyor shall have actively engaged in hydrographic and land survey operations during the past 3 years.

1.4 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals with an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-01 Data

Survey Schedule and Drawings Depicting Tracklines; GA

Prior to the start of any survey work, the Contractor shall submit a schedule for all survey work and drawings that show the tracklines for each hydrographic survey.

Electronic Positioning System and Sounding Equipment Specifications; GA.

Prior to the start of any survey work, the Contractor shall submit specifications for all proposed hydrographic survey equipment.

SD-08 Statements

Survey Crew Qualifications; GA.

Prior to start of any survey work, the Contractor shall submit name, address, telephone number, and qualifications of the surveyor, crew chief, superintendent, and all other persons who are proposed to perform surveys or survey-related duties to the Contracting Officer (CO) for review and acceptance.

SD-18 Records

Field Notes, Computations and Survey Quantities; GA.

On the day the Contractor submits request for progress payment, the Contractor shall furnish the CO copies of all field notes, computations, any records relating to the quantity survey or to the layout of the work, and an IBM PC-compatible version of any computer software required to interpret the finished data and records. The Contractor is responsible for converting data and drawing files to a standard software version approved by the CO. Standard ASCII format is pre-approved for data files.

Survey data shall be provided in x, y, z (easting, northing, elevation) format. Each data file shall include a descriptive header including, but not limited to: software and equipment information, client, project, horizontal and vertical datum, units, tidal correction, survey type, alignment, and stations surveyed.

1.5 PROJECT RECORD DOCUMENTS

The Contractor shall maintain on Site a complete, accurate log of control of survey work as it progresses.

Upon completion of the Work, the Contractor shall submit Record Documents to the CO under the provisions of Section 01780 RECORD DRAWINGS.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall exercise care during the execution of the Work to minimize any disturbance to existing property and to the landscape and waters in the areas surrounding the work Site. Survey crews shall not traverse into controlled or contaminated areas without approval from the CO.

3.2 SURVEY REFERENCE POINTS

Five survey control points (PSR-1 through PSR-5) have been established on land and are shown on the Drawings. For all surveys, the horizontal datum that shall be used by the Contractor is Washington State Plane North northing and easting coordinates in feet, using the North American Datum (NAD 1983). All water-based surveys shall be shown in mean lower low water (MLLW), raw and corrected in feet.

The Contractor shall protect survey control points prior to starting site work and preserve permanent reference points during construction. The Contractor shall not relocate site reference points without prior written approval from the CO.

The Contractor shall promptly report to the CO the loss, damage, or destruction of any reference point or relocation required because of changes in grades or other reasons. The Contractor shall replace dislocated survey control points based on original survey control at no additional cost to the Government. Replacement of dislocated survey control points shall be done by a land surveyor licensed in the State of Washington.

3.3 INSPECTION

The Contractor shall verify locations of Site reference and survey control points prior to starting work. The Contractor shall promptly notify the CO of any discrepancies discovered. The Contractor shall also verify layouts periodically during construction.

3.4 SURVEY REQUIREMENTS

3.4.1 General

The Contractor shall reference survey and site reference points to the provided control monuments and record locations of survey control points, with horizontal and vertical data, on Project Record Documents.

3.4.2 Topographic Surveys

Topographic surveys for areas above MLLW shall be done before and after all capping in RA1. These surveys shall be done to supplement the hydrographic surveys required for the

in water work. Surveys shall be done with cross section intervals not to exceed 50 feet on center from which a 1-foot interval contour map will be required in an electronic format. The topographic surveys shall cover RA1 from +15 feet MLLW down to 0 feet MLLW, or sufficiently low to tie in with bathymetric survey data.

The Contractor shall with its own forces obtain working or construction lines or grades as needed. All control surveys for elevation shall be ±0.01 foot and, for horizontal, control angles shall be to the nearest 20 seconds ±10 seconds, and measured distances shall be to ±0.01 foot. All measurement surveys for elevation shall be to the nearest 0.01 foot ±0.005 foot and for horizontal distances shall be to ±0.1 foot.

The Contractor shall provide all materials as required to properly perform the surveys, including, but not limited to, instruments, tapes, rods, measures, mounts and tripods, stakes and hubs, nails, ribbons, other reference markers, and all else as required. All material shall be of good professional quality and in first-class condition.

All lasers, transits, and other instruments shall be calibrated and maintained in accurate calibration throughout the execution of the work. Calibration certificates shall be submitted to the CO prior to the use of any instrument.

The Contractor shall furnish all materials and accessories (i.e., grade markers, stakes, pins, spikes, etc.) required for the proper location of grade points and line. All marks given shall be carefully preserved and, if destroyed or removed without the CO's approval, they shall be reset, if necessary, at the Contractor's expense.

3.4.3 Hydrographic Surveys

3.4.3.1 General

Hydrographic surveys shall be performed in accordance with the standards given in USACE Engineering Manual 1110-2-1003. Surveys shall include both hydrographic and topographic (upland data) in areas where caps extend above low-water elevations.

3.4.3.2 Procedures

Hydrographic survey procedures (positioning modes, electronic positioning system [EPS] calibration, data reduction, adjustment, processing, and plotting) shall conform to industry standards. Horizontal location observations shall compensate for errors, geodetic corrections, and atmospheric variations. Data recordation, annotation, and processing procedures shall be consistent with recognized hydrographic survey standards. Failure to perform and process such surveys in accordance with recognized standards will result in a rejection and nonpayment for work performed. Tide data from National Oceanic and Atmospheric Administration (NOAA) tide gauge # 9447130 shall be used to adjust the survey data to MLLW and to compare with the real-time kinematic (RTK) vertical data.

3.4.3.3 Equipment

The Contractor shall conduct hydrographic surveys using a real-time kinematic differential global positioning system (RTK-DGPS) and a single-beam, dual-frequency or multi-beam, single-frequency echosounder system to obtain soundings. The survey vessel shall be equipped with the RTK-DGPS for determining the horizontal and vertical location of the soundings. The system shall be capable of sub-meter horizontal positioning accuracy and 1.6 inches vertical positioning accuracy. The sounding equipment shall produce a high-resolution, permanent record that accurately depicts bottom profiles. All proposed surveying equipment shall be approved by the CO prior to beginning the Work, as required in paragraph 1.4 SUBMITTALS.

a. Pre-Construction Bathymetry and As-Built Bathymetry surveys for all Work under the Contract shall be accomplished with multi-beam single-frequency equipment. These surveys shall cover RA1 through RA5.

b. All other surveys including, but not limited to, pre-capping surveys, cap placement completion surveys, the pre-dredging survey, and the final dredging survey shall be accomplished with single-beam dual-frequency equipment.

The Contractor shall conduct and document the quality control procedures recommend by the equipment manufacturer and procedures shown in the USACE Hydrographic Manual, Table 9-6 (for single-beam echosounder systems) or Table 11-2 (for multi-beam echosounder systems).

3.4.3.4 Soundings

Sounding and survey lines shall be located as follows:

a. For pre-capping and cap completion surveys in RA1, sounding and survey lines shall be generally perpendicular to the shoreline and shall intersect the baseline at intervals of no greater than 50 feet. In addition, the sounding and survey lines shall be co-located with the transects shown on the Drawings

b. For pre-capping and cap completion surveys in RA2a, RA2b, and RA3, sounding lines shall be on a grid system with lines no greater than 50 feet apart.

c. For pre-capping and cap completion surveys in RA4, sounding lines shall be parallel to the slope gradient with lines no greater than 50 feet apart.

d. For the pre-dredging and final dredging surveys, sounding and survey lines shall be generally perpendicular to the shoreline and shall intersect the baseline at intervals of no greater than 50 feet. In addition, the sounding and survey lines shall be co-located with the transects shown on the Drawings

e. Sounding lines shall extend a minimum of 50 feet beyond the project survey boundaries or as otherwise approved. Interval between soundings on each line shall not exceed 1 foot.

f. All cap completion surveys and the final dredging survey shall be completed on the same sounding lines as the pre-capping and pre-dredging surveys. Soundings shall not deviate more than 10 feet left or right from the initial survey line.

Soundings shall be on MLLW datum. The sounding and survey lines shall be field marked on the fathogram chart during the data acquisition. The location, time of survey, tide height, and direction that line is surveyed shall also be marked on the fathograms.

At least five leadline soundings shall be conducted during each survey to confirm that the soundings meet the water depth accuracy requirements established for this project, which are shown in Table 01720-1.

Table 01720-1
ACCURACY REQUIREMENTS FOR SOUNDINGS

Survey Type	Water Depth	Accuracy
Single-Beam Surveys	0-30 feet	± 0.3 feet
	> 30 feet	± 1 % of water depth
Multi-Beam Surveys	0-60 feet	± 0.3 feet
	> 60 feet	± 0.5 % of water depth

3.4.3.5 Field Notes

Field notes shall indicate the location of each sounding line, the date and time (hour and minutes) each sounding line is taken, and explanation for any line terminated early. The tide shall be recorded for each line surveyed and noted on the section during the survey. Notes shall include tidal data, i.e., height of tide (MLLW datum), bar checks, time of the tide readings, and date and location of the tide gage used for each area surveyed.

3.4.3.6 Quantity Computations

For dredging surveys, quantities shall be computed to the nearest cubic yard based on the pre-and post dredging sounding lines surveyed. Pay volumes for dredging shall be determined by the Contractor using Triangulated Irregular Network (TIN) volume computations in accordance with paragraph 3.5 QUANTITY SURVEYS.

3.4.3.7 Survey Conference(s)

At the pre-construction conference, the Contractor's chief surveyor shall meet with the CO to discuss the survey proceedings, methods, and equipment to be employed for the Contractor's surveys.

3.4.3.8 Survey Timing and Quality Control

The Contractor shall perform hydrographic surveys as specified at the below listed times during this Contract. These surveys shall verify that all Contract dredging depths, structure, or fill dimensions are being obtained as specified. All surveys shall begin where capping commenced for each RA of the Work.

Progress surveys shall be conducted in RAs to monitor the accuracy of the work being performed. At a minimum, the Contractor shall perform the surveys required in Table 01720-2.

Table 01720-2
HYDROGRAPHIC SURVEYING REQUIREMENTS

RA	Event	Method
1-5	Pre-Construction Bathymetry	Multi-beam echosounding, with topographic survey above MLLW
1	Final Cap	Single-beam echosounding, with topographic survey above MLLW
2b and 4	Pre-Cap[a]	Single-beam echosounding
	Final Cap (RA2b)	Single-beam echosounding
	Final Cap (RA4-3 surveys)	Single-beam echosounding
2a and 3	Pre-Dredging[a,b]	Single-beam echosounding
	Final Dredging[b,c]	Single-beam echosounding
	Final Cap (RA2a)	Single-beam echosounding
	Final Cap (RA3)	Single-beam echosounding
1-5	As-Built Bathymetry	Multi-beam echosounding, with topographic survey above MLLW

Notes:
[a] These single-beam surveys may be accomplished concurrently with the multi-beam preconstruction survey.
[b] The pre-dredge and final dredge surveys shall cover all dredge areas, including applicable portions of RA1.
[c] The final dredge survey shall cover RA2a and RA3 and serve as the pre-cap survey in those RAs.

3.4.4 Positioning Control

3.4.4.1 Horizontal Position Control During Dredging and Capping

A short to medium range electronic positioning system (EPS) shall be activated during all in-water operations. This EPS shall be established, operated and maintained by the Contractor during the period of the contract when in-water work is actively underway. The EPS shall display and record the barge and bucket locations continuously (i.e., real-time positioning) during all in-water operations. The control requirements for this system shall comply with the minimum performance standards for Navigation and Dredging Support Surveys, as specified in EM 1110-2-1003, Table 3-1. The Contractor may also propose, for approval by the CO, alternate methods for monitoring the bucket position. The Government shall have access to the monitoring equipment to determine the location of capping equipment during the Work.

A continuous graphic printout plotter and/or graphic monitor shall be on any vessel using an EPS. A complete record copy of the position data (vessel track history), including date, time, coordinates, and root-mean-square (RMS) (i.e., quality of position closure) shall be submitted to the CO as part of the Daily Contractor Quality Control (CQC) Report, in accordance with Section 01451 CONTRACTOR QUALITY CONTROL.

3.4.4.2 EPS System Configuration

The EPS system shall be, at a minimum, similar or equal in design, performance, accuracy, operation characteristics, and frequency to those identified in the USACE Hydrographic

Surveying Engineering Manual (Hydrographic Manual), listed in paragraph 1.1 REFERENCES.

3.4.4.3 EPS Shore-Based Control

The Contractor shall be responsible for maintaining the established horizontal control to locate active and/or passive shore-based EPS transmitter/receiver devices (See paragraph 3.2 SURVEY REFERENCE POINTS). All control shall meet Third Order, Class I, accuracy standards as defined (and referenced) under paragraph 1.3 of the Hydrographic Manual. The Contractor shall obtain all right-of-entry permits and/or leases as required to operate and maintain shore-based electronic equipment on public/private property at no additional cost to the Government.

3.4.4.4 EPS Calibration

EPS calibration techniques shall conform to standard hydrographic surveying practice consistent with minimization of systematic errors inherent to and consistent with the selected EPS system, as specified under Chapters 1 and 4 of the Hydrographic Manual. The Contractor shall be responsible for accurate and reliable EPS calibration for the duration of this contract, and shall document calibration records as part of the Daily CQC Report.

3.4.4.5 EPS Breakdown

The Contractor shall have a backup system in the event that the primary system is rendered inoperable. In the event that both the primary and backup systems are rendered inoperative, the Contractor shall make provisions within 36 hours to be operational. No additional cost to the Government or increase in the Contract time will be allowed. In the event of a failure in either the shore-based or ship-based electronic equipment, the Government shall be immediately notified of the time of failure and time of repair.

3.4.4.6 Tidal Control During Dredging and Capping

To establish capping thickness to the MLLW datum, the Contractor shall adjust data to MLLW using tide data from the NOAA tide gauge. The tide data shall also be used to compare to the RTK vertical data. Tidal changes shall be recorded in MLLW datum, with these changes visually provided to the capping or survey vessel at all times during the capping process to allow proper adjustment of cap thickness. A printed record of the tidal changes shall become part of the Daily CQC Report in accordance with Section 01451 CONTRACTOR QUALITY CONTROL.

3.5 QUANTITY SURVEYS

The Contractor shall conduct quantity (elevation) surveys and the data derived from these surveys shall be used in computing the quantities for dredging in accordance with Section 02325 DREDGING. Progress quantity surveys are not required for capping activities; progress quantities will be based on weight of imported material delivered. The Contractor shall conduct the surveys and computations for any period for which progress payments are requested. These surveys and computations shall be done under the supervision of and shall

be certified by a Washington-Licensed Land Surveyor or Washington-Licensed Civil Engineer. The surveyor or engineer shall have at least 5 years experience in computing earthwork quantities. The surveys shall also be conducted under the direction of a representative of the CO, unless the CO waives this requirement in a specific instance. Quantity calculations shall be prepared by the Contractor using the TIN volume technique, and using HYPACK™ MAX or other commercially-available software as approved by the CO. Additionally, the CO will make such computations as are necessary to verify the quantities of construction.

3.6 SURVEY RECORDS

On the day the Contractor submits request for progress payment, the Contractor shall furnish the CO originals of all field notes, computations, any records relating to the quantity survey (dredging) or to the layout of the Work, and an IBM PC-compatible version of any computer software required to interpret the finished data and records. The CO will use them as necessary to verify the amount of progress payments. The Contractor shall retain copies of all such material furnished to the CO.

3.7 PAYMENT AS AN INCIDENTAL

The cost to the Contractor of all Work and delays occasioned by giving lines and grades, or making other necessary measurements, will be considered as having been included in and incidental to the lump sum prices and unit prices for other items of the Work.

END OF SECTION

SECTION 01780

RECORD DRAWINGS

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-04 Drawings

Record Field Data; GA

Five sets of the Record Field Data shall be submitted to the Contracting Officer (CO) for review and approval a minimum of 20 calendar days prior to the date of final inspection. If review of the preliminary Record Drawings reveals errors and/or omissions, the drawings will be returned to the Contractor for corrections. The Contractor shall make all corrections and return the Record Drawings for backcheck to the CO within 10 calendar days of receipt. When submitted drawings are accepted, one set of marked drawings will be returned to the Contractor for the completion of the Record Drawings.

Final Record Drawings; GA

The final Record Drawings shall be completed and returned together with the approved preliminary Record Drawings to the U.S. Army Corps of Engineers (USACE), Seattle District Office, Survey Branch, Engineering Records, within 30 calendar days of final acceptance. All drawings from the original Drawings set shall be included, including the drawings where no changes were made. The Government will review all final Record Drawings for accuracy and conformance to the drafting standards and other requirements contained in paragraph 3.2 ELECTRONIC FILE RECORD DRAWINGS. The drawings will be returned to the Contractor if corrections are necessary. The Contractor shall make all corrections and shall include the Final Record Drawings with each copy of the Project Closeout Report specified in Section 01788 PROJECT CLOSEOUT.

Electronic Record Drawings; FIO

No later than 30 calendar days after final acceptance a complete set of Record Drawings shall be submitted in Intergraph MicroStation electronic file format. The electronic file format, layering standards and submittal requirements are specified in paragraph 3.2 ELECTRONIC FILE RECORD DRAWINGS.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 RECORDS FIELD DATA

The Contractor shall keep at the construction Site two complete sets of full-size prints of the Drawings, reproduced at Contractor expense, one for the Contractor's use, one for the Government. During construction, both sets of prints shall be marked to show all deviations in actual construction from the Drawings. The color red shall be used to indicate all additions and green to indicate all deletions. The Record Drawings shall show the following information but not be limited thereto:

a. The locations and description of any utility lines and other installations of any kind or description known to exist within the work area. The location shall include dimensions and/or survey coordinates to permanent features.

b. The results of progress-related bathymetry surveys; the results of the final record bathymetry survey. The bathymetric contours shall be plotted at 1-foot intervals.

c. Correct elevations if changes were made in Site grading from the Drawings.

d. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor.

e. All changes or modifications from the original design and from the final inspection.

f. Where Drawings or specifications allow options, only the option actually used in the Work shall be shown on the Record Drawings. The option not used shall be deleted.

These deviations shall be shown in the same general detail utilized on Drawings. Marking of the prints shall be pursued continuously during construction to keep them up to date. In addition, the Contractor shall maintain full-size marked-up drawings, survey notes, sketches, nameplate data, pricing information, description, and serial numbers of all installed equipment, if applicable. This information shall be maintained in a current condition at all times until the completion of the Work. The resulting field- marked prints and data shall be referred to and marked as "Record Field Data," and shall be used for no other purpose. They shall be made available for inspection by the CO whenever requested during construction and shall be jointly inspected for accuracy and completeness by the CO and a responsible representative of the Contractor prior to submission of each monthly pay estimate. Failure to keep the Record Field Data current shall be sufficient justification to withhold a retained percentage from the monthly pay estimate.

3.2 ELECTRONIC FILE RECORD DRAWINGS

No earlier than 30 calendar days after award the Government will have available for the Contractor one set of Intergraph MicroStation electronic file format Drawings, to be used for preparation of Record Drawings. These format requirements also apply to drawings prepared in accordance to Section 01400 REMEDIAL ACTION MANAGEMENT PLAN. The electronic file drawings will be available on ISO-9660 CD-ROM. The Contractor has 30 calendar days after the receipt of the electronic file to verify the usability of the data files, and bring any discrepancies to the attention of the CO. Any discrepancies will be corrected within 15 calendar days and files returned to the Contractor. The Contractor shall incorporate all deviations from the original Drawings as recorded in the approved "Record Field Data" (see Paragraph 3.1). The Contractor shall also incorporate all the written modifications to the Drawings which were issued by amendment or contract modification. All revisions and changes shall be incorporated; i.e., items marked "deleted" shall be deleted, clouds around new items shall be removed, etc.

The Record Drawings shall be done in a quality equal to that of the originals. Line work, line weights, lettering, and use of symbols shall be the same as the original line work, line weights, and lettering, and symbols. Separate layers from the original Drawing layers shall be used for all revisions made. If additional drawings are required they shall be prepared in electronic file format under the same guidance. When final revisions have been completed, each drawing shall be identified with the words "RECORD DRAWINGS" in block letters at least 3/8-inch high placed above the title block if space permits, or if not, below the title block between the border and the trim line. The date of completion and the words "REVISED RECORD DRAWINGS" shall be placed in the revision block above the latest revision notation.

3.2.1 Electronic File Submittal Requirements

MicroStation electronic file(s) shall be in MicroStation version 5.0 'DGN' binary format. All support files required to display or plot the file(s) in the same manner as they were developed shall be delivered along with the files. These files include but are not limited to Font Libraries, Pen Tables, and Referenced files. All drawings shall be submitted in the Micro Station format.

Layering shall conform to the guidelines defined by the American Institute of Architects (AIA) standard document, "CAD Layer Guidelines", copyright 1997. An explanatory list of which layer is used at which drawing and an explanatory list of all layers which do not conform to the standard AIA CAD Layer Guidelines including any user definable fields permitted by the guidelines shall be provided with each submittal.

Electronic File Deliverable Media: All electronic files shall be submitted on ISO 9660 format CD-ROM. Two complete sets of disks shall be submitted along with one complete set of prints. Submittals on CD-ROM shall include a label with the Contractor's firm name, project name and location, submittal type (RECORD DRAWINGS) and date. Each submittal shall be accompanied by a hard copy transmittal sheet that contains the above information together with tabulated information about each file, as shown below:

Electronic File Name	Plate Number	Drawing Title

Electronic version of the table shall be included with each submittal set of disks.

3.3 PAYMENT

All costs incurred by the Contractor in the preparation and furnishing of Record Drawings in electronic file format shall be included in the contract price for Record Drawings. Approval and acceptance of the final Record Drawings shall be accomplished before final payment is made to the Contractor.

3.4 ADDITIONAL RECORD DRAWING PRINTS

One set of marked-up record prints shall be furnished at the time of system acceptance testing. These record prints shall be in addition to the submittals of marked-up Record Drawing prints specified elsewhere in the Contract.

END OF SECTION

SECTION 01788

PROJECT CLOSEOUT

PART 1 GENERAL

1.1 SCOPE

This section covers the requirements for final reporting, cleaning, inspection, and other procedures necessary for Contract closeout.

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-09 Reports

Project Closeout Report; GA.

The Contractor shall submit a Project Closeout Report for approval no later than 90 calendar days after completion of the Work. In general this report shall include all documentation of construction activities. This report shall include, as a minimum, the following items:

a. The Cost and Performance Reports in accordance with Section 01240 COST AND PERFORMANCE REPORT

b. All required chemical testing results in accordance with Section 01450 CHEMICAL DATA QUALITY CONTROL

c. Contractor Quality Control records in accordance with Section 01451 CONTRACTOR QUALITY CONTROL

d. Safety and Health Phase-out Report in accordance with Section 01351 SAFETY, HEALTH, AND EMERGENCY RESPONSE (HTRW)

e. Waste management records in accordance with Section 02120 TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS

f. Record Drawings showing limits of final dredging and capping, and final topography in accordance with Section 01780 RECORD DRAWINGS

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 CLEANING THE PROJECT SITE

The cleaning work shall include the following:

a. Removal of all waste such as excess construction material, wood, bituminous concrete, debris, and any other foreign material

b. Removal of temporary Site facilities and utilities

3.2 ADMINISTRATIVE PROVISION

3.2.1 Substantial Completion

Prior to substantial completion, the Contracting Officer (CO) shall present to the Contractor a punch list of work items to be completed in accordance with the Contract Documents. When the Contractor considers the Work on the punch list to be substantially complete, the Contractor shall submit written notice with a list of items to be completed or corrected and the estimated dates of the completion or correction.

3.2.2 Correcting Deficiencies

Should inspection by the CO find the Work is not substantially complete, the CO will promptly notify the Contractor in writing, listing observed deficiencies. The Contractor shall remedy the deficiencies and send a new written notice of substantial completion. This procedure shall continue until such time when the CO is satisfied with such repairs and corrections. When the CO finds the Work to be substantially complete, the CO will prepare a Certificate of Substantial Completion with a list of deficiencies which require timely correction and/or nonconstruction deficiencies in accordance with provisions of the General Conditions.

3.3 FINAL ACCEPTANCE

3.3.1 Documentation

When the Contractor considers the Work to be complete, the Contractor shall submit to the CO written certification that:

a. Contract Documents have been reviewed

b. Work has been inspected for compliance with Contract Documents

c. Work has been completed in accordance with Contract Documents, and deficiencies listed in the Certificate of Substantial Completion have been corrected

d. Work is complete and ready for final inspection

3.3.2 Deficiency Notification and Corrections

Should the CO inspection find the Work incomplete, the CO will promptly notify the Contractor in writing a listing of observed deficiencies. The Contractor shall remedy the deficiencies and send a second certification of final completion. This procedure shall continue until such time when the CO is satisfied with such repairs and corrections.

3.3.3 Acceptance Certification

When the CO finds the Work is complete, the CO will consider closeout submittals, and a Final Acceptance Certificate will be issued to the Contractor. When the Contractor receives the Final Acceptance Certificate, the Contractor shall submit final invoice for final payment.

END OF SECTION

SECTION 02120

TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

The Contractor is advised that transportation of hazardous materials that do not leave this Superfund Site do not invoke the U.S. Department of Transportation (DOT) requirements for labeling and the Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions. No off-site transportation of hazardous waste is included in the base Contract, because no hazardous waste is expected to be generated as a result of the Work; however, an option for transport/disposal of unknown hazardous waste streams is included to cover unexpected materials.

The following non-hazardous materials may be transported off-site for recycle or disposal: dredged material, pilings, other timber, debris, concrete, asphalt, or other solid waste from construction activities. All disposal of hazardous and nonhazardous waste shall be conducted in compliance with the CERCLA Off-Site Policy (40 CFR 300.440, Procedures for Planning and Implementing Off-Site Response Actions).

Disposal work shall include furnishing all labor, tools, equipment and incidentals required for transport of dredge materials and any associated debris from their existing location to an off-site upland disposal facility. Disposal work also includes all transportation and disposal fees. All dredged material and debris shall be disposed of at an approved Subtitle "D" Landfill unless waste characterization testing indicates the presence of hazardous wastes. Disposal of Contractor-generated sediment due to exceeding overdepth limits or dredging outside of authorized areas will be at the Contractor's expense.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. The most recent version of the reference applies.

CODE OF FEDERAL REGULATIONS (CFR)

40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 279	Standards for the Management of Used Oil
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
49 CFR 107	Hazardous Materials Program Procedures
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 178	Specifications for Packagings

WASHINGTON ADMINISTRATIVE CODE (WAC)

WAC 173-303	Washington Dangerous Waste Regulations
WAC 173-304	Minimum Functional Criteria for Solid Waste

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-09 Report

Waste Management Plan; GA

The Contractor shall prepare a Waste Management Plan (WMP) as part of the Remedial Action Management Plan (RAMP) in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN.

SD-09 Reports

Recordkeeping; GA

Information necessary to file state annual or U.S. Environmental Protection Agency (EPA) biennial reports for all hazardous waste transported, treated, stored, or disposed of under this contract. The Contractor shall not forward these data directly to the regulatory agency but to the Contracting Officer (CO) at the specified time. The submittal shall contain all the information necessary for filing of the formal reports in the form and format required by the governing federal or state regulatory agency. A cover letter shall accompany the data to include the Contract number, Contractor name, and project location.

Spill Response; FIO

In the event of a spill or release of a hazardous substance (a list of hazardous substances and reportable quantities is provided in 40 CFR 302), or pollutant or contaminant, or oil (as governed by the Oil Pollution Act (OPA), 33 U.S.C. 2701 et seq.), the Contractor shall notify the CO immediately. If the spill exceeds a reporting threshold, the Contractor shall follow the pre-established procedures for immediate reporting to the CO.

Exception Reports; GA

In the event that a manifest copy documenting receipt of hazardous waste at the treatment, storage, and disposal facility is not received by the Contractor within 35 days of shipment initiation, the Contractor shall prepare and submit an Exception Report to the CO within 37 days of shipment initiation.

SD-13 Certificates

Qualifications; FIO

Copies of the current certificates of registration issued to the Contractor and/or Subcontractors or written statements certifying exemption from these requirements.

Off-Site Policy Compliance Certification; GA

A letter certifying that EPA considers the facilities to be used for all off-site disposal to be acceptable in accordance with the Off-Site Policy in 40 CFR 300, Section .440. This certification shall be provided for wastes from CERCLA Sites, 42 U.S.C. 9601 et seq., responses. See Attachment 02120-A, Sample Certification, at the end of this Section.

Certificates of Disposal; FIO

Certificates documenting the ultimate disposal of hazardous wastes within 180 days of initial shipment. Receipt of these certificates will be required for final payment.

Packagings Certification; GA

All transportation-related shipping documents shall be submitted to the CO, including draft hazardous waste manifests; draft land disposal restriction notifications; draft manifests for PCBs; draft bills of lading for hazardous and nonhazardous materials; lists of corresponding proposed labels, packages, markings, and placards to be used for shipment; and waste profiles and supporting waste analysis documents, for review a minimum of 14 days prior to anticipated pickup. Packaging assurances shall be furnished prior to transporting hazardous material. Generator copies of hazardous waste manifests, land disposal restriction notifications, generator copies of manifests used for initiating shipments of PCBs, used oil invoices/shipment records, bill of ladings for hazardous and nonhazardous materials, and supporting waste analysis documents shall be furnished when shipments are originated. Receipt copies of waste shipment records at the designated disposal facility shall be furnished not later than 35 days after acceptance of the shipment.

SD-18 Records

Notices of Non-Compliance and Notices of Violation; FIO

Notices of non-compliance or notices of violation by a federal, state, or local regulatory agency issued to the Contractor in relation to any work performed under this Contract. The Contractor shall immediately provide copies of such notices to the CO. The Contractor shall also furnish all relevant documents regarding the incident and any information requested by the CO, and shall coordinate its response to the notice with the CO or his designated representative prior to submission to the notifying authority. The Contractor shall also furnish a copy to the CO of all documents submitted to the regulatory authority, including the final reply to the notice, and all other materials, until the matter is resolved.

1.4 QUALIFICATIONS

1.4.1 Transportation And Disposal Coordinator

The Contractor shall designate, by position and title, one person to act as the Transportation and Disposal Coordinator (TDC) for this Contract. The TDC shall serve as the single point of contact for all environmental regulatory matters and shall have overall responsibility for total environmental compliance at the Site including but not limited to accurate identification and classification of hazardous waste and hazardous materials; determination of proper shipping names; identification of marking, labeling, packaging, and placarding requirements; and completion of waste profiles, hazardous waste manifests, asbestos waste shipment records, PCB manifests, bills of lading, exception and discrepancy reports; and all other environmental documentation. The TDC shall have, at a minimum, one year of specialized experience in the management and transportation of hazardous waste.

1.4.2 Training

The Contractor's hazardous materials employees shall be trained, tested, and certified to safely and effectively carry out their assigned duties in accordance with Section 01351 SAFETY, HEALTH, AND EMERGENCY RESPONSE. The Contractor's employees transporting hazardous materials or preparing hazardous materials for transportation shall be trained, tested, and certified in accordance with 49 CFR 172.

1.4.3 Certification

The Contractor and/or Subcontractors transporting hazardous materials shall possess a current certificate of registration issued by the Research and Special Programs Administration (RSPA), U.S. Department of Transportation, when required by 49 CFR 107, Subpart G.

1.5 LAWS AND REGULATIONS REQUIREMENTS

Work shall meet or exceed the minimum requirements established by federal, state, and local laws and regulations that are applicable. These requirements are amended frequently and the Contractor shall be responsible for complying with amendments as they become effective. In the event that compliance actions exceed the scope of work or conflict with specific requirements of the Contract, the Contractor shall notify the CO immediately.

1.6 DEFINITIONS

a. Hazardous Material. A substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated pursuant to the Hazardous Materials Transportation Act, 49 U.S.C. Section 1801 et seq. The term includes materials designated as hazardous materials under the provisions of 49 CFR 172, Sections .101 and .102, and materials that meet the defining criteria for hazard classes and divisions in 49 CFR 173. EPA designated hazardous wastes are also hazardous materials.

b. Hazardous Waste. A waste that meets criteria established in RCRA or specified by the EPA in 40 CFR 261 or which has been designated as hazardous by a RCRA authorized state program.

1.7 SITE-SPECIFIC INFORMATION

Off-site disposal of waste is expected to be limited to dredged material and potentially associated debris generated during dredging. Existing information indicates this material is not a hazardous waste or Washington State Dangerous Waste. Coordinate with the EPA-approved disposal facility to determine the need for any additional characterization of waste prior to disposal. Obtain CO approval prior to any additional characterization.

The following non-hazardous materials may be encountered during dredging and shall be transported off site for recycle or disposal:

a. Concrete
b. Asphalt
c. Piling
d. Wood debris
e. Riprap
f. Other solid waste from construction activities

PART 2 PRODUCTS

2.1 MATERIALS

The Contractor shall provide all of the materials required for the packaging, labeling, marking, placarding, and transportation of hazardous wastes and hazardous and nonhazardous materials in conformance with DOT standards. Details in this specification shall not be construed as establishing the limits of the Contractor's responsibility.

2.1.1 Packagings

The Contractor shall provide bulk and non-bulk containers for packaging hazardous materials/wastes consistent with the authorizations referenced in the Hazardous Materials Table in 49 CFR 172, Section .101, Column 8. Bulk and non-bulk packaging shall meet the corresponding specifications in 49 CFR 173, referenced in the Hazardous Materials Table, 49 CFR 172, Section .101. Each packaging shall conform to the general packaging requirements of Subpart B of 49 CFR 173, to the requirements of 49 CFR 178 at the specified packing group performance level, to the requirements of special provisions of column 7 of the Hazardous Materials Table in 49 CFR 172, Section .101, and shall be compatible with the material to be packaged as required by 40 CFR 262. The Contractor shall also provide other packaging-related materials such as materials used to cushion or fill voids in overpacked containers, etc. Sorbent materials shall not be capable of reacting dangerously with, being decomposed by, or being ignited by the hazardous materials being packaged. Additionally, sorbents used to treat free liquids to be disposed of in landfills shall be non-biodegradable as specified in 40 CFR 264, Section .314.

2.1.2 Markings

The Contractor shall provide markings for each hazardous material/waste package, freight container, and transport vehicle consistent with the requirements of 49 CFR 172, Subpart D, 40 CFR 262, Section .32 (for hazardous waste), and 40 CFR 761, Section .45 (for PCBs). Markings must be capable of withstanding, without deterioration or substantial color change, a 180-day exposure to conditions reasonably expected to be encountered during container storage and transportation.

2.1.3 Labeling

The Contractor shall provide primary and subsidiary labels for hazardous materials/wastes consistent with the requirements in the Hazardous Materials Table in 49 CFR 172, Section .101, Column 6. Labels shall meet design specifications required by 49 CFR 172, Subpart E, including size, shape, color, printing, and symbol requirements. Labels shall be durable and weather resistant and capable of withstanding, without deterioration or substantial color change, a 180-day exposure to conditions reasonably expected to be encountered during container storage and transportation.

2.1.4 Placards

For each off-site shipment of hazardous material/waste, the Contractor shall provide primary and subsidiary placards consistent with the requirements of 49 CFR 172, Subpart F. Placards shall be provided for each side and each end of bulk packaging, freight containers, transport vehicles, and rail cars requiring such placarding. Placards may be plastic, metal, or other material capable of withstanding, without deterioration, a 30-day exposure to open weather conditions and shall meet design requirements specified in 49 CFR 172, Subpart F.

2.1.5 Spill Response Materials

The Contractor shall provide spill response materials including, but not limited to, containers, adsorbent, shovels, and personal protective equipment (PPE). Spill response materials shall be available at all times in which hazardous materials/wastes are being handled or transported. Spill response materials shall be compatible with the type of material being handled.

2.2 EQUIPMENT AND TOOLS

The Contractor shall provide miscellaneous equipment and tools necessary to handle hazardous materials and hazardous wastes in a safe and environmentally sound manner.

PART 3 EXECUTION

3.1 ON-SITE HAZARDOUS WASTE MANAGEMENT

Should hazardous wastes be generated during work activities, the Contractor shall be responsible for ensuring compliance with all Federal, State, and local hazardous waste laws and regulations. The Contractor shall verify those requirements when preparing reports, waste shipment records, hazardous waste manifests, or other documents related to shipping hazardous materials. The Contractor shall identify hazardous materials using criteria set forth in 40 CFR 261 and WAC 173-303 and other applicable State and local laws, regulations, and ordinances. When accumulating hazardous waste or hazardous materials on Site, the Contractor shall comply with generator requirements in 40 CFR 262 and WAC 173-303. On-site accumulation times shall be restricted to applicable time frames referenced in 40 CFR 262, Section .34 and WAC 173-303. Accumulation start dates shall commence when waste is first generated (i.e., containerized or otherwise collected for discard). The

Contractor shall inspect all hazardous waste areas weekly and shall provide written documentation of the inspection. Inspection logs shall contain date and time of inspection, name of individual conducting the inspection, problems noted, and corrective actions taken.

3.1.1 Hazardous Waste Classification

The Contractor, in consultation with the CO, shall identify all waste codes applicable to each hazardous waste stream based on requirements in 40 CFR 261 or any applicable state or local law or regulation. The Contractor shall also identify all applicable treatment standards in 40 CFR 268 and state land disposal restrictions and shall make a determination as to whether or not the waste meets or exceeds the standards. Waste profiles, analyses, classification, and treatment standards information shall be submitted to CO for review and approval.

3.1.2 Containerized Hazardous Waste

The Contractor shall only use containers in good condition and compatible with the waste to be stored. The Contractor shall be responsible for ensuring containers are closed except when adding or removing waste. The Contractor shall be responsible for immediately marking all hazardous waste containers with the words "hazardous waste" and other information required by 40 CFR 262, Section .32, and any applicable state or local law or regulation as soon as the waste is containerized. An additional marking shall be placed on containers of "unknowns" designating the date sampled, and the suspected hazard. The Contractor shall be responsible for inspecting containers for signs of deterioration and shall be responsible for responding to any spills or leaks.

3.1.3 Inspection

The Contractor shall inspect all hazardous waste areas weekly and shall provide written documentation of the inspection. Inspection logs will contain date and time of inspection, name of individual conducting the inspection, problems noted, and corrective actions taken.

3.2 OFF-SITE WASTE MANAGEMENT

The Contractor shall use RCRA Subtitle C-permitted facilities which meet the requirements of 40 CFR 264 or facilities operating under interim status which meet the requirements of 40 CFR 265 for hazardous waste disposal. The Contractor shall use RCRA Subtitle D or recycling facilities for nonhazardous material being transported off Site. Disposal or recycling facilities with significant RCRA violations or compliance problems (such as facilities known to be releasing hazardous constituents into ground water, surface water, soil, or air) shall not be used.

3.2.1 Treatment, Storage, and Disposal (TSD) Facility and Transporter

The Contractor shall provide the CO with EPA ID numbers, names, locations, and telephone numbers of all proposed disposal and recycling facilities and transporters. This information shall be contained in the Waste Management Plan for approval prior to waste disposal.

3.2.2 Status of the Facility

Facilities receiving hazardous waste must be permitted in accordance with 40 CFR 270 or operating under interim status in accordance with 40 CFR 265 requirements or must be permitted by an authorized state program. Additionally, prior to using a TSD Facility or other facility for off-site disposal of any hazardous or non-hazardous waste, the Contractor shall contact the EPA Regional Off-Site Coordinator specified in 40 CFR 300, Section .440, to determine the facility's status and document all information necessary to satisfy the requirements of the EPA Off-Site Policy and furnish this information to the CO.

3.2.3 Packagings Certification

Prior to shipment of any material off site, the Contractor's TDC shall provide written certification to the CO that hazardous and nonhazardous materials have been properly packaged, labeled, and marked in accordance with Department of Transportation and EPA requirements.

3.2.4 Transportation

The Contractor shall use manifests for transporting hazardous wastes as required by 40 CFR 263 or any applicable state or local law or regulation. Transportation shall comply with all requirements in the Department of Transportation referenced regulations in the 49 CFR series. The Contractor shall acquire manifests in accordance with the hierarchy established in 40 CFR 262, Section .21. The Contractor shall prepare hazardous waste manifests for each shipment of hazardous waste shipped off Site. Manifests shall be completed using instructions in 40 CFR 262, Subpart B, and any applicable state or local law or regulation. Manifests and waste profiles shall be submitted to CO for review and approval. The Contractor shall prepare land disposal restriction notifications as required by 40 CFR 268 or any applicable state or local law or regulation for each shipment of hazardous waste. Notifications shall be submitted with the manifest to the CO for review and approval.

3.2.4.1 Barge Requirements

Dredged material may be loaded into lined shipping containers on-site and transported via flat-top barge to the transfer facility in accordance with the approved Contractor's Waste Management Plan.

If dredged material is transported in bulk to the transfer facility, barges used for hauling dredged material to the approved transfer facility shall be closed hull with side walls. Overflow will not be permitted from barges transporting dredged material out of the MSU. Barges shall be tightly sealed to prevent leakage of materials. Any barges that have side walls that do not seal properly shall be removed from the Work until satisfactory repairs are made. The Contractor's Waste Management Plan shall address how leaks will be prevented, contained and cleaned up should they occur, submitted in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN.

3.2.5 Disposal of Non-Hazardous Wastes

Disposal of non-hazardous waste shall be at the disposal facility identified in the Waste Management Plan and approved by the CO. The Contractor shall maintain all documentation as required under paragraph 3.3.3 Shipping Documents.

3.2.6 Treatment and Disposal of Hazardous Wastes

Any hazardous waste shall be transported to an approved hazardous waste treatment, storage, or disposal facility within 90 days of the accumulation start date on each container. The Contractor shall ship hazardous wastes only to facilities that are properly permitted to accept the hazardous waste or operating under interim status. The Contractor shall ensure wastes are treated to meet land disposal treatment standards in 40 CFR 268 prior to land disposal. The Contractor shall propose TSD facilities via submission of the Waste Management Plan, subject to the approval of the CO.

3.3 HAZARDOUS MATERIALS MANAGEMENT

The Contractor, in consultation with the CO, shall evaluate prior to shipment of any material off Site whether the material is regulated as a hazardous waste in addition to being regulated as a hazardous material; this shall be done for the purpose of determining proper shipping descriptions, marking requirements, etcetera, as described below.

3.3.1 Identification of Proper Shipping Names

The Contractor shall use 49 CFR 172, Section .101 to identify proper shipping names for each hazardous material (including hazardous wastes) to be shipped off Site. Proper shipping names shall be submitted to the CO in the form of draft shipping documents for review and approval.

3.3.2 Packaging, Labeling, and Marking

The Contractor shall package, label, and mark hazardous materials/wastes using the specified materials and in accordance with the referenced authorizations. The Contractor shall mark each container of hazardous waste of 110 gallons or less with the following:

HAZARDOUS WASTE - Federal Law Prohibits Improper Disposal.

If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency.

Generator's name _____

Manifest Document Number _____.

3.3.3 Shipping Documents

The Contractor shall ensure that each shipment of hazardous material sent off Site is accompanied by properly completed shipping documents.

3.3.3.1 PCB Waste Shipment Documents

The Contractor shall prepare hazardous waste manifests for each shipment of PCB waste shipped off Site. Manifests will be completed using instructions in 40 CFR 761, Sections .207 and .208 and all other applicable requirements. Documents shall be submitted to CO for review and approval.

3.3.3.2 Other Hazardous and Nonhazardous Material Shipment Documents

The Contractor shall prepare a bill of lading for each shipment of hazardous and nonhazardous material that is not accompanied by a hazardous waste manifest which fulfills the shipping paper requirements. The bill of lading shall satisfy the requirements of 49 CFR 172, Subpart C, (and 40 CFR 279 if shipping used oil) and any applicable state or local law or regulation, and shall be submitted to the CO for review and approval. For laboratory samples, the Contractor shall prepare bills of lading and other documentation as necessary to satisfy conditions of the sample exclusions in 40 CFR 261, Section .4(d) and (e), and any applicable state or local law or regulation. Bills of lading requiring shipper's certifications shall be signed by the CO.

3.4 EPA ID NUMBER

The Contractor shall use the Facility EPA ID number.

3.5 ASBESTOS WASTE DOCUMENTS (NOT USED)

3.6 WASTE MINIMIZATION

The Contractor shall minimize the generation of hazardous waste to the maximum extent practicable. The Contractor shall take all necessary precautions to avoid mixing clean and contaminated wastes. The Contractor shall identify and evaluate recycling and reclamation options as alternatives to land disposal. Requirements of 40 CFR 266 shall apply to: hazardous wastes recycled in a manner constituting disposal; hazardous waste burned for energy recovery; and hazardous wastes with economically recoverable precious metals.

3.7 RECORDKEEPING

The Contractor shall be responsible for maintaining adequate records to support information provided to the CO regarding exception reports, annual reports, and biennial reports to the state or EPA.

3.8 SPILL RESPONSE

The Contractor shall respond to any spill of hazardous materials or hazardous waste, which are in the custody or care of the Contractor pursuant to this Contract. Any direction from the CO concerning a spill or release shall not be considered a change under the Contract. The Contractor shall comply with all applicable requirements of Federal, State, and local laws or regulations regarding any spill incident.

3.9 EMERGENCY CONTACTS

The Contractor shall be responsible for complying with the emergency contact provisions in 49 CFR 172, Section .604. Whenever the Contractor ships hazardous materials, the Contractor shall provide a 24-hour emergency response contact and phone number of a person knowledgeable about the hazardous materials being shipped and who has comprehensive emergency response and incident mitigation information for that material, or has immediate access to a person who possesses such knowledge and information. The phone must be monitored on a 24-hour basis at all times when the hazardous materials are in transportation including during storage incidental to transportation. The Contractor shall ensure that information regarding this emergency contact and phone number is placed on all hazardous materials shipping documents. The Contractor shall designate an emergency coordinator and post the following information at areas in which hazardous wastes are managed:

a. The name of the emergency coordinator

b. Phone number through which the emergency coordinator can be contacted on a 24-hour basis

c. The telephone number of the local fire department

d. The location of fire extinguishers and spill control materials

Attachment 02120-A
SAMPLE OFF-SITE POLICY CERTIFICATION MEMO

Project/Contract #: _____
Waste Stream: _____
Primary TSD Facility, EPA ID # and Location: _____
Alter. TSD Facility, EPA ID # and Location: _____

EPA Region X	Primary Contact	Secondary Contact
	Telephone No.	Telephone No.
	Fax: No.	Fax No.

EPA representative contacted: _____
EPA representative phone number: _____
Date contacted: _____

Comment: _____
The above EPA representative was contacted on _____. As of that date the above Sites were considered acceptable in accordance with the Off-Site Policy in 40 CFR 300.440.

Signature: _____ Date: _____
Phone number: _____

END OF SECTION

SECTION 02325

DREDGING

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. The most recent version of the reference applies.

CODE OF FEDERAL REGULATIONS (CFR)

33 CFR 81	72 COLREGS (International Regulations for Preventing Collision at Sea—1972): Implementing Rules
33 CFR 84	Annex I: Positioning and Technical Details of Lights and Shapes
33 CFR 85	Annex II: Additional Signal for Fishing Vessels in Close Proximity
33 CFR 86	Annex III: Technical Details of Sound Signal Appliances
33 CFR 89	Inland Navigation Rules: Implementing Rules

U.S. COAST GUARD (USCG)

M16672.2	(1999) Navigation Rules Instruction Manual

1.2 DESCRIPTION OF WORK

Sediments shall be dredged from the Crowley Marine Services Area (RA3) and adjacent portions of RA1 as shown on the Drawings. Dredging this material is required to maintain current navigational depths and access to Crowley Marine Services, provide appropriate cutback slopes for cap construction, and allow for the extension of the former Longfellow Creek outfall.

Dredging work shall include furnishing all labor, tools, equipment, and incidentals required to dredge and dewater sediments as described on the Drawings and in the Specifications.

1.3 DEFINITION

Hard material is defined as material requiring the use of special equipment for economical removal, and includes boulders or fragments too large to be removed in one piece by the dredge.

1.4 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-01 Data

Contractor's dredging plan; GA

The Contractor shall submit a dredging plan as part of the Site Work Plan in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN.

SD-04 Drawings

Drawings of surveys during progress of Work by soundings or sweepings, GA.

Vessel Management Plan; GA

The Contractor shall prepare and submit a Vessel Management Plan with the RAMP in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN.

1.5 MATERIAL TO BE REMOVED

The material to be removed was physically characterized from a composite sample of cores from three sampling locations in RA3. The composite sample in this area indicated a silty sand (SM) material consisting of sand (averaging 71 percent) with some silt (23 percent) and trace clay (5 percent) and gravel (1 percent). The sampled material was considered granular and non-plastic, with a moisture content of 27 percent (mass water/mass solids).

In the areas to be dredged, all materials shall be removed and disposed of as indicated on the Drawings. Debris may be present, potentially including riprap near the existing Longfellow Creek Overflow outfall. If material is encountered that cannot be removed with normal mechanical dredging equipment, the Contractor shall promptly notify the Contracting Officer (CO), and a determination shall be made as to its disposition.

1.5.1 Hard Material

The removal of hard material is not included. If hard material is encountered, the CO shall be notified immediately.

1.5.2 Geotechnical Information

Geotechnical information regarding the materials to be dredged has been obtained by the U.S. Environmental Protection Agency (EPA) and is included in the Technical Exhibit.

The Contractor shall make his own determinations and conclusions regarding the nature of these materials, and the methods and procedures to be utilized in performing the Work. The CO will not make extra payment, nor shall the Contractor make any claim for extra payment for subsurface conditions that may be, in the opinion of the Contractor, different from the conditions indicated by the Drawings, Specifications, or Technical Exhibit, except as specified herein.

1.6 ARTIFICIAL OBSTRUCTIONS

The Government has no knowledge of existing wrecks, wreckage, or other material of such size or character as to require special or additional equipment except as shown on the Drawings. However, the Contractor may encounter debris or other obstructions such as riprap slope facing, stone chunks, pieces of broken cable, and old timber logs and piling during the dredging that is not shown on the Drawings. Several overhead steel cables exist in the Crowley Marine Services berthing area. The Contractor shall coordinate with the CO to temporarily remove and replace the cables. Several dolphins and the Crowley Marine Services Pier are present in the area. As indicated on the Drawings, no under-pier or under-dolphin dredging is included in the Work.

Prior to dredging, the Contractor may rake the dredge areas and remove debris encountered. Debris removed from the dredged area shall be removed from the water. If an obstruction is encountered during dredging, the Contractor shall promptly notify the CO, and a determination shall be made as to its disposition. Disposal shall be in accordance with Section 02120 TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS.

1.7 QUANTITY OF MATERIAL

The total estimated amount of in-place material to be removed from within the specified limits, including side slopes, but excluding overdepths, is approximately 8,200 cy. The maximum estimated amount of allowable overdepth dredging is 1,800 cy.

The estimated quantity for bidding purposes is 10,000 cy which is the total quantity, including overdepth. The quantities listed are estimates only.

1.8 OVERDEPTH DREDGING

The final dredge elevation shall be at or below the required dredge depth indicated on the Drawings, with a maximum overdredge limit of 1 foot. If post-dredge surveying indicates that dredging operations failed to achieve the required dredge depth, the Contractor shall re-dredge the area to the required dredge depth at no additional cost to the Government.

1.9 SIDE SLOPES

Dredging on side slopes shall follow, as closely as practicable, the lines indicated on the Drawings. A 1-foot overdredge allowance is permitted for dredging beyond the indicated neatline side slopes.

Slopes shall be dredged with a maximum slope inclination as designated on the Drawings. Slope dredging shall proceed from the top of the slope downward. Extreme care must be taken to avoid undercutting and over-steepening of existing slopes. Slope excavation in excess of the overdredge tolerance limits shall be brought to grade with approved capping material, in accordance with Section 02483 SEDIMENT CAP, at the Contractor's expense. Under no circumstances will backfilling with dredged materials be allowed.

1.10 ENVIRONMENTAL PROTECTION REQUIREMENTS

The Contractor shall provide and maintain during the life of the Contract, environmental protective measures in accordance with Section 01355 ENVIRONMENTAL PROTECTION. These measures shall include, but are not limited to, erosion control, spill response, and water quality monitoring.

It is possible that disturbance of historical Native American materials may occur as a result of sediment dredging. If any archaeological resources are discovered during excavation, the Contractor shall cease dredging and proceed in accordance with Section 01355 ENVIRONMENTAL PROTECTION.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 INSPECTION

The Contractor shall inspect the Work, keep records of work performed, and ensure that gages, targets, ranges, and other markers are in place and usable for the intended purpose. The Contractor shall provide boats, boatmen, laborers, and materials necessary for inspecting, supervising, and surveying the Work. When required, the Contractor shall provide transportation for the CO and inspectors to and from the dredging plant and adjacent points on shore.

3.2 CONDUCT OF DREDGING WORK

3.2.1 Order of Work

The Contractor shall conduct the Work in accordance with the approved Final RAMP, submitted in accordance with Section 01400 REMEDIAL MANAGEMENT PLAN. The Contractor shall notify the U.S. Army Corps of Engineers (USACE) Regulatory Branch Enforcement Section and the USCG Vessel Traffic Service (VTS) at least 14 days prior to commencing dredging. The Government reserves the right to change the order of Work at any time. Dredging is scheduled to occur prior to the capping of nearby portions of RA1, RA2a, and RA3, and shall precede extension of the Longfellow Creek Overflow outfall. No dredging will be permitted within the fish window in accordance with Section 01145 SITE-SPECIFIC SUPPLEMENTARY REQUIREMENTS.

3.2.2 Vessel Management

The Contractor shall monitor navigation activities near dredging activities. Except as approved by the CO, the Contractor shall conduct operations in such a manner as to prevent obstruction to navigation, and in the event that the Contractor's construction equipment (dredges, barges, work boats, anchor buoys, etc.) obstructs any channel or berthing areas as to make difficult or endanger the safe passage of vessels, said equipment shall be immediately moved on the approach of any vessel to such an extent as may be necessary to afford a practical passage. The Contractor shall coordinate with the CO for access and timing of operations. The schedule and the Contractor's Site Work Plan shall take into account such anticipated interruptions to the Contractor's operations. The Contractor shall keep the U.S. Coast Guard (USCG) and the Port of Seattle police apprised of the position of his equipment and shall notify them 24 hours in advance of changes of operations or equipment location. Signal lights shall be displayed in accordance with USCG Instruction Manual M16672.2 Navigation Rules, International-inland (COMPTINST m16672.2), 33 CFR 81 Appendix 'A' (international) and 33 CFR 84 through 33 CFR 89 (inland), as applicable.

Weather and mechanical breakdowns can affect ship schedules and the Contractor must expect to work around the ship movements. Except as approved by the CO, marine traffic will have precedence at all times.

The Contractor shall submit a Vessel Management Plan that documents the proposed vessels, navigation routes, and coordination of activities with waterway users. Contents of the Vessel Management Plan are described in Section 01400 REMEDIAL ACTION MANAGEMENT PLAN.

The Contractor shall regularly check with the USCG Vessel Traffic Service (VTS) to identify any potential conflicts with tribal fishing operations and alert the CO of any potential conflicts.

3.2.3 Lights

Navigation aids and lights for all marine equipment shall be in accordance with Section 01500 TEMPORARY CONSTRUCTION FACILITIES.

3.2.4 Ranges, Gages, and Lines

The Contractor shall furnish, set, and maintain ranges, buoys, and markers needed to define the Work and to facilitate inspection. Tide gages shall be established and maintained in locations observable from each part of the Work so that the depth may be determined. Dredging shall be suspended when the gages or ranges cannot be seen or followed. Ranges, gages and lines shall conform to applicable requirements in Section 01720 SURVEYING.

3.2.5 Methods Of Dredging

All dredging for this project shall be completed by mechanical dredge. Dredging equipment and methods proposed for use by the Contractor shall be designed to minimize the dispersion of resuspended sediments during dredging. The Contractor's dredging operations shall conform to the requirements for water quality monitoring in accordance with Section 01355 ENVIRONMENTAL PROTECTION. The Contractor shall maintain the plant, scows, coamings, barges, and associated equipment to meet the requirements of the Work. Positioning control for the dredging equipment shall be in accordance with the applicable requirements of Section 01720 SURVEYING.

3.2.5.1 Monitoring of Dredging Operations

While dredging, the Contractor shall closely monitor the position of dredging equipment to ensure that the excavation limits conform to the requirements of the Contract Documents. No multiple bite to achieve a full bucket or stockpiling of material shall be permitted. Sweeping in areas designated for subsequent sediment capping may be performed only with the approval of the CO. Sweeping is defined as dragging a bucket over the completed excavation to level the surface to the finished grade.

If a fish kill occurs or fish or wildlife are observed in distress, the Contractor shall immediately cease dredging and contact the CO.

3.2.5.2 Dewatering and Overflow

The Contractor shall place all dredged material on flat-deck barges for dewatering on site. The sediments will be allowed to dewater by gravity drainage for a minimum of 8 hours, and the barges will be equipped with filters for limiting turbidity of overflow. Best engineering practices shall be used to minimize free-draining liquids prior to disposal. No off-site discharge of dewatering liquids will be permitted.

3.2.6 Disposal of Excavated Material

Off-site disposal of dewatered, dredged material shall be in accordance with Section 02120 TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS.

3.2.7 Salvaged Material

Anchors, chains, firearms, and other articles of value, which are brought to the surface during dredging operations, shall remain or become the property of the Government and shall be deposited on shore at a convenient location near the site of the Work, as directed by the CO.

3.2.8 Safety of Structures

The dolphins in the dredge area are over-water-structures supported by piling. Dredging will not be attempted under dolphins. Adjacent to dolphins, the Contractor shall remove the

specified depth of material to within 5 feet of the dolphin as shown on the Drawings. The Crowley Marine Services pier includes dolphins supporting the pontoon system for raising and lowering the pier. No under-pier dredging shall be conducted.

The prosecution of Work shall ensure the stability of dolphins, piers, bulkheads, and other structures lying on or adjacent to the Site of the Work, insofar as structures may be jeopardized by dredging operations. The Contractor shall repair, at no additional cost to the Government, damage resulting from dredging operations, insofar as such damage may be caused by variation in locations or depth of dredging, or both, from that indicated or permitted under the Contract.

3.2.9 Plant Removal

Upon completion of the Work, the plant shall be promptly removed, including ranges, buoys, piles, and other markers or obstructions.

3.3 FINAL EXAMINATION AND ACCEPTANCE

The Contractor shall conduct a hydrographic survey (single-beam echosounding) no later than 48 hours after the completion of dredging. The survey shall be completed in accordance with Section 01720 SURVEYING. The Government shall be notified at least 48 hours in advance of when soundings are to be made and shall be permitted to accompany the sounding party. When the dredging is found to be in a satisfactory condition, the Work therein will be accepted as complete. Final dredge quantity estimates will be subject to deductions or correction of deductions previously made because of excessive overdepth, dredging outside of authorized areas, or disposal of material in an unauthorized manner.

END OF SECTION

SECTION 02483

SEDIMENT CAP

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

The Work includes furnishing all labor, materials, tools and equipment necessary for placement of capping materials within the Marine Sediment Unit (MSU) for remediation of Pacific Sound Resources (PSR) Superfund Site (Site) sediments. For engineering purposes the MSU cap area is subdivided into "remediation areas" (RAs) according to specific site conditions and operational considerations that require different cap designs, cap materials specifications, or construction methods. The Work includes capping of the following RAs: RA1, RA2a, RA2b, RA3, and RA4. Capping of RA1 is included in the Base Contract; capping of RA2a, RA2b, RA3, and RA4 may be awarded as options by the Contracting Officer (CO). The capping boundaries are shown on the Drawings. Based on the defined boundaries, the plan view cap area for these RAs totals approximately 36.4 acres.

The Contractor shall select materials that are approved by the CO as suitable capping materials, and transport them to the Site. The Contractor shall use only approved borrow materials (see Section 01450 CHEMICAL DATA QUALITY CONTROL for chemical requirements). The Contractor shall place the cap as described in this section and as shown on the Drawings.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. The most recent version of the reference applies.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 422	(1963; R 1998) Particle-Size Analysis of Soils

ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA SW-846	(Rev O; updates I, II, IIA, IIB, III, and IIIA) Test Methods for Evaluating Solid Waste (Vol IA, IB, IC, and II)

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT)

WSDOT	(2000) Standard Specifications for Road, Bridge and Municipal Construction

PUGET SOUND ESTUARY PROGRAM (PSEP)

PSEP	(1997) Recommended Guidelines for Sampling Marine Sediment, Water Column, and Tissue in Puget Sound. In "Puget Sound Protocols and Guidelines"

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-01 Data

Contractor's Capping Plan; GA

The Contractor shall submit a capping plan as part of the Site Work Plan in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN that includes the means of transporting and stockpiling materials, proposed capping methods, sequences of work and coordination with the dredging and nearshore work, means of measuring progress, means of cap verification and navigation positioning. The Contractor's capping plan shall define specific methods for verification of the cap layers in RA1, including the verification methods specified in this section and additional methods that may be proposed by the Contractor. Such additional methods may include additional segmentation of RA1, plotting of mechanical bucket positioning data, frequent leadline surveys, underwater video documentation, or other methods. The Contractor shall coordinate with Section 02325 DREDGING for related elements.

SD-09 Reports

Pre-Construction Testing Report; GA.

The Contractor shall submit a Pre-Construction Testing Report no later than 45 calendar days after the CO approves such testing, and 10 calendar days prior to the start of construction, that summarizes the test procedures and results for the borrow source pre-construction analyses. Results shall include, but not be limited to, sieve analysis and physical and chemical test reports for borrow source characterization.

SD-13 Certificates

Procurement of Borrow Materials; GA.

Laboratory test result showing that the borrow material is uncontaminated. Provide certificates indicating that the commercial borrow source operation complies with applicable Federal, State, and local regulations.

Testing; GA.

Qualifications and validation of the commercial testing laboratory or Contractor's testing facilities. Refer to Section 01451 CONTRACTOR QUALITY CONTROL for requirements.

1.4 CONSTRUCTION FACILITIES

Temporary navigation aids and lights for Contractor's marine equipment shall be in accordance with Section 01500 TEMPORARY CONSTRUCTION FACILITIES.

1.5 ARTIFICIAL OBSTRUCTIONS

The Government has no knowledge of existing wrecks, wreckage, or other material of such size or character as to require special or additional equipment except as shown on Drawings. However, the Contractor may encounter debris or other obstructions such as riprap slope facing, stone chunks, pieces of broken cable, and old timber logs and piling during the capping that are not shown on the Drawings.

1.5.1 RA1 Obstructions

1.5.1.1 Piling, Viewing Pier, and Eastern Pier

The majority of the existing piling in RA1 will be removed by others prior to capping as shown on the Drawings. The viewing pier (a pile-supported structure) and a small pier on the eastern edge of the project limits will remain in RA1, and capping beneath these piers shall be conducted by the Contractor where shown on the Drawings. Cap material shall be cast under the viewing pier using conveyors, mechanical equipment, or hydraulic washing, or mechanically graded into place at higher beach elevations or other methods approved by the CO.

1.5.1.2 Crowley Marine Services Pier

The area under the Crowley Marine Services pier has little available clearance in which to accommodate a cap. The Contractor shall place a thin layer (6 inches) of gravel mix capping material under this pier.

1.5.1.3 Former Longfellow Creek Overflow Outfall

An engineered extension of this pipe is required to accommodate the cap in this area in accordance with Section 02630 STORM DRAINAGE. The cap will also require scour protection at the outfall, consisting of a riprap apron, in accordance with paragraph 2.1.7 Riprap.

1.5.1.4 Unidentified East Outfall

This outfall is a dilapidated 12-inch steel pipe at approximately +8 feet mean lower low water (MLLW), on the eastern portion of the shoreline near the elevated bench. No flow has been observed from this pipe. The pipe shall be grouted with concrete in accordance with Section 02630 STORM DRAINAGE, and the cap in this area shall be placed over the pipe as shown on the Drawings.

1.5.2 RA3 Obstructions

The dolphins in RA3 are pile-supported structures. Cap material shall be cast under the dolphins. Several overhead steel cables are strung between the dolphins and the Crowley Marine Services pier. Coordination with Crowley Marine Services will be required to temporarily remove the cables.

PART 2 PRODUCTS

2.1 MATERIAL SOURCES

Material sources shall be selected well in advance of the time when the material will be required. Suitable representative samples and test reports shall be submitted to and approved by the CO prior to delivery of materials to the Site. The Contractor shall ensure that there is an availability of an adequate and acceptable materials source, based on quantity, quality, and gradation to complete the Work. All borrow sources and imported materials used by the Contractor shall meet the specifications listed below.

2.1.1 Beach Sand

The Contractor shall select materials that meet the quality requirements listed below from an existing commercial source or sources. Material shall be "clean sand" with no man-made or environmental contaminants. Black sand or other dark sand will not be accepted. Beach sand shall consist of non-fractured, river-washed, naturally occurring, round to oblong material meeting the gradation requirements of Table 02483-1.

Table 02483-1
BEACH SAND GRADATION

Particle Size (US Sieve Size)	Percent Passing
No. 4	100
No. 8	85 to 100
No. 16	65 to 85
No. 30	40 to 75
No. 40	35 to 65
No. 200	10 to 20

2.1.2 Sand Cap Mix

The Contractor shall select materials, which meet the quality requirements listed below from an existing commercial source or sources. Material shall be "clean sand" primarily subangular, with no man-made or environmental contaminants. Gradations for the sand cap mix capping material are shown in Table 02483-2. The sand cap mix shall have a minimum total organic carbon (TOC) content of 0.5 percent by weight. Sand cap mix shall contain no floatable material.

Table 02483-2
SAND CAP MIX GRADATION

Particle Size (US Sieve Size)	Percent Passing
3/8-inch	100
1/4-inch	90 to 100
No. 8	40 to 100
No. 50	2 to 60
No. 200	0 to 10

2.1.3 Coarse Sand Mix

The Contractor shall select materials, which meet the quality requirements listed below from an existing commercial source or sources. Material shall be "clean sand" with no man-made or environmental contaminants. Coarse sand mix shall conform to the gradation requirements shown in Table 02483-3.

Table 02483-3
COARSE SAND MIX GRADATION

Particle Size (US Sieve Size)	Percent Passing
1/2-inch	100
3/8-inch	80 to 100
No. 4	30 to 50
No. 8	2 to 10
No. 200	0 to 5

2.1.4 Gravel Mix

The Contractor shall select materials from an existing commercial source or sources. Gravel mix shall be well-graded, sandy gravel, primarily angular, with no man-made or environmental contaminants. Gravel mix shall conform to the gradation requirements shown in Table 02483-4.

Table 02483-4
GRAVEL MIX GRADATION

Particle Size (US sieve size)	Percent Passing
2 1/2-inch	100
2-inch	65 to 100
1-inch	50 to 85
1/4-inch	30 to 50
No. 40	0 to 16
No. 200	0 to 9

2.1.5 Filter Material No. 1

The Contractor shall select materials from an existing commercial source or sources. Filter material No. 1 shall be clean, free-draining sandy gravel and cobbles, primarily angular, with

no man-made or environmental contaminants. Filter material No. 1 shall conform to the gradation requirements shown in Table 02483-5.

Table 02483-5
FILTER MATERIAL NO. 1 GRADATION

Particle Size (US sieve size)	Percent Passing
8-inch	100
3-inch	30 to 75
2-inch	20 to 60
3/4-inch	15 to 40
No. 40	0 to 5
No. 200	0 to 5

2.1.6 Filter Material No. 2

The Contractor shall select materials from an existing commercial source or sources. Filter material No. 2 shall be clean, free-draining sand and gravel, primarily angular, with no environmental contaminants. Filter material No. 2 shall conform to the gradation requirements shown in Table 02483-6. Filter material No. 2 shall have a minimum TOC content of 0.5 percent by weight. Filter material No. 2 shall contain no floatable material.

Table 02483-6
FILTER MATERIAL NO. 2 GRADATION

Particle Size (US sieve size)	Percent Passing
2 1/2-inch	100
2-inch	65 to 100
1-inch	50 to 85
1/4-inch	30 to 50
No. 40	0 to 16
No. 200	0 to 9

2.1.7 Riprap

Riprap shall consist of broken stone that is hard, sound, dense, and durable from an approved source. Riprap shall be free from seams, cracks, and other defects tending to destroy its resistance to weather and seawater. Dry unit weight shall not be less than 160 pounds per solid cubic foot. Rock for riprap shall be angular; each piece shall have its greatest dimension not greater than three times its least dimension. Riprap shall conform to the gradation requirements shown in Table 02483-7.

Table 02483-7
RIPRAP GRADATION

Weight of Individual Pieces (pounds)	Percent Passing by Weight (percent of pieces lighter than the stated weight)
50	10 to 20
300	10 to 50
1000	100

2.1.8 Habitat Mix

The Contractor shall select materials from an existing commercial source or sources. Habitat mix shall consist of clean, naturally occurring rounded or sub-angular river sandy gravel, primarily (greater than 80 percent) igneous or metamorphic rock. Individual stones shall be generally free of seams, cracks, and other defects tending to destroy its resistance to weathering. Bulk material shall be free of soil, clay balls, debris, wood, organic matter, and other extraneous material. Habitat mix shall meet the gradation requirements of Table 02483-8.

Table 02483-8
HABITAT MIX GRADATION

Particle Size (US sieve size)	Percent Passing
2-inch	100
1 1/2-inch	80 to 95
3/4-inch	50 to 80
No. 4	30 to 50
No. 200	0 to 8

2.2 GRADATION TESTS

Prior to starting placement of materials and using samples selected by the CO, the Contractor shall conduct as directed at least one, but not more than two gradation tests (ASTM D 422) from each material type and borrow source, except for riprap. A USACE-certified laboratory using standard sieve sizes shall conduct tests. Minimum test sample size shall be 200 pounds. All costs of such tests shall be borne by the Contractor and shall be incidental to placing materials. Results of such tests shall be submitted for approval in the Pre-Construction Testing Report prior to placement of material.

2.3 ACCEPTANCE CRITERIA FOR CAP MATERIALS

Materials shall be inspected at the Site prior to placement. The Contractor shall be responsible for maintaining gradations as specified. Materials which do not meet gradation or quality as herein before specified will be rejected and no payment will be made regardless of any general or provisional acceptance of materials from a stockpile or pit source. In addition to tests required in paragraph 2.2 GRADATION TESTS, one gradation test shall be conducted for each 10,000 tons of each gradation of material delivered to the Site for placement. Minimum test sample size shall be 200 pounds. Additional tests shall be

conducted if furnished materials do not meet gradation requirements. Results of tests shall be furnished to the CO within 24 hours following selection of sample. All costs of such tests shall be borne by the Contractor and shall be incidental to placing materials.

For the sediment cap, the acceptance standard for the cap material is as follows:

a. Borrow material shall not be obtained from an industrial Site, nor suspected to have been modified by the addition of man-produced chemicals.

b. Borrow material shall meet the requirements shown in Tables 02483-1 through 02483-8.

c. Borrow material (with the exception of riprap, gravel mix, and filter material No.1) shall have chemical concentrations at or below criteria in Table 01450-2 in Section 01450 CHEMICAL DATA QUALITY CONTROL.

d. All borrow material (with the exception of riprap, gravel mix, and filter material No.1), shall be sampled and analyzed for semi-volatile organics (SW-846 Method 8270), inorganics (SW-846 Method 6000/7000), polychlorinated biphenyls (PCBs) (SW-846 Method 8082), pesticides (SW-846 Method 8081) and TOC (SW-846 Method 9060).

e. Borrow material shall meet the TOC requirements where specified for the material type.

f. The required frequency of analyses for chemical concentrations and TOC content of the borrow materials are as follows:

   i. Two separate samples and chemical analyses of each material shall be initially required.

   ii. Additionally, two separate samples and chemical analyses of each material shall be required at the beginning of the second and third construction season (if a third season is needed).

   iii. Two additional samples and analyses shall be required if a material is obtained from a different supplier that the originally tested material.

   iv. Riprap, gravel mix, and filter material No.1 do not require chemical testing.

For riprap, the CO will designate a qualified geotechnical engineer to visually inspect the riprap at the quarry source. The geotechnical engineer will inspect the riprap for size distribution, hardness, durability, angularity, shape, porosity, and presence of deleterious material. Approval of the riprap by the CO's designee is required prior to its delivery to the Site.

PART 3 EXECUTION

3.1 BARGE REQUIREMENTS

Barges employed for hauling clean imported materials may be either bottom-dump or flat type. Bottom-dump barges shall be tightly sealed to prevent leakage of materials. The Contractor's Environmental Protection Plan (submitted with the RAMP, in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN and Section 01355 ENVIRONMENTAL PROTECTION) shall address how leaks will be prevented, contained, and cleaned up should they occur.

Navigation aids and lights for all marine equipment shall be in accordance with Section 01500 TEMPORARY CONSTRUCTION FACILTIES. The Contractor shall manage vessels and avoid interference with navigation in accordance with Section 02325 DREDGING, and in accordance with the vessel management plan described in Section 01400 REMEDIAL ACTION MANAGEMENT PLAN.

Positioning Control shall be in accordance with the applicable requirements of Section 01720 SURVEYING.

3.2 PLACEMENT OF MATERIAL

Borrow material shall be transported and placed from barges in the cap areas as shown on the Drawings. Payment will not be made for any material that is deposited elsewhere than in the designated RAs, unless otherwise directed by the CO. Floatable material shall not be placed in open-water areas. Prior to capping, the Contractor shall provide advance notice to the U.S. Coast Guard (USCG) – Notice to Mariners, and coordinate with the CO regarding other site users (e.g., Crowley Marine Services and tribal fisheries departments).

Placement of capping materials shall be accomplished such that material deposits form a uniform layer of the required thickness over the designated area, and water quality compliance criteria are not exceeded. Placement method(s) shall be used that minimizes any resuspension of bottom sediments to prevent contamination of the capping materials. All caps will be constructed with multiple lifts of material, as described herein. Placement methods shall be modified if the resulting cap lift thickness exceeds the maximum lift thickness shown on Table 02483-9. With the exception of the initial gravel mix lifts in RA1, placement of cap material shall be accomplished such that intermingling of existing contaminated sediments with cap material is minimized.

The allowable lift thicknesses, placement rates, and consolidation periods, and cap thickness requirements are summarized in Tables 02483-9 and 02483-10, respectively. At the direction of the CO, the Contractor shall modify the placement methods if the monitoring results are not acceptable (e.g., if cores show non-uniform placement or excessive mixing of cap material with underlying sediments). To verify compliance with the requirements of Table 02483-10, the Contractor shall submit the following information with each Daily Quality Control Report, in accordance with Section 01451:

a. Drawing showing area in which cap material was placed

b. Calculated area (acres) in which cap material was placed, to the nearest 0.1 acre

c. Type of material placed

d. Lift number

e. Quantity of material placed (tons)

f. For riprap placed in keys or toe berm, the quantity of material placed per linear foot.

3.2.1 RA1 Material Placement

Placement shall be accomplished mechanically placing borrow material in the RA1 cap area from a barge. Other method(s) of placement proposed by the Contractor shall be approved in advance by the CO. Cap material shall be placed in lifts with thicknesses not to exceed those shown in Table 02483-9. Material shall be graded to the dimensions shown on the Drawings. Earth moving equipment may be used for final cap grading in RA1 but shall not operate below water. Equipment such as conveyors may be used to place materials under the piers.

3.2.1.1 Slope Capping in RA1

The intent of the slope cap is to provide a compact blanket of riprap over designated slope areas. The slopes shall be capped as follows:

a. Before placing slope protection materials, the slopes shall be dressed to the lines and grades shown on the Drawings. All slope protection materials shall be placed starting at the base of the slope and working upwards.

b. Riprap Key (where shown on the Drawings): At the base of slopes to be capped, a riprap key shall be excavated during dredging, to the dimensions indicated on the Drawings. When construction of the slope cap begins, the excavated key will be filled with riprap to provide a firm base for supporting the overlying slope cap. Placing of riprap by any method likely to cause segregation will not be permitted.

c. Where toe berms are called out on the Drawings, the entire thickness of the toe berm shall be placed prior to working upward. Placing of riprap by any method likely to cause segregation will not be permitted.

d. Filter Material Layer: A layer of filter material shall be placed on the prepared slopes to the full thickness and limits specified on the Drawings using methods that will not cause segregation of particle sizes within the bedding. Materials shall be uniformly deposited over the slopes such that the surface of the layer is even and free from mounds or windrows. Dumping above the waterline for underwater placement shall be prohibited.

e. Riprap Armoring Layer: Riprap shall be placed over the filter material layer in a manner that will produce a close-fitting and well-keyed mass of rock and so as to minimize the percentage of voids. The riprap layer shall be constructed to the lines, grades, and thickness shown on the Drawings.

Riprap shall be placed in sections perpendicular to the slope axis, immediately after the slope has been dressed with the filter material, to prevent damage of filter materials due to waves or tidal fluctuations. The riprap shall be placed over the filter material layer to its full course thickness in one operation and in such a manner as to avoid displacing the underlying material. Riprap shall be placed starting at the base of the slope and working upwards. Any damage to the filter material layer shall be repaired prior to placing the riprap. Placing of riprap by any method likely to cause segregation will not be permitted. The larger rock shall be well distributed and all rock shall be so placed and distributed such that there will be no large accumulation or areas composed largely of either the larger or smaller sizes of rock.

Hand placing or rearranging of individual rock by mechanical equipment may be required to secure results specified above. There shall be no loose or unkeyed rocks on the slope face, and any unkeyed rock shall be promptly removed.

f. Habitat Mix shall be uniformly placed over the riprap armoring layer and over specified areas of existing riprap as shown on the Drawings to fill the interstices of the larger stone.

g. Voids greater than 18 inches (in average plan dimension) in riprap at elevations between 0 feet MLLW and +13 feet MLLW shall be filled with gravel mix prior to placing habitat mix.

3.2.2 RA2a and RA3 Material Placement

The base layer of sand cap mix may be placed in RA2a and RA3 mechanically or by hydraulic washing from a barge, and the top layers of coarse sand and gravel mix may be placed mechanically. Other method(s) may be proposed by the Contractor and may be approved in advance by the CO. Equipment such as conveyors may be used to place materials under the Crowley Marine Services dolphins. Cap material shall be placed at rates not to exceed those shown on Table 02483-9.

3.2.3 RA2b Material Placement

Cap material may be placed in RA2b mechanically or by hydraulic washing from a barge, or by other method(s) proposed by the Contractor and approved by the CO. Cap material shall be placed at rates not to exceed those shown on Table 02483-9.

3.2.4 RA4 Material Placement

Cap material may be placed in RA4 mechanically or by hydraulic washing from a barge, or by other method(s) proposed by the Contractor and approved by the CO. Cap material shall be placed at rates not to exceed those shown on Table 02483-9.

RA4 has the most restrictive lift thickness requirements (to avoid bearing capacity failures and potential landsliding) and thus the placement will be monitored intensively.

Table 02483-9
ALLOWABLE LIFT THICKNESSES AND CONSOLIDATION PERIODS FOR CAP PLACEMENT

Remediation Area	Lift Number	Maximum Allowable Thickness of Cap Lift (ft)[a]	Maximum Allowable Placement Rate (ton/acre)[b]	Required Consolidation Period
1	1	1	--	Allow 48 hours consolidation between lifts[c]
	2	2	--	
	3, 4, 5	5	--	
2a, 2b, 3	1	1	2100	Allow 48 hours consolidation between lifts
	2	2	4200	
	3, 4	2	4200	
4	1	0.5	1200	Allow 48 hours consolidation between lifts
	2	0.75	1800	
	3, 4	1.75	4000	

Notes:
[a] Maximum allowable thicknesses are based on bearing capacity analyses. In RA1, Contractor shall not place individual lifts in greater thicknesses than those shown in this column.
[b] In RA2a, RA2b, RA3, and RA4, Contractor shall place cap material at rates not to exceed those shown in this column.
[c] Consolidation period does not apply to placement of riprap and filter material on armored slopes.
-- - Not applicable

Table 02483-10
CAP THICKNESS REQUIREMENTS

Remediation Area	Minimum Cap Thickness (inches)	Overplacement Allowance (inches)	Underplacement Tolerance (inches)
RA1	[a]	12	12[b]
RA2a	42	12	0
RA2b	30	12	0
RA3	42	12	0
RA4	30	12	0

Notes:
[a] Grade final surface of RA1 to lines and grades shown on Drawings. Outer flank of toe berm may deviate from the lines and grades shown on the Drawings.
[b] Underplacement tolerance in RA1 is 12 inches at elevations below 0 ft MLLW. There is no underplacement tolerance above 0 ft MLLW.

3.3 WATER QUALITY MONITORING

The Contractor shall perform water quality monitoring during capping activities in accordance with Section 01355 ENVIRONMENTAL PROTECTION.

3.4 CAP VERIFICATION

Sediment cap verification sampling, including field and laboratory procedures, shall be described in detail in the approved Contractor's Sampling and Analysis Plan (SAP), including Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP), submitted in accordance with Section 01450 CHEMICAL DATA QUALITY CONTROL.

The CO shall be notified at least 48 hours in advance of any cap verification sampling activities. The Contractor shall provide space on board the sampling vessel for up to 3 personnel designated by CO to observe verification sampling activities, if so requested by the CO.

3.4.1 Chemical Testing Parameters

Where chemical testing is designated, the Contractor shall analyze cap verification samples for the chemicals of concern (COCs), using the analytical methods, and quantification limits listed in Section 01450 CHEMICAL DATA QUALITY CONTROL, Table 01450-2.

3.4.2 Cap Verification Sampling Reports

Chemical analytical work for cap verification sampling will be conducted on an accelerated 14 calendar-day turnaround time, unless otherwise specified by the CO. Cap Verification Sampling Reports shall be submitted to the Government no later than 21 calendar days after completion of the field sampling activities for each sampling event. The reports shall include the following:

a. Sample Location Map, with remediation boundaries and sample locations posted based on actual field coordinates.

b. Field geologic descriptions of surface sediment samples.

c. Core logs, where required (e.g., cap thickness verification).

d. Analytical Laboratory Report, including project narrative, chain-of-custody records, and QA/QC information in accordance with Section 01450 CHEMICAL DATA QUALITY CONTROL.

e. Independent Data Quality Review by a qualified chemist not employed by the Contract analytical laboratory, to assess data precision, accuracy, and completeness, as specified in Section 01450 CHEMICAL DATA QUALITY CONTROL.

3.4.3 Cap Verification Sampling

Where cap verification sampling is specified in a given area, the Contractor shall not place additional material in that area until the CO approves the cap verification sampling results and identifies the need for response actions.

3.4.3.1 Cap Verification Sampling Events and Locations

The Contractor shall perform cap verification sampling as specified at the below listed times and locations during this Contract. The sampling requirements are summarized in Table 02483-11. All sediment core samples shall be collected at the locations shown on the Drawings, unless otherwise indicated by the CO. Cores shall be driven a minimum of 12 inches into native material. The cap thickness, the depth to the basal contact, and the nature of the basal contact (e.g., sharp, gradational, intermixed, etc.) shall be logged by a qualified geologist. All coring and sample collection shall be conducted in accordance with PSEP guidelines (PSEP 1997). Hydrographic survey data shall be used in conjunction with cap verification sampling to assess the thickness of the cap. Hydrographic surveys shall be in accordance with Section 01720 SURVEYING.

a. Cap Thickness Verification. All sediment cores and Sediment Profile Imaging (SPI) images described below shall be evaluated to assess the physical thickness of the cap and individual layers of the cap. Core samples shall be collected:

   i. After placement of first lift of sand cap mix in RA1, RA2a, RA2b, and RA3.

ii. After placement of the final lift of sand cap mix in RA1, RA2a, RA2b, RA3, and RA4.

iii. After placement of coarse sand in RA2a.

b. First Lift of Sand Cap Mix. In RA1, RA2a, RA2b, and RA3, the Contractor shall collect cores following placement of the first lift of sand cap mix. The Contractor shall perform visual inspection of the cores for evaluation of intermixing with native sediments and determination of lift thickness.

c. First Lift in RA4 SPI. In RA4, the Contractor shall conduct SPI surveys following placement of the first lift of sand cap mix. The Contractor shall assess the images for evaluation of intermixing with native sediments and determination of lift thickness. The frequencies for image surveys are summarized in Table 02483-12.

d. Final Sand Cap Mix Lift. In RA1, RA2a, and RA3, the Contractor shall collect cores following placement of the final lift of sand cap mix. The Contractor shall perform visual inspection of the cores for determination of sand cap mix layer thickness. The Contractor shall analyze surface sediment samples (top 4 inches) from the cores, to represent the sand cap mix surface. These samples shall be collected as baseline data for long-term monitoring, therefore, no compliance evaluation requirements for chemistry are described in this Section. However, the CO may require response actions if visual evidence of contamination exists at the sand cap mix layer surface. Chemical testing of the samples shall be conducted as specified in paragraph 3.4.1 Chemical Testing Parameters.

e. Mid-Point of Cap. In RA2b and RA4, the Contractor shall collect cores following completion of the cap and analyze samples from a 4-inch interval at the mid-point of the cap profile. These samples shall be collected as baseline data for long-term monitoring, therefore, no compliance evaluation requirements are described in this Section. Chemical testing of the samples shall be conducted as specified in paragraph 3.4.1 Chemical Testing Parameters.

f. Cap Surface Verification. In RA2a, RA2b, and RA4, the Contractor shall collect cores following completion of the cap and analyze samples from the top 4 inches of the cap surface. For RA2b and RA4, these samples shall be from the same cores used for the mid-point of cap samples. Chemical testing of the samples shall be conducted as specified in paragraph 3.4.1 Chemical Testing Parameters.

3.4.3.2 Compliance Evaluation

In general, chemical concentrations in surface sediments (top 4 inches) on the final grade of the cap must be below the Sediment Quality Standards (SQS). The SQS are listed in Section 01450 CHEMICAL DATA QUALITY CONTROL, Table 01450-2.

a. First Lift of Sand Cap Mix. Excessive intermixing is defined as the visible presence of native sediments intruding more than 6 inches (RA1, RA2a, RA2b, and RA3) or 4

inches (RA4) into the cap material. In response to observed excessive intermixing of sand cap mix material with native sediments, based on visual inspection, the Contractor shall modify operations to minimize cross-contamination, disturbance and resuspension of the underlying sediments. The Contractor shall modify operations if measured lift thicknesses exceed the prescribed limits in Table 02483-10.

b. First Lift in RA4 (SPI). The following criteria shall be used to evaluate SPI results for the first lift in RA4:

   i. At least 90 percent of samples shall show a minimum thickness of 1 inch.

   ii. At least 50 percent of samples shall show a minimum thickness of 4 inches.

   Response actions will be required if these criteria are not met.

c. Sand Cap Mix Layer in RA1, RA2a, and RA3. Where thickness of the sand cap mix is less than the minimum thickness shown on the Drawings, the Contractor shall place additional sand cap mix to achieve the required thickness prior to placing subsequent lifts of coarser material.

d. Cap Surface Verification – Final Lift. All surface sediment samples on the final cap surface must be below the SQS. Response action(s) will be required for any SQS exceedances on the final cap surface.

e. Final Cap Thickness Verification. The cap thickness in RA1 shall be determined by hydrographic and topographic surveys. The cap thickness in RA2a, RA2b, RA3, and RA4 shall be determined by sediment core logs and verified by hydrographic surveys. Cap thickness shall be determined after correcting the core depths for coring induced compaction. Tolerances (overplacement, underplacement, and maximum grades) are shown on the Drawings. Response actions will be required for all areas with a lesser thickness of capping material than specified. Response actions will be required for any area greater than 2,500 square feet that exhibits a cap thickness greater than the design thickness plus the over placement allowance. Response actions will be required for any location that exhibits a cap thickness greater than the design thickness plus twice the overplacement allowance. Response actions will be required for oversteepend areas in RA1.

3.4.3.3 Response Actions

Response actions will be determined on a case-by-case basis by the CO. Response actions may include any of the following, alone or in combination:

a. Additional Capping. Additional capping material shall be added, as necessary, to ensure that all portions of the cap meet the cap thickness requirements of Table 02483-11.

b. Offset Sampling. If a verification sample indicates that the final cap surface exceeds the SQSs, conduct offset sampling as shown on the Drawings. Core samples shall be collected at each of the four offset sampling locations. A sample of the 0 to 4 inch depth interval from each of the cores shall be analyzed for any constituents that exceeded the SQS concentrations, shown in Table 01450-2, in the original sample analysis. Where offset sampling is required, a core shall also be collected from the initial sampling location that exceeded the SQS, and samples from the following depth intervals shall be analyzed: 0 to 4, 4 to 12, 12 to 24, and 24 to 36 inches.

c. Overcapping. If the offset sampling confirms that final cap surface exceeds the SQSs, additional thin lifts (e.g., 6 to 12-inch lifts) of capping material may be added to the surface as directed by the CO. However, placement of additional capping material shall not compromise the navigational requirements of the waterway.

d. Modification of Operations. If monitoring detects non-uniform placement, excessive lift heights, or excessive intermixing of native sediments and cap materials, the Contractor shall implement operational modifications at no expense to the Government, that may include:

   i. Limiting the fall distance of the cap material through the water column,

   ii. Slowing the placement rate (tons per acre or tons per day),

   iii Modify placement methods or equipment, and/or

   iv. Other modifications, as directed by the CO.

e. Re-grading. In RA1, if the final cap surface exceeds the design lines and grades plus the overplacement allowance above 0 feet MLLW, the Contractor shall re-grade to the proper lines and grades at no expense to the Government.

Table 02483-11
CAP VERFICATION SAMPLING REQUIREMENTS

RA	Event	Sample Type[a]	Analysis[b]	No. of Cores[c]	No. of Samples Analyzed
1 (gravel cap areas only)	First sand cap mix lift	Core	Visual inspection for intermixing with native sediments	10	0
	Final sand cap mix lift	Core	Chemical analysis (0-4 inches)	10	10
2a	First lift	Core	Visual inspection for intermixing with native sediments	5	0
	Final sand cap mix lift	Core	Chemical analysis (0-4 inches)	5	5
	Final cap surface and profile	Core	Chemical analysis at surface (0-4 inches)	5	5
2b	First lift	Core	Visual inspection for intermixing with native sediments	4	0
	Final cap surface and profile	Segmented core	Chemical analysis at surface (0-4 inches) and a 4-inch interval at the mid-point of the cap	4	8
3	First lift	Core	Visual inspection for intermixing with native sediments	2	0
	Final sand cap mix lift	Core	Chemical analysis (0-4 inches)	2	2
4	Final cap surface and profile	Segmented core	Chemical analysis at surface (0-4 inches) and a 4-inch interval at the mid-point of the cap	15	30

Notes:
[a] All cores shall penetrate a minimum of 12 inches into native material. All cores shall be relatively undisturbed samples. All cores shall be logged and evaluated for thickness of cap and individual layers.
[b] Chemical analysis includes COCs and TOC, reported in mg/kg dry weight. Reporting limit for TOC = 0.1%.
[c] See Drawings for sampling locations. Re-occupy first lift stations for collection of final cap samples.

TOC - total organic carbon
COC - chemical of concern

Table 02483-12
SUMMARY OF SEDIMENT PROFILE IMAGING SURVEYS IN RA4

Survey Area[a]	Approximate Survey Density	No. of Images
Segment 1- Below –90 ft MLLW	60 ft on center	40
Segment 1- Above –90 ft MLLW	60 ft on center	40
Segment 2	90 ft on center	40
Segment 3	90 ft on center	40

Notes:
[a] Survey areas are shown on the Drawings. All surveys to follow placement of first lift of material.
ft - feet or foot
MLLW - mean lower low water

3.5 FINAL EXAMINATION AND ACCEPTANCE

As soon as practicable after the completion of capping, (and prior to close of a given construction season) individual areas will be examined by the Government. The Contractor will be permitted to inspect the data and methods used in preparing the final estimate. When individual areas are found to be in a satisfactory condition, the Work therein will be accepted as complete. Final estimates will be subject to deductions or correction of deductions previously made because of capping outside of authorized areas or placement of material in an unauthorized manner.

END OF SECTION

SECTION 02630

STORM DRAINAGE

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. The most recent version of the reference applies.

AMERICAN CONCRETE PIPE ASSOCIATION (ACPA)

ACPA 01-102	(1988) Concrete Pipe Handbook
ACPA 01-103	(1990) Concrete Pipe Installation Manual

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 497	(1995) Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement
ASTM A 615/A 615M	(1996; Rev. A) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM C 76	(2000) Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C 150	(1997) Portland Cement
ASTM C 443	(1994) Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-01 Data

Concrete piping including fittings and jointing materials; FIO

Commercial concrete for use in pipe abandonment; FIO

Contractor's outfall extension plan; GA

The Contractor shall submit an outfall extension plan as part of the Site Work Plan in accordance with Section 01400 REMEDIAL ACTION MANAGEMENT PLAN.

SD-13 Certificates

Pipeline and fittings, including factory-applied linings and joint materials; FIO

The Contractor shall submit certificates attesting that tests set forth in each applicable referenced publication have been performed, whether specified in that publication to be mandatory or otherwise and that production control tests have been performed at the frequency or intervals specified in the publication. Other tests shall have been performed within 3 years of the date of submittal of certificates on the same type, class, grade, and size of material as is being provided for the project.

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Delivery and Storage

1.3.1.1 Piping

The Contractor shall inspect materials delivered to Site for damage, and store with minimal handling. Store rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.

1.3.2 Handling

The Contractor shall handle pipe, fittings, and other accessories in a manner to ensure delivery to the work area in sound undamaged condition.

PART 2 PRODUCTS

2.1 PIPELINE MATERIALS

2.1.1 Concrete Piping

2.1.1.1 Concrete Pipe and Fittings

Storm drainage pipe shall be reinforced concrete pipe conforming to ASTM C 76, Class IV. Fittings and specials shall conform to the applicable requirements specified for the pipe and shall be of the same strength as the pipe. Cement used in manufacturing pipe and fittings shall be Type II conforming to ASTM C 150.

2.1.1.2 Jointing Materials for Concrete Piping

Gaskets and pipe ends for rubber gasket joint shall conform to ASTM C 443.

2.1.1.3 Joint Sealants

Provide primers and lubricants as recommended by the manufacturer. Concrete pipe joints shall be suitable for use with the joint sealants specified. Joint sealants shall be rubber O-ring gaskets, conforming to ASTM C 443.

2.2 EROSION CONTROL RIPRAP

Riprap shall be provided in accordance with Section 02483 SEDIMENT CAP.

2.3 MISCELLANEOUS MATERIALS

2.3.1 Pipe Abandonment Materials

The 12-inch steel pipe (Unidentified East Outfall) shall be abandoned with a plug consisting of commercial concrete. Water required shall be provided in accordance with Section 01500 TEMPORARY CONSTRUCTION FACILITIES.

PART 3 EXECUTION

3.1 INSTALLATION OF PIPELINES AND APPURTENANT CONSTRUCTION

3.1.1 General Requirements for Installation of Pipelines

These requirements shall apply to pipeline installation except where specific exception is made under paragraph 3.1.2 Special Requirements.

3.1.1.1 Location

The Work covered by this Section shall terminate at a point approximately 90 feet from the existing 84-inch outfall, unless otherwise indicated on the Drawings.

3.1.1.2 Earthwork

Earthwork operations shall be performed in accordance with Section 02483 SEDIMENT CAP and the following requirements.

As part of the outfall extension, sediment will be dredged along the alignment of the extension, in accordance with Section 02325 DREDGING. As noted on the Drawings, the CO will inspect the dredged surface in this area for the presence of unsuitable fine-grained material, and may require additional removal to minimize the potential for settlement of and damage to the outfall extension. Provide access for the CO to inspect the dredged material. The side slopes of the dredged trench shall be armored with riprap within 8 hours of dredging, and at the end of the existing pipe within 1 hour of dredging. Riprap may be removed and re-used when pipe is in place and the trench is being backfilled.

Remove accumulated sediments from within the existing pipe as shown on the Drawings, and in accordance with Section 02325 DREDGING.

3.1.1.2.1 Bedding

That Contractor shall place bedding in 8-inch maximum loose lifts. Bedding material shall conform to the requirements of gravel mix in accordance with Section 02483 SEDIMENT CAP. Uniform and continuous support shall be provided for each section of pipe except at depressions necessary for making proper joints.

3.1.1.2.2 Backfill

Place backfill in 12-inch maximum lifts unless otherwise specified. The Contractor shall ensure that backfill is tamped firmly under pipe haunches. Backfill shall consist of the products indicated on the Drawings and specified in Section 02483 SEDIMENT CAP. Backfill shall be constructed evenly on each side and along the full length of the pipe structure, ensuring that no damage is done to the utility or its protective coating. The Contractor shall provide a minimum cover of 3 feet over the pipe during construction. Final cap thickness over the pipe shall be as indicated on the Drawings.

3.1.1.3 Pipe Laying and Jointing

Inspect each pipe and fitting before and after installation; remove those found damaged or defective from Site and replace with new. Lay pipe with the bell ends in the upgrade direction. Adjust spigots in bells to produce a uniform space. Blocking or wedging between bells and spigots will not be permitted. Replace by one of the proper dimensions any pipe or fitting that does not allow sufficient space for proper calking or installation of joint material. Provide batterboards not more than 25 feet apart for checking and ensuring that pipe invert elevations are as indicated. Laser beam method may be used in lieu of batterboards for the same purpose.

3.1.2 Special Requirements

3.1.2.1 Installation of Concrete Piping

The existing pipe may have a degraded terminus. Inspect the pipe before and after dredging the trench, and take actions necessary to connect the new outfall extension pipe to the existing outfall pipe, potentially including field-fabricated joint. Install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section and with the provisions for jointing procedures of ACPA 01-103 or of ACPA 01-102, Chapter 9. Make joints with the gaskets previously specified for joints with this piping. Clean surfaces receiving lubricants, cements, or adhesives. Affix gaskets to pipe not more than 24 hours prior to the installation of the pipe. Protect gaskets from sun, blowing dust, and other deleterious agents at all times. Before installation of the pipe, inspect gaskets and remove and replace loose or improperly affixed gaskets. Align each pipe section with the previously installed pipe section, and pull the joint together. If, while pulling the joint, the

gasket becomes loose and can be seen through the exterior joint recess when the pipe is pulled up to within one inch of closure, remove the pipe and remake the joint.

3.1.2.2 Installation of Concrete Plug

The existing 12-inch steel outfall pipe shall be plugged with concrete for a minimum distance of 2 feet from the pipe outlet. Care shall be used in placing the concrete to see that the end of the pipe is completely filled and thoroughly plugged.

3.2 FIELD QUALITY CONTROL

3.2.1 Field Tests and Inspections

The Contracting Officer (CO) will conduct field inspections and witness field tests specified in this section. The Contractor shall be able to produce evidence, when required, that each item of Work has been constructed properly in accordance with the Contract Documents.

3.2.2 Pipeline Testing

Check each straight run of pipeline visually for deficiencies, including uneven joints. Survey the pipe invert at the outfall after the pipe is installed, and again after all backfilling and capping in adjacent areas is complete.

END OF SECTION

SECTION 02940

SHORELINE RESTORATION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. The most recent version of the reference applies.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 1785	(1999) Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS RR-W-410	(Rev D; Am 1) Wire Rope and Strand

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Temporary timber logs; GA
Anchor assemblies; GA
Concrete anchor blocks; GA

1.3 DESCRIPTION OF WORK

This Work shall consist of structural improvements to restore the shoreline habitat at the Pacific Sound Resources (PSR) Superfund Site (Site). This Section describes the structures and ancillary materials used to complete the improvements.

PART 2 PRODUCTS

2.1 TIMBER LOGS

In general, these materials shall be used for temporary timber log installations. Timber logs shall be from an approved source and provided by the Contractor.

The furnished timber logs shall be cedar or fir logs of recent vintage and free from insects, rot, and decay. Timber logs shall be less than 18 months old. Logs may be barked or un-barked. Timber logs shall have rootwad attached. Nominal rootwad diameter shall be a minimum of 2 times the timber bole diameter and a maximum of 4 times the timber bole diameter.

2.2 ANCHORS

Timber members shall be anchored using a cable anchoring assembly and a concrete anchor block.

2.2.1 Cable Anchor Assemblies

The cable anchor assemblies shall consist of one anchor cable, one polyvinyl chloride (PVC) sleeve, and two 2-bolt guy clamps. The anchor assembly shall be connected to one concrete anchor block on the cut side of the timber log and two concrete anchor blocks on the rootwad side of the timber log as shown on the Drawings. The concrete anchor block shall meet requirements described in paragraph 2.2.2 Concrete Anchor Blocks.

The anchor cable shall be 3/8-inch diameter 19x7 steel strand wire rope (construction) per FS RR-W-410. The cable shall be passed through a PVC sleeve inserted into a hole drilled in the timber log. The PVC sleeve shall be 1-inch diameter, Schedule 40. The cable shall be connected to the concrete anchor block by passing one end of the cable through the loop embedded in the concrete block. The cable shall be secured with a minimum of two guy clamps. The clamps shall be 2-bolt offset steel clamps with an individual track for each cable end. The clamps shall be a minimum of 9 inches from the loop and a minimum of 3 inches from each other. The minimum tension applied to the cable when guy clamps are installed shall be 1,500 pounds. Guy clamps shall be connected securely to cable using the minimum torque required by the manufacturer. The Contractor shall provide a guy clamp and submit data to demonstrate that the guy clamp is capable of retaining the cables without movement of the cables under an applied tension of two times the specified installation tension (3,000 pounds).

2.2.2 Concrete Anchor Blocks

Concrete anchor blocks shall be pre-cast with minimum weight shown on the Drawings. Concrete block shall have No. 5 rebar embedded loop. If approved by the CO, cast-in-place concrete anchor blocks may be used as an alternate to pre-cast concrete anchor blocks. Cast-in-place blocks shall be equal in weight to the pre-cast concrete blocks specified on the

Drawings. Cast-in-place concrete anchor blocks shall not be used unless written approval is received from the CO.

2.3 TIMBER LOG BACKFILL

Timber log backfill shall be installed at locations as shown on the Drawings. Timber log backfill shall conform to the requirements of filter material No. 1 in Section 02483 SEDIMENT CAP.

PART 3 EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

This section describes installation requirements for shoreline restoration improvements. Except as noted, the materials used to construct shoreline restoration and aquatic habitat improvements will be as specified in PART 2 PRODUCTS. All structures, devices, materials, and appurtenances shall be installed in a dry condition.

3.2 TEMPORARY TIMBER LOGS

Each timber log shall be anchored with a minimum of three concrete anchor blocks with cable anchor assemblies as shown on the Drawings. The ground shall be excavated to receive the timber log, rootwad and anchor blocks. When installed below 14.4 MLLW, backfill shall be completed using timber log backfill as shown on the Drawings.

END OF SECTION

Part IV

PART IV

CONSTRUCTION QUALITY ASSURANCE PLAN FOR RA1 THROUGH RA4

FINAL DESIGN
CONSTRUCTION QUALITY ASSURANCE PLAN
FOR REMEDIATION AREAS 1, 2a, 2b, 3, AND 4

Pacific Sound Resources Superfund Site
Marine Sediments Unit
Seattle, Washington

Prepared by
URS Group, Inc.

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ABBREVIATIONS AND ACRONYMS

APL	American President Lines
ARAR	applicable or relevant and appropriate requirement
ASTM	American Society for Testing and Materials
BMP	best management practice
CIH	certified industrial hygienist
CO	Contracting Officer
COC	chemical of concern
CQA	Construction Quality Assurance
CQAP	Construction Quality Assurance Plan
CQC	contractor quality control
CWA	Clean Water Act
cy	cubic yards
DO	dissolved oxygen
DQO	data quality objective
DRET	dredge elutriate test
EDC	Engineering During Construction
EPA	U.S. Environmental Protection Agency
EPS	electronic positioning system
H	horizontal
HMTA	Hazardous Materials Transportation Act
kHz	kilohertz
µg/kg	micrograms per kilogram
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MLLW	mean lower low water
MOA	Memorandum of Agreement
MSU	Marine Sediments Unit
NTU	nephelometric turbidity unit
OMMP	Operations and Maintenance Monitoring Plan
Port	Port of Seattle
PSEP	Puget Sound Estuary Program
PSR	Pacific Sound Resources
PSRMP	Pacific Sound Resources Management Plan

ABBREVIATIONS AND ACRONYMS (Continued)

QA/QC	quality assurance/quality control
QAR	Quality Assurance Representative
QC	quality control
RA	remediation area
RAMP	Remedial Action Management Plan
RCRA	Resource Conservation and Recovery Act
ROD	record of decision
RTK-DGPS	real-time kinematic differential global positioning system
SAP	Sampling and Analysis Plan
SMS	sediment management standard
SPI	sediment profile imaging
SQS	sediment quality standard
SSHP	Site Safety and Health Plan
USACE	U.S. Army Corps of Engineers
TIN	Triangulated Irregular Network
TSCA	Toxic Substances Control Act
TSS	total suspended solids
V	Vertical
WAC	Washington Administrative Code

1.0 INTRODUCTION

The Construction Quality Assurance Plan (CQAP) identifies the quality assurance/quality control (QA/QC) procedures that will be used to confirm that construction of the Pacific Sound Resources Superfund Site Marine Sediments Unit (MSU) remediation project complies with the conditions and requirements of the remedial design documents approved by the U.S. Environmental Protection Agency (EPA). This CQAP has been prepared by URS under contract to EPA, and is considered a part of the Pacific Sound Resources Management Plan (PSRMP). It specifies the types of environmental monitoring that will be performed and how the construction managers will use the monitoring data to direct modifications to the construction procedures, as necessary.

The U.S. Army Corps of Engineers (USACE) will be the contracting entity for all dredging and cap construction activities, and will procure remedial construction contractors and administer all construction and oversight contracts. All construction in RA1 through RA4 will be bid competitively and may be completed under one contract. The contract for these areas will include a base item that covers the first year's activities, and option items for subsequent activities. The contract will include requirements for construction QC, including water quality monitoring, sampling, land and hydrographic surveying, reporting, and other activities described in this RA1 through RA4 CQAP. If the USACE elects to award all of the options, the same Contractor would construct all of RA1 through RA4. The terminology used in this CQAP assumes that one Contractor is awarded all options. If the USACE does not elect to award all of these options, then another contractor will be procured through competitive bidding.

Following contract award, the Contractor will prepare a Remedial Action Management Plan (RAMP) and other submittals as called for in the Specifications. No physical work at the site may be performed before approval of the necessary Drawings.

The Contractor will use the contract Drawings and Specifications to develop the required pre-construction submittals that outline the Contractor's QA/QC requirements for this project. Contractor submittals are described in Section 5 of this CQAP and submittal procedures are described in Section 01330 of the Specifications. Although not a part of the contract documents, this CQAP will be available to the Contractor and may be used to assist in preparing the submittals. This CQAP does not supercede any of the requirements of the Drawings and Specifications.

For the purposes of remedial design and construction, the site has been subdivided into remediation areas (RAs), as shown in Figure 1-1. Construction in RA5 will be completed under separate contracts and is outside the scope of this CQAP. The CQAP for RA5 (CQAP-RA5) is also included in the PSRMP, which has been prepared by the USACE.

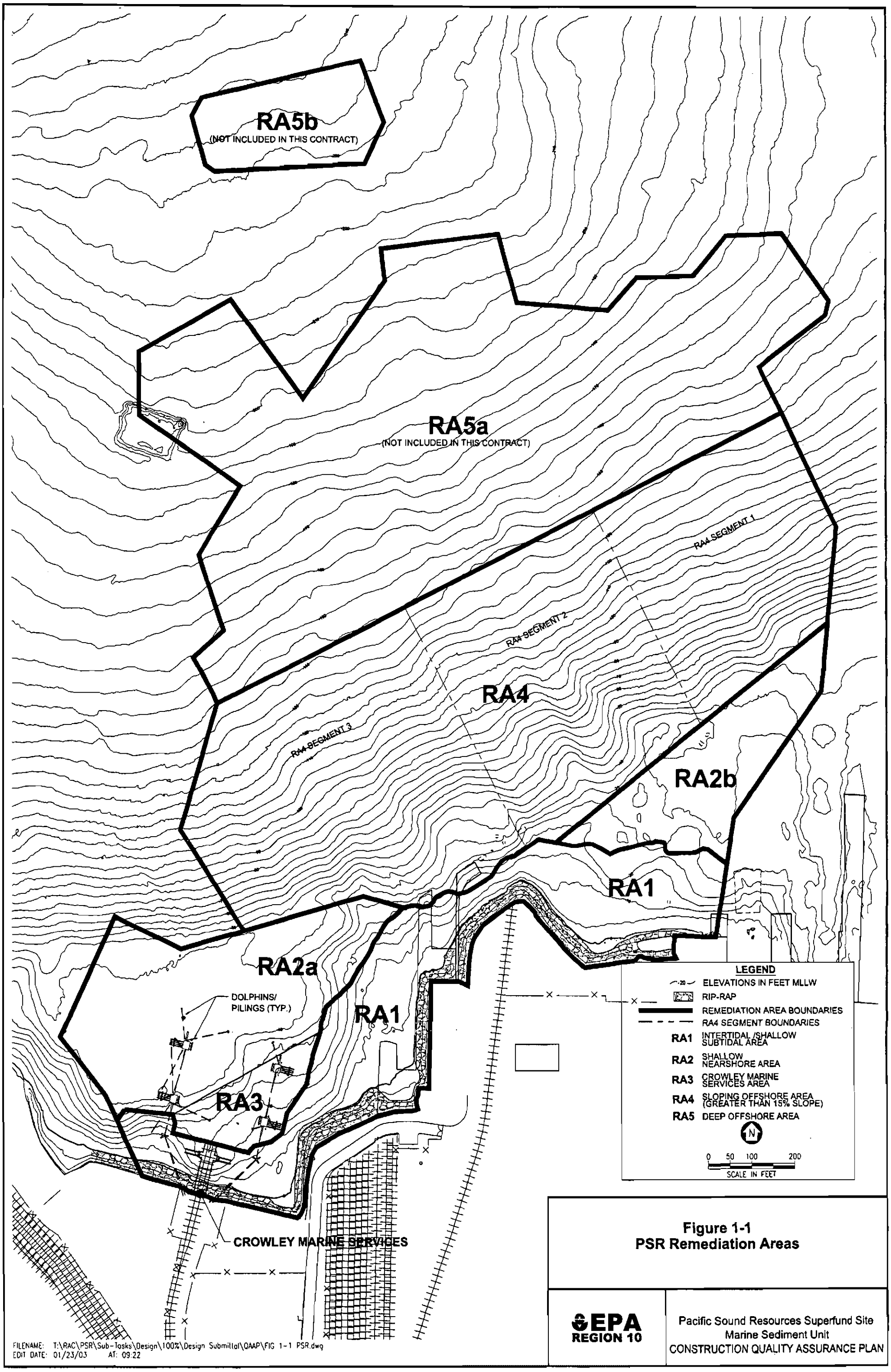


Figure 1-1
PSR Remediation Areas

2.0 ORGANIZATION OF THE CQAP

The remainder of the CQAP is organized as follows:

- Section 3.0 Project Roles and Responsibilities presents the roles and responsibilities of the parties involved in the remediation action
- Section 4.0 Contractor/Subcontractor Qualifications describes the qualifications and experience required for the Contractor and any selected subcontractors
- Section 5.0 Documentation and Reporting describes the submittal requirements before and during construction activities
- Section 6.0 Overview of Inspection, Sampling, and Monitoring Activities summarizes the inspections, tests, sampling, and monitoring activities to verify compliance with the contract documents
- Section 7.0 Remedial Action Construction Elements, Quality Control Measures, and Corrective Actions provides a task-by-task description of construction elements, their associated QC measures, environmental monitoring requirements, and corrective actions for out-of-compliance conditions
- Section 8.0 References

3.0 PROJECT ROLES AND RESPONSIBILITIES

The roles and responsibilities of the parties involved in the remedial action are described below. An organization chart is presented in Figure 3-1.

3.1 U.S. ENVIRONMENTAL PROTECTION AGENCY

EPA is the regulatory authority and responsible agency for designing the remedial action. The design documents have been prepared by URS under contract to EPA, and have been approved by EPA. A Project Manager will be designated to exercise project oversight for the agency and to coordinate with the USACE. EPA will make final decisions to resolve unforeseen problems that may change the project components or the manner in which the construction is undertaken. EPA will also coordinate access issues with the Port of Seattle and Tribes.

3.2 U.S. ARMY CORPS OF ENGINEERS

Construction will be managed by the USACE and executed by contractor(s) specializing in the required in-water remedial activities, including dredging and offshore capping. The USACE will contract the construction of this project and will review and approve the RAMP and other Contractor submittals. USACE will designate a Project Manager who will act as the point of contact between EPA and USACE. The Project Manager will be responsible for assuring the quality of work conducted by USACE, preparing and tracking budgets and schedules, and coordinating tasks.

On-site responsibility for construction management and contract administration will be assigned by USACE to the Contracting Officer (CO). The CO will have total authority and responsibility to deal with the Contractor on all contractual matters and to ensure that the Contractor complies with contract requirements and provides all necessary QA/QC information. The CO may delegate some QA activities to a third party. This party is commonly an employee of USACE and is referred to as the Quality Assurance Representative (QAR). Alternatively, certain QA activities may be subcontracted to a Construction Quality Assurance (CQA) engineer. In this CQAP, the term "QA Inspector" is used to refer to the CO's designee(s).

The CO or his designee will be responsible for overseeing the implementation of the CQAP, including the required monitoring, sampling, testing, and reporting. Included with this responsibility is the monitoring of the Contractor's QC activities to ensure that project construction is conducted in accordance with the Drawings and Specifications.

The USACE may also contract for construction oversight services. The construction oversight contractor reports to the CO. In the event the USACE employs a construction oversight contractor, the interface on all contractual matters will be between the CO and the Contractor.

The Project Manager and CO will be supported by the USACE Engineering During Construction (EDC) Team. This group provides technical scoping and contract support, technical review of monitoring plans and reports, and evaluations of monitoring results and potential modifications to the monitoring program.

3.3 CONTRACTOR

The Contractor will be required to perform the remedial construction activities, including dredging, disposal of dredged sediments, capping, construction of the outfall extension, and all related work elements in accordance with the Drawings and Specifications. The Contractor will be selected through a competitive bidding process. Contractors bidding for the project may be pre-qualified by USACE prior to bidding to determine that the bidder is qualified, in terms of experience and capability, to perform the work.

Direction of the work for the Contractor will be through an on-site Superintendent who will be responsible for executing the work in full compliance with the Drawings and Specifications. The Superintendent will coordinate with the CO or a designee of the CO to resolve job-related problems and perform day-to-day project management. The Superintendent may utilize one or more foremen to directly supervise the major construction activities. The Superintendent will exercise supervision over subcontractors, if subcontractors are utilized.

Section 01451 Contractor Quality Control of the contract Specifications requires the Contractor to develop and implement a Contractor Quality Control (CQC) Plan through which the Contractor assures compliance with the requirements of the contract. The CQC Plan will identify personnel, procedures, methods, instructions, inspections, records, and forms to be used in the CQC system. The CQC Plan must be approved by the CO. The CQC Manager will have written

CQC duties and responsibilities delegated by an officer of the firm. The Contractor will also employ a Health and Safety Manager to implement its Site Safety and Health Plan (SSHP); the SSHP specifies the minimum health and safety requirements for job site activities, and the procedures/controls to be employed for protection of on-site personnel, tenants, and visitors. The CQC Plan will state the chain of command for the CQC Manager and the Health and Safety Manager to ensure that any corrective actions needed to maintain safe working conditions, protect the environment, or control the quality of work will be executed in an accurate and expeditious manner.

3.4 SUBCONTRACTORS

The Contractor may employ subcontractors to perform selected phases of the work for which they have special expertise. The subcontractors are responsible to the prime Contractor for the quality of their work, protection of the environment, and the health and safety of their personnel in accordance with the Contractor's CQC Plan, Environmental Protection Plan, and SSHP. The subcontractor's principals will designate a job site foreman with responsibility under the direction of the Superintendent to see that the work is conducted in accordance with the contract requirements.

3.5 PORT OF SEATTLE

The uplands area adjacent to the MSU is owned by the Port of Seattle (Port). The Port leases its land to various tenants. As of December 2002, these tenants included Crowley Marine Services (Crowley), Burlington Northern Santa Fe, and American President Lines (APL). EPA will coordinate access issues with the Port.

3.6 CROWLEY MARINE SERVICES

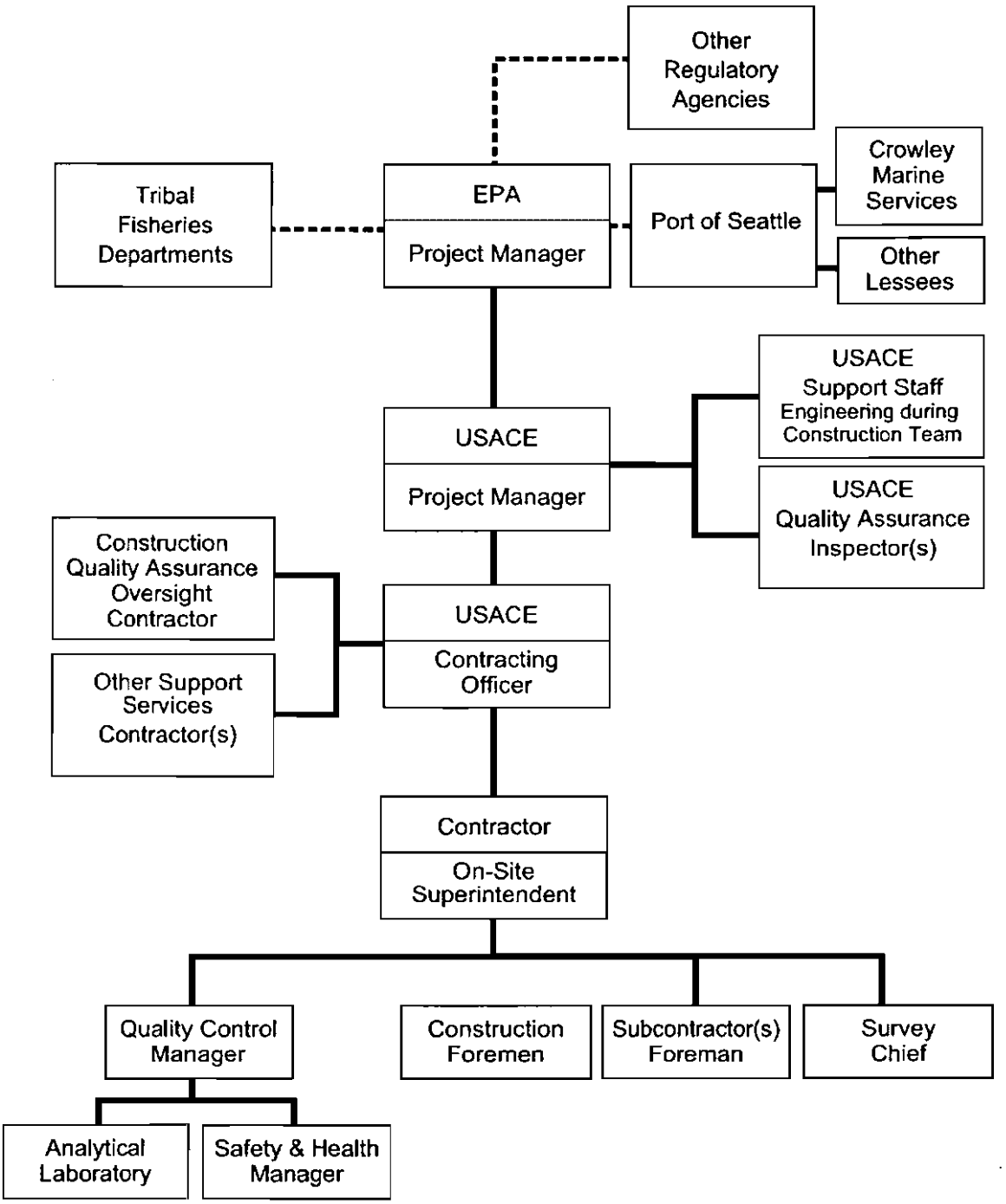
Crowley leases the upland area adjacent to the western end of the MSU. Crowley conducts container offloading from barges. Its operations use offshore structures within the MSU, including a floating pier and four pile-supported dolphins. In-water construction activities will be coordinated with vessel traffic to and from the Crowley pier. EPA will work with the Port to coordinate access issues involving Crowley.

3.7 UNITED STATES COAST GUARD

The U.S. Coast Guard is responsible for vessel traffic management and maritime safety and security. In-water construction activities will be coordinated with the Coast Guard.

3.8 SUPPORT SERVICES CONTRACTORS

During the course of construction, support services contractors may be utilized to ensure that the design objectives are realized and that the project is constructed in accordance with the Drawings and Specifications. Each contractor will have a project manager who will interface with EPA and USACE in carrying out their responsibilities.



Note: The Contractor's organization will be stated in the approved Contractor Quality Control (CQC) Plan.

Job No. 33755206.08000

Figure 3-1
Organization Chart

4.0 CONTRACTOR, SUBCONTRACTOR, AND QA PERSONNEL QUALIFICATIONS

As part of bidding on the project, each prospective contractor must demonstrate that it has the expertise, experience, and capability to satisfactorily conduct the work. The Contractor will employ, as part of its permanent organization, senior, knowledgeable, and experienced personnel to run the project. For example, the Superintendent will be required to have at least 10 years of experience in the type of work being contracted. The journeyman operators, surveyors, and other Contractor personnel performing key jobs must also have the demonstrated ability and skills to satisfactorily perform their respective assignments.

The Contractor's CQC Manager, and the organization as a whole, must have documented qualifications and experience to perform checks on the Contractor's operations necessary to determine compliance with the contract provisions. Additionally, any subcontractors utilized in the work must have demonstrated to the satisfaction of the CO that they are qualified and have satisfactorily performed the type of work for which they will be engaged. However; responsibility for subcontractor performance rests with the prime Contractor. As appropriate, all Contractor and subcontractor personnel will be required to have current health and safety training required by the Washington State Department of Labor and Industries (Chapter 296-62 WAC, Subpart P, Hazardous Waste Operations and Emergency Response), including on-site training.

Personnel designated by the CO to conduct QA activities must have a minimum of 3 years of experience on similar projects. For some elements of the project, the QA Inspector will be required to be a professional engineer registered in the State of Washington. One or more QA Inspectors will be present on the job site during all times construction activities are being conducted.

5.0 DOCUMENTATION AND REPORTING

The Contractor will be responsible for QC during construction. The CO or his designee will be responsible for QA (i.e., to verify that the required QC measures have been implemented). Section 5.1 describes the primary preconstruction submittals, and Section 5.2 describes the primary submittals required during construction. Additional submittal requirements are contained in the Specifications. The PSR Management Guidelines (USACE 2003) contain a Data and Documents Management Plan that provides guidance for construction managers on submittals procedures.

5.1 PRECONSTRUCTION DOCUMENTATION

Prior to beginning work on the project, the Contractor will be required to submit a RAMP for approval by the CO. Requirements for the RAMP are defined in Section 01400 of the Specifications. The RAMP will describe in narrative form the methods to be employed in the remedial action including equipment types, modes of operation, schedules, sequence of activities, and other aspects necessary to describe how and when the specified work will be performed. Construction QA/QC procedures will be addressed in various elements of the RAMP, as described below.

The RAMP will include the following:

- Site Work Plan
- CQC Plan
- SSHP
- Environmental Protection Plan
- Sampling and Analysis Plan
- Waste Management Plan
- Vessel Management Plan
- Project Schedule

5.1.1 Site Work Plan

The Site Work Plan will describe the methods for the Contractor's execution of the remedial action consisting of limited dredging and sediment capping at the PSR Superfund site MSU. The Site Work Plan will be coordinated with the requirements of Specifications Section 02325 Dredging, Section 02483 Sediment Cap, and Section 02630 Storm Drainage. The Site Work Plan will include a dredging plan, a capping plan, an outfall extension plan, and a graphical Site Plan.

5.1.2 Contractor Quality Control Plan

The CQC Plan will present the system through which the Contractor ensures that construction activities are being implemented in compliance with the requirements of the contract. Requirements for the CQC Plan are defined in Section 01451 Contractor Quality Control of the Specifications. The CQC Plan will describe methods used to ensure that the dredge cuts and sediment cap are constructed according to the Drawings and Specification. The QC methods include hydrographic surveys, core sampling, and other methods of data collection. The CQC Plan will also describe corrective actions to be taken to ensure the remedy is constructed in accordance with the Drawings and Specifications.

The CQC Plan will identify personnel, procedures, methods, instructions, inspections, records, and forms to be used in the CQC system. Specifically, the CQC Plan will include a description of procedures for maintaining and updating activity logs, procedures for reporting emergencies or out-of-specification conditions, recordkeeping procedures for personnel, equipment maintenance and calibration, and daily and monthly reporting requirements.

5.1.3 Site Safety and Health Plan

The Contractor will prepare an SSHP presenting the minimum health and safety requirements for job site activities, and the measures and procedures to be employed for protection of on-site personnel. Requirements for the SSHP are defined in Section 01351 Safety, Health, and Emergency Response of the Specifications. The Contractor's Safety and Health Manager will be responsible for production of the plan. The plan will cover the controls, work practices, personal protective equipment (PPE), and other health and safety requirements that will be implemented by the Contractor in connection with the remedial action construction activities.

5.1.4 Environmental Protection Plan

The Environmental Protection Plan governs site activities relating to pollution prevention and minimization, spill control and reporting, stormwater management, noise and dust control, and compliance with state and federal water, wastewater, air, and solid waste regulations. Specific requirements for the Environmental Protection Plan are defined in Section 01355 Environmental Protection of the Specifications. The plan will cover potential environmental releases as a result of the Contractor's operations, as well as monitoring and corrective actions necessary to control such releases. The plan will address pollution prevention, containment and cleanup, and erosion and turbidity control as they pertain to the following construction activities:

- Dredging of clean or contaminated sediments
- Transportation of dredged sediments
- Disposal of dredged sediments and debris
- Capping and other in-water construction

The Environmental Protection Plan will discuss engineering and operational procedures, or other best management practices (BMPs), that will be employed to minimize sediment resuspension during construction. The Environmental Protection Plan will include a Water Quality Monitoring Plan. The Water Quality Monitoring Plan will describe the specific methods and procedures to be used by the Contractor (or subcontractor) to collect and analyze surface water samples during construction to ensure compliance with state water quality standards.

5.1.5 Sampling and Analysis Plan

A Sampling and Analysis Plan will be prepared in accordance with Section 01450 Chemical Data Quality Control of the Specifications. The Sampling and Analysis Plan will include a Sediment Verification Sampling Plan. The Sediment Verification Sampling Plan will describe the specific methods and procedures that will be used by the Contractor (or subcontractor) to collect and analyze sediment verification samples during construction to ensure that the final remedy complies with SQS. At a minimum, this plan will include a description of field sampling equipment, verification sampling locations, sediment sampling and processing procedures, sample handling and chain of custody, analytical methods, laboratory QC limits, and other QA procedures.

5.1.6 Waste Management Plan

The Waste Management Plan will describe the anticipated volumes of hazardous and non-hazardous wastes, including dredge spoils, that will be generated, and the management and disposal of these wastes. Requirements for the Waste Management Plan are defined in Section 02120 Transportation and Disposal of Hazardous and Non-Hazardous Materials of the Specifications. The plan will include certification that the waste will be managed in accordance with all applicable federal, state, and local laws and regulations, including, but not limited to, the Resource Conservation and Recovery Act (RCRA), the Toxic Substances Control Act (TSCA), and the Hazardous Materials Transportation Act (HMTA).

5.1.7 Vessel Management Plan

The Contractor will prepare a Vessel Management Plan in accordance with the requirements of Section 02325 Dredging of the Specifications. The Contractor will coordinate with the CO, tribal fisheries departments, and Crowley for access and timing of operations and keep the USCG and Port of Seattle police apprised of the position of equipment.

5.1.8 Project Schedule

A project schedule and periodic updates will be prepared in accordance with Section 01320 Project Schedule of the Specifications.

5.2 CONSTRUCTION DOCUMENTATION

5.2.1 Daily Quality Control Report

During construction activities, the Contractor will prepare a Daily Quality Control Report and submit it to the CO. The report will summarize the work performed by the Contractor, the equipment used, and the results of any QC inspections, tests, or other monitoring activities. The reports will also document any noncompliant conditions, communication of such conditions to the CO, and corrective actions taken to bring the construction activity into compliance.

5.2.2 Weekly Quality Assurance Report

The CO or his designee will prepare a Quality Assurance Report on a weekly basis and submit it to EPA. The Quality Assurance Report will include a detailed description of construction events, as well as any delays and their causes. The report will describe the results of QA inspections, testing, surveying, and monitoring activities, and the effectiveness of the Contractor's QC activities. The Contractor's Daily Quality Control Reports will be provided weekly to EPA with the Quality Assurance Report. In the event that QA inspections reveal an out-of-specification condition, the Daily Quality Control Report will be forwarded to EPA no later than the next business day (see below). Where QA inspections utilize the results of the Contractor's surveys and tests, these results will be summarized and included in the Quality Assurance Report. An example of the weekly Quality Assurance Report form is presented in Figure 5-1.

If QA inspections reveal out-of-specification conditions, the CO will immediately contact the Superintendent to determine what action will be taken to modify the construction operation and correct the condition. If warranted, this initial contact will be followed up with a written memorandum to the Superintendent confirming any oral instructions given. Instructions to the Contractor for any work that deviates from the Specifications will be confirmed with the Contractor in writing. The results of these discussions and follow-up corrective actions will be included in the weekly Quality Assurance Report.

The CO or his designee will meet weekly with the EPA Project Manager to review the weekly Quality Assurance Report and to keep the EPA Project Manager informed of continuing events as the remediation work proceeds. The meetings will be regularly scheduled and take place at the same location, day, and time each week. Any work not in accordance with the contract documents and/or EPA-approved work plans will be brought to the immediate attention of EPA. Any changes to EPA-approved documents must first have EPA approval before being implemented.

In the event that a change or changed condition is encountered, as defined in the contract documents, the CO will review the condition and make a determination as to what revision in the construction activity or construction product will be required, consistent with the intent of the design. EPA will be involved in the review and revision if the change is significant in its impact. The weekly meeting between the CO and EPA's Project Manager is the forum to discuss any changes in construction activities or construction products.

The CO and EPA will consult and coordinate with the Port, including participation in meetings and field inspections relating to Port properties, per the EPA/Port Memorandum of Agreement (MOA).

SRCQAP-4

Pacific Sound Resources MSU Remediation
Quality Assurance Report

Period Covered: _____

Description of Work Inspected:

_____

_____

_____

_____

Results of Inspection (Including Any Out-of-Specs Conditions):

_____

_____

_____

_____

_____

Test Results (Including Any Out-of-Spec Conditions):

_____

_____

_____

_____

_____

Instructions to Contractor and Corrective Action Taken:

_____

_____

_____

_____

Submitted by: _____

Title: _____ Date: _____

Job No. 33755206.08000

Figure 5-1
Example of Weekly Quality Assurance Report Form

6.0 OVERVIEW OF INSPECTION, SAMPLING, AND MONITORING ACTIVITIES

The Contractor will conduct inspections, sampling and testing, and monitoring activities to ensure compliance with the terms and conditions of the remedial construction contract. The CO, either independently or in cooperation with the Contractor, will conduct inspections, sampling, and testing to verify compliance with the terms and conditions of the contract. An overview of these activities is presented in this section. Documentation requirements and detailed descriptions of the monitoring activities are discussed in Sections 5.0 and 7.0, respectively.

Inspection, sampling, and monitoring activities include:

- Verification that sediments have been dredged to the specified dimensions in RA3.
- Verification of conformance with water quality monitoring procedures, and compliance with Washington State Surface Water Quality Standards during in-water construction activities.
- Verification that imported materials comply with contract requirements for quality, durability, gradation, and chemical quality prior to delivery to the job site.
- Verification that rip rap slopes have been properly placed to the depths and extents specified and using the required materials.
- Verification of cap thickness and elevation.
- Verification of conformance with sediment quality monitoring procedures, and compliance with the sediment quality standards.
- Verification of submittals and coordination requirements.

7.0 REMEDIAL ACTION CONSTRUCTION ELEMENTS, QUALITY CONTROL MEASURES, AND RESPONSE ACTIONS

The Contractor will be required to perform the following primary remedial action construction elements:

- Dredging and disposal of sediments
- Construction of a sediment cap in RA1, RA2a, RA2b, RA3, and RA4

This section describes the remedial action construction elements, QC measures, and potential corrective actions. All work will be conducted in strict accordance with the Drawings and Specifications, including the implementation of QA/QC procedures specified therein.

Data quality objectives (DQOs) have been developed to evaluate the need to conduct response actions related to the QC concerns identified in this section. Use of DQOs includes identification of quantitative criteria for measurement precision, frequency and/or intensity of measurements, and the threshold (or deviation from specified limits) that will trigger a response action. DQOs are intended to ensure that only data that are needed to support decision-making are collected and that these data have an appropriate level of accuracy to support the related decision.

7.1 DREDGING AND DISPOSAL OF SEDIMENTS

The primary QC concerns associated with dredging of contaminated sediments are as follows:

- Achieving the specified depths for navigation at the Crowley pier
- Potential water quality impacts during dredging
- Removal of all compressible materials beneath the outfall extension
- Proper disposal of dredged material

DQOs have been developed for monitoring to verify that the Contractor is meeting the Specifications related to these concerns. The DQOs are described in Sections 7.1.2.2 and 7.1.3.2 and are summarized in Table 7-1.

7.1.1 Task Description

This element includes the removal and disposal of contaminated sediments from RA3 and adjacent areas of RA1, as described in the Drawings and Specifications. Sediments will be removed using a mechanical bucket dredge or other approved method. The total estimated in-place volume of material to be removed from within the specified limits, including side slopes, but excluding overdepths, is approximately 8,200 cubic yards (cy). Including the 1-foot overdepth allowance, the total estimated in-place volume to be dredged is approximately 10,000 cy.

7.1.2 Achieving Specified Dredging Depths

Sediments within the active navigation area at the Crowley pier must be satisfactorily removed to the required depths and limits shown on the Drawings. To ensure that this occurs, the contract will allow 1 foot of overdredge depth. Monitoring activities and potential corrective actions related to achieving specified dredging depths are described in this section. Hydrographic surveys and dredging equipment controls will be required, as discussed below.

7.1.2.1 Monitoring Activities

Hydrographic surveys and dredging equipment controls are required to ensure that sediments are satisfactorily removed to the depths and limits specified on the Drawings. Survey equipment will be maintained and calibrated for the life of the contract. Maintenance and calibration procedures will be prescribed in the CQC Plan to ensure that the equipment performs to the accuracy required by the Specifications.

Hydrographic Surveys. The Contractor will perform pre-dredge and post-dredge hydrographic surveys. These surveys will be used to establish compliance with the Drawings and to serve as the basis for payment. Interim surveys (progress surveys) may also be performed to control progress of the work. The post-dredge survey also will serve as the baseline for evaluating cap thickness in RA2a and RA3; therefore, the post-dredge survey will cover all of these two areas.

The pre-dredge, post-dredge, and progress surveys (if required) will be performed using an electronic positioning system (EPS) and a single-beam echosounder system. The Specifications require use of a real-time kinematic differential global positioning system (RTK-DGPS) for positioning control during the surveys. The survey control requirements will comply with the

minimum performance standards for Navigation and Dredging Support Surveys, as specified in the USACE manual EM 1110-2-1003, Table 3-1 (USACE 2002). Because of the complexity of the dredge cut prism, the pre-dredge, post-dredge, and any progress surveys will be conducted using a trackline spacing no greater than 50 feet to minimize interpolation error. To allow accurate quantity computations, the Contractor will be required to re-occupy the tracklines used for the pre-dredge survey during the post-dredge and any progress surveys. The survey vessel will not be allowed to deviate more the 10 feet to either side of the original trackline.

The precision of single-beam methods is typically ±0.3 foot for water depths up to 30 feet and ±1 percent of the water depth for water depths exceeding 30 feet (Keener 2002). The Specifications require the Contractor to meet this precision. Dual frequencies (typically 24 to 28 kHz and 200 kHz) will be used to offset potential measurement error due to sediments that may be resuspended near the seafloor during cap placement ("fluff"). The Contractor will be required to perform and document the QC procedures shown in EM 1110-2-1003, Table 9-6 (USACE 2002).

Pay volumes will be determined by the Contractor using Triangulated Irregular Network (TIN) volume computations. TIN routines for volume determination and terrain visualization are commonly available in commercial site design and some survey software packages. The Contractor will submit all data files and computations to the CO for verification.

Dredging Equipment Controls. The Contractor will be required to accurately locate and track the movement and cut depth of the dredging equipment. If an EPS on the dredging equipment is used for horizontal positioning, the control requirements for this system must comply with the minimum performance standards for Navigation and Dredging Support Surveys, as specified in EM 1110-2-1003, Table 3-1 (USACE 2002).

The CO will work closely with the CQC Manager and hydrographic survey crew to independently verify the dredge's horizontal position and dredging depth. This may be done by evaluating the Contractor's QC surveys and/or positioning data, conducting independent surveys, or a combination of both methods. If the CO determines that the Contractor is not dredging at the proper depth or in the correct location, the CO will immediately contact the Superintendent to correct the situation. Any such direction and corrective action will be documented in the next Quality Assurance Report.

7.1.2.2 Data Quality Objectives

DQOs for achieving specified dredging depths are shown in Table 7-1. The DQOs include applicable measurements and associated quantitative criteria for evaluating whether final dredged seafloor elevations comply with the Specifications. These criteria include required measurement precision, frequency and/or intensity of measurements, and the threshold (or deviation from specified seafloor elevations) that will trigger response actions.

Types of Measurements. For pre-dredge, progress, and post-dredge surveys, the elevation of the seafloor, in feet MLLW, will be measured using a single-beam echosounder system.

Frequency and Intensity of Measurements. To minimize interpolation error, a maximum trackline spacing of 50 feet will be used. The relatively small area to be dredged (approximately one acre) can be surveyed in less than a day using a trackline spacing of 50 feet.

Measurement Precision. The required precision of seafloor elevations is ±0.5 foot. In the area to be dredged, mudline elevations are higher than -40 feet MLLW. In water depths of 40 feet and less, the precision of the bathymetric data is expected to be ±0.4 foot or better. Therefore, the required precision can be achieved using a single-beam echosounder system. The Contractor will be required to conduct a minimum of five leadline soundings during each survey to confirm that seafloor elevations have been measured to within ±0.5 foot using the single-beam echosounder system.

Threshold for Response Actions. Response actions will be required when the final dredged seafloor elevation is more than 0.5 foot higher than the elevation specified in the Drawings and Specifications.

7.1.2.3 Potential Response Actions

Seafloor elevations more than 0.5 foot higher than the specified elevation will be dredged to within the +0.5/-1.0 foot specification.

7.1.2.4 QA Activities

The QA Inspector will review Section 01720 Surveying and Section 02325 Dredging of the Specifications and the Contractor's Dredging Plan. The Dredging Plan will contain descriptions of the Contractor's methods for determining the positions of the barge and dredge bucket.

The CO and the QA Inspector will work closely with the Contractor's CQC Manager and hydrographic survey crew to independently verify the dredge's horizontal position and dredging depth. This may be done by evaluating the Contractor's QC surveys and/or positioning data, conducting independent surveys, or a combination of both methods. If the CO determines that the Contractor is not dredging at the proper depth or in the correct location, the CO will immediately contact the Superintendent to correct the situation. Any such direction and corrective action will be documented in the next Quality Assurance Report.

The Contractor will submit survey data to the CO upon completion of each survey. The CO will forward the data to the EDC team for independent review and verification. The CO will instruct the Contractor to redredge areas found to be out of compliance with the design grades or elevations.

7.1.3 Potential Water Quality Impacts During Dredging

The Contractor will be required to conduct water quality monitoring during dredging to control water quality impacts caused by sediment resuspension. The Contractor will monitor turbidity and other conventional parameters at specified sampling frequencies, locations, and depths, as described in this section. Water quality will be evaluated for compliance with the Washington State Water Quality Standards (Chapter 173-201A WAC). In addition, oil spill control measures (e.g., oil booms) will be implemented as needed during dredging activities.

The Contractor will prepare a Water Quality Monitoring Plan as a supplement to the Environmental Protection Plan, to be submitted prior to the start of construction, for approval by EPA and the CO. The Water Quality Monitoring Plan will describe field and laboratory sampling, analysis, and QC procedures for monitoring short-term water quality impacts from dredging, capping, disposal, and other construction activities. The Environmental Protection Plan will discuss engineering and operational procedures, or other best management practices (BMPs), that will be employed to minimize sediment resuspension during construction.

7.1.3.1 Monitoring Activities

Requirements for surface water quality sampling and analysis are defined in Section 01355 Environmental Protection of the Specifications. During construction, Washington State water quality criteria will need to be attained at specified points of compliance. These criteria include general water use and criteria classes (WAC 173-201A-030) for turbidity, temperature, dissolved oxygen (DO), and toxic conditions. Real-time measurement of these parameters during dredging activities can be conducted in the field using portable equipment.

The purpose of the water quality monitoring program is to provide ongoing assessment of the water quality impacts during dredging and related construction activities. The specific objectives of the monitoring program are:

- Ensure that water quality parameters (turbidity, temperature, and DO) remain within acceptable limits and that toxic conditions do not occur in the water
- Implement appropriate modifications to construction operations, if necessary based on feedback from the monitoring program, in a manner that minimizes impacts to the receiving water
- Document the results of the water quality monitoring program

A temporary mixing zone will be established during the in-water construction activities, and the points of compliance will be set at the boundary of this mixing zone. EPA will designate the allowable mixing zone and has typically approved 300-foot mixing zones in Puget Sound. Water quality will be monitored at the points of compliance and at an "early warning" station located 150 feet from dredging operations, and the Contractor will be required to modify its dredging methods, if required to ensure compliance.

Compliance Criteria. The requirements of the Environmental Protection Plan specification (Section 01355) are designed to fulfill the substantive requirements of the Clean Water Act Section 401 water quality compliance certification. The CWA was identified as an applicable or relevant and appropriate requirement (ARAR) in the Record of Decision (ROD; EPA 1999). Consistent with these requirements, the Contractor will ensure that construction activities comply with the water quality standards for surface waters of the State of Washington (Chapter 173-201A WAC), the delegated state regulation for implementing CWA provisions. The

Contractor is also responsible for documenting ambient "background" water quality prior to and during construction.

Elliott Bay is a "Class A" water body. The following water quality standards (WAC 173-201A-030) apply to Elliott Bay, except in the indicated temporary mixing zones:

- **Turbidity.** Turbidity must not exceed 5 nephelometric turbidity units (NTUs) over background turbidity when the background turbidity is 50 NTUs or less, or when there is more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTUs.

- **Dissolved Oxygen.** DO must exceed 6.0 milligrams per liter (mg/L). When natural conditions, such as upwelling, occur, causing the DO to be depressed near or below 6.0 mg/L, natural DO levels may be degraded by up to 0.2 mg/L by human-caused activities.

- **Temperature.** Temperature must not be greater than 16 degrees Celsius (°C). When the background temperature naturally exceeds 16°C, the incremental increase shall not exceed 0.3°C.

- **Toxic Conditions.** Toxic concentrations must be "below those which have the potential either singularly or cumulatively to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health, as determined by the department (WAC 173-201A-030)."

Monitoring Parameters. During the pre-design investigation, a dredge elutriate test (DRET) was conducted on a composite sample from RA3. The results of this testing, reported in the pre-design investigation data summary (USEPA 2002a), indicate that chemical concentrations are not expected to exceed either the acute or chronic water quality criteria in WAC 173-201A-040 (i.e., the water quality standard for toxic conditions in WAC 173-201A-030 is not expected to be exceeded). Thus, no monitoring of chemical constituents in the water column is needed during dredging.

Water quality monitoring for turbidity, DO, and total suspended solids (TSS) will be performed during all monitoring events and schedules. Controlling turbidity and TSS during construction

activities will implicitly control the release of chemical contaminants during dredging, capping, and disposal. Monitoring for toxic conditions will be conducted on an ongoing basis. Stop work conditions are indicated in Section 7.1.3.3.

Monitoring Locations. Monitoring locations will be established for ambient conditions and for compliance monitoring during construction activities. Monitoring locations are shown in the Drawings.

Ambient Monitoring Locations. Before construction and during construction, but outside the influence of construction activities, the Contractor will monitor ambient water quality conditions to establish background values for water quality parameters. DO, temperature, and turbidity criteria are based on comparisons to background conditions; therefore, background conditions must be established at the onset of construction and continually monitored during construction.

The ambient monitoring locations include three stations located approximately 500 feet north, east, and west of the capping area boundary. Background monitoring measurements will be collected 24 to 48 hours prior to initiation of any in-water construction. Background will be defined as the upper 90th percentile values for turbidity and temperature and the lower 90th percentile value for DO. Ambient water quality sampling locations will continue to be monitored during construction, and background values will be recalculated monthly, based on updated monitoring results.

Compliance Boundaries. Compliance boundaries will be established for all construction activities using a designated mixing zone. The size of the mixing zone will be a site-specific determination by EPA for the MSU and will be documented in the Section 401 water quality compliance certification. The compliance boundary will be set at the edge of the mixing zone (e.g., at 300 feet) in a radial direction from the dredge, and the boundary will move with the position of the dredge.

Compliance Monitoring Locations. Four monitoring locations will be established for the dredging activity. Three of the monitoring locations will be along the mixing-zone boundary along the predominant direction of tidal flow, including two stations in the downcurrent direction and one station in the upcurrent direction. The fourth monitoring location will be situated at the mid-point of the mixing zone (i.e., 150 feet from the dredging equipment) downcurrent from the dredging activity. The mid-point monitoring location provides an "early warning" of water quality impacts.

The exact monitoring locations may move laterally along the compliance boundary and the mid-point. Monitoring locations will be positioned to intercept any visible turbidity plumes emanating from dredging activities.

Monitoring Depths. At each monitoring location, water quality parameters will be measured at three depths: shallow (within 3 feet of water surface), intermediate (approximate mid-point of the water column), and deep (within 6 feet of the sea floor). The three measurements will be combined into a single depth-averaged value at each location to evaluate compliance with water quality criteria.

7.1.3.2 Data Quality Objectives

DQOs for monitoring potential water quality impacts during dredging are shown in Table 7-1. The DQOs include applicable measurements and associated quantitative criteria for evaluating whether water quality conditions during dredging activities comply with the Specifications. These criteria include frequency and/or intensity of measurements, required measurement precision, and the threshold that will trigger response actions.

Monitoring Frequency. Conventional parameters will be measured in situ in the water column for real-time feedback to the Contractor. Water quality monitoring for conventional parameters will be performed according to three schedules:

- Intensive monitoring (twice per dredging shift)
- Routine monitoring (once daily)
- Limited monitoring (once weekly)

Section 01355 Environmental Protection of the Specifications defines each of the monitoring schedules. Activities involving the dredging of contaminated sediments will begin with an intensive monitoring schedule. Following a specified period of time with no exceedances of water quality criteria, the monitoring program may be revised to a less frequent schedule.

Measurement Precision. The measurement precision for turbidity, DO, and temperature will be ±0.5 NTU for turbidity, ±0.1°C for temperature, and ±0.5 mg/L for DO, or better. The precision range for DO exceeds the threshold for action criterion when background DO is less than 6.0 mg/L. However, it is not anticipated that the background DO will be less than 6.0 mg/L.

Thresholds for Action. Thresholds for implementing response actions are the State of Washington water quality standards for surface waters, which are provided in Section 7.1.3.1, measured at the compliance boundary. In addition, response actions will be implemented if DO is less than or equal to 4.0 mg/kg at the "early warning" monitoring location.

7.1.3.3 Potential Response Actions

Two classes of response actions will be established: "stop work" and "modify operations."

Stop Work. Dredging activities will cease at the first indication of any of the following conditions in the construction area:

- An observable oil sheen outside of the containment booms
- Distressed or dying fish or wildlife
- DO concentrations less than 4.0 mg/L at any monitoring location

The CO or his on-site designee will have authority to issue stop work orders if and when such conditions are observed.

Modify Operations. If an exceedance of a water quality criterion occurs at the compliance boundary, the Contractor will be required to modify construction operations to alleviate the water quality impacts. Such modifications may include slowing the dredging rate, dredging during appropriate tidal windows, or implementing additional engineering controls.

Documentation. The Contractor will include all water quality monitoring results from the day's measurements with the Daily QC Reports that are submitted to the CO. The Contractor will also submit a monthly Water Quality Report to the CO and EPA. These monthly reports will contain a summary of the month's in-water construction activities, the Contractor's performance relative to water quality, a summary of any exceedances of water quality criteria and corrective actions taken, and updated background values.

7.1.3.4 QA Activities

The QA Inspector will review Section 01355 Environmental Protection of the Specifications and the Contractor's Environmental Protection Plan. The QA Inspector will monitor the Contractor's water sampling operations to verify samples are collected at the locations and depths specified in

the Section 401 Water Quality Certification. The QA Inspector will compile the Contractor's equipment calibration and water quality monitoring results and include these data in the Weekly QA Report.

The QA Inspector will use the Contractor's water quality monitoring data to independently verify whether exceedances of the water quality criteria have occurred. Any exceedances will be reported to the CO, who will notify EPA of the noncompliant situation within four hours from the time the exceedance is determined, and of the corrective actions that are being implemented. An exceedance will trigger intensive monitoring, and EPA will be kept apprised of ongoing monitoring results. If water quality conditions do not improve, the CO will consult with EPA to determine what additional actions may be necessary.

7.1.4 Dredging of Outfall Extension in RA1

The primary QA/QC concern is removal of all highly compressible material to prevent unacceptable pipe settlement. Based on existing information, the design dredge cuts are expected to remove all highly compressible material. However, QA Inspectors (including a qualified geotechnical engineer) must inspect the material in the finished dredge cut to determine if all highly compressible material has been removed.

7.1.4.1 Monitoring Activities

Monitoring will consist of inspection of excavated material during and after completion of dredging the outfall extension alignment, as described in Section 02325 Dredging of the Specifications. The CO will designate a qualified geotechnical engineer as the QA Inspector to visually examine the dredged material, as described in Section 7.1.4.3. The QA Inspector will also daily assess the condition of the temporary slope protection in the dredge cut, and ensure that the Contractor corrects any sloughing until the outfall extension is completed.

7.1.4.2 Potential Response Actions

The CO will instruct the Contractor to dredge additional material and re-sample if highly compressible material is present in the outfall extension dredge cut. If any redredging is indicated, the EDC team will be consulted immediately to monitor the progress and results of the redredging. Highly compressible material is defined as sediment containing more than

60 percent silt with observable organic material or containing more than 75 percent silt without observable organic material.

7.1.4.3 QA Activities

For this project element, the QA Inspector will be a qualified geotechnical engineer registered in the State of Washington. The QA Inspector will observe the dredging in this area and inspect the excavated material as it is removed. Additionally, the QA Inspector will instruct the Contractor to collect at least three partial buckets of material (at least a 1-foot bite) from the completed dredge cut and visually examine the samples. If the samples indicate significant presence of highly compressible material, the CO will instruct the Contractor to dredge additional material and resample. The QA Inspector's observations, any test results, and any instructions to the Contractor to dredge additional material will be reported in the next Weekly QA Report.

7.1.5 Transportation and Disposal of Dredged Material

Dredged material will be dewatered on site and transported offsite for disposal following the requirements of Section 02325 Dredging and Section 02120 Transportation and Disposal of Hazardous and Non-Hazardous Materials of the Specifications. The primary QA/QC concerns are proper classification of the dredged material for disposal, the potential for releases of dredged material during transport, and proper documentation of disposal of the dredged material.

7.1.5.1 Classification of Material for Disposal

The material to be dredged has been characterized for disposal. The sample results are presented in the Technical Exhibit and in Draft Technical Memorandum No. 1 (USEPA 2002). Based on these test results, it is anticipated that the material will not be classified as hazardous waste under RCRA regulations or dangerous waste under the State of Washington regulations. Additional testing could be required, depending on the requirements of the disposal facility selected by the Contractor. If oily material is encountered during dredging, the Contractor may be required to segregate the material and conduct additional testing to classify the material for disposal, depending on the requirements of disposal facility. Any required additional testing will be identified in the Contractor's Waste Management Plan.

7.1.5.2 Potential Releases of Dredged Material During Transport

The Contractor will be required to transport the material in a manner that limits the potential for releases of contaminated water or sediment during transport. The dredged material may be transported offsite in lined shipping containers or in bulk in a closed-hull barge with side walls. At the transfer point, the dredged material will be transferred to lined rail cars and transported to an EPA-approved Subtitle D disposal facility.

The Contractor will prepare a Waste Management Plan in accordance with Section 01400 Remedial Action Management Plan of the Specifications that describes handling, storage, transportation, and disposal of the dredged material. The Plan will also describe how releases will be prevented during transport and how releases will be contained and cleaned up, should they occur. The Contractor will designate a Transportation and Disposal Coordinator to serve as a single point of contact for matters related to disposal of dredged material.

7.1.5.3 Documentation of Disposal

The Contractor will be required to provide a letter certifying that EPA considers the facilities to be used for off-site disposal to be acceptable in accordance with the off-site policy in 40 CFR 300.440. The Contractor will be required to provide copies of waste shipment records from the disposal facilities not later than 35 days after acceptance of the shipment.

7.1.5.4 QA Activities

The QA Inspector will review Section 02120 Transportation and Disposal of Hazardous and Non-Hazardous Materials of the Specifications and the Contractor's Waste Management Plan. The Contractor will report the results of any additional testing required by the disposal facility in the Daily QC Reports, and these results will also be reported in the Weekly QA Reports.

The Weekly QA Reports will document any releases during transport of dredged material, including estimated amounts and mitigation measures undertaken. The QA Inspector will inspect each barge load of dredged material before it leaves the site to verify that the material is adequately dewatered on site.

The Weekly QA Reports will also include copies of waste shipment records from the disposal facilities. The QA Inspector will compare volumes of material reported in the waste shipment

records with volumes of material dredged to verify there is a record of proper disposal of all dredged material.

7.2 CONSTRUCTION OF SEDIMENT CAP IN RA1, RA2A, RA2B, RA3, AND RA4

Design of the sediment cap is governed by the following design parameters established in the ROD:

- The minimum cap thickness shall be 5 feet in the intertidal area
- Capping material shall be at least as clean or cleaner than the SQS
- Capping material shall be selected and placed in such a way as to provide appropriate habitat for the marine organisms natural to the area

Section 7.2.1 describes construction of the cap in RA1 through RA4.

The primary QC concerns associated with sediment cap placement are as follows:

- Verifying that the chemical and physical characteristics of the capping material are appropriate for their intended use
- Ensuring that the capping material is satisfactorily placed over the required areas and to the required thicknesses (including the potential for slope failures in RA4)
- Verifying that the cap has not been cross-contaminated by the underlying sediments during placement
- Ensuring that unacceptable water quality impacts do not occur during cap placement

DQOs have been developed for monitoring to verify the Contractor is complying with the Specifications related to these concerns. The DQOs are described in Sections 7.2.2 through 7.2.5 and summarized in Table 7-2.

An overview of monitoring activities during cap placement is presented in Figure 7-1.

7.2.1 Task Description

7.2.1.1 RA1: Intertidal/Shallow Subtidal Area

The RA1 boundaries are defined to extend from the top of the bank, offshore a sufficient distance to construct the required grade transitions to the adjacent offshore RAs. According to the ROD (USEPA 1999), a minimum 5-foot cap thickness is required for capping contaminated sediments in the intertidal area. The intertidal area includes areas with existing mudline elevations from -10.0 to +14.8 feet MLLW and post-construction elevations of -4.0 to +14.8 feet MLLW.

Two types of caps will be placed in RA1: a thick slope cap and a gravel cap. The thick slope cap will be placed at a 2H:1V sideslope to transition between the gravel cap and the deeper, less steeply sloping areas of the MSU. The RA1 caps are multi-layered with layer thicknesses indicated in the Drawings.

In the portions of RA1 where armor material is required (i.e., in thick slope cap areas), the filter layer and armor material must be placed as soon as possible following completion of the cap subgrades, to avoid erosion. The Drawings include notes on the acceptable placement sequence for cap materials in RA1.

Acceptance criteria for the cap materials are provided in Section 02483 Sediment Cap of the Specifications. Capping materials used in RA1 will be placed mechanically from a barge in lifts. Earth moving equipment may be used to grade cap materials during periods of low tide.

Erosive forces due to surface waves, propeller wash, and cross-shore sediment transport processes were evaluated to determine the acceptable particle size of capping material in RA1. Design elements include intertidal habitat enhancement and establishment of beach areas. Engineered features such as specific materials, specific slopes, and riprap slope caps are necessary for physical cap stability in RA1. Due to the complex topography in RA1, significantly different slope profiles are required along various segments of the shoreline.

7.2.1.2 RA2a and RA2b: Shallow Nearshore Area

RA2 consists of two discrete nearshore areas, RA2a and RA2b, which extend from approximately -15 to -50 feet MLLW. RA2a and RA2b are characterized by relatively flat areas or shallow slopes, with localized steepened areas. Erosive forces due to propeller wash determine the particle size of capping material in RA2a. Erosive forces are not anticipated to be significant in RA2b. Capping materials used in RA2a and RA2b will be placed mechanically from a barge in lifts.

7.2.1.3 RA3: Crowley Marine Services Area

It is necessary to maintain navigational depths in this area for barges, tugs, and other vessels. Because of the need to maintain navigational access, dredging is required in this area prior to cap placement. The capping material in this area must resist erosive forces from propeller wash. Capping materials used in RA3 will be placed mechanically from a barge in lifts.

7.2.1.4 RA4: Sloping Offshore Area

This area extends from approximately -40 to -140 feet MLLW and includes relatively steep slopes with approximately 15 percent to 25 percent grades. Stability of these soft/loose sediment slopes and the potential for failure during cap placement requires specific controlled cap placement methods. These methods include placement of relatively thin lifts, with time allowed for consolidation of underlying soft sediments between lifts, and placement of cap materials starting at the base of the slope and working progressively upslope. The relatively deep water, steep slopes, and thin cap lifts in RA4 result in greater difficulties for monitoring cap placement compared to RA1 through RA3.

The RA4 cap will be placed in three segments during the 2004 construction window. Within each segment, the cap will be placed in three or more lifts: a maximum 6-inch first lift, a maximum 9-inch second lift, and a final lift(s) (each a maximum of 12 inches) to bring the cap up to a minimum thickness of 30 inches and a maximum thickness of 42 inches, including the 12-inch overplacement allowance. Capping materials used in RA4 will be placed by hydraulic washing from a barge, or by other methods as approved by the CO.

7.2.2 Cap Materials Quality

Cap materials must be used that conform with the requirements in Section 02483 Sediment Cap of the Specifications for gradation and organic carbon content and Section 01450 Chemical Data Quality Control of the Specifications for chemical contaminant concentrations. It is possible that the CO may require additional chemical analyses than those specified, if determined necessary by EPA. Such additional analyses would be a change order.

7.2.2.1 Monitoring Activities

Borrow materials designated for use as capping materials will be routinely tested for compliance with Section 02483 Sediment Cap of the Specifications. All borrow sources must be tested by the Contractor and approved by the CO prior to their use. One to two samples of each material type from each borrow source will be tested for particle-size distribution (all materials except riprap), chemical analysis (all materials except riprap, filter material #1, and gravel mix), and total organic carbon (TOC). Chemical concentrations must not exceed the SQS concentrations shown in Table 7-3. The sand cap mix and filter material #2 must contain a minimum amount of TOC (0.5 percent) to provide adequate chemical isolation.

Following approval of a borrow source, capping materials will be tested for proper gradation at a minimum rate of one sample per 10,000 tons. Results will be provided to the CO within 24 hours.

Analyses for chemical concentrations and TOC content of the cap materials are required as stated in the Specifications. Two separate samples and chemical analyses of each material is initially required. Additionally, two separate samples and chemical analyses of each material is required at the beginning of the second and third construction season (if a third season is needed). Two additional samples and analyses are required if a material is obtained from a different supplier that the originally tested material. Riprap, gravel mix, and filter material #1 do not require chemical testing. The CO or his representative may conduct inspections of borrow sources to confirm materials are of a uniform quality.

For riprap, the CO will designate a QA Inspector to visually inspect the riprap at the quarry source prior to delivery of any riprap to the site. The QA Inspector will inspect the riprap for size, angularity, shape, porosity, and presence of deleterious material (such as soil or roots). The

QA Inspector will also review the results of specific gravity, degradation, and durability tests for conformance with the requirements of Section 02483 Sediment Cap of the Specifications.

7.2.2.2 Data Quality Objectives

DQOs for monitoring imported cap material quality are shown in Table 7-2. The DQOs include applicable measurements and associated quantitative criteria for evaluating whether imported materials comply with the Specifications. These criteria include frequency and/or intensity of measurements, required measurement precision, and the threshold that will trigger response actions.

Types of Measurements. Cap materials will be tested for constituents included in the SMS and particle size analysis prior to being transported to the site. Materials analyzed for SMS constituents will also be analyzed for TOC. The SMS constituents are listed in Table 7-3. The methods of analysis include:

- SMS constituents (all materials except riprap, filter material #1, and gravel mix):
  - Metals: EPA Method 6000/7000
  - Semivolatile organic compounds (nonionizable and ionizable organic compounds except pesticides/PCBs): EPA Method 8270
  - Pesticides/PCBs: EPA Method 8081/8082
  - TOC: EPA Method 9060
- Particle size analysis: ASTM D422

Analytical laboratory QC procedures are listed in Section 01450 Chemical Data Quality Control of the Specifications.

Measurement Frequency. The Contractor will be required to obtain approval for the import material source(s) prior to the start of capping operations. Requirements for testing to obtain approval are shown in the Specifications. Once the source(s) is approved, the Contractor will be

required to test one sample per 10,000 tons of material for proper gradation (particle size analysis).

Measurement Sensitivity. Maximum quantitation limits for chemical analyses are shown in Table 7-3. The quantification limit for TOC must not exceed 0.1 percent on a dry weight basis.

Thresholds for Response Actions. For particle size, material must meet the gradation requirements listed in Section 02483 Sediment Cap of the Specifications. The thresholds for response actions are the SQS concentrations shown in the Specifications, Section 01450 Chemical Data Quality Control, Table 01450-2. For nonionizable organic compounds, the dry weight equivalent will be used if the TOC content of the sample is less than 0.5 percent or greater than 4 percent.

7.2.2.3 Potential Response Actions

Materials that do not meet the threshold requirements cannot be used at the site. The Contractor will be required to remove the non-conforming materials from the site and supply alternate capping materials.

7.2.2.4 QA Activities

The QA Inspector will review the import material requirements in Section 02483 Sediment Cap of the Specifications. The Contractor will submit representative samples and test reports to the CO for approval prior to delivery of materials to the site. A geotechnical engineer designated by the CO will inspect riprap materials at the source prior to delivery of materials to the site.

Following approval of the borrow source, the Contractor will test the materials for compliance with the gradation requirements at the rate of one sample per 10,000 tons. The QA Inspector will review the test results supplied by the Contractor and include these results in the Weekly QA Reports. The QA Inspector will also inspect each load of materials upon delivery to the site. The results of the inspections will be documented in the Weekly QA Reports along with copies of invoices from the material suppliers. The QA Inspector will notify the CO of any material that does not meet the Specifications.

7.2.3 Thickness of Cap Lifts and Final Cap

Potential QC concerns related to thickness of cap lifts and the final cap thickness include inadequate or excessive thickness of individual lifts or the final cap. The design prescribes maximum lift heights to protect against failure of the underlying soft sediment, minimum thickness of the sand cap to provide for adequate chemical isolation of contaminants, and minimum total cap thickness to provide adequate protection from erosion. A 12-inch overcapping allowance is included in the design.

The Contractor will conduct pre-construction and post-construction hydrographic surveys. These surveys will provide data needed to confirm adequate final cap thickness using differential bathymetry and documentation of as-built bathymetry. The pre-construction and post-construction surveys are described in Section 7.2.3.1.

Activities for monitoring cap thickness in RA1, RA2, and RA3 are described in Section 7.2.3.2. The presence of relatively deep water, steep slopes, and required thin cap lifts result in the selection of different monitoring methods in RA4, which are described in Section 7.2.3.3.

Monitoring for the thickness of cap lifts and final cap will be coordinated with monitoring for excessive intermixing of cap materials and native sediments, which is described in Section 7.2.4.

7.2.3.1 Overview of Hydrographic Survey Approaches

The Contractor will be required to conduct pre-construction, pre-cap, post-cap, and as-built hydrographic surveys. This section describes the approaches used to conduct these surveys.

Pre-Construction and As-Built Hydrographic Surveys. The Contractor will conduct multi-beam hydrographic surveys prior to the start of construction activities and following completion of cap placement. The surveys will cover the entire area of the MSU (RA1 through RA5). The surveys will document pre-construction and as-built conditions. The pre-construction survey is part of the base contract, and the as-built survey is an option item.

The multi-beam surveys will provide 100 percent coverage of the survey area. The Contractor will be required to conduct leadline soundings to confirm that seafloor elevations have been measured to a precision of ±0.5 percent of the water depth. The Contractor will be required to conduct and document the calibration and QC procedures recommended by the equipment

manufacturers and the QC procedures for multi-beam surveys listed in EM 1110-2-1003, Table 11-2 (USACE 2002).

For horizontal and vertical positioning, the Specifications require use of RTK-DGPS. Control points have been established at the site for RTK-DGPS, and the positions of the five control points, designated PSR-1 through PSR-5, are shown in the Drawings. Use of RTK-DGPS will enable horizontal positioning precision of ±3.3 feet and vertical positioning precision of ±2.0 inches.

In areas too shallow for access by the survey vessel (typically seafloor elevations higher than about -1.5 feet MLLW), conventional land surveying methods will be used. The Contractor will be required to measure horizontal and vertical positions to a precision of ±0.1 foot.

Pre-Cap and Post-Cap Hydrographic Surveys. Multi-beam echosounding systems provide full seafloor coverage and greater accuracy than single-beam echosounding systems. The time and expense associated with reducing multi-beam data, however, makes these systems less desirable for verifying that the Contractor has constructed the cap to the required thickness and elevation. Single-beam post-cap surveys will be conducted for these purposes.

In RA2a, RA2b, RA3, and the shallower (less than 100 feet water depth) parts of RA4, the final cap thickness will be evaluated using differential bathymetry. In RA1, adequate cap thickness will be ensured by achieving the elevations and grades shown on the Drawings. Consequently, pre-cap bathymetry is required in RA2a, RA2b, RA3, and RA4, but is not required in RA1. In RA 2a and RA3, the post-dredge survey will provide the pre-cap bathymetry.

Because of the data manipulation required and the uncertainty introduced by using multi-beam survey data as a baseline for the single-beam progress and post-cap survey, single-beam data will be used as the baseline for differential bathymetry. The single-beam pre-cap data could be efficiently acquired by either conducting the multi-beam and single-beam surveys simultaneously from a single vessel or by processing only the data acquired by the nadir beam of the multi-beam system. Single-beam hydrographic surveys are described further in Sections 7.2.3.2 (RA1, RA2, and RA3) and Section 7.2.3.3 (RA4).

7.2.3.2 Monitoring Activities in RA1, RA2, and RA3

Water depths in RA1, RA2, and RA3 are generally less than 50 feet. For these water depths, differential bathymetry can be used to determine the final cap thickness and grades with acceptable precision. In RA1, a post-cap survey using single-beam echosounding, will be used to verify design lines and grades. Pre-cap and post-cap surveys, using single-beam echosounding, will be used to evaluate the final cap thickness in RA2a, RA2b, and RA3.

Through-cap coring will be used to monitor placement of the initial 12-inch sand cap mix lift and to verify the thickness of the sand cap mix. Where mechanical placement is used, positioning controls on the placement bucket will be used to provide real-time monitoring of cap placement.

In RA2a, RA2b, and RA3, differential analysis of the pre-cap and post-cap hydrographic surveys will provide information regarding verification of cap thickness. However, in addition to the combined horizontal and vertical positioning errors of the two surveys, consolidation of soft sediments under the cap will lower the final cap elevation. Thus, the consolidation effect will introduce a systematic (but variable) low bias to the cap thicknesses interpreted from differential bathymetry. It is anticipated that it will be possible to correct for this low bias through "calibration" of the differential bathymetry results with actual core descriptions.

It is anticipated that some difficulties with achieving uniform placement of capping materials could be encountered at the startup of cap placement and that refinement of placement methods will generally result in more precise cap placement as the project proceeds. Coring data from placement of the first lift in the first area to be capped (anticipated to be the eastern part of RA1) can be used to adjust placement methods during first lift placement in subsequent areas. The refinement is anticipated to be ongoing, and the coring data from the first lift can be used to provide more accurate placement of the second (and final) sand cap mix lift in RA1 through RA3.

Hydrographic Surveys. Pre-cap and post-cap bathymetry will be acquired using an acoustic single-beam echosounder. The nominal precision of these methods is typically ±0.3 foot in water depths up to 30 feet and ±1% of the depth of water in water depths exceeding 30 feet (Keener 2002). Dual frequencies (typically 24 to 28 kHz and 200 kHz) will be used to offset potential measurement error due to sediments that may be resuspended near the seafloor during cap placement ("fluff"). The Contractor will be required to perform and document the calibration

and QC procedures recommended by the equipment manufacturers and the QC procedures listed in EM 1110-2-1003, Table 9-6.

Horizontal and vertical positioning control during hydrographic surveys will be accomplished using RTK-DGPS, as described in Section 7.2.3.1.

At least five leadline soundings will be conducted during each survey to confirm this precision is achieved. The precision of the leadline soundings will be determined by the vertical positioning precision plus the measurement precision. The vertical positioning precision is ±2.0 cm, and a measurement precision of ±0.4 inches (for cap surface) to ±1.2 inches (for soft native sediments) should be achievable during calm seas and slack tidal currents. The overall precision of leadline soundings ranges from ±2.4 inches (±0.2 foot) for measuring the cap surface to ±3.2 inches (±0.3 foot) for measuring the pre-cap seafloor. The Contractor will include the depths measured at the leadline sounding locations using both acoustical and leadline methods in the Daily Quality Control Report for the following day. The QA Inspector will record these data in the Weekly Quality Assurance Report.

Through-Cap Coring. Through-cap coring will be used to monitor placement of the initial 12-inch maximum lift, to verify the thickness of the sand cap mix, to confirm the final cap thickness at the discrete coring locations, and to calibrate the cap thicknesses interpreted using differential bathymetry in RA2a and RA2b and the shallow portions (less than 100 feet water depth) of RA4. Coring activities will be coordinated with those used to monitor intermixing of cap materials and native sediment during placement. Core samples in RA1 through RA3 will be collected on an approximately 200-foot grid. The sample locations are shown on the Drawings.

Core samples may also aid interpretation of the final cap thickness determined using differential bathymetry because of the uncertainty associated with consolidation of native sediments. Consolidation can result in lower cap surface elevations that could mistakenly be interpreted as incomplete cap placement using the results of differential bathymetry. Core samples will directly measure the actual thickness.

Core samples will penetrate a minimum of 12 inches into native sediments. The samples will be extracted on-board the sampling vessel and the thickness of cap layers measured. The Contractor will be required to collect undisturbed samples. The Contractor's RAMP will specify the procedures required to collect undisturbed samples consistent with regional guidance (PSEP 1997). Collection of undisturbed samples requires that the sampler create minimal bow wake

when descending, form a leakproof seal when the sediment sample is taken, and prevent winnowing and excessive sample disturbance when ascending.

Contractor's Daily Reports. The Contractor will be required to monitor the weight of material placed per unit area during each lift. The weight of material placed and the area covered will be recorded daily in the Contractor's Daily QC Reports. The weight of material placed over a given area may be computed by monitoring changes in barge displacement, or by other methods proposed by the Contractor.

Placement Bucket Positioning Controls. The Contractor will be required to accurately monitor the horizontal and vertical position of the mechanical bucket used to place the cap materials in RA1 (and potentially in RA2a, RA2b, and RA3). The requirements for positioning control are the same as those for dredging, which are described in Section 7.1.2.1.

The Contractor's Capping Plan will define specific methods for verification of the cap layers in RA1, including the verification methods described in this section and additional methods that may be proposed by the Contractor. Such additional methods may include additional segmentation of RA1, plotting of mechanical bucket positioning data, frequent leadline surveys, underwater video documentation, or other methods.

7.2.3.3 Monitoring Activities in RA4

The relatively deep water, steep slopes, and thin cap lifts in RA4 result in unique considerations for monitoring cap placement in this area. The monitoring objectives of the first lift will be to verify that the cap is being placed with an acceptable degree of uniformity and that slope failures are not occurring. The cap placement staging and monitoring program are designed to detect non-uniformity of placement or slope failures early on, to enable the Contractor to implement the changes needed to ultimately place a cap that meets the 30 to 42 inches thickness requirement throughout RA4.

The Contractor will be required to control the amount of cap material placed per unit area. Consequently, if the first lift of cap material is placed uniformly, such that the areas are limited where the cap is too thin or absent, areas of excessive mounding would also be limited. The monitoring objectives for the first cap lift, therefore, are to verify that the areal extent of the cap where the material placed is less than four inches thick is within prescribed limits and that slope failures are not occurring. It is anticipated that, once the placement method is "proven" using

relatively intensive monitoring of the first lift placement in Segment 1 of RA4, less intensive monitoring will be required during placement of the first lift in the remaining segments and during placement of the second and final lifts.

Sediment Profile Imaging. Sediment profile imaging (SPI) can be used to detect thin layering within surface sediment profiles. The SPI device consists of a camera and optical prism that is lowered to the bottom. The prism is driven by gravity into the sediment, penetrating to a depth of up to 6 to 8 inches. The camera is activated to obtain an image of sediment layering and benthic activity. SPI can be used to rapidly collect data (potentially greater than 100 images per day) and provide results within 24 hours. The ability of the prism to penetrate the sand cap could limit the utility of SPI. At some locations, the penetration achieved could be less than 6 inches.

SPI allows monitoring of the presence of the biologically-active zone, which could aid in detecting slope failures because the sand cap and biologically-active zone would be absent within a failure location. A additional benefit of SPI would be its utility for evaluating intermixing of the cap materials and native materials.

Following initial cap placement in the deeper half of Segment 1 of RA4, SPI monitoring will be used to rapidly assess whether the first layer of cap material is being placed uniformly. In addition, the images will also be examined for indications of slope failure (e.g., neither cap material nor a zone of benthic activity are present in the image). If this initial assessment indicates the material is not being placed uniformly or if slope failures have occurred, the need for response actions will be evaluated prior to conducting additional cap placement. Through-cap coring may be conducted to aid interpretation of the SPI data, particularly in areas where SPI is unable to penetrate the entire cap thickness. SPI will not be used for monitoring the second and final lifts in RA4 or for monitoring in other RAs.

Through-Cap Coring. Through-cap coring will be used in RA4 to confirm the final cap thickness. Core samples will be collected on an approximately 300-foot grid. A total of 15 core samples will be collected in RA4. The locations of the core samples are shown in the Drawings.

Through-cap cores will also be used, together with the bathymetric data, to evaluate the consolidation of the underlying native sediment. Consolidation can result in reductions in cap surface elevations that could mistakenly be interpreted as incomplete cap placement.

Through-cap coring for confirming cap lift thickness and final cap thickness will be coordinated with the requirements for monitoring the chemical composition of the in-place cap, which are discussed in Section 7.2.4.

Hydrographic Survey. Differential bathymetry using single-beam echosounding will be used to confirm that the final cap thickness is 30 to 42 inches in areas of RA4 where the water depth is less than 100 feet. The surveys will be completed throughout all of RA4; however, below -100 feet MLLW, only relatively large deviations from the design cap thickness can be detected. Single-beam echosounding and related positioning requirements are described in Sections 7.2.3.1 and 7.2.3.2.

7.2.3.4 DQOs for Thickness of Cap Lifts and Final Cap

DQOs for achieving specified cap lift and final cap thickness requirements are shown in Table 7-2. The DQOs include applicable measurements and associated quantitative criteria for evaluating whether cap lift and final cap thickness comply with the Specifications. These criteria include required measurement precision, frequency and/or intensity of measurements, and the threshold (or deviation from specified seafloor elevations) that will trigger corrective actions.

RA1, RA2a, RA2b, and RA3—Initial Lift of Sand Cap Mix. The measurements used for confirming initial lift placement are through-cap coring and material placement rates. The threshold for response actions for coring is initial lift thickness exceeding the prescribed limit (12 inches in RA1 through RA3). Cores will be collected on an approximately 200-foot grid. No lower threshold on lift thickness has been defined. It is anticipated that the Contractor will place material at a rate that is approximately equal to the maximum placement rate allowed by the Specifications. Therefore, an upper threshold is adequate to control uniformity of placement. The required precision for through-cap cores is lift thickness measured to ±0.1 foot.

The threshold for material placement rates is a rate exceeding the prescribed placement rate (in tons per acre) for the first lift in RA1 through RA3. Material placement rates will be measured and reported daily. Material placement rates are listed in Section 02483 Sediment Cap of the Specifications. The measurement precision for material placement rates is estimated to be better than ±100 tons per acre.

RA1, RA2a, RA2b, and RA3—Sand Cap Mix Layer. The measurements used for confirming thickness of the sand cap mix are through-cap coring and material placement rates. In RA1 and

RA3, these cores will be collected once the full thickness of the sand cap mix layer is in place. In RA2a and RA2b, these cores will be collected after final placement of the entire cap thickness. The threshold for response actions for through-cap coring is 0 to +12 inches of the prescribed sand cap mix thickness. The minimum sand cap mix thickness is 24 inches in RA1, RA2a, and RA3 and 30 inches in RA 2b. In RA2b, where no erosion protection is required, the top of the sand cap mix is the top of the final cap. Cores will be collected on an approximately 200-foot grid. The required precision for through-cap cores is sand cap mix thickness measured to ±0.1 foot.

RA1, RA2a, RA2b, and RA3—Final Cap. Final cap thickness in RA1 through RA3 will be measured using single-beam hydrographic surveys, with a conventional land survey in areas of RA1 inaccessible to the survey vessel. The thresholds for response actions are measured cap thicknesses less than the design thickness, and measured cap thicknesses more than 12 inches greater than the design thickness. The lower threshold indicates the cap is not of the required thickness, and thus will trigger a response action when any location on the cap is below the design thickness. (Note: The portions of RA1 below 0 feet MLLW have a 12-inch underplacement tolerance.) The 12-inch overplacement threshold will trigger a response action when any area greater than 2,500 square feet exceeds the 12-inch overplacement allowance, or when any one location exceeds two times the 12-inch overplacement allowance. An additional threshold for the thick slope cap areas of RA1 is that the final slope must not be steeper than 1.75H:1V, except toe berms, which may be at the angle of repose.

Bathymetric data will be acquired on a maximum 50-foot trackline spacing, including the transects shown in the Drawings. The required measurement precision is ±0.3 foot in water depths up to 30 feet and ±1 percent of the water depth in water depths greater than 30 feet. In RA1 through RA3, the required precision ranges from ±0.3 foot to ±0.5 foot.

Topographic survey elevations also will be measured on a maximum 50-foot trackline spacing, including the transects shown in the Drawings. The required precision of elevation measurements is ±0.1 foot.

RA4—Initial Lift. The thickness of the initial lift in RA4 will be measured using SPI. A total of four SPI surveys will be conducted, including one each in the deeper half of Segment 1, the shallower half of Segment 1, Segment 2, and Segment 3. Each survey will include images from approximately 40 locations.

The threshold for response actions is no less than 90 percent of the images showing a sand mix layer thickness of greater than or equal to 1 inch and no less than 50 percent of the images showing a sand mix layer thickness of greater than or equal to 4 inches. A measurement precision has not been defined for SPI; however, it is anticipated that resolution of layering thinner than one inch will be achieved consistently. Images that are less than 6 inches deep, are affected by smearing of sediment on the prism, or are otherwise ambiguous will be reacquired.

An additional threshold for evaluating response actions is related to the potential for slope failures. Potential slope failure is indicated if both sand cap mix and evidence of a biologically active surface sediment layer are absent from an image.

RA4—Final Cap. The thickness of the final cap will be measured using a combination of single-beam hydrographic surveys and through-cap coring. In the shallower areas of RA4 (less than 100 feet water depth), the need for response actions will be evaluated using the results of the single-beam bathymetry, with coring using to verify the results. In the deeper areas of RA4 (greater than 100 feet water depth), the need for response actions will be evaluated using the results of through-cap coring, with bathymetry used to interpolate the cap thickness between coring locations.

The thresholds for response actions are measured cap thicknesses less than the design thickness, and measured cap thicknesses more than 12 inches greater than the design thickness. The lower threshold indicates the cap is not of the required thickness, and thus will trigger a response action when any location on the cap is below the design thickness. The 12-inch threshold indicates overplacement of cap material greater than the overplacement allowance. The 12-inch threshold will trigger a response action when any area greater than 2,500 square feet exceeds the 12-inch overplacement allowance, or when any one location exceeds two times the 12-inch overplacement allowance. Bathymetric data will be acquired on a 50-foot trackline spacing. In water depths of less than 100 feet, where bathymetric data will be used to evaluate the need for response actions, the required precision is ±1.0 foot. Through-cap core samples will be collected on an approximate 300-foot grid. The expected precision for through-cap core samples is ±0.1 foot of cap thickness.

7.2.3.5 Potential Response Actions

RA1, RA2a, RA2b, and RA3—Initial Lift of Sand Cap Mix. Core samples exhibiting initial sand cap mix lift thickness greater than 12 inches indicate that material is not being placed

uniformly. The Contractor will be required to reduce the placement rate (in tons per acre) or increase the uniformity of material placement by modifying the rate (in tons per hour) or method of material placement.

RA1, RA2a, RA2b, and RA3—Sand Cap Mix Layer. Response actions will be required when the cores indicate areas where the sand cap mix is less than the required thickness (24 inches in RA1, RA2a, and RA3 and 30 inches in RA2b). In these areas, the cap thickness may be inadequate to provide full chemical isolation. The response action will be placement of additional material to increase the cap thickness to the required minimum.

RA1, RA2a, RA2b, and RA3—Final Cap. Where the final cap thickness or grade is less than the design thickness or grade, the Contractor will be required to place additional cap material to achieve the design thickness or grade, with an overplacement allowance of 12 inches. In areas of RA1 where the design grade is lower than 0 feet MLLW, the Contractor will be required to place additional cap material where the final cap surface is more than 12 inches lower than the design grade. Where the final slope of the thick slope cap riprap surface is steeper than 1.75H:1V (except for toe berm), the Contractor will be required to flatten the slope, either by regrading or placing additional material.

Where the final cap thickness or grade is more than 12 inches greater than the design thickness or grade in an area exceeding 2,500 square feet, the Contractor will be required to modify operations to avoid overplacement in subsequent areas. In RA1, the Contractor will also be required to regrade to the correct lines and grades.

RA4—Initial Lift. Monitoring of the initial lift in RA4 is conducted primarily to provide an early assessment of whether the Contractor needs to modify the placement method or placement rate. It is anticipated that high or low areas of the cap would be remedied during subsequent lifts. If the results of the SPI survey indicate the material is not being placed uniformly, the cause could be uneven placement or transport of capping material outside of the target area by tidal currents. The CO, at his discretion, may elect to conduct an additional SPI survey in the area that was downcurrent during the placement activities. If excessive off-target transport is occurring, the CO may require the Contractor to stop placement during periods of maximum currents.

If excessive off-target transport is not determined to be the cause of nonuniform cap placement, the Contractor will be required to modify his placement method or placement rate.

If the SPI survey indicates slope failures, possible response actions include further evaluation of the areal extent of the failure, reducing the allowable lift height, reducing the rate of placement (in tons per hour), and increasing the time between lifts to allow for further consolidation of the soft native sediments. Response actions for slope failures will be evaluated by the CO and EDC Team on a case-by-case basis, considering the areal extent and depth of the failure.

RA4—Final Cap. Response actions will be required when the final cap thickness is less than 30 inches. The response action will be placement of additional material to increase to cap thickness to a minimum of 30 inches. The CO may also elect to conduct additional core sampling to (1) evaluate the extent of areas where the cap is too thin or (2) where incomplete cap placement is indicated by single-beam bathymetry, verify the deficiency is not an artifact of the survey precision.

Where the final cap thickness or grade is more than 12 inches greater than the design thickness in an area exceeding 2,500 square feet, the Contractor will be required to modify operations to avoid overplacement in subsequent areas.

7.2.3.6 QA Activities

The QA Inspector will review Sections 01720 Surveying and 02483 Sediment Cap of the Specifications and the Contractor's Capping Plan. The Contractor's Capping Plan will describe the methods that will be used to ensure the cap layer thickness, total cap thickness, and final cap grades and slopes comply with the Specifications.

The CO will review and approve the Contractor's proposed positioning and survey equipment Specifications and personnel qualifications prior to mobilization. The QA Inspector will inspect all positioning and surveying equipment when it is mobilized to the site for conformance with the Contractor's pre-construction submittal. The CO will be notified of any equipment or personnel that were not included in the pre-construction submittal. The QA Inspector will verify that equipment calibration and QC procedures conducted by the Contractor are in accordance with the recommendations of the equipment manufacturers. The calibration and QC data will be included in the Weekly QA Reports prepared by the QA Inspector.

The Contractor will notify the QA Inspector daily of planned areas of cap placement. The CO and the QA Inspector will work closely with the Contractor's CQC Manager and hydrographic survey crew to independently verify the location of cap placement. This may be done by

evaluating the Contractor's QC surveys and/or positioning data, conducting independent surveys, obtaining location information from the U.S. Coast Guard Vessel Traffic Service, or a combination of methods. If the CO determines that the Contractor is not placing material at the correct location, the CO will immediately contact the Superintendent to correct the situation. Any such direction and corrective action will be documented in the next QA Report.

The Contractor will report placement rates in his Daily QC Report. The QA Inspector will verify that the placement rates do not exceed the limits defined in the Specifications and notify the CO if any allowable placement rates are exceeded. The QA Inspector will review the Contractor's method of determining the amount of material placed (e.g., by monitoring changes in barge displacement) and periodically verify the Contractor's measurements.

The Contractor will include the depths measured at the leadline sounding locations using both acoustical and leadline methods in the Daily Quality Control Report. These data will also be included in the Weekly Quality Assurance Report. The Contractor's survey data will be evaluated by the EDC team to independently verify that the cap layer thickness and final cap thickness, grades, and slopes comply with the Specifications. The EDC team will also use cap thicknesses indicated by through-cap cores to evaluate the effects of settlement of the soft, native sediments on the cap thickness interpreted from differential bathymetry. The EDC team will report any out-of-compliance conditions to the CO, who will work with the Contractor to determine the appropriate response action.

The QA Inspector and any other personnel designated by the CO will review initial coring and SPI data (or other methods proposed by the Contractor) and notify the CO if the Contractor is exceeding the allowable lift thickness or if non-uniform material placement is occurring, as defined in Section 7.2.3.4. The CO will work with the Contractor to determine the appropriate modifications to the placement rate or method to ensure the allowable lift thickness is not exceeded in subsequent areas.

In RA4, a QC concern is the potential for slope failures during cap placement. The annotated SPI images will be submitted to the EDC team for independent evaluation of slope failure. If slope failure is indicated by the SPI images (absence of both sand cap mix and a biologically active zone), the CO will work with the Contractor to determine the appropriate response action.

7.2.4 Composition of Cap

The primary QC concern is the potential for excessive intermixing of the cap materials and underlying contaminated sediments during cap placement. Potential contamination of the cap resulting from intermixing of the cap materials and underlying contaminated sediments will be monitored during cap placement. To document as-built conditions, construction monitoring includes collection of samples for baseline characterization of the chemical composition of the cap for use in the long-term monitoring program.

Excessive intermixing could result in concentrations of chemicals of concern that exceed the allowable concentrations prescribed in the ROD (EPA 1999). The allowable concentrations are the SQS, and compliance with the SQS in the top 4 inches of the cap must be verified. The chemicals of concern and SQS concentrations are shown in Table 7-3. Verification sampling will not be conducted at the cap surface in RA1 and RA3, where the cap surface will consist of gravelly materials that are too coarse-grained for laboratory testing.

Adequate placement and distribution of organic carbon in the cap materials is not considered a significant QC concern. It is anticipated that some stratification of materials will occur during placement of the sand cap mix in RA4, resulting in settling of the organic carbon near the top of each lift. Some resuspension and mixing of these materials is expected to occur as granular particles in overlying layers settle on the cap surface. Additional mixing over time is expected as a result of bioturbation. These processes are anticipated to result in a satisfactory distribution of organic carbon within the cap over the long term. Consequently, sampling for the TOC content of the in-place cap will be limited to final cap surface samples and OMMP baseline samples.

Long-term monitoring of potential cap contamination due to diffusion and advection of contaminants present in the native sediments or due to offsite sources is discussed in the Operations and Maintenance Monitoring Plan (OMMP).

7.2.4.1 Monitoring Activities

Monitoring for intermixing of cap materials and native sediments is most critical during the placement of the first lift and will be coordinated with monitoring conducted to confirm adequate lift thickness. Monitoring will be designed to evaluate whether excessive mixing is occurring during the initial phases of cap placement, using monitoring techniques that allow assessment within a timeframe that is consistent with construction activities. The initial assessment results

will be used by the construction managers and the Contractor to determine the need for modification of the Contractor's placement methods or rates. Once a satisfactory method and rate of cap placement has been determined using the initial assessment results, monitoring for excessive mixing will be less critical.

Visual and chemical analysis of samples collected from through-cap cores will be the primary tool used to evaluate intermixing. A summary of core sampling activities is shown in Table 7-4. The Contractor will be required to collect and analyze field duplicate QA samples at a rate of 10 percent of primary samples as described in Section 01450 Chemical Data Quality Control of the Specifications.

Initial Sand Cap Lift Placement in RA1 through RA3. Monitoring of the initial sand cap mix lift will be conducted using core samples of the cap material in RA1 through RA3. These are the same core samples collected for monitoring of the initial lift thickness. The core samples will be visually evaluated for intermixing with underlying sediments. Chemical analysis of initial lift samples will not be conducted because intermixing should be readily observed and the length of laboratory turnaround times could impact the progress of cap placement. The core locations are shown in the Drawings. Sample collection methods are described in Section 7.2.3.2.

The QA Inspector will examine the core samples for the presence of fine-grained material or discoloration that indicates the presence of native sediments within the cap materials. Native sediments should not intrude more than 6 inches into the sand cap mix.

Initial Sand Cap Lift Placement in RA4. SPI will be used to evaluate intermixing of the cap materials and native sediments during placement of the initial 6-inch lift in RA4. The same images used to evaluate the thickness of the first lift, described in Section 7.2.3.3, will be used to evaluate intermixing.

In RA4, where the thickness of the first lift is 6 inches, native sediments should not intrude more than 4 inches into the sediment cap material. As described in Section 7.2.3.3, cap placement within RA4 will begin in the deeper half of Segment 1. Following this initial placement, the Contractor will collect 40 images within the area. If native sediment intrusion into the placed cap material exceeds four inches in a significant percentage of the samples, response actions will be evaluated. The CO, at his discretion, may direct the Contractor to modify his placement methods or placement rate.

Top of Sand Cap Mix (RA1, RA2a, and RA3). In RA1, RA2a, and RA3, the top of the sand cap mix is the top of the chemical isolation layer. Samples of the top of the sand cap mix will be collected from through-cap cores in these RAs and analyzed for chemicals of concern. The chemicals of concern are listed in Table 7-3. The through-cap cores will be the same as those used to verify the sand cap mix thickness, as described in Section 7.2.3.2. In RA2b and RA4, the top of the sand cap mix is the final cap surface. Therefore, these samples are described in the following section.

The monitoring program is designed to identify excessive mixing during the initial sand cap lift placement; therefore, it is not anticipated that visual evidence of intermixing will be present throughout the sand cap mix. The purpose of collecting samples of the top of the sand cap mix in RA1, RA2a, and RA3 is to characterize baseline chemical concentrations for long-term monitoring of cap performance under the OMMP. Consequently, response actions for top of sand cap mix have not been developed for RA1, RA2a, and RA3.

Final Cap Coring. For the final cap, chemical analysis of cap samples from the 0 to 4 inch depth interval will be used to verify cap acceptability in RA2a, RA2b, and RA4. Final cap verification sampling will not be conducted at the cap surface in RA1 and RA3, where the cap surface will consist of materials that are too coarse-grained for laboratory testing.

Figure 7-2 depicts the decision criteria for verifying cap acceptability and potential response actions. As shown in Figure 7-2, exceedance of SQS by any sample will trigger offset confirmation sampling in the vicinity of the sample. If the results of the offset confirmation sampling do not exceed the compliance criteria, no additional cap material placement or resampling will be required. If the results of the offset confirmation sampling exceed the compliance criteria, placement of an additional cap material will be conducted. Offset confirmation sampling is described in Section 7.2.4.3.

In addition to samples of the final cap surface, samples will be collected and analyzed from the cores at the top of the sand cap (RA2a) or the midpoint of the cap (RA2b and RA4). Analysis of these samples will serve as a baseline for the long-term monitoring of cap performance.

7.2.4.2 DQOs for Cap Composition

DQOs for evaluating excessive intermixing of the cap material and native sediments and for verifying final cap compliance are shown in Table 7-2.

Initial Lift Placement—RA1 through RA3. The threshold for evaluating response actions is greater than 6 inches of intermixing in through-cap cores. Cores will be collected at approximately a 200-foot grid. The required precision is detection of the thickness of intermixing to ±0.1 foot.

Initial Lift Placement—RA4. The threshold for evaluating response actions is greater than 4 inches of intermixing observed in SPI images. Images will be acquired on an approximately 60-foot grid in Segment 1 of RA 4 (a total of approximately 80 images) and an approximately 90-foot grid in Segment 2 and 3 (approximately 40 images per segment). The required precision is resolution of the thickness of intermixing to ±0.1 foot. Images that are less than 6 inches deep, affected by smearing of sediment on the prism, or otherwise ambiguous will be reacquired.

Top of Sand Cap Mix (RA1, RA2a, and RA3). No threshold for response actions has been identified for top of sand cap monitoring in RA1, RA2a, and RA3; however, DQOs for the long-term monitoring baseline samples have been identified. Sampling locations are shown in the Drawings. Samples will be collected on an approximately 200-foot grid in RA1 through RA3 (21 total sample locations) and an approximately 300-foot grid in RA4 (15 total sample locations). The COCs are listed in Table 7-3. Maximum quantification limits for chemical analyses are shown in Table 7-3. The quantification limit for total organic carbon must not exceed 0.1 percent on a dry weight basis.

Final Cap (RA2b and RA4) and Top of Sand Cap Mix (RA1, RA2a, and RA3). The threshold for response actions in RA2b, and RA4 is chemical concentrations exceeding the SQS in the 0 to 4 inch depth interval by any COC at any sampling location. No threshold for response actions has been identified for the long-term monitoring baseline samples collected at the top of sand cap mix in RA1, RA2a, and RA3; however, DQOs have been identified.

Sampling locations are shown in the Drawings. Samples will be collected on an approximately 200-foot grid in RA1 through RA3 (21 total sample locations) and an approximately 300-foot grid in RA4 (15 total sample locations). The samples will be analyzed for COCs and total organic carbon. The COCs and maximum quantification limits are shown in Table 7-3. The quantification limit for TOC must not exceed 0.1 percent on a dry weight basis.

7.2.4.3 Potential Response Actions

Initial Sand Cap Lift Placement. The response actions for intermixing exceeding the thresholds for action are for the Contractor to modify the method or rate of placement. For placement using mechanical methods, the modifications could include limiting the fall distance of the cap material through the water column.

Final Cap. The decision framework for evaluating final cap sediment quality is shown in Figure 7-2. At sample locations where the SQS is exceeded, a new core sample will be collected. The core will be segmented and analyzed to characterize the depth of contamination and to determine whether the contamination is construction related. Samples from depth intervals of 0 to 4 inches, 4 to 12 inches, 12 to 24 inches, and 24 to 36 inches (if present) will be analyzed for any constituents that exceeded the SQS in the original 0- to 4-inch sample analysis.

At these locations, offset sampling will also be conducted to evaluate the nature and extent of the contamination. Offset cores will be collected at four locations offset 50 feet from the original sample location. The exact offset sampling locations will be determined by the CO (or his designee) considering the proximity of adjacent samples and RA boundaries. Samples of the 0 to 4-inch depth interval from each of the cores will be analyzed for any constituents that exceeded the SQS in the original sample analysis. The original sample result and the four offset sample results will comprise a cluster of five data points to verify compliance with SQS. The area of the cap associated with the cluster will be considered out-of-compliance if either of the following conditions occur:

- Any three of the five sample results exceeds the SQS
- Any single sample result is greater than two times the SQS

If neither of the conditions occur, the cap will be considered in compliance and no further actions would be required. If the cap is found to be out of compliance, an additional 6 inches of clean capping material will be placed, and the five sample locations will be resampled and reevaluated.

7.2.4.4 QA Activities

The QA Inspector will review Sections 01450 Chemical Data Quality Control and Section 02483 Sediment Cap of the Specifications. The Contractor's Capping Plan will describe methods and equipment proposed for collection of core samples. The QA Inspector will inspect the coring

equipment prior to its use to ensure it complies with the CO-approved Capping Plan. The QA Inspector will work closely with the Contractor to ensure the core samples are collected at the locations shown in the Drawings.

All core samples will be inspected by a geotechnical engineer designated by the CO. If the core does not penetrate the entire thickness of the emplaced cap, the location must be resampled. The QA Inspector will notify the CO when excessive intermixing is observed in core samples of the first lift of cap material. Excessive intermixing is defined as greater than 6 inches in RA1 through RA3 and greater than 4 inches in RA4. The results of the visual inspection of the core samples will also be reported in the Weekly QA Reports prepared by the QA Inspector. Should excessive intermixing be observed, the CO will work with the Contractor to modify placement methods or rates to minimize intermixing during subsequent cap placement.

The Contractor will maintain a log of verification samples collected from the final cap surface. The Contractor will also collect and analyze field duplicated samples at the rate of 10 percent of primary samples. The QA Inspector will be present during sample preparation to ensure the verification samples submitted to the laboratory are collected from the specified depth interval.

The QA Inspector will verify that the sample numbers and locations comply with the Specifications. The QA Inspector will also maintain copies of the chain-of-custody forms for the project file. The sample results, including QA samples and laboratory QC reports, will be submitted by the Contractor in the Chemical Data Report and evaluated for compliance with the Specifications by a chemist designated by the CO.

If the results of the cap surface samples indicate areas where the cap contains COCs exceeding the SQS, the CO will notify the Contractor that offset confirmation sampling must be conducted. Offset confirmation sampling is described in Section 7.2.4.3. The results of the offset confirmation sampling will be evaluated using the criteria shown in Section 7.2.4.3 to determine whether placement of additional cap material is required.

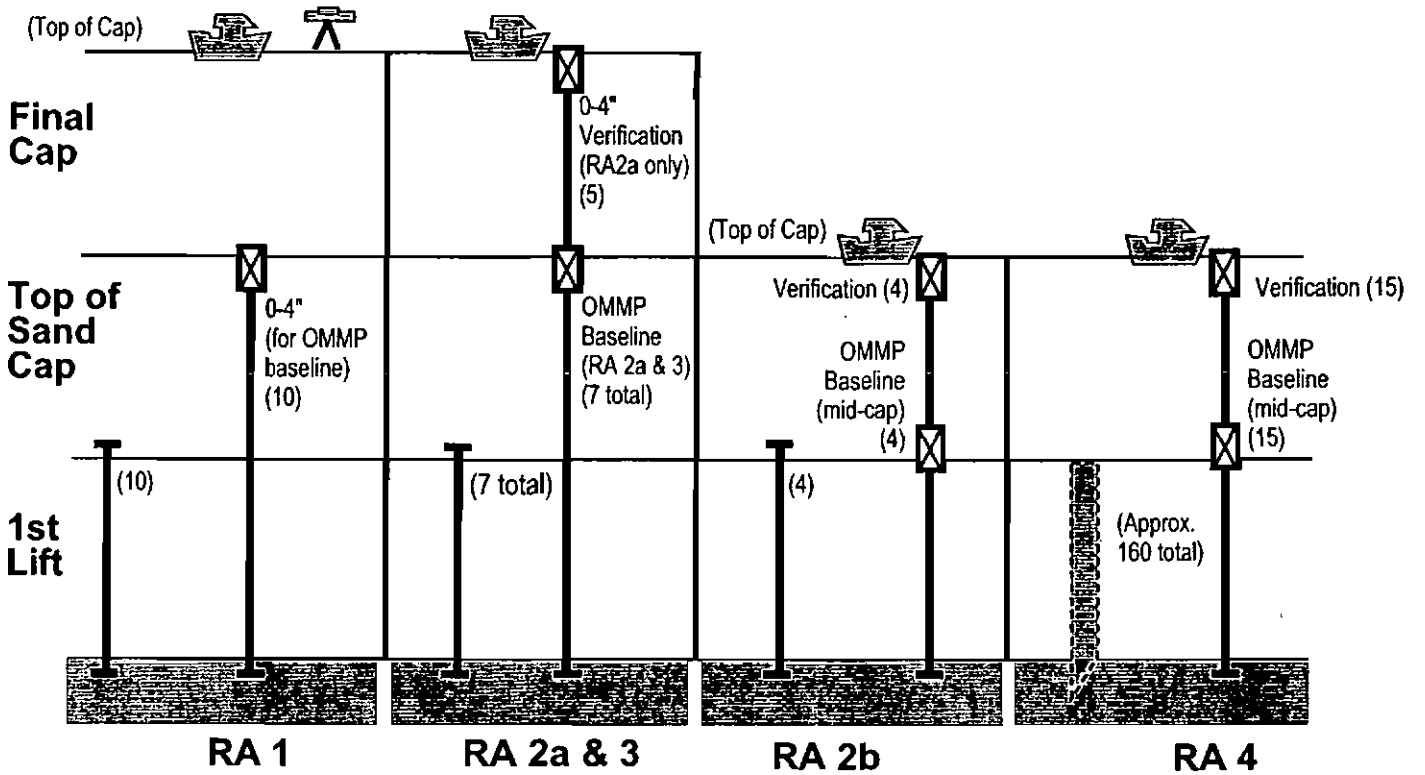
7.2.5 Water Quality Impacts During Cap Placement

Similar to the RA3 dredging, water quality monitoring will be conducted during cap placement. The compliance boundary will be referenced to the point of cap placement, and the monitoring program will include the same monitoring locations, schedule, and parameters as described in Section 7.1.3. QA activities will also parallel those described in Section 7.1.3.

Cap placement activities will cease at the first indication of either of the following conditions in the construction area:

- An observable oil sheen outside of the containment booms
- Distressed or dying fish or wildlife
- DO less than 4.0 mg/L at any monitoring location

If an exceedance of a water quality criterion occurs at the compliance boundary, the Contractor will be required to modify cap placement operations to alleviate the water quality impacts. The modifications may involve reducing the material placement rate, placing materials only during appropriate tidal windows, or implementing additional engineering controls. EPA will be notified of the noncompliant situation within 4 hours from the time the exceedance is determined, and of the corrective actions that are being implemented. The exceedance will trigger intensive monitoring, and EPA will be kept apprised of ongoing monitoring results. If water quality conditions do not improve, the CO will consult with EPA to determine what additional actions may be necessary.



NOT TO SCALE

LEGEND

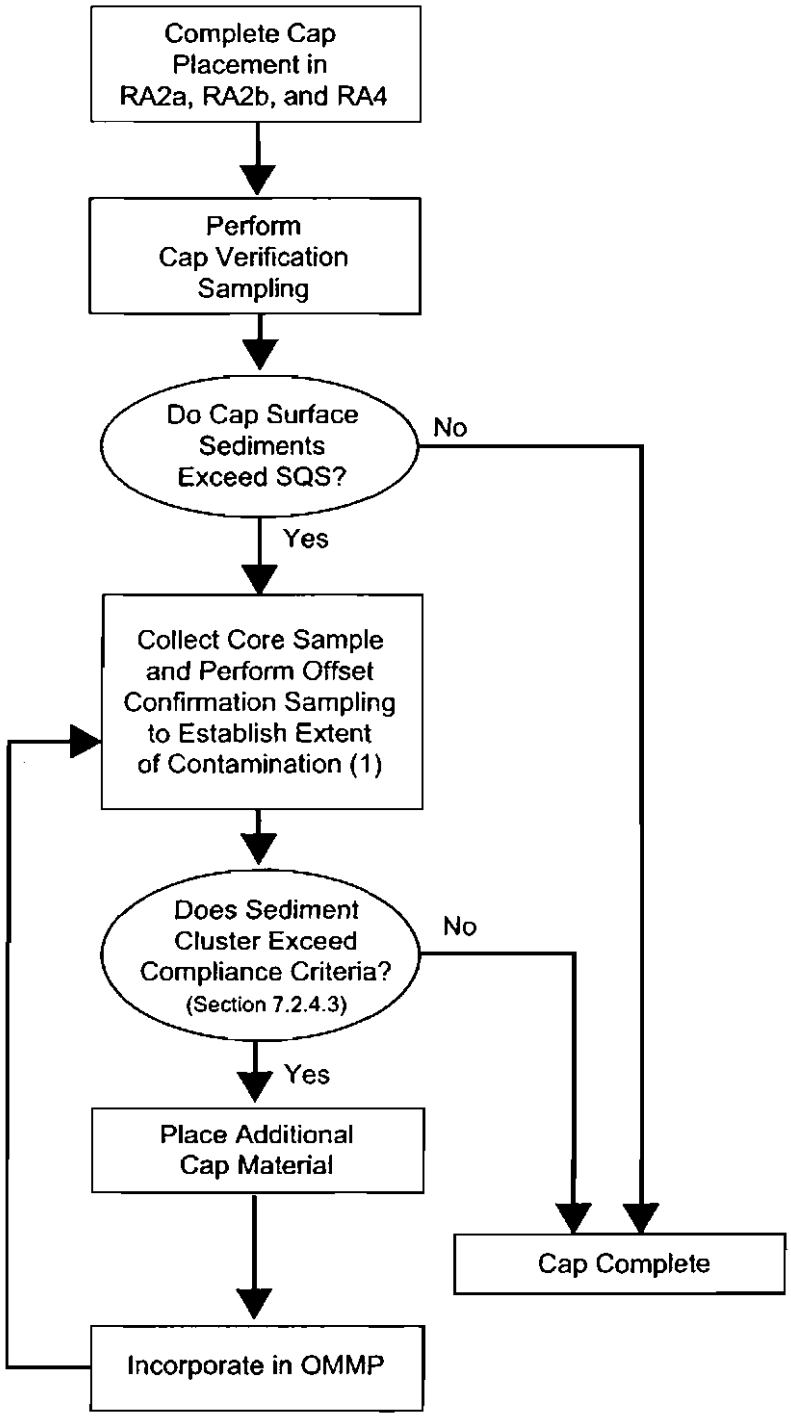
- Core (visual inspections for thickness and intermingling)
- Sample for Laboratory Analysis
- Hydrographic Survey (Single-beam)
- (10) Number of cores or samples
- Topographic Survey
- Sediment Profile Imaging

NOTES:
1. Pre-construction and post-construction multi-beam hydrographic surveys will be conducted for RAs 1-4.
2. Single-beam pre-capping hydrographic surveys will be conducted in all RAs.
3. Cap placement rates (in tons per acre) will be tracked daily in all RAs.
4. Verification of thick slope cap layers to be accomplished by daily tracking of quantities placed, final surveys, and other methods proposed by the Contractor.

Figure 7-1

Job No. 33755206.08000

Overview of Cap Placement Monitoring Activities



(1) The CO may elect to forego offset sampling and proceed directly to additional cap material placement

Figure 7-2

Decision Framework for Final Cap Sediment Quality

Table 7-1
Data Quality Objectives for Dredge Monitoring

Specification Section	Problem Statement	Related Decision or Action	Measurement	Threshold for Action	Required Precision	Frequency/Intensity of Testing
02325	Determine if final mudline grades are within acceptable limits	Conduct additional dredging	Pre-dredging survey: Mudline elevation, measured using single-beam bathymetry.	None	± 0.5 ft.	Transects on 50-ft spacing including the transects shown in the Drawings.
			Final dredging survey: Mudline elevation, measured using single-beam bathymetry	Not to exceed +6 in./-12in. from neatline	± 0.5 ft.	Transects on 50-ft spacing including the transects shown in the Drawings.
02325; 01355	Determine if unacceptable water quality impacts are occurring during dredging.	Suspension of dredging activities (toxic conditions observed) or modification of dredging method	Water quality parameters (turbidity, temperature, DO, and TSS) toxic conditions, and sheens. Monitoring locations. Point of compliance: monitoring station(s) 300 feet from active dredging or cap placement activities. Early warning station: one station 150 feet from active dredging or cap placement activities.	Turbidity. (Measured at point of compliance): Background <50 NTU: Not to exceed 5 NTU above background. Background >50 NTU: Increase not to exceed >10% of background value. Temperature. (Measured at point of compliance): Not to exceed 16°C or an incremental increase >0.3°C when background temperature naturally exceeds 16°C. DO. (Measured at point of compliance): Not less than 6.0 mg/L. If background is less than 6.0 mg/L, decrease not to exceed 0.2 mg/L. (Measured at "early warning" station): Not less than 4.0 mg/L. TSS. None Toxic conditions. (Visually monitored in and around work area): dead or distressed fish or wildlife must not be observed; oily sheen must not be present on water surface outside of containment booms.	Turbidity: ±0.5 NTU Temperature: ±0.1°C DO: ±0.5 mg/L	Ambient. Measurements at four reference stations 24 to 48 hours prior to start of construction. At least one reference station monitored during construction concurrent with point-of-compliance monitoring. Intensive. Minimum frequency of twice per 8-hour shift. Can be reduced to "Routine"if thresholds have not been exceeded for 2 consecutive days Routine. Minimum frequency of once daily. Can be reduced to "Limited" if thresholds have not been exceeded for 5 consecutive days. Limited. Minimum frequency of once weekly.

Notes:
DO - dissolved oxygen
mg/L - milligrams per liter
NTU - nephelometric turbidity units
TSS - total suspended solids

Table 7-2
Data Quality Objectives for Cap Placement Monitoring

Specification Section	Potential Quality Control Concern	Related Decision or Action	Measurement	Threshold for Action	Required Precision	Frequency/Intensity of Testing
02483; 01450	Confirm capping materials comply with specifications.	Provide alternate capping material	Particle size distribution (ASTM D422) and chemical concentrations (EPA 6000/7000 for metals; EPA 8270 for SVOCs, and EPA 8082 for PCBs). Organic carbon content where specified (EPA 9060).	See Specifications 02483 Part II for product requirements. See Specifications Table 01450-2 for acceptable chemical concentrations.	Chemical detection limits not to exceed concentrations shown in Table 01450-2	Two samples per material type per borrow source per construction season tested for particle-size distribution, organic carbon concentration (TOC), and chemical concentrations. Analysis for TOC and chemical concentrations not required for filter material No. 1, gravel cap mix, or riprap. One sample per 10,000 tons for particle-size analysis.
02483; 01720	Confirm cap lift thickness and total cap thickness comply with specifications. Confirm slope failures are not occurring in RA4.	Place additional capping material (inadequate layer thickness); change rate/method of cap placement (excessive layer thickness or slope failure); or regrade cap surface	All RAs Pre-capping hydrographic survey using single-beam bathymetry.	None	Water depths <30 ft: ±0.3 ft Water depth >30 ft: ±1% of water depth	Transects on 50-ft spacing including the transects shown in the Drawings.
			RA1 Initial Lift. Lift thickness measured using through-cap coring. Sand Cap Mix. Sand cap thickness measured using through-cap coring. Thick Slope Cap Subgrade. Leadline surveys. Measure graded filter layer prior to riprap placement. All Lifts. Quantity placed per unit area (from Contractor's daily reports). Final Cap. Land survey (intertidal) and single-beam bathymetry (subtidal).	RA1 Initial Lift. Not to exceed 12 inches. Sand Cap Mix. Not less than 24 inches. Thick Slope Cap Subgrade. Slopes not to exceed 1.75H:1V (toe berms may be at angle of repose) All Lifts. Placement rates not to exceed specified volume per unit area. Final Cap. Must attain specified grades and elevations within -0 to +12 inches (design grades higher than 0 feet MLLW) or within -12 to +12 inches (design grades lower than 0 feet MLLW)	RA1 Land Survey. ±0.1 ft Single-beam Bathymetry. ±0.5 ft Cores. ±0.1 ft thickness	RA1 Land Survey. Transects on 50-ft spacing including the transects shown in the Drawings. Single-beam Bathymetry. Transects on 50-ft spacing including the transects shown in the Drawings. Cores. Approximately 200 ft grid spacing.
			RA2a, RA2b, and RA3 Initial Lift. Lift thickness measured using through-cap coring. Sand Cap Mix (RA2a and RA3). Sand cap thickness, measured using through-cap coring. All Lifts. Quantity placed per unit area (from Contractor's daily reports). Final Thickness. Single-beam bathymetry and through-cap coring.	RA2a, RA2b, and RA3 Initial Lift. Not to exceed 12 inches. Sand Cap Mix (RA2a and RA3). Not less than 24 inches. All Lifts. Placement rates not to exceed specified volume per unit area. Final Thickness. Must attain specified minimum thickness with one foot overplacement allowance.	RA2a, RA2b, and RA3 Single-beam Bathymetry. ±0.5 ft Cores. ±0.1 ft thickness	RA2a, RA2b, and RA3 Initial Lift and Sand Cap Mix (RAs 2a & 3) Approximately 200 ft grid spacing for through-cap coring. Minimum 2 cores in each RA for each lift. All Lifts. Daily reports Final cap. 50 ft trackline spacing for bathymetry. Approximately 200 ft grid spacing for through-cap coring. Minimum 2 cores in each RA.

Table 7-2 (Continued)
Data Quality Objectives for Cap Placement Monitoring

Specification Section	Potential Quality Control Concern	Related Decision or Action	Measurement	Threshold for Action	Required Precision	Frequency/Intensity of Testing
02483; 01720 (continued)			RA4 Initial Lift. Lift thickness, measured using sediment profile imaging (SPI). All Lifts. Quantity placed per unit area (from Contractor's daily reports). Final Thickness. Through-cap coring and single-beam bathymetry.	RA4 Initial Lift. Must attain thickness of ≥1 inch in ≥90% and ≥4 inches in ≥50% of the images. All Lifts. Placement rates not to exceed specified volume per unit area. Indications of slope failure. Final Thickness. Must attain specified minimum thickness (30 inches) with one foot overplacement allowance.	RA4 Cores. ±0.1 ft thickness SPI. Minimum 6 inch penetration Single-beam Bathymetry. ±1.0 ft in water depths of <100 ft	RA4 Initial Lift. Approximately 80 images in Segment 1 and approximately 40 images in each of Segments 2 and 3. All Lifts. Daily reports Final cap. Approximately 300 ft grid spacing for through-cap coring (14 cores total). 50 ft trackline spacing for bathymetry.
02483; 01450	Confirm contaminated substrate is not intermixing with clean cap material during placement.	Change rate/method of cap placement to reduce mixing with contaminated substrate or place additional thickness of sand cap mix material.	Initial Lift Visual monitoring of intermixing in core samples (RA1 through RA3) or SPI images (RA4)	Initial Lift Visual evidence of contaminated sediments not to intrude more than 6 inches (RA1 through RA3) or 4 inches (RA4) into the emplaced sand cap mix material.	Initial lift Cores. ±0.1 ft thickness of intermixing SPI. Minimum 6 inch penetration	Initial Lift RA1 through RA3: Approximately 200 ft grid spacing for through-cap coring. RA4: Approximately 80 images in Segment 1 and approximately 40 images in each of Segments 2 and 3.
			Sand Cap Mix (RA1, RA2a, and RA3) COC (SVOCs, PCBs, metals) concentrations and organic carbon content on cap surface (0 to 4 inches)	Sand Cap Mix (RA1, RA2a, and RA3) None, samples for long-term monitoring baseline.	Sand Cap Mix (RA1, RA2a, and RA3) See Specifications section 01450-2 for reporting limits for COCs	Sand Cap Mix (RA1, RA2a, and RA3) Samples collected on approximately 200 ft grid.
			Final Cap (RA2a, RA2b, and RA4) COC (SVOCs, PCBs, metals) concentrations and organic carbon content on cap surface (0 to 4 inches) (See note 1).	Final Cap (RA2a, RA2b, and RA4) Chemical concentrations exceeding SQS. See Specifications Table 1450-2 for SQS concentrations.	Final cap (RA2a, RA2b, and RA4) See Specifications section 01450-2 for reporting limits for COCs	Final Cap (RA2a, RA2b, and RA4) Samples collected on approximately 200 ft grid (RA2a and RA2b) or approximately 300 ft grid (RA4). Offset sampling, as directed by CO, where chemical concentration(s) exceed SQS.

Table 7-2 (Continued)
Data Quality Objectives for Cap Placement Monitoring

Specification Section	Potential Quality Control Concern	Related Decision or Action	Measurement	Threshold for Action	Required Precision	Frequency/Intensity of Testing
01450; 01355	Determine if unacceptable water quality impacts are occurring during cap placement.	Change rate/method of cap placement to prevent water quality impacts	Water quality parameters (turbidity, temperature, DO, and TSS) toxic conditions, and sheens Monitoring locations Point of compliance: monitoring station(s) 300 feet from active dredging or cap placement activities. Early warning station: one station 150 feet from active dredging or cap placement activities.	Turbidity. (Measured at point of compliance): Background <50 NTU: Not to exceed 5 NTU above background. Background >50 NTU: Increase not to exceed >10% of background value. Temperature. (Measured at point of compliance): Not to exceed 16°C or an incremental increase >0.3°C when background temperature naturally exceeds 16°C. DO. (Measured at point of compliance): Not less than 6.0 mg/L. If background is less than 6.0 mg/L, decrease not to exceed 0.2 mg/L. (Measured at "early warning" station): Not less than 4.0 mg/L. TSS. None Toxic conditions. (Visually monitored in and around work area): dead or distressed fish or wildlife must not be observed; oily sheen must not be present on water surface outside of containment booms.	Turbidity: ±0.5 NTU Temperature: ±0.1°C DO: ±0.5 mg/L	Ambient. Measurements at four reference stations 24 to 48 hours prior to start of construction. At least one reference station monitored during construction concurrent with point-of-compliance monitoring. Intensive. Minimum frequency of twice per 8-hour shift. Can be reduced to "Routine" if thresholds have not been exceeded for 2 consecutive days Routine. Minimum frequency of once daily. Can be reduced to "Limited" if thresholds have not been exceeded for 5 consecutive days. Limited. Minimum frequency of once weekly.

Note:
1. Final cap samples will be collected from core samples that penetrate the entire cap. In addition to samples from 0 to 4 inches, the cores will be segmented, and samples of the mid-height of the sand cap mix will be analyzed as for COCs to provide a baseline for long-term monitoring.

COC - chemical of concern
DO - dissolved oxygen
mg/L - milligrams per liter
NTU - nephelometric turbidity units
PCBs - polychlorinated biphenyls
SPI - sediment profile imaging
SQS - sediment quality standard
SVOC - semivolatile organic compound
TOC - total organic carbon
TSS - total suspended solids

Table 7-3
Sediment Management Standards and Required Reporting Limits

Chemical Parameter	Required for Imported Materials	Required for Cap Verification	Sediment Management Standards	Dry Weight Analogs of SMS Criteria	Analytical Method	Method Reporting Limit
			SQS[f]	Dry Weight Equivalent[g]		
Metals			mg/kg dry wt	mg/kg dry wt		mg/kg dry wt
Arsenic	X		57	57	EPA Method 6000/7000	20
Cadmium	X		5.1	5.1	EPA Method 6000/7000	2
Chromium	X		260	260	EPA Method 6000/7000	20
Copper	X	X	390	390	EPA Method 6000/7000	20
Lead	X		450	450	EPA Method 6000/7000	20
Mercury	X	X	0.41	0.41	EPA Method 6000/7000	0.1
Silver	X		6.1	6.1	EPA Method 6000/7000	2
Zinc	X	X	410	410	EPA Method 6000/7000	20
Nonionizable Organic Compounds						
Polynuclear Aromatic Hydrocarbons			mg/kg organic carbon[a,c]	µg/kg dry wt[a]		µg/kg dry wt
Total LPAH[b]	X	X	370	5,200	EPA Method 8270	10
Naphthalene	X	X	99	2,100	EPA Method 8270	10
Acenaphthylene	X	X	66	1,300	EPA Method 8270	10
Acenaphthene	X	X	16	500	EPA Method 8270	10
Fluorene	X	X	23	540	EPA Method 8270	10

Table 7-3 (Continued)
Sediment Management Standards and Required Reporting Limits

Chemical Parameter	Required for Imported Materials	Required for Cap Verification	Sediment Management Standards	Dry Weight Analogs of SMS Criteria	Analytical Method	Method Reporting Limit
			SQS[f]	Dry Weight Equivalent[g]		
Polynuclear Aromatic Hydrocarbons			**mg/kg organic carbon[a,e]**	**µg/kg dry wt[a]**		**µg/kg dry wt**
Phenanthrene	X	X	100	1,500	EPA Method 8270	10
Anthracene	X	X	220	960	EPA Method 8270	10
2-Methylnaphthalene	X	X	38	670	EPA Method 8270	10
Total HPAH[c]	X	X	960	12,000	EPA Method 8270	10
Fluoranthene	X	X	160	1,700	EPA Method 8270	10
Pyrene	X	X	1,000	2,600	EPA Method 8270	10
Benz[a]anthracene	X	X	110	1,300	EPA Method 8270	10
Chrysene	X	X	110	1,400	EPA Method 8270	10
Total benzofluoranthenes[d]	X	X	230	3,200	EPA Method 8270	10
Benzo[a]pyrene	X	X	99	1,600	EPA Method 8270	10
Indeno[1,2,3-c,d]pyrene	X	X	34	600	EPA Method 8270	10
Dibenzo[a,h]anthracene	X	X	12	230	EPA Method 8270	10
Benzo[g,h,i]perylene	X	X	31	670	EPA Method 8270	10

Table 7-3 (Continued)
Sediment Management Standards and Required Reporting Limits

Chemical Parameter	Required for Imported Materials	Required for Cap Verification	Sediment Management Standards	Dry Weight Analogs of SMS Criteria	Analytical Method	Method Reporting Limit
			SQS[f]	Dry Weight Equivalent[g]		
Chlorinated Benzenes			**mg/kg organic carbon**	**µg/kg dry wt.**		**µg/kg dry wt.**
1,2-Dichlorobenzene	X		2.3	35	EPA Method 8270	10
1,3-Dichlorobenzene	X		--	--	EPA Method 8270	10
1,4-Dichlorobenzene	X		3.1	110	EPA Method 8270	10
1,2,4-Trichlorobenzene	X		0.81	31	EPA Method 8270	10
Hexachlorobenzene	X		0.38	22	EPA Method 8270	10
Phthalate Esters			**mg/kg organic carbon**	**µg/kg dry wt.**		**µg/kg dry wt.**
Dimethyl phthalate	X		53	71	EPA Method 8270	10
Diethyl phthalate	X		61	200	EPA Method 8270	10
Di-n-butyl phthalate	X		220	1,400	EPA Method 8270	10
Butyl benzyl phthalate	X		4.9	63	EPA Method 8270	10
Bis[2-ethylhexyl]phthalate	X		47	1,300	EPA Method 8270	10
Di-n-octyl phthalate	X		58	6,200	EPA Method 8270	10

Table 7-3 (Continued)
Sediment Management Standards and Required Reporting Limits

Chemical Parameter	Required for Imported Materials	Required for Cap Verification	Sediment Management Standards SQS[f]	Dry Weight Analogs of SMS Criteria Dry Weight Equivalent[g]	Analytical Method	Method Reporting Limit
Miscellaneous			**mg/kg organic carbon**	**µg/kg dry wt**		**µg/kg dry wt**
Dibenzofuran	X	X	15	540	EPA Method 8270	10
Hexachlorobutadiene	X		3.9	11	EPA Method 8270	10
N-nitrosodiphenylamine	X		11	28	EPA Method 8270	10
Pesticides/PCBs			**mg/kg organic carbon**	**µg/kg dry wt**		**µg/kg dry wt**
PCBs	X	X	12	130	EPA Method 8082	10
Ionizable Organic Compounds			**µg/kg dry wt**	**µg/kg dry wt**		**µg/kg dry wt**
Phenol	X	X	420	420	EPA Method 8270	10
2-Methylphenol	X	X	63	63	EPA Method 8270	10
4-Methylphenol	X	X	670	670	EPA Method 8270	10
2,4-Dimethylphenol	X	X	29	29	EPA Method 8270	50
Pentachlorophenol	X	X	360	360	EPA Method 8270	50
Benzyl alcohol	X		57	57	EPA Method 8270	10
Benzoic acid	X		650	650	EPA Method 8270	10
Conventional Parameters						**Percent dry wt**
Total organic carbon	X	X	--	--	EPA Method 9060/PSEP	0.1

Table 7-3 (Continued)
Sediment Management Standards and Required Reporting Limits

[a]Where chemical criteria in this table represent the sum of individual compounds or isomers, the following methods shall be applied: (I) Where chemical analyses identify an undetected value for every individual compound/isomer then the single highest detection limit shall represent the sum of the respective compounds/isomers; and (ii) Where chemical analyses detect one or more individual compound/isomers, only the detected concentrations will be added to represent the group sum.

[b]The total LPAH criterion represents the sum of the following low molecular weight polynuclear aromatic compounds: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene. 2-Methylnaphthalene is not included in the LPAH definition. The LPAH criterion is not the sum of criteria values for the individual LPAH compounds listed.

[c]The total HPAH criterion represents the sum of the following high molecular weight polynuclear aromatic compounds: fluoranthene, pyrene, benz[a]anthracene, chrysene, total benzofluoranthenes, benzo[a]pyrene, indeno[1,2,3-cd]pyrene, dibenz[a,h]anthracene, and benzo[ghi]perylene. The HPAH criterion is not the sum of criteria values for the individual HPAH compounds listed.

[d]The total benzofluoranthenes criteria are to be compared to the sums of the concentrations of the b, j, and k isomers of benzofluoranthene.

[e]The listed values represent concentrations in parts per million "normalized" on a total organic carbon basis. To normalize to total organic carbon, the dry-weight concentration for each parameter is divided by the decimal fraction representing the percent total organic carbon content of the sediment.

[f]Use values in this column when sample TOC ≥ 0.5% and ≤ 4.

[g]Use values in this column when sample TOC < 0.5% or > 4%.

Notes:
HPAH - high molecular weight polycyclic aromatic hydrocarbon
LPAH - low molecular weight polycyclic aromatic hydrocarbon
mg/kg - milligram per kilogram
µg/kg - microgram per kilogram
PCB - polychlorinated biphenyl
SQS - sediment quality standards
TOC - total organic carbon

Table 7-4
Cap Verification Sampling Requirements

RA	Event	Sample Type[a]	Analysis[b]	No. of Cores[c]	No. of Samples Analyzed
1 (gravel cap areas only)	First sand cap mix lift	Core	Visual inspection for intermixing with native sediments	10	0
	Final sand cap mix lift	Core	Chemical analysis (0-4 inches)	10	10
2a	First lift	Core	Visual inspection for intermixing with native sediments	5	0
	Final sand cap mix lift	Core	Chemical analysis (0-4 inches)	5	5
	Final cap surface and profile	Core	Chemical analysis at surface (0-4 inches)	5	5
2b	First lift	Core	Visual inspection for intermixing with native sediments	4	0
	Final cap surface and profile	Segmented core	Chemical analysis at surface (0-4 inches) and a 4-inch interval at the mid-point of the cap	4	8
3	First lift	Core	Visual inspection for intermixing with native sediments	2	0
	Final sand cap mix lift	Core	Chemical analysis (0-4 inches)	2	2
4	Final cap surface and profile	Segmented core	Chemical analysis at surface (0-4 inches) and a 4-inch interval at the mid-point of the cap	15	30

Notes:
[a] All cores shall penetrate a minimum of 12 inches into native material. All cores shall be relatively undisturbed samples. All cores shall be logged and evaluated for thickness of cap and individual layers.
[b] Chemical analysis includes COCs and TOC, reported in mg/kg dry weight. Reporting limit for TOC = 0.1%.
[c] See Drawings for sampling locations. Re-occupy first lift stations for collection of final cap samples.

8.0 REFERENCES

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