

Contract No.: EP-W-09-002
WA #: 062-RDRD-A205

Region 2 RAC2 Remedial Action Contract

Specifications Final Remedial Design

Raritan Bay Slag Superfund Site
Margaret's Creek Sector
Old Bridge Township, New Jersey



January 6, 2017

**CDM
Smith**

**RARITAN BAY SLAG SUPERFUND SITE
MARGARET'S CREEK SECTOR - FINAL REMEDIAL DESIGN**

BIDDING SCHEDULE

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Estimated Quantity</u>	<u>Unit Cost</u>	<u>Total</u>
<u>SECTION A - GENERAL REQUIREMENTS</u>					
0001	General Conditions	L.S.	NA	NA	
0002	Safety, Health, and Emergency Response	L.S.	NA	NA	
0003	Temporary Facilities	Month	10		
0004	Site Security	Weeks	42		
0005	Surveying	L.S.	NA	NA	
<u>SECTION B - SITE PREPARATION</u>					
0006	Pre-Excavation Sampling	L.S.	NA	NA	
0007	Clearing and Grubbing	S.F.	274,000		
0008	Soil Erosion and Sediment Control	L.S.	NA	NA	
0009	Soil Stockpile and Loadout Area	L.S.	NA	NA	
0010	Sediment Containment Area	L.S.	NA	NA	
0011	Secondary Access Road	C.F.	700		
<u>SECTION C - DEWATERING AND WATER TREATMENT SYSTEM</u>					
0012	Temporary Cofferdam	L.F.	2,450		
0013	Dewatering	L.S.	NA	NA	
0014	Water Treatment System Installation and Startup Testing	NA	NA	NA	
0014A	Required Items	L.S.	NA	NA	
0014B	Optional Items	L.S.	NA	NA	
0015	Water Treatment System O&M	Month	6		
0016	Discharge to POTW Fee	M. Gallons	6.6		
<u>SECTION D - EXCAVATION, WASTE HANDLING, AND DISPOSAL</u>					
0017	Primary Excavation	B.C.Y.	20,500		
0018	Secondary Excavation	B.C.Y.	6,200		
0019	Post-Excavation and Waste Characterization Sampling	L.S.	NA	NA	
0020	Transportation and Disposal of Subtitle D Material	TONS	21,000		
0021	Transportation and Disposal of RCRA Waste	TONS	20,300		
<u>SECTION E - RESTORATION</u>					
0022	Backfill and Compaction	E.C.Y.	21,610		
0023	Topsoil	E.C.Y.	4,630		
0024	Stone Access Road	S.F.	22,700		
0025	Seeding	NA	NA	NA	
0025A	Upland Areas	S.F.	106,700		
0025B	Wetland Transition Areas	S.F.	102,400		
0026	Wetland Restoration	L.S.	NA	NA	
0027	Wetland Monitoring and Maintenance	Year	5		

**TECHNICAL SPECIFICATIONS
RARITAN BAY SLAG SUPERFUND SITE
MARGARET'S CREEK SECTOR**

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**TECHNICAL SPECIFICATIONS
RARITAN BAY SLAG SUPERFUND SITE
MARGARET'S CREEK SECTOR**

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SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.1 SITE DESCRIPTION

The Raritan Bay Slag Superfund Site (the Site) is approximately 1.5 miles in length and located in a recreation area on the shore of Raritan Bay, in the eastern part of Old Bridge Township within the Laurence Harbor section in Middlesex County, New Jersey. A small portion of the western end of the Site, the western jetty at the Cheesequake Creek Inlet, is located in the Borough of Sayreville. The Site is bordered to the north by Raritan Bay and to the east, west, and south by residential properties.

The Site been divided into 3 sectors with 11 site areas based on areas identified in historical investigations, site physical characteristics, and the locations of known or potential sources:

- Seawall Sector (Areas 1, 2, 3, 4, 5, and 6), where slag was deposited and used to reinforce the seawall
- Jetty Sector (Areas 7, 8, and 11), which consists of a jetty encapsulated with slag
- Margaret's Creek Sector (Area 9), comprising a wetlands portion and an upland portion
- Area 10, a non-impacted area located to the east of the Site, used to collect background samples.

Slag, battery casings and associated wastes (i.e., demolition debris in the form of concrete and a variety of bricks, including fire bricks), contaminated soils and sediments were identified at the Site. Lead is the primary contaminant of concern at the Site.

Waves in Raritan Bay flow predominantly from the east and northeast (from the Atlantic Ocean), and contaminants from the Seawall and Margaret's Creek sectors tend to migrate westward. Currents near the Jetty sector are complex due to strong tidal currents within Cheesequake Creek. This complicated environment dictates a specific sequencing of cleanup activities to prevent recontamination of remediated areas. The sequence for site remediation to prevent recontamination is as follows: the Margaret's Creek sector; the Seawall sector; and then the Jetty sector. Therefore, this remedial action focusses on the Margaret's Creek Sector.

1.2 SITE HISTORY

In late 1960s and early 1970s, slag, mostly in the form of blast furnace pot bottoms from a secondary lead smelter, was used in the construction of a seawall in an area that had sustained significant beach erosion and damage due to a series of storms in the 1960s. Demolition debris in the form of concrete and a variety of bricks, including fire bricks, was also placed along the beachfront. A portion of the seawall also contains large riprap believed to have been placed over the slag when the grassed and paved portion of the park was developed.

The western jetty at Cheesequake Creek Inlet is part of a federally authorized navigation project by the United States Army Corps of Engineers (USACE) and has been in existence since the USACE constructed it in the late nineteenth century. Slag was reportedly placed on the jetty during the same general time period as the construction of the seawall. Most of the jetty is covered with slag that is similar in appearance to slag on the seawall. The slag was placed on the jetty and used as fill/stabilizing material for the seawall. Sea Land Development Corp., the owner of the property on which the seawall was built, used the lead slag for the seawall construction.

In 2007, the New Jersey Department of Environmental Protection (NJDEP) identified elevated levels of antimony, arsenic, chromium, copper and lead in soils along the seawall and at the edge of the beach near the western end of the seawall. Old Bridge Township placed a temporary "snow" fence in this area, posted "Keep off" signs in the park along the split rail fence that borders the edge of the seawall, and notified the residents of Laurence Harbor.

Margaret's Creek is characterized by four habitats types: beach, tidal marsh, scrub/shrub, and upland forest, with tidal marsh habitat the most dominant. The entire area has been subjected to intrusive activities such as the placement of miscellaneous debris, slag, and battery casing, littering, and excavation of soil. Two large marsh communities are divided by an access road but are hydraulically connected by a culvert. The sporadic dumping of waste on the ground surface primarily occurred in the upland areas of Margaret's Creek. In March 2009, the 47-acre property associated with Margaret's Creek was also included in the overall site. The "Proposed Rule" proposing the Site for inclusion on the National Priorities List (NPL) was published in the Federal Register on April 9, 2009. The "Final Rule" adding the Site to the NPL was published in the Federal Register on November 4, 2009.

The Remedial Investigation and Feasibility Study was completed in December 2011 and September 2012, respectively for the Site. The Record of Decision (ROD) for the Site was signed by EPA in May 2013 and called for removal of the source material, institutional controls, and long-term monitoring. Additional investigation and removal actions were conducted by EPA's Removal Support Team (RST) 3 between 2013 and 2016 as part of Superstorm Sandy Response Action.

1.3 SUMMARY OF AVAILABLE DATA

The primary sources of contamination are slag from a lead reclamation process and battery casings. Lead is the primary contaminant of concern. The upland area of Margaret's Creek contains visible slag waste piles. Crushed battery casings were also observed scattered in upland areas of Margaret's Creek. No slag or battery casings were observed in the wetland sediment.

The lead soil and sediment results, groundwater and surface water results, and results of leachability testing conducted on soil, slag and battery casing material during previous investigations are included in the Design Analysis Report. The maximum soil lead concentration detected at the Site was 78,000 milligrams per kilogram (mg/kg).

1.4 PROJECT OBJECTIVES

The Contract Documents (specifications and drawings) were prepared using performance and prescriptive designs to implement the remedy for the Margaret's Creek sector of the Site. The temporary water treatment system, dewatering system, temporary cofferdam and the excavation support system are intended to be performance-based. The Contractor shall submit shop drawings for approval prior to start of construction activities. The purpose of this format is to encourage the Contractor to add value to the system based on previous experience.

The ROD outlined the remedial action objectives (RAOs), which address the human health risks and environmental concerns at the Site. The RAOs are summarized below:

- Reduce exposure resulting from incidental ingestion of slag, battery casings and associated wastes, contaminated soils and sediments to levels that are protective of human health.
- Reduce exposure resulting from the ingestion of slag, battery casings and associated wastes to via food chain to levels that are protective of ecological receptors.
- Reduce migration of contamination from the slag and battery casings and associated wastes to surface water, soil, and sediments to levels that are protective of human health and ecological receptors.
- Reduce migration of contamination from the soil and sediments to surface water and sediments to levels that are protective of human health and ecological receptors.
- Reduce metals concentrations in surface water to levels that are protective of ecological receptors by remediating source materials.

To achieve these RAOs, the remedial action will remove slag and battery casings and associated wastes, contaminated soil and sediment thus, eliminating incidental ingestion risk to residents and recreators utilizing the Site. The selected remedy will remove the concentrations of lead above the cleanup levels of 400 mg/kg in soil and sediment. The approach to surface water contamination at the Site is to remove the slag and battery casings and associated wastes, contaminated soil and sediment that act as sources of contamination to the surface water. This will reduce the surface water contamination over time to acceptable levels. Monitoring will be implemented to assess the effectiveness of the approach by comparing the monitoring results to a set of cleanup goals. Baseline surface water monitoring will be performed as part of this Remedial Action, and subsequent monitoring will be addressed in the Contractor's Remedial Action Work Plan.

1.5 WORK INCLUDED IN DESIGN PACKAGE

The Contractor shall complete all work covered by the Contract Documents. The work consists primarily of pre-excavation sampling; clearing and grubbing; construction of a staging area, temporary water treatment plant containment area, a sediment containment area, a soil/sediment stockpile and loadout area; construction and operation of a dewatering system, installation and operation of temporary water treatment system, temporary coffer dams, and temporary discharge to the local publicly owned treatment works (POTW) or to surface water;

excavation as shown on the Contract Drawings; drying of sediment; loadout of excavated material for off-site disposal at an approved facility; reconstruction of access roads, backfilling; grading; and wetland restoration. The work includes, but is not limited to the following:

1.5.1 Obtaining the necessary permits and approvals from applicable federal, state, and local regulatory agencies to execute the project unless otherwise noted within the Contract Documents. The Contractor shall be responsible for all fines related to permits/authorizations issued with regard to the work completed and waste transportation by the Contractor. EPA will be responsible for submitting the Soil Erosion and Sediment Control Plan for certification by the Freehold Soil Conservation District, the NJDEP Division of Land Use Requirements permit equivalency, and the New Jersey Pollutant Discharge Elimination System/Discharge to Surface Water (NJPDES/DSW) permit equivalent.

1.5.2 Providing all submittals identified in the Specifications and summarized in the submittal register to the EPA's Representative in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.

1.5.3 Providing all utilities, materials, equipment, labor, and facilities required to perform the work in accordance with the Contract Drawings and Specifications.

1.5.4 Mobilization, including all labor, materials, and equipment required to provide the following activities including but not limited to:

1.5.4.1 Compliance with health and safety requirements as specified in SECTION 01351 - SAFETY, HEALTH AND EMERGENCY RESPONSE.

1.5.4.2 Constructing of the staging area, as shown on the Contract Drawings or as directed by the EPA's Representative.

1.5.4.3 Installing project and safety signs, as specified in SECTION 01580 - SIGNS.

1.5.4.4 Providing temporary utilities (electric, telephone and internet), parking, construction staging area, signage, and security.

1.5.4.5 Performing a pre-excavation survey of the Site.

1.5.4.6 Performing pre-excavation sampling and analysis, including soil and sediment delineation sampling, tree trunks characterization, and surface water baseline sampling in accordance with the Contract Documents.

1.5.4.7 Marking out all underground utilities, and field verifying the location and depth for all underground utilities within excavation areas.

1.5.4.8 Providing and maintaining site security in accordance with SECTION 01540 - SECURITY.

1.5.4.9 Constructing the sediment containment area, soil stockpile/loadout area, temporary water treatment system area, decontamination pad and personnel hygiene facilities as specified in the Contract Documents.

1.5.4.10 Designing, installing and operating a dewatering system including temporary cofferdam for excavation. Performing operation and maintenance of the dewatering system.

1.5.4.11 Designing, installing and operating a temporary water treatment system for treating the water generated during excavation activities. The treated water shall be discharged to Middlesex County Utilities Authority (MCUA) POTW. Alternatively, if the Contractor cannot discharge the treated water to MCUA POTW, the Contractor shall discharge the treated water to surface water in accordance with New Jersey Pollution Discharge Elimination System (NJPDES) Surface Water Discharge permit.

1.5.4.12 Performing perimeter air monitoring in accordance with SECTION 01362 - PERIMETER AIR MONITORING.

1.5.4.13 Implementing soil erosion and sediment controls as specified in SECTION 02370 - EROSION CONTROL AND STORMWATER MANAGEMENT.

1.5.4.14 Excavating contaminated material to the excavation depths as shown on the Contract Drawings and as specified in SECTION 02111 - EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. Inspecting the excavation bottom and side slope for visual contamination, slag and battery casings.

1.5.4.15 Performing post-excavation verification sampling to meet NJDEP verification requirements for closure samples in accordance with the Contract Documents.

1.5.4.16 Performing secondary excavation of contaminated material as directed by EPA based on the results of post-excavation confirmation sample analysis and/or field observations in accordance with the Contract Documents. No secondary excavation shall be performed without approval from EPA.

1.5.4.17 Performing waste segregation of the excavated material as specified in the Contract Documents and in accordance with disposal facility requirements. Transferring excavated material to the staging area in accordance with SECTION 02111 - EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.

1.5.4.18 Collecting and analyzing waste characterization, post-excavation, and backfill material samples in accordance with SECTION 01450 - CHEMICAL DATA QUALITY CONTROL and the Contractor's approved Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP).

1.5.4.19 Performing waste handling and disposal of excavated material in accordance with SECTION 02120 - TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.

1.5.4.20 Supplying clean fill material and topsoil, backfilling the excavated areas with clean fill material, and site grading as specified in the Contract Documents.

1.5.4.21 Completing site restoration, including seeding and wetlands planting to the limits shown on the Restoration Plan in accordance with SECTION 02921 - UPLAND SEEDING, SECTION 02955 - FRESHWATER WETLAND RESTORATION, and SECTION 02957 - BRACKISH MARSH RESTORATION.

1.5.4.22 Reconstructing the Old Bridge Municipal Utilities Authority (OBMUA) fire access road to the limit shown on the Contract Drawing in accordance with the Contract Documents.

1.5.4.23 Conducting a final site survey and preparing As-Built Drawing(s) documenting site restoration conditions upon completion of remediation in accordance with SECTION 01550 - SURVEYING.

1.5.5 Demobilizing and securing the Site.

1.5.6 Completing closeout and project documentation in accordance with SECTION 01780 - PROJECT CLOSEOUT.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01201

PRE-CONSTRUCTION AND PRE-WORK CONFERENCES

PART 1 GENERAL

1.1 PRE-CONSTRUCTION CONFERENCE

Within 30 calendar days after issuance of the Notice to Proceed (NTP), the Contractor shall meet with the EPA and the EPA’s Representative for a Pre-Construction Conference to discuss project schedules.

1.2 PRE-WORK CONFERENCE

1.2.1 Two Pre-Work Conferences will be held between the Contractor and EPA’s Representative. The two Pre-Work Conferences will be held approximately two weeks prior to the start of Pre-Excavation Sampling and prior to mobilization for construction activities, respectively. Pre-Work Conference Attendance by the Contractor's superintendent, quality control personnel, safety personnel, and subcontractor's superintendents shall be required. The purpose of these conferences is to review submittals, safety, payrolls and labor relations, environmental protection, project schedules and payment, and procurement of materials. Questions concerning the administrative requirements or any other aspect of the project may also be addressed.

1.2.2 Unless specified otherwise, the Contractor shall submit an electronic copy or 3 hard copies of the following for review at least 21 calendar days prior to the Pre-Work Conference to be held prior to Pre-Excavation Sampling:

1.2.2.1 Project Organizational Chart and Project Manager Name and Experience in accordance with SECTION 01310 – JOB SITE ADMINISTRATION.

1.2.2.2 Initial and Revised Project Schedules, in accordance with SECTION 01320 – PROJECT SCHEDULE.

1.2.2.3 Submittal Register, in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.

1.2.2.4 Site Safety and Health Plan, in accordance with SECTION 01351– SAFETY, HEALTH, AND EMERGENCY RESPONSE.

1.2.2.5 Uniform Federal Policy Quality Assurance Project Plan, in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.

1.2.2.6 Contractor Quality Control Plan, in accordance with SECTION 01451 – CONTRACTOR QUALITY CONTROL.

1.2.3 Unless specified otherwise, the Contractor shall submit an electronic copy or 3 hard copies of the following for review at least 21 calendar days prior to the Pre-Work Conference to be held prior to mobilization for construction activities:

1.2.3.1 Environmental Protection Plan, in accordance with SECTION 01355 – ENVIRONMENTAL PROTECTION.

1.2.3.2 Perimeter Air Monitoring Plan, in accordance with SECTION 01362 – PERIMETER AIR MONITORING.

1.2.3.3 Security Plan, in accordance with SECTION 01540 – SECURITY.

1.2.3.4 Pre-Excavation Survey in accordance with SECTION 01550 – SURVEYING.

1.2.3.5 Traffic Control Plan, in accordance with SECTION 01585 – TRAFFIC CONTROL.

1.2.3.6 Site Preparation Plan and Herbicide Application Plan in accordance with SECTION 02100 – SITE PREPARATION.

1.2.3.7 Excavation and Handling Plan in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.

1.2.3.8 Waste Management and Transportation Plan in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.

1.2.3.9 Dewatering and Drainage Plan in accordance with SECTION 02140 – DEWATERING AND DRAINAGE.

1.2.3.10 Freshwater Wetland Restoration Plan in accordance with SECTION 02955 – FRESHWATER WETLAND RESTORATION.

1.2.3.11 Brackish Marsh Restoration Plan in accordance with SECTION 02957 – BRACKISH MARSH RESTORATION.

1.2.3.12 Water Treatment Plan, in accordance with SECTION 13300 – WATER TREATMENT SYSTEM.

Any plans submitted to the EPA’s Representative in advance of the Pre-Work conference will be briefly reviewed by the EPA’s Representative and will also be subjected to discussion during this conference.

1.3 PRE-CONSTRUCTION QUALITY CONTROL CONFERENCE

After the Pre-Work Conference, before start of construction, a Pre-Construction Quality Control Conference will be held between the Contractor and EPA’s Representative. The purpose of this conference is to discuss the quality control procedures to be used for all on-site and off-site work, and defining the interrelationship of the Contractor’s Management and the EPA’s

Representative’s Quality Assurance. Additional details are included in SECTION 01451 – CONTRACTOR QUALITY CONTROL.

1.4 PRE-CONSTRUCTION SAFETY CONFERENCE

The Contractor shall meet with the EPA’s Representative for a Pre-Construction Safety Conference, before start of construction. The purpose of this conference is to discuss how work will be safely implemented including, but not limited to, work procedures, safety considerations associated with those work procedures, heavy equipment to be used, training required to operate equipment, and other safety requirements, such as training to be conducted and safety equipment to be used.

1.5 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with a “EA” designation; submittals having an “FIO” designation are for information only. The following shall be submitted accordance with SECTION 01330 - SUBMITTAL PROCEDURES:

1.5.1 Conference Meeting Minutes; Product Data, EA

The Contractor shall record the minutes of the meetings including significant proceedings and decisions arising from the four conferences, and within seven calendar days after each meeting furnish an electronic copy of the minutes to the EPA’s Representative. After the EPA’s Representative’s review and approval, the Contractor shall distribute copies to each participant in the meeting and to parties affected by decisions made at the meeting.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

The EPA’s Representative shall schedule and administer the Pre-Construction Conference, Pre-Work Conference, Pre-Construction Quality Control Conference and Pre-Construction Safety Conference, as specified in Paragraphs 1.1 through 1.4 of this section. The EPA’s Representative shall prepare agenda and preside at conferences. The Contractor shall make physical arrangements for and participate at conferences; and shall record the minutes including a detailed description of proceedings and decisions, as specified in Paragraph 1.5.1 of this section.

END OF SECTION

SECTION 01202

PROJECT PROGRESS MEETINGS

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 This section describes the minimum requirements for conducting Project Progress Meetings during execution of the construction work.

1.1.2 The Contractor shall schedule and administer Project Progress Meetings at a minimum of one per week and such additional meetings as required, when requested by either the EPA’s Representative or the Contractor during any stage of this project when it is deemed necessary to raise any significant questions, establish new guidelines, introduce a new aspect to the project, or address any other items affecting the progress of work. The Contractor shall attend these meetings with all necessary personnel as determined by the EPA’s Representative for the duration of this contract. A suggested meeting agenda is provided within this section.

1.1.3 Meetings and conferences shall take place at the project site or some other location that is satisfactory to both the EPA’s Representative and the Contractor.

1.2 ATTENDANCE

The following persons shall attend the Progress Meetings:

- EPA Project Manager
- EPA’s Representative
- Contractor's Site Superintendent
- Contractor's Project Manager
- Contractor's Key Quality Control Staff
- Contractor's Safety and Health Manager and/or Officer and Emergency Response Coordinator Specialist
- NJDEP’s Project Manager or representative
- Subcontractors as appropriate to the agenda
- Suppliers as appropriate to the agenda
- Others as requested by the EPA’s Representative or as appropriate to the agenda

1.3 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals having an “FIO” designation are for information only. The Contractor shall submit

the following to the EPA’s Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES:

1.3.1 Project Progress Meeting Minutes; Product Data; EA

The Contractor shall be responsible for recording the minutes of Project Progress Meetings including any significant proceedings and decisions arising from the conferences. The Contractor shall reproduce and submit to the EPA’s Representative within two calendar days after each meeting an electronic copy of the minutes of the meeting. After the EPA’s Representative’s review and approval, the Contractor shall distribute copies to each participant in the meeting and to parties affected by decisions made at the meeting.

1.3.2 Project Cost Summary Report; Product Data; EA

On a weekly basis, the Contractor shall submit to the EPA’s Representative the Project Cost Summary Report for review and approval.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall schedule and administer Project Progress Meetings at a minimum of once per week and additional meetings as required, and if requested by the EPA or the EPA’s Representative.

3.2 GENERAL MEETING REQUIREMENTS

The Contractor shall administer the following general requirements for the Progress Meetings:

- Prepare agenda for meetings
- Make physical arrangements for meetings
- Preside at meetings
- Record the minutes including a detailed description of proceedings and decisions
- Reproduce and distribute an electronic copy of minutes in accordance with Section 1.3.1

3.3 SUGGESTED AGENDA

The following is a suggested agenda for Project Progress Meetings; the Contractor shall modify this agenda in accordance with ongoing work.

- Review and approval of minutes of previous meeting
- Review of Health and Safety

- Maintenance of quality and safety standards
- Review of work progress
- Permit activities
- Field observations, problems, conflicts
- Problems which impede the schedule, and proposed corrective actions
- Review of off-site materials and equipment delivery schedules
- Corrective measures and procedures to regain projected schedule
- Revisions to project schedule
- Review of planned progress during succeeding work period
- Coordination of schedules
- Review of submittal schedules; expedite as required
- Milestone dates
- Review of transmittals submitted to the EPA’s Representative, submittals returned from the EPA’s Representative, transmittals pending re-submittal, and Requests for Information (RFIs)
- Review of quality control, including all completed inspections
- Discussion of pending changes and substitutions
- Review of proposed changes for effect on construction schedule and on completion date, and effect on other contracts of the project
- Community relations issues
- Discussion of other business, as appropriate
- Assignment of action items

END OF SECTION

SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 SUMMARY

This section covers the methods and procedures which will be used to measure the Contractor's work and to provide payment to the Contractor for work performance. It is the responsibility of the bidder to make a thorough investigation of the drawings, specifications, and the Site to determine the scope of work included in each bid item. Payments will be made to the Contractor based on the quantities of work as measured in accordance with the specified methods of measurement and the prices stipulated as shown on the Bidding Schedule. This method of payment will constitute complete compensation for all work shown on the Contract Drawings and provided in the Contract Specifications or other contract documents, and for all costs of accepting the general risks, liabilities and shall include, but not be limited to, compensation for overhead, profit, materials and services, and performing all work required to accomplish and complete the work specified under each item and all other work required.

1.2 LUMP SUM ITEMS

1.2.1 The quantities of work performed under lump sum items will not be measured except for the purpose of determining reasonable interim payments.

1.2.2 Interim payments will be made in accordance with the estimated value of work done as determined by the EPA’s Representative or as specified in this section. After the award of the contract, the Contractor shall submit a detailed breakdown of all lump sum items that will be used for partial payments.

1.3 UNIT PRICE ITEMS

1.3.1 Payments will be made for unit price items in accordance with the measurement methods set forth in this section or, where specified payment limits are unclear, as determined reasonable by the EPA’s Representative, at the unit prices entered in the Bidding Schedule.

1.3.2 Interim measurements and/or payments may be adjusted to account for partially completed work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

SECTION A - GENERAL REQUIREMENTS (BID ITEMS 0001 THROUGH 0005)

3.1 GENERAL CONDITIONS (BID ITEM 0001)

3.1.1 Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.

3.1.2 Payment for general conditions will be made at the lump sum price bid, for which price and payment shall be full compensation for the expense of said conditions. General Conditions shall include all of the items required under these Contract Documents but not covered under other bid items, including but not limited to: the Contractor’s cost for insurance, bonds, fees, permits, and other similar expenses directly related to and required by these Contract Documents; the preparation and submittal of all required plans; project-dedicated supervisory staff and equipment; compliance with specified regulatory requirements; acquiring all applicable permits and permit-equivalents; pre-construction and construction period planning, scheduling, submittals, reporting, administration; contractor quality control; environmental protection and spill control; project photographs and videotaping; mobilization and demobilization of heavy equipment; the preparation and submittal of the Remedial Action Report, and other requirements and related miscellaneous items.

3.2 SAFETY, HEALTH, AND EMERGENCY RESPONSE (BID ITEM 0002)

3.2.1 Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.

3.2.2 Payment for safety, health, and emergency response will be made at the lump sum price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for providing safety, health, and emergency response equipment, facilities, personnel, and services detailed in SECTION 01351 - SAFETY, HEALTH AND EMERGENCY RESPONSE, SECTION 01362 - PERIMETER AIR MONITORING and the Contract Documents. This item shall include, but not be limited to, costs to implement the occupational safety monitoring program, safety personnel, safety monitoring equipment, perimeter air monitoring, emergency response materials and supplies, environmental protection and spill control kits, and personnel protection equipment.

3.3 TEMPORARY FACILITIES (BID ITEM 0003)

3.3.1 Measurement for this unit price item will be made to the nearest month of operation and maintenance performed for temporary facilities, in accordance with the Specifications.

3.3.2 Payment for Temporary Facilities will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to furnish, maintain, and operate the trailer compound for the Contractor and the EPA’s Representative and furnish, install, operate, maintain, remove, and dispose of the equipment washdown and decontamination facilities throughout the duration of the project. Costs shall

include, but not be limited to, furnishing project trailers, mobilization and demobilization of trailers/facilities, utility connections and services (power, telephone, internet), portable toilets, computers and peripherals, office supplies and equipment, cleaning services for the trailers, project signs, work lights, and other temporary facilities in accordance with SECTION 01500 - TEMPORARY CONSTRUCTION FACILITIES AND UTILITIES and as otherwise required by the Contract Documents.

3.4 SITE SECURITY (BID ITEM 0004)

3.4.1 Measurement for this unit price item will be made to the nearest week in accordance with the Specifications.

3.4.2 Payment for security will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to provide security in accordance with SECTION 01540 - SECURITY or as otherwise required by the Contract Documents.

3.5 SURVEYING (BID ITEM 0005)

3.5.1 Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.

3.5.2 Payment for surveying will be made at the lump sum price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to perform surveying for baseline conditions, excavated areas, and final grade, and preparation of as-built drawings and any other requirements found in SECTION 01550 - SURVEYING or as otherwise required by the Contract Documents.

SECTION B - SITE PREPARATION (BID ITEMS 0006 THROUGH 0011)

3.6 PRE-EXCAVATION SAMPLING (BID ITEM 0006)

3.6.1 Measurement for this lump sum item shall include all items described under this bid item and no separate quantity measurement shall be made.

3.6.2 Payment for Pre-Excavation Sampling will be made at the lump sum bid price, for which price and payment will be full compensation for all labor, equipment, materials, and incidentals required to perform pre-excavation sampling in accordance with Contract Drawings, SECTION 01450 - CHEMICAL DATA QUALITY CONTROL, SECTION 02100 - PRE-EXCAVATION SAMPLING AND SITE PREPARATION.

3.7 CLEARING AND GRUBBING (BID ITEM 0007)

3.7.1 Measurement for this unit price item will be made to the nearest square foot of clearing and grubbing completed in accordance with the Specifications.

3.7.2 Payment for clearing and grubbing will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for clearing and grubbing of all trees, shrubs, roots, and other objectionable vegetative material within the limits of excavation and the clearing limits as defined on the Contract Drawings, and in accordance with SECTION 02230 – CLEARING AND GRUBBING. This item shall also include the chipping cost of cleared trees, and spreading of chipped material on site. The transportation and disposal of all grubbed material at an approved Subtitle D landfill, including cleared *Phragmites* mixed with contaminated soil for transport is included under Bid Item 0020.

3.8 SOIL EROSION AND SEDIMENT CONTROL (BID ITEM 0008)

3.8.1 Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.

3.8.2 Payment for soil erosion and sediment control will be made at the lump sum price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to furnish, install, and maintain silt fencing, hay bales, and other soil erosion and sediment controls for the duration of the project. Soil erosion and sediment control measures shall be in accordance with the requirements of the Freehold Soil Conservation District, SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT and the Contract Drawings. Price and payment for the removal of control measures at the completion of the work shall also be included as part of this bid item.

3.9 SOIL STOCKPILE AND LOADOUT AREA (BID ITEM 0009)

3.9.1 Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.

3.9.2 Payment for the soil stockpile and loadout area will be made at the lump sum price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to construct, maintain, and remove the stockpile and loadout area for excavated material as shown on the Contract Drawings, and in accordance with SECTION 02100 – PRE-EXCAVATION SAMPLING AND SITE PREPARATION or as otherwise required by the Contract Documents. Disposal of stockpile area construction material is included under Bid Item 0020. Loading of waste from the stockpile area into vehicles for off-site transportation and disposal is included under Bid Items 0020 and/or 0021.

3.10 SEDIMENT CONTAINMENT AREA (BID ITEM 0010)

3.10.1 Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.

3.10.2 Payment for the sediment containment area will be made at the lump sum price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to construct, maintain, and remove the sediment containment area for excavated sediment as shown on the Contract Drawings, and in accordance with SECTION

02100 – PRE-EXCAVATION SAMPLING AND SITE PREPARATION or as otherwise required by the Contract Documents. Disposal of sediment containment area construction material is included under Bid Item 0020. Loading of waste from the sediment containment area into vehicles for off-site transportation and disposal is included under Bid Items 0020 and/or 0021.

3.11 SECONDARY ACCESS ROAD (BID ITEM 0011)

3.11.1 Measurement for this unit price item will be made to the nearest cubic foot of crushed stone used to supplement the existing secondary access road in accordance with the specifications.

3.11.2 Payment for the secondary access road will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for supplementation of the existing secondary access road as defined on the Contract Drawings and as required for construction access, and in accordance with SECTION 02100 – PRE-EXCAVATION SAMPLING AND SITE PREPARATION.

SECTION C – DEWATERING AND WATER TREATMENT SYSTEM (BID ITEMS 0012 THROUGH 0016)

3.12 TEMPORARY COFFERDAM (BID ITEM 0012)

3.12.1 Measurement for this unit price item will be made to the nearest linear foot of temporary cofferdam rented and shall include other items described under this bid item, and no separate quantity measurement shall be made.

3.12.2 Payment for installation of temporary cofferdams will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to rent, install, maintain, and relocate temporary cofferdams during dewatering and excavation operations in accordance with SECTION 02140 – DEWATERING AND DRAINAGE and as otherwise required by the Contract Documents. This item shall also include the removal of temporary cofferdams when no longer necessary for dewatering.

3.13 DEWATERING (BID ITEM 0013)

3.13.1 Measurement for this lump sum item shall include all items described under this bid item and no separate quantity measurement shall be made.

3.13.2 Payment for dewatering will be made at the lump sum bid price, for which price and payment will be full compensation for all labor, equipment, materials, and incidentals required to design, install, operate and maintain the dewatering system designed in accordance with SECTION 02140 – DEWATERING AND DRAINAGE to dewater the excavation area during excavation and backfill operations. This item shall also include transfer of water from the dewatering operations to the onsite water treatment system.

3.14 WATER TREATMENT SYSTEM INSTALLATION AND STARTUP TESTING (BID ITEM 0014)

3.14.1 REQUIRED ITEM (BID ITEM 0014A)

3.14.1.1 Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.

3.14.1.2 Payment for water treatment system installation and startup testing will be made at the lump sum price bid, for which price and payment will be full compensation for mobilization, demobilization, installation and startup testing of the water treatment system in accordance with SECTION 13300 – WATER TREATMENT SYSTEM and as otherwise required by the Contract Documents. This bid item includes all required sampling for startup testing, construction of water treatment system containment area, installation of effluent discharge pipe, valves, fittings, cleanouts and appurtenances between the treatment system and the discharge outfall, and placement and maintenance of a rip-rap at outfall to prevent excessive scouring at the discharge point if discharge is to surface water. Design submittal for water treatment system is included under Bid Item 0001.

3.14.2 OPTIONAL ITEM (BID ITEM 0014B)

3.14.2.1 Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.

3.14.2.2 Payment for water treatment system installation of optional items will be made at the lump sum price bid, for which price and payment will be full compensation for mobilization, demobilization, installation of the optional components of the water treatment system in accordance with SECTION 13300 – WATER TREATMENT SYSTEM and as otherwise required by the Contract Documents in order to meet discharge permit criteria. This optional items will be executed at the direction of the EPA’s Representative.

3.15 WATER TREATMENT SYSTEM O&M (BID ITEM 0015)

3.15.1 Measurement for this unit price item will be made to the nearest month of full-scale operation of the water treatment system completed, in accordance with the Specifications.

3.15.2 Payment for water treatment system O&M will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to furnish, maintain, and operate the full-scale water treatment system during dewatering operations in accordance with SECTION 13300 – WATER TREATMENT SYSTEM and as otherwise required by the Contract Documents. It shall include, without limitation, the cost of equipment rentals, filter bag and carbon replacement (if used), compliance sampling, utility costs, maintenance of treatment system, and conveyance of water to the point of discharge.

3.16 DISCHARGE TO PUBLICLY OWNED TREATMENT WORKS (POTW) FEE (BID ITEM 0016)

3.16.1 Measurement for this unit price item will be made to the nearest million gallon of water discharged from the water treatment system to the Middlesex County Utilities Authority (MCUA) POTW, in accordance with the Specifications.

3.16.2 Payment for the discharge to POTW fee will be made at the unit price, for which price and payment will be full compensation for the fee for discharge of construction-generated, treated water to the MCUA POTW system in accordance with SECTION 13300 – WATER TREATMENT SYSTEM and as otherwise required by the Contract Documents. Operation of the water treatment system and conveyance of water to the point of discharge are included under Bid Item 0015.

SECTION D - EXCAVATION, WASTE HANDLING, AND DISPOSAL (BID ITEMS 0017 THROUGH 0021)

3.17 PRIMARY EXCAVATION (BID ITEM 0017)

3.17.1 Measurement for this unit price item will be made in bank cubic yards measured in place after excavation, by a land surveyor, or approved alternative and confirmed by the EPA’s Representative. The volume of excavation shall be measured by means of surveys before and after excavation.

3.17.2 Payment for primary excavation will be made at the unit price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for excavation of contaminated material from within the primary excavation limits, as shown on the Contract Drawings and detailed in the SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. Payment will also include on-site handling, delivery of contaminated material to designated stockpile area, and management of stockpiles. Excavation dewatering, post-excavation sampling, transportation, disposal, and surveying costs are included under other bid items.

3.18 SECONDARY EXCAVATION (BID ITEM 0018)

3.18.1 Measurement for this unit price item will be made in bank cubic yards measured in place after excavation, by a land surveyor, or approved alternative and confirmed by the EPA’s Representative. The volume of excavation shall be measured by means of surveys before and after excavation.

3.18.2 Payment for secondary excavation will be made at the unit price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for secondary excavation based on post-excavation sampling results and as approved by the EPA’s Representative in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. Payment will also include on-site handling

and delivery of contaminated material to the designated stockpile area. Excavation dewatering, stockpile area management, post-excavation sampling, transportation, disposal, and surveying costs are not included under this bid item.

3.19 POST-EXCAVATION AND WASTE CHARACTERIZATION SAMPLING (BID ITEM 0019)

3.19.1 Measurement for this lump sum item shall include all items described under this bid item and no separate quantity measurement shall be made.

3.19.2 Payment for Post-Excavation and Waste Characterization Sampling will be made at the lump sum bid price, for which price and payment will be full compensation for all labor, equipment, materials, and incidentals required to perform post-excavation and waste characterization/disposal sampling in accordance with Contract Drawings, SECTION 01450 - CHEMICAL DATA QUALITY CONTROL, SECTION 02111 - EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. Post-excavation sampling will be required to determine whether secondary excavation is required or to document the concentrations of contaminant of concern at the excavation limits.

3.20 TRANSPORTATION AND DISPOSAL OF SUBTITLE D MATERIAL (BID ITEM 0020)

3.20.1 Measurement for this unit price item will be made to the nearest ton of Subtitle D material disposed of off site.

3.20.2 Payment for transportation and disposal of Subtitle D material will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for loadout, transportation, and disposal of Subtitle D material in accordance with SECTION 02120 - TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL and any other requirements in the Contract Documents. Waste characterization sampling required by disposal facility is included under Bid Item 0019.

3.21 TRANSPORTATION AND DISPOSAL OF RCRA WASTE (BID ITEM 0021)

3.21.1 Measurement for this unit price item will be the actual number of tons of RCRA waste transported, treated, and disposed of off site.

3.21.2 Payment for the Transportation and Disposal of RCRA Waste will be made at the unit price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for the loadout, off-site transportation, treatment, and disposal of RCRA Waste in accordance with SECTION 02120 - TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL and any other requirements in the Contract Documents. Waste characterization sampling required by disposal facility is included under Bid Item 0019.

SECTION E - RESTORATION (BID ITEMS 0022 THROUGH 0027)

3.22 BACKFILL AND COMPACTION (BID ITEM 0022)

3.22.1 Measurement for this unit price item will be made to the nearest embankment cubic yard of compacted backfill material (common and structural fill) installed, measured in-place by a land surveyor or approved and confirmed by the EPA’s Representative.

3.22.2 Payment for backfill and compaction will be made at the unit price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for the delivery, placement, compaction, testing and grading of common and structural fill material, in accordance with SECTION 02201 – BACKFILL, COMPACTION AND GRADING and the Contract Documents.

3.23 TOPSOIL (BID ITEM 0023)

3.23.1 Measurement for this unit price item will be made to the nearest embankment cubic yard of topsoil installed, measured in-place by a land surveyor, or approved alternative and confirmed by the EPA’s Representative.

3.23.2 Payment for topsoil will be made at the unit price bid, for which price and payment will be full compensation for all labor, equipment, material, testing and incidentals required for the delivery of topsoil, in accordance with Section 02201 – BACKFILL, COMPACTION AND GRADING and the Contract Documents.

3.24 STONE ACCESS ROAD (BID ITEM 0024)

3.24.1 Measurement for this unit price item will be made to the nearest square foot of restored access roads in accordance with the specifications.

3.24.2 Payment for restoration of the Old Bridge Municipal Utilities Authority (OBMUA) fire access road will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to restore the access road as shown on the Contract Drawings, and in accordance with SECTION 02201 – BACKFILL, COMPACTION, AND GRADING or as otherwise required by the Contract Documents. This item also shall include, but not be limited to, costs for providing temporary emergency access during construction. Structural fill required for road restoration is included within Bid Item 0022.

3.25 SEEDING (BID ITEM 0025)

3.25.1 Measurement for this unit price item will be made to the nearest square foot of upland area and wetland transition zone seeded in accordance with the Specifications.

3.25.2 Payment for seeding will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for upland area

and wetland transition zone seeding as shown in the Contract Drawings, and in accordance with SECTION 02921 - UPLAND SEEDING or as otherwise required by the Contract Documents.

3.26 WETLAND RESTORATION (BID ITEM 0026)

3.26.1 Measurement for this lump sum item will include all items described under this bid item, and no separate quantity measurement shall be made.

3.26.2 Payment for wetland restoration will be made at the lump sum price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for the testing, delivery, placement and final grading of loam organic-rich topsoil over the wetland areas, restoration of the emergent and forested wetlands in accordance with SECTION 02955 - FRESHWATER WETLAND RESTORATION and SECTION 02957 - BRACKISH MARSH RESTORATION and as shown on the Contract Drawings, including the planting of trees, shrubs, and ground cover in the wetlands, material warranties, and installation of deer fencing.

3.27 WETLAND MONITORING AND MAINTENANCE (BID ITEM 0027)

3.27.1 Measurement for this unit price item will be the actual number of years that monitoring and maintenance is performed in accordance with the Specifications.

3.27.2 Payment for wetland monitoring and maintenance will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for wetland monitoring and maintenance in accordance with SECTION 02955 - FRESHWATER WETLAND RESTORATION and SECTION 02957 - BRACKISH MARSH RESTORATION or as otherwise required by the Contract Documents. This item shall also include preparation of the Wetland Inspection Plan, Maintenance Plan, and preparation of the annual report and submittal to the New Jersey Department of Environmental Protection (NJDEP).

END OF SECTION

SECTION 01310

JOB SITE ADMINISTRATION

PART 1 GENERAL

1.1 SCOPE OF WORK

The Contractor shall provide all services required to assure site safety, site security, site communication, project management, record keeping and individual additional task performance. These services shall include the provision of qualified personnel to be accepted by the EPA’s Representative and the equipment necessary to complete the performance of such tasks.

1.2 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals having an “FIO” designation are for information only. The Contractor shall submit the following to the EPA’s Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES:

1.2.1 Project Organizational Chart; Pre-Construction Submittals; EA

The Contractor shall submit an organizational chart including all personnel to be used on the project prior to Pre-Construction Conference.

1.2.2 Project Manager Name and Experience; Pre-Construction Submittals; EA

The Contractor shall submit the name and experience of the Project Manager for the project within 14 calendar days from the Notice to Proceed.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 SITE SAFETY

The Contractor shall be responsible for the safe operation of the work at the Site and shall employ a Safety and Health Manager (SHM) and a Site Safety and Health Officer (SSHO). These individuals shall be responsible for the administration of site health and safety, and shall have the responsibilities as defined in SECTION 01351 - SAFETY, HEALTH AND EMERGENCY RESPONSE.

3.2 QUALITY CONTROL

The Contractor shall be responsible for the overall management of quality control and shall have the overall responsibility for quality control as defined in SECTION 01451 - CONTRACTOR QUALITY CONTROL.

3.3 PROJECT MANAGEMENT AND RECORDKEEPING

3.3.1 The Contractor shall provide an overall project management team including a Project Manager and administrative personnel qualified and capable of providing management for the project including construction supervision, expediting labor relations, staffing and recordkeeping. The Contractor shall submit a detailed Project Organizational Chart, which shows the key individuals directly involved in the project.

3.3.2 The Project Manager shall take overall responsibility for conducting the work and for ensuring that the work is conducted in accordance with the requirements of the Contract Documents. The Project Manager shall be responsible for communication and information exchange with the EPA’s Representative and shall officially represent the Contractor in all project-related activities. The Project Manager, at a minimum, shall have authority to sign payments and change orders.

3.3.3 The Contractor shall make available in a timely manner records of all site activity, quantities of materials delivered to the Site, quantities of materials utilized, quantities of materials excavated, quantities of water discharged to Middlesex County Utilities Authority (MCUA) publicly owned treatment works (POTW) or to surface water, the waste quantities produced, laboratory results, waste transportation activity information and all other information required to support requests for payment.

3.3.4 A minimum of 14 calendar days before mobilization, the Project Manager and the EPA’s Representative shall meet with Old Bridge Township and Middlesex County engineers in the presence of the EPA. The parties will discuss the planned construction approach and phasing of work.

Items to be discussed shall include, but are not limited to:

- Planned construction methods to be used
- The type and size of equipment and operating procedures including heavy equipment operations, mechanical equipment operations, etc
- The effect of construction on overhead and buried utilities
- Community protection requirements
- Planned work hours and access to the Site
- Emergency contact procedures

The Contractor shall record the minutes of the meeting and include all significant proceedings and decisions.

3.4 WORKING HOURS

3.4.1 Working hours shall be scheduled by the Contractor to occur between 7:00 am to 4:00 pm, Monday through Friday. Work shall not be permitted before 7:00 am or after 4:00 pm unless approved by the EPA.

3.4.2 The Contractor may be permitted to conduct construction activities six days per week, Monday through Saturday, with the approval of the EPA.

3.4.3 Written notification of any changes to the normal work schedule, including work before 7:00 am, after 4:00 pm, or on Saturdays, shall be submitted to the EPA’s Representative at least one (1) week in advance of proposed changes.

END OF SECTION

SECTION 01320

PROJECT SCHEDULES

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 The Contractor shall furnish all labor, materials, equipment, and incidentals required to prepare and update critical path method project schedules, and prepare the monthly progress reports for review at the Pre-Construction Conference and subsequent progress meetings.

1.1.2 The Contractor shall prepare and update the project schedule using a computer software system that produces legible, easily updated critical path schedules. The Contractor shall submit the software to the EPA’s Representative for approval prior to use.

1.2 FORM OF SCHEDULES

1.2.1 The Contractor shall prepare the critical path schedules in the form of a bar chart with the following details.

1.2.1.1 Identify the project at the top of the project schedule.

1.2.1.2 Provide a separate horizontal bar for each work activity or operation.

1.2.1.3 Provide bold vertical lines, at one-week intervals, with consecutive numbering of each week on the horizontal time scale.

1.2.1.4 Identify the first work day of each work item on the horizontal time scale.

1.2.1.5 The chronological order of the start of each major operation or segment of work will determine the vertical location of its bar on the chart.

1.2.1.6 The sheet size shall be as approved by the EPA’s Representative.

1.3 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals having an “FIO” designation are for information only. The Contractor shall submit to the EPA’s Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES:

1.3.1 Initial Project Schedule; Pre-Construction Submittals; EA

Submit initial project schedule for approval within 15 days after Notice of Award is made. Project schedule to start with the Notice to Proceed date and end at project completion and demobilization.

1.3.2 Revised Project Schedule; Pre-Construction Submittals; EA

Submit revised project schedule, if necessary, for approval within five (5) days after date of the Notice to Proceed and during each regular monthly progress meeting.

1.3.2.1 The EPA’s Representative will review schedules and return a reviewed copy within seven (7) days after receipt.

1.3.2.2 If required, the Contractor shall resubmit a revised schedule within seven (7) days after return of reviewed copy.

1.4 QUALIFICATIONS

The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Project Schedule as described below shall be prepared. The scheduling of design and construction shall be the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Designers, subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate Project Schedule. The approved Project Schedule shall be used to measure the progress of the work, and to aid in evaluating time extensions, and to provide the basis of all progress payments.

3.1.1 Approved Project Schedule

The Contractor shall use the approved Project Schedule to measure the progress of the work and to aid in evaluating time extensions. The schedule shall be cost loaded and activity coded. The schedule will provide the basis for all progress payments. If the Contractor fails to submit any schedule within the time prescribed, the EPA’s Representative may withhold approval of progress payments until the Contractor submits the required schedule.

3.1.2 Schedule Status Report

Provide a Schedule Status Report on at least a monthly basis. If, in the opinion of the EPA’s Representative, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress including those that may be required by the EPA’s Representative, without additional cost to the Government. In this circumstance, the EPA’s Representative may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction planned, and to submit for approval any supplementary schedule or schedules as the EPA’s Representative deems necessary to demonstrate how the approved rate of progress will be regained.

3.1.3 Default Terms

Failure of the Contractor to comply with the requirements of the EPA’s Representative shall be grounds for a determination by the EPA’s Representative that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the EPA’s Representative may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of the contract.

3.2 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 EPA’s Representative.

3.2.1 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 the Precedence Diagram Method (PDM).

3.2.2 Level of Detail Required

The Project Schedule shall include an appropriate level of detail. Failure to develop or update the Project Schedule or provide data to the EPA’s Representative at the appropriate level of detail, as specified by the EPA’s Representative, shall result in the disapproval of the schedule. The EPA’s Representative will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule:

3.2.2.1 Activity Durations

Contractor submissions shall follow the direction of the EPA’s Representative regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods.

3.2.2.2 Design and Permit Activities

Design and permitting activities, including necessary conferences and follow-up actions and design package submission dates, shall be integrated into the schedule.

3.2.2.3 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, and delivery.

3.2.2.4 Critical Activities

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

- Submittal and approval of all required plans
- Pre-excavation sampling
- Mobilization for construction activities
- Permitting
- Clearing and grubbing
- Soil erosion and sediment control
- Air monitoring
- Sediment containment area and soil stockpile/loadout area construction
- Temporary water treatment system containment area construction
- Temporary water treatment system installation
- Temporary water treatment system start-up and testing
- Sediment dewatering
- Excavation and backfilling
- Transportation and disposal of contaminated material
- Wetlands and site restoration
- Pre-final inspection
- Correction of punch list from pre-final inspection
- Final inspection
- Project close-out and demobilization

3.2.2.5 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, and Notice to Proceed (NTP) for phasing requirements.

3.2.2.6 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.

3.2.2.7 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.

3.2.2.8 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 modification 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 Modification or Claim Number. Whenever possible, changes shall be added to the schedule by adding new activities. Existing activities shall not normally be changed to reflect modifications.

3.2.2.9 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.

3.2.2.10 Phase of Work

All activities shall be identified in the Project Schedule by the phase of work in which each activity occurs. Activities shall not contain work in more than one phase of work.

3.2.2.11 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.

3.2.2.12 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.

3.2.3 Scheduled Project Completion

The schedule interval shall extend from the contract start date to the contract completion date. The contract completion activity (End Project) shall finish based on the required contract duration in the accepted contract proposal, as adjusted for any approved contract time

extensions. The first scheduled work period shall be the day after NTP is acknowledged by the Contractor.

3.3 PROGRESS REVISIONS

3.3.1 Indicate progress of each activity to date of submission.

3.3.2 Show changes occurring since previous submission of schedule with the following details:

- Show major changes in scope or quantities (if any).
- Show activities modified since previous submission.
- Show revised projections of progress and completion.
- Show other identifiable changes.

3.3.3 Provide a very brief narrative report as needed to define:

- Problem areas, anticipated delays, and the impact on schedule.
- Recommended corrective action and its effect.
- The effect of changes, if any, on schedules of subcontractors.

3.4 REQUESTS FOR TIME EXTENSIONS

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

3.4.1 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 EPA’s Representative’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, shall not be a cause for a time extension to the contract completion date.

3.4.2 Submission Requirements

The Contractor shall submit a justification for each request for a change in the contract completion date based upon the most recent schedule update. Such a request shall include, as a minimum:

- A list of affected activities, with their associated project schedule activity number
- A brief explanation of the causes of the change
- An analysis of the overall impact of the changes proposed

3.5 DIRECTED CHANGES

If the NTP is issued for changes prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the EPA’s Representative within 14 calendar days of the NTP being issued. The proposed revisions to the schedule will be approved by the EPA’s Representative prior to inclusion of those changes within the Project Schedule. If the Contractor fails to submit the proposed revisions, the EPA’s Representative may furnish the Contractor with 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 EPA’s Representative, the Contractor shall advise the EPA’s Representative within 14 calendar days of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the EPA’s Representative’s revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 14 calendar days of receipt of the EPA’s Representative’s proposed revisions, the Contractor will be deemed to have concurred with the EPA’s Representative’s proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

END OF SECTION

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUBMITTAL IDENTIFICATION

1.1.1 The submittals described herein are those required, and further described in other sections of the specifications, for acceptance by the EPA’s Representative. Other requirements pertaining to submittals may be included in the Special Clauses.

1.2 SUBMITTAL REQUIREMENTS

1.2.1 Submittals Requiring Approval (EA)

Approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the EPA’s Representative.

1.2.2 Information Only Submittals (FIO)

All submittals not requiring approval will be for information only.

1.3 APPROVED SUBMITTALS

Approval of submittals by the EPA’s Representative 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, as the Contractor under the Contractor's Quality Control (CQC) requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After submittals have been approved by the EPA’s Representative, no resubmits for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.4 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the EPA’s Representative and promptly furnish a corrected submittal in the form 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, a notice in accordance with the Contract Clause "Changes" shall be given promptly to the EPA’s Representative.

1.5 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall make submittals as required by the specifications. The EPA’s Representative may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same used in the Contract Drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with Contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor. Proposed deviations from the contract requirements shall be clearly identified. 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 list); certifications; warranties; and other such required submittals. Submittals requiring approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of, in accordance with manufacturers Safety Data Sheets (SDS) and in compliance with existing laws and regulations.

3.2 SUBMITTAL REGISTER

At the end of this section is a Submittal Register listing items of equipment and materials for which submittals are required by the specifications; this list may not be all inclusive and additional submittals may be required.

3.3 SCHEDULING

3.3.1 Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 21 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delays, damages, or time extensions will be allowed for time lost in late submittals.

3.3.2 The EPA’s Representative will review the Submittal Register for approval action.

3.3.3 The approved register will become a part of the contract and Contractor shall be subject to the requirements thereof. The Contractor shall revise and/or update the register monthly to take into account all changes in the contract. Each such revised addition and/or revision to the register shall be submitted to the EPA’s Representative for approval. This register and the progress schedules shall be coordinated.

3.4 TRANSMITTAL FORM

The sample Transmittal Form attached to this section shall be used for submitting both submittals requiring approval and information only submittals in accordance with instructions on the reverse side of the form. This form shall be properly completed by filling out all the heading blank spaces

and identifying each item submitted. Special care will 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.

3.5 SUBMITTAL PROCEDURE

Submittals shall be made as follows:

3.5.1 Procedures

The Contractor shall submit five copies, each with separate transmittal, and/or an electronic copy to the EPA’s Representative in accordance with the Submittal Register. The mailing address for these submittals shall be obtained at the Pre-Construction Conference. Items not to be submitted with five copies, as specified in the Submittal Register, such as samples and test cylinders, shall be submitted accompanied by five copies of the submittal register.

3.5.2 Deviations

For submittals that include proposed deviations requested by the Contractor, the column "variation" of the submittal register shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The EPA’s Representative reserves the right to rescind approval of submittals containing unnoted deviations.

3.5.3 The Contractor shall submit items listed on the Contract Drawings and listed or specified in the other sections of these specifications. The EPA’s Representative may request submittals in addition to those listed when deemed necessary to adequately describe the work covered in the respective sections. Each submittal shall be completed and in sufficient detail for ready determination of compliance with the contract requirements.

3.6 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.

3.7 APPROVED SUBMITTALS

Upon completion of review of submittals requiring approval, the submittals will be identified as having received approval by being so stamped and dated. Three copies of the submittal will be retained by the EPA’s Representative and one copy of the submittal will be returned to the Contractor.

3.8 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the EPA’s Representative is not required on information only submittals. The EPA’s Representative 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 EPA’s Representative from requiring removal and replacement of nonconforming material incorporated in the work.

3.9 RESUBMISSION REQUIREMENTS

3.9.1 Make any corrections or changes in the submittals required by the EPA’s Representative and resubmit until approved.

3.9.2 Revise initial drawings or data, and resubmit as specified for the initial submittal.

3.9.3 Indicate any changes which have been made other than those requested by the EPA’s Representative.

3.9.4 For samples, submit new samples as required for initial submittal.

3.10 PROFESSIONAL ENGINEER (P.E.) CERTIFICATION FORM

If specifically required in other Sections of these Specifications, the Contractor shall submit a New Jersey P.E. Certification for each item required, in the form attached to this Section, completely filled in and stamped.

3.11 SUBMITTAL DESCRIPTIONS

3.11.1 Pre-Construction Submittals

Pre-construction submittals are required prior to the start of construction (work) issuance of contract notice to proceed, or commencing work on site, or the start of the next major phase of the construction.

3.11.2 Shop Drawings

3.11.2.1 Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work. Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

3.11.2.2 Shop drawings include, but are not necessarily limited to, fabrication and installation drawings, schedule information and coordination drawings, as applicable to the work.

3.11.2.3 All calculations or analyses used to develop designs shall be submitted with the detailed shop drawings.

3.11.3 Product Data

Product data, as specified in individual sections include, but are not necessarily limited to, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer’s product specification and installation or use instructions, manufacturer’s printed statements of compliance and applicability, catalog cuts, product photographs, production or quality control inspection and test reports and certificates.

3.11.4 Samples

Samples specified in individual sections include, but are not necessarily limited to, physical examples of the items to be used in the work.

3.11.5 Design Data

Calculations, mix designs, analyses or other data pertaining to a part of the work

3.11.6 Test Reports

Reports signed by an authorized official of a testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accordance with specified requirements. Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to the job site. Report which includes findings of a test made at the job site or on a sample taken from the job site, on a portion of work during or after installation. Investigation reports. Daily checklists. Final acceptance tests and operational reports.

3.11.7 Certificates

Statements signed by responsible officials of the manufacturer of a product, system or material attesting that the product, system or material meets the specification requirements. Must be dated after award of project contract and clearly name the project. Document required of the Contractor, or of a supplier, installer or subcontractor through the Contractor, the purpose of which is to further the quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

3.11.8 Manufacturer’s Instructions

Preprinted material describing installation of a product, system or material, including special notices and Safety Data Sheets (SDS) concerning impedances, hazards and safety precautions.

3.11.9 Manufacturer’s Field Reports

Documentation of the testing and verification actions taken by the manufacturer’s representative to confirm compliance with the manufacturer’s standards or instructions. The documentation must be signed by an authorized official of a testing laboratory or agency, must state the test results, and indicate whether the material, product, or system has passed or failed the test.

3.11.10 Operation and Maintenance Data

Data that are furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel. These data are needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

3.11.11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

3.12 CONTRACTOR'S RESPONSIBILITIES

3.12.1 The Contractor shall review shop drawings, product data and samples prior to submission to determine and verify the following:

- Field measurements
- Field construction criteria

3.12.2 The review and approval of shop drawings or samples by the EPA’s Representative shall not relieve the Contractor from its responsibility with regard to the fulfillment of the terms of the contract. All risks of error and omission are assumed by the Contractor, and the EPA’s Representative will have no responsibility.

3.12.3 No portion of the work requiring a shop drawing, working drawings, sample, or catalog data shall be started nor shall any materials be fabricated, installed or used on the Site prior to the approval of the EPA’s Representative. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved shop drawings and data shall be at the Contractor's risk. The EPA’s Representative will not be liable for any expense for delay due to corrections or remedies required to accomplish conformity.

3.12.4 Project Work, materials, fabrication and installation shall conform to approved shop drawings, working drawings, applicable samples, and catalog data.

END OF SECTION

RMS SUBMITTAL REGISTER INPUT FORM											CONTRACT NUMBER						
TITLE AND LOCATION		RARITAN BAY SLAG SUPERFUND SITE, MARGARET'S CREEK SECTOR, OLD BRIDGE TOWNSHIP, MIDDLESEX COUNTY, NEW JERSEY															
SECTION	PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL										CLASSIFICATION				
			PRECONSTRUCTION SUBMITTALS	SHOP DRAWINGS	PRODUCT DATA	SAMPLES	DESIGN DATA	TEST REPORTS	CERTIFICATES	MFRS INSTRUCTIONS	MFRS FIELD REPORT	OPERATION & MAINTENANCE DATA	CLOSEOUT SUBMITTALS	FOR INFORMATION ONLY	EPA REPRESENTATIVE APPROVAL		
02955	1.3.1	WETLAND RESTORATION PLAN	●														●
02955	1.3.2	MATERIAL SAMPLES			●												●
02955	1.3.3	STATE NURSERY INSPECTION CERTIFICATES AND SAMPLES															●
02955	1.3.4	PLANT STOCK CERTIFICATIONS															●
02955	1.3.5	WETLAND SCIENTIST CERTIFICATION															●
02955	1.3.6	MAINTENANCE INSTRUCTIONS															●
02955	1.3.7	WETLAND RESTORATION INSPECTION REPORTS															●
02955	1.3.8	WETLAND RESTORATION MONITORING REPORTS															●
13300	1.2.1	WATER TREATMENT PLAN	●														●

SECTION 01351

SAFETY, HEALTH, AND EMERGENCY RESPONSE

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 This section provides requirements for developing and implementing a Site Safety and Health Plan (SSHP) for occupational and non-occupational exposure protection during excavation and handling of contaminated materials that is required by the Contractor’s Safety and Health Manager (SHM). The requirements shall apply to work performed in both “contaminated” and “clean” areas.

1.1.2 This section describes the responsibilities of the Contractor for safety, health, and emergency response. The work performed under these specifications shall be actively managed so as to:

- Prevent injuries to employees or other persons
- Maintain employee exposures to health hazards well below the occupational limits established by Occupational Safety and Health Administration (OSHA) or American Conference of Governmental Industrial Hygienists (ACGIH)
- Keep the exposure of area residents to air contaminants well below the levels established for general public exposure by OSHA, the United States Environmental Protection Agency (EPA), or the New Jersey Department of Environmental Protection (NJDEP).
- Prevent increasing contaminant levels in soil, water, and sediment near the site

Any disregard for the provisions of these safety and health requirements shall be deemed just and sufficient cause for termination of the contract without compromise or prejudice to the rights of the Contractor.

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. Where reference is made to one of the standards below, the revision in effect at the time of contract award shall apply. If conflicts exist between these standards, regulations, or requirements, the most stringent of the documents shall apply.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

ACGIH	Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices
ACGIH	Guide to Occupational Exposure Values

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z87.1	Occupational and Educational Personal Eye and Face Protection Devices
ANSI Z88.2	Practices for Respiratory Protection
ANSI Z89.1	Industrial Head Protection
ANSI Z358.1	Emergency Eyewash and Shower Equipment
ANSI Z590.3	Prevention through Design

AMERICAN PETROLEUM INSTITUTE (API)

API RP 2003	Protection Against Ignition Arising Out of Static, Lightning, and Stray Currents
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AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM F2412	Standard Test Methods for Foot Protection
ASTM F2413	Standard Specification for Performance Requirements for Foot Protection

CODE OF FEDERAL REGULATIONS (CFR)

10 CFR 19	Notices, Instructions and Reports to Workers: Inspection and Investigations
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
40 CFR 302	Designation, Reportable Quantities, and Notification
41 CFR Part 50-204	Safety and Health Standards for Federal Supply Contracts
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans

FEDERAL ACQUISITION REGULATION

52.236.13	Accident Prevention
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NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH Pub No. 85-115	Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities
NIOSH	Manual of Analytical Methods, 5th. Edition, Volumes 1 and 2

NIOSH Pocket Guide to Chemical Hazards, Pub No. 2010-168

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

OSHA Industrial Hygiene Field Technical Manual

TED 01-00-015 OSHA Technical Manual

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA Standard Operating Safety Guides

EPA Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)

EPA Air Quality Guidelines – National Ambient Air Quality Standards (NAAQS)

Order 1440.2 Health and Safety Requirements for Employees Engaged in Field Activities

NEW JERSEY ADMINISTRATIVE CODE (N.J.A.C.)

N.J.A.C. 16:25A Soil Erosion and Sediment Control Standards

N.J.A.C. 7:26E Technical Requirements for Site Remediation

N.J.A.C. 7:29 Noise Control

N.J.A.C. 7:13 Flood Hazard Area Control Act Rules

N.J.A.C. 7:26G Hazardous Waste

N.J.A.C. 7:26 Solid Waste

1.3 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with a “EA” designation; submittals having an “FIO” designation are for information only. The Contractor shall provide each of the following documents to the EPA’s Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES. The Contractor shall maintain a copy of all documents described in this section onsite at all times during construction.

1.3.1 Site Safety and Health Plan; Pre-Construction Submittals; EA

The Contractor shall submit the SSHP to the EPA’s Representative at least 21 calendar days prior to the Pre-Work conference. The SSHP must be approved by the EPA’s Representative prior to commencement of field activities. The Contractor shall allow 30 calendar days for the approval process.

A SSHP shall address in detail the issues listed below and in Paragraph 1.7 – Site Safety and Health Plan of this section. Significant aspects of the SSHP include:

- Site description and history
- Site map with hospital route
- Types of concentrations of site contamination
- Hazards of concern
- Waste characteristics
- Hazardous material summary
- Monitoring equipment
- Scope of construction work
- Work zones (exclusion zone, contamination reduction zone, support zone)
- Heat/cold stress monitoring
- Exposure monitoring and sampling program
- Accident prevention
- Activity hazard analysis for each major phase of work
- Organizational structure indicating personnel responsibilities
- Hearing conservation program
- Spill and discharge control procedures
- Material handling and disposal
- Engineering safeguards
- Dust control plan
- Personal protective equipment (PPE) requirements and maintenance procedures
- Standard operating procedures and work guidelines
- Site control measures
- Personal hygiene
- Equipment and personnel decontamination procedures
- Emergency response and contingency procedures
- Emergency contacts
- Logs, reports, and recordkeeping
- Medical surveillance requirements indicated in Paragraph 1.13 – Medical Surveillance
- Training requirements

In addition to describing how exposure levels will be maintained below maximum permissible concentrations (OSHA, ACGIH, etc.) the SSHP will also address the health and safety hazards associated with each site task and operation to be performed during the remedial action. The following outlines anticipated tasks/operations:

- Mobilization
- Topographic and excavation surveying
- Site preparation/clearing and grubbing

- Sediment containment area and stockpile/loadout area construction
- Soil erosion and sediment control
- Installation of temporary drainage features
- Installation and operation of temporary wastewater treatment and discharge system
- Sampling and chemical data acquisition
- Excavation
- Dewatering
- Soil/sediment disposal
- Backfilling and grading
- Wetlands and upland site restoration
- Decontamination of personnel, tools, and equipment
- Demobilization

1.3.2 Work Zone and Decontamination Facility Drawings; Shop Drawings; EA

The Contractor shall submit the drawings showing the Exclusion Zone, Contamination Reduction Zone and Support Zone boundaries and decontamination facility area for the EPA’s Representative’s approval prior to commencement of field activities.

1.3.3 Weekly Safety and Accident Reports; Product Data; FIO

The Contractor shall submit the following documents to the EPA’s Representative during the course of the project site work:

- Weekly Safety Report (within one week)
- Accident Notification (with 24 hours) and Report (within 6 days)

The accident report shall address 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 accident/incident.
4. Location of the accident/incident, i.e., site location, facility name.
5. Brief summary of the accident/incident giving pertinent details including type of operation ongoing at the time of the accident/incident including type of construction equipment used, PPE used, etc.
6. Cause of the accident/incident, if known.
7. Names of personnel injured.

8. Casualties (fatalities, disabling injuries).
9. Details of any existing chemical hazard or contamination.
10. Estimated property damage, if applicable.
11. Nature of damage, effect on contract schedule.
12. Action taken by Contractor to ensure safety and security.
13. Other damage or injuries sustained publicly or privately.

1.3.4 Exposure and Air Monitoring Data; Product Data; FIO

The Contractor shall submit the Air Monitoring Data required by this section.

1.3.5 Personnel Health and Safety Certificates; Certificates; FIO

The Contractor shall submit the following information to the EPA’s Representative for approval at or prior to the Pre-Work Conference:

- Initial medical certifications and annual exam certificates for all field personnel
- Training certificates for all field personnel who have completed the safety and health course required by OSHA 29 CFR 1910.120
- Respirator fit-test certificates for all field personnel
- Construction Safety

1.3.6 Safety and Health Manager Statements; Certificates; FIO

The Contractor shall submit the following information to the EPA’s Representative prior to mobilizing on site:

- An affidavit signed by the SHM indicating the Contractor's commitment to follow the SSHP
- A statement indicating that personnel who will enter the work zone understand that they are working on a hazardous waste site/operations and are trained and qualified in compliance with 29 CFR 1910.120(e)
-

1.3.7 Certificate of Worker/Visitor Acknowledgement; Certificates; FIO

The Contractor shall submit a Certificate of Worker/Visitor Acknowledgement for each worker or visitor on site in accordance with the requirements of this section.

1.3.8 Project Safety and Health Phase-Out Report; Closeout Submittals; FIO

The Project Safety and Health Summary Report shall be signed by the project SHM and submitted to the EPA’s Representative within 30 days of completing project site work. The report shall conform to the requirements of Paragraph 1.40 – Safety and Health Phase-out Report.

1.4 REGULATORY REQUIREMENTS

Work performed under this Contract shall comply with all applicable Federal, State, and local safety and occupational health laws and regulations. This includes, but is not limited to:

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION STANDARDS

29 CFR 1910	Section 38	“Emergency Action Plans”
	Section 95	“Occupational Noise Exposure”
	Section 120	“Hazardous Waste Operations and Emergency Response”
	Subpart I	“Personal Protection Equipment”
	Section 146	“Permit Required Confined Spaces”
	Section 147	“The Control of Hazardous Energy (Lockout/Tagout)”
	Subpart Z	“Toxic and Hazardous Substances”
29 CFR 1926	Section 21	“Safety Training and Education”
	Section 59	“Hazard Communication”
	Section 62	“Lead”
	Section 65	“Hazardous Waste Operations and Emergency Response”
	Subpart F	“Fire Protection and Prevention”
	Subpart M	“Fall Protection”
	Subpart P	“Excavations”
10 CFR 19	Section 11	“Notices, Instructions, and Reports to Workers: Inspections and Investigations”

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 PRE-CONSTRUCTION SAFETY CONFERENCE

Contractor representatives who have a responsibility or significant role in accident prevention on the project shall be required to attend a Pre-Construction Safety Conference where information including, but not limited to, work procedures, safety considerations associated with those work procedures, heavy equipment to be used, training and experience to operate equipment, and safety interventions such as training and safety equipment will be provided.

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 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

1.7.1 Preparation and Implementation

A SSHP shall be prepared covering onsite work to be performed by the Contractor and all subcontractors. The SHM 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.

1.7.2 Acceptance and Modifications

Prior to submittal, the SSHP shall be signed and dated by the SHM, and the Site Superintendent. The EPA’s Representative will review the SSHP and return it to the Contractor with comments. Deficiencies in the SSHP will be discussed at the Pre-Construction Safety Conference. The Contractor shall make all necessary amendments required by the EPA’s Representative and resubmit it for approval. This procedure shall continue until the EPA’s Representative gives final written approval. At that time, the Contractor shall indicate its commitment to following the SSHP by an affidavit, signed by the company SHM. The Contractor shall not mobilize onsite prior to receiving written approval of the SSHP.

Onsite work shall not begin until the plan has been approved and accepted by the EPA’s Representative. A copy of the written SSHP shall be maintained onsite and shall be made available in accordance with 29 CFR 1910, Section 120 (b) (1) (v) and 29 CFR 1926, Section 65 (b) (1) (v).1.8.4. As work proceeds, the SSHP shall be adapted to new situations and new health and safety conditions. It is the responsibility of the Contractor to ensure that the SSHP is updated accordingly. Changes and modifications to the accepted SSHP shall be made with the knowledge and concurrence of the SHM, the Site Superintendent, and the EPA’s Representative. The requested modification may not be implemented until authorized in writing by the EPA’s Representative. Should any unforeseen hazard become evident during the performance of the work, the Site Safety and Health Officer (SSHO) shall bring such hazard to the attention of the SHM, the Site Superintendent, and the EPA’s Representative, both verbally and in writing, for resolution as soon as possible. In the interim, necessary action shall be taken to re-establish and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment. Disregard for the provisions of this specification or the accepted SSHP shall be cause for stopping of work until the matter has been rectified.

1.8 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

The Margaret’s Creek Sector of the Raritan Bay Slag Superfund Site is a 47-acre property consisting of wetlands and upland areas associated with Margaret’s Creek located between the beach and State Highway Route 35. Site contaminants which have been identified in soil and sediment at depths ranging from ground surface to 4 feet below ground surface (bgs) include co-located lead at concentrations up to 78,000 milligrams per kilogram (mg/kg) and arsenic at concentrations up to 39 mg/kg. Additional heavy metals have been identified in many samples at lower concentrations, most frequently copper, chromium, and antimony. Primary sources of contamination identified within the Margaret’s Creek Sector include crushed battery casings present between ground surface to 2.5 feet bgs and secondary lead smelting slag present between the ground surface and up to 7 feet bgs. Both slag and crushed battery casings have failed Toxicity Characteristic Leaching Procedure (TCLP) testing for lead. Lead has been defined as the site contaminant of concern (COC).

Additional project site conditions are detailed in SECTION 01010 – SUMMARY OF WORK.

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

- Description of site location, topography, size and past uses of the Site.
- A list of contaminants that may present occupational safety and health hazards. This list shall be created by evaluating the analytical results in this section and by researching sources of information from past site investigation activities. Chemical names, concentrations ranges, affected media, locations onsite 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 ACTIVITY HAZARD ANALYSIS

Prior to beginning each major phase of work, an Activity Hazard Analysis shall be prepared by the Contractor performing that work, and submitted for review and acceptance. A major phase of work is defined as an operation involving a type of work presenting hazards not experienced in previous operations or where a new subcontractor or work crew is to perform. 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. Work shall not proceed on that phase until the activity hazard analysis has been accepted and a preparatory meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activities, including the government onsite representatives. The activity hazard analyses shall be continuously reviewed and, when appropriate, modified to address changing site conditions or operations, with the concurrence of the SHM, the Site Superintendent, and the EPA’s Representative. Activity Hazard Analyses shall be attached to and become a part of the SSHP. The Activity Hazard Analyses shall comply with 29 CFR 1910, Subpart I, “Personal Protective Equipment” and shall, as described in ANSI Z590.3, Prevention through Design, provide the information necessary for determining safety and health procedures, equipment, and training to protect onsite personnel, the environment, and the public. The following elements, at a minimum, shall be addressed.

The Contractor shall provide all equipment, materials, and personnel necessary to protect onsite personnel and members of the public from injury or exposure to physical, chemical, or biological hazards. The Contractor shall operate a program of protective equipment maintenance in accordance with the manufacturer’s specifications. All equipment shall be NIOSH-approved, if applicable. The EPA’s Representative will reject the use of equipment if, in the EPA’s Representative’s opinion, it provides less protection than that specified in the SSHP.

1.9.1 Site Tasks and Operations (Work Plan)

Based on the type of remediation required, anticipated major site tasks and operations to be performed, as described in Paragraph 1.3.1, and the initial levels of protection required appear in Table 01351-1.

TABLE 01351-1 TASK/SPECIFIC LEVELS OF PROTECTION

TASK	LEVEL OF PROTECTION IN EXCLUSION ZONE
Mobilization	D
Topographic Surveying	D Modified
Site Preparation/Clearing and Grubbing	Initial: D Modified Contingency: D
Sediment Containment Area and Stockpile Area Construction	Initial: D Modified Contingency: D
Installation of Water Treatment System	D Modified
Operation and Maintenance of Water Treatment System	D Modified
Sediment Dewatering ¹	D Modified
Excavation ^{1,2}	Initial: D Modified Contingency: C
Soil/Sediment Disposal ²	Initial: D Modified Contingency: C
Chemical Sampling ²	Initial: D Modified Contingency: C
Backfilling, Grading and Site Restoration	D Modified
Decontamination of Personnel, Tools and Equipment	D Modified
Demobilization	D Modified

¹ Any activities that take place on or near the water require the worker to wear a United States Coast Guard (USCG) approved Personal Floatation Device.

² Any workers performing intrusive activities or activities likely to lead to airborne lead shall be required to wear respirators until lead exposure monitoring results indicate that respiratory protection can be modified.

1.9.2 Hazards

The following potential hazards may be encountered during site work. This is not a complete list; therefore, the list shall be expanded and/or revised as necessary during preparation of the SSHP.

- Physical Hazards - Hazards including heavy equipment operation, contaminant handling,

- process equipment operations, slips, trips, and falls, etc.
- Chemical Hazards - Hazards involving chemical, physical and toxicological properties of contaminants sources and pathways of employee exposures, anticipated onsite and offsite exposure levels, and regulatory (including federal, state and local) or recommended protective exposure standards.
 - Physical Agents - Hazards associated with noise and heat/cold stress.
 - Biological Hazards - Hazards associated with poisonous plants, insects, and animals shall also be evaluated in the SSHP.
 - Action Levels - Action levels shall be established for the active work areas in accordance with current EPA air quality guidelines (NAAQS). Minimum acceptable action levels for active work areas appear in Table 01351-2.

TABLE 01351-2 MINIMUM ACCEPTABLE ACTION LEVELS

CONTAMINANT	LEVEL	ACTION TO BE TAKEN*
<u>ACTIVE WORK AREA</u>		
Dust in air (total, above bkg)	0.5 mg/ m ³	Evaluate dust suppression and work practices and take action to control dust
Airborne lead	30 µg/ m ³ averaged over an 8-hour period	Evacuate area
Noise	90 dBA	Implement engineering or administrative control
Combustible gas in air	>10% LEL	Evacuate area
Oxygen in air	< 19.5%	Evacuate area
	> 22%	Evacuate area

SITE PERIMETER

Refer to SECTION 01362 – PERIMETER AIR MONITORING for perimeter air monitoring and sampling requirements, action level and required actions.

Notes:

* Changes in these initial action levels may be required during the course of this project but will only occur with the written approval of the EPA’s Representative.

Abbreviations:

- mg/ m³ - milligrams per cubic meter
- µg/ m³ - micrograms per cubic meter
- dBA - decibels (A-weighted)
- bkg - background
- LEL - lower explosive limit

1.10 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

An organizational structure shall be developed that sets forth lines of authority, responsibilities, and communication procedures concerning site safety, health, and emergency response. The SSHP shall include a description of this organizational structure as well as qualifications and responsibilities of each of the following individuals. The structure shall include the means for coordinating and controlling work activities of subcontractors and suppliers. The Contractor shall obtain the EPA’s Representative’s acceptance before replacing any member of the Safety and Health Staff.

The safety and health organization shall be separately identified from the project's operations organizations in order to maintain the appropriate degree of independence from day-to-day activities. The project manager shall be responsible for safety and health on the project including providing the proper and adequate personnel, materials, and resources to implement the safety and health program.

1.10.1 Site Superintendent

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

1.10.2 Safety and Health Manager (SHM)

1.10.2.1 Qualifications

The services of a Certified Industrial Hygienist (CIH) certified by the American Board of Industrial Hygiene shall be used. The name, qualifications (education summary and documentation), and work experience summary shall be included in the SSHP. The SHM shall have the following additional qualifications:

- A minimum of three years’ experience in developing and implementing safety and health programs at hazardous waste sites
- Documented experience in supervising professional and technician-level personnel
- Documented experience in developing worker exposure assessment programs and air monitoring programs and techniques
- Documented experience in the development of PPE programs and conducting PPE hazard evaluations for the types of activities and hazards likely to be encountered on this project.
- Working knowledge of state and federal occupational safety and health regulations

1.10.2.2 Responsibilities

The SHM shall:

- Be responsible for the development, implementation, oversight, and enforcement of the SSHP
- Sign and date the SSHP prior to submittal
- Conduct initial site-specific training

- Be present on site during the first three days of remedial activities and at the startup of each new major phase of work
- Visit the site as needed and at least once per month during construction activities, to audit the effectiveness of the SSHP. Any safety and health deficiencies shall be noted in writing with action items identified and assigned so as to resolve deficiencies.
- Be available at all times for emergencies
- Provide consultation as needed to ensure the SSHP is fully implemented
- Coordinate any modifications to the SSHP with the Site Superintendent, the SSHO, and the EPA’s Representative
- Provide continued support for upgrading/ downgrading the level of personal protection
- Be responsible for evaluating air monitoring data and recommending changes to engineering controls, work practices, and PPE
- Review accident reports and results of daily inspections
- Serve as a member of the Contractor’s quality control staff

1.10.3 Site Safety and Health Officer (SSHO)

1.10.3.1 Qualifications

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

- A minimum of two years’ experience in implementing safety and health programs at hazardous waste sites where Level C PPE was required
- Documented experience in construction techniques and construction safety procedures
- Working knowledge of federal and state occupational safety and health regulations
- 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
- Certified as having completed training in First Aid and CPR by a recognized organization such as the American Red Cross

1.10.3.2 Responsibilities

The SSHO shall:

- Assist and represent the SHM in onsite training and the day-to-day onsite implementation and enforcement of the accepted SSHP. The SSHO shall report directly to the SHM.
- 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 (ERP), spill containment program, and preparation of records by performing a daily safety and health inspection and documenting results on the Daily Safety Inspection Log in accordance with 29 CFR 1904.

- Have authority to stop work if unacceptable health or safety conditions exist, and take necessary action to re-establish and maintain safe working conditions.
- Consult with and coordinate any modifications to the SSHP with, the SHM, the Site Superintendent, and the EPA’s Representative.
- Serve as a member of the Contractor's quality control staff on matters relating to safety and health.
- Conduct accident investigations and prepare accident reports.
- Review results of daily quality control inspections and document safety and health findings into the Daily Safety Inspection Log and track noted safety and health deficiencies to ensure that they are corrected.
- Conduct emergency response training which shall include the following: procedures, spill plans, firefighting plans, posting of emergency numbers, and medical support.
- In coordination with site management and the SHM, recommend corrective actions for identified deficiencies and oversee the corrective actions.

1.10.4 Occupational Physician or Licensed Health Care Provider (LHCP)

1.10.4.1 Qualifications

The services of a licensed physician or LHCP, who is certified in occupational medicine by the American Board of Preventative Medicine, or who, by necessary training and experience is Board-eligible, shall be used. The physician or LHCP shall be familiar with the site hazards and the scope of this project. The medical consultant's name, qualifications, and knowledge of the Site's conditions and proposed activities shall be included in the SSHP.

1.10.4.2 Responsibilities

The physician or LHCP shall be responsible for the determination of medical surveillance protocols and for review of examination/test results performed in compliance with 29 CFR 1910, Section 120 (f) and 29 CFR 1926, Section 65 (f) and Paragraph 1.13 – Medical Surveillance.

1.10.5 Persons Certified in First Aid and CPR

At least two persons who are currently certified in first aid, CPR, and use of an automated external defibrillator by the American Red Cross or other approved agency shall be on site at all times during site operations. He/she shall be trained in universal precautions and the use of PPE as described in the Blood borne Pathogens Standard of 29 CFR 1910, Section 1030. The person may perform other duties but shall be immediately available to render first aid when needed.

1.10.6 Safety and Health Technicians

For each work crew in the Exclusion Zone (EZ), one person, designated as a Safety and Health technician, shall perform activities such as air monitoring, decontamination, and safety oversight on behalf of the SSHO. They shall have appropriate training equivalent to the SSHO in each specific area for which they have responsibility and shall report to the SSHO.

1.11 TRAINING

All onsite Contractor personnel involved in intrusive work, or work that could expose them to site related contamination shall receive training in accordance with the Contractor's written safety and health training program and 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. Personnel not involved with intrusive work, such as sediment containment area construction shall not require the above training.

1.11.1 General Hazardous Waste Operations Training

Personnel entering the EZ or Contamination Reduction Zone (CRZ) shall have successfully completed 40 hours of hazardous waste instruction off the Site, three days actual field experience under the direct supervision of a trained, experienced supervisor, and eight hours refresher training annually. Onsite supervisors shall have completed the above training and eight hours of additional, management and supervisor training as specified in 29 CFR 1910.120/29 CFR 1926.65 (e) (4). Copies of current training certification statements shall be submitted prior to initial entry onto the work site. The Contractor shall maintain, at the work site, documentation that shows that each onsite employee or subcontractor has completed the safety and health training course appropriate for their job function and responsibility. The training certificates shall be current within 12 months of the start of work and remain up-to-date during work performance.

1.11.2 Site-specific Training

The Contractor’s SHM shall approve a site-specific training session for the Contractor and government personnel scheduled to work onsite. This training may be given by the SSHO. This site-specific training shall consist of an initial safety and health briefing on the following information:

- Names of personnel and alternate responsible for site safety and health
- Hazards present on the Site
- Hazard communications training
- Safe use of engineering controls and equipment onsite
- Work practice by which the employee can minimize risks from hazards
- Selection, use, care, and maintenance of PPE
- Site control procedures, including log-in and log-out
- Site decontamination procedures
- Standard operating safety procedures
- Site emergency response contingency plan

1.11.2.1 Initial Session (Pre-entry Briefing)

Prior to commencement of onsite field activities, all site employees, including those assigned only to the Support Zone (SZ), shall attend a site-specific safety and health training session to ensure that all personnel are familiar with requirements and responsibilities for maintaining a safe and healthy work environment. Procedures and contents of the accepted SSHP shall be thoroughly discussed. The EPA’s Representative shall be notified at least five calendar days prior to the initial site-specific training session so government personnel involved in the project may attend.

1.11.2.2 Periodic Sessions

Periodic on-site training shall be conducted by the SSHO for personnel assigned to work at the Site during the following week. The training shall address safety and health procedures, work practices, any changes in the SSHP, activity hazard analyses, work tasks, schedules, results of previous week's air monitoring, review of safety discrepancies and accidents.

All onsite personnel (Contractor, subcontractor(s), and government representatives) shall participate in the specified, periodic safety meetings. All affected personnel shall attend the special training. Training attendance and participation shall be documented in a training log. The SHM may delegate the day-to-day implementation of this follow-up training policy to the SSHO.

1.11.2.3 Training logs shall document personnel in attendance, topics covered and length of training for each type of training.

1.12 PERSONAL PROTECTIVE EQUIPMENT

1.12.1 The Contractor’s PPE Program shall comply with 29 CFR Part 1910.132, 29 CFR Part 1910.120, and 29 CFR Part 1910.136. Onsite personnel exposed to contaminants shall be provided with appropriate personnel protective equipment. Components of levels of protection (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. 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 onsite fit-testing of respirators, cleaning, maintenance, inspection, and storage of PPE.

1.12.2 Operations under this contract may require work exposure to potentially hazardous materials. The Contractor shall, therefore, provide and ensure the wearing of all necessary PPE for all personnel on site. All personnel entering the Work Zones shall don, at a minimum, level D PPE. The SHM shall establish and evaluate, as the work progresses, the levels of protection for each work activity. The SHM shall also establish action levels for upgrade or downgrade in levels of PPE. Protocols and the communication network for changing the level of protection shall be described in the SSHP. The PPE evaluation protocol shall address air monitoring results, potential for exposure, changes in site conditions, work phases, job tasks, weather, temperature extremes, individual medical considerations, etc.

1.12.3 Based on available information, the initial minimum protection for each major task and operation appear in Table 01351-1. 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.

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

- a. Level D – Work clothing, as dictated by the weather
 - i. Safety (steel toe/shank) shoes or boots
 - ii. Safety glasses, goggles, or face shield

- iii. Disposable, hooded, one-piece, full-body coveralls constructed of spun-bonded olefin or polypropylene fabrics (e.g. Tyvek or equivalent)
- iv. Hard hat
- v. Items from the Level D modified list, as required for tasks.

b. Modified Level D –

- i. Hard hat
- ii. Safety glasses, goggles, or face shield
- iii. Nitrile, neoprene or natural rubber gloves (when handling contaminated soils or water)
- iv. Gloves with cotton liners
- v. Hearing protection (where required)
- vi. Disposable boot covers of (minimum) 60 mil rubberized PVC
- vii. United States Coast Guard (USCG) approved Personal Flotation Device for activities that occur over or near water

c. Level C –

- i. Full-face piece, air purifying respirator equipped with filter cartridges approved by NIOSH for particulates and lead
- ii. Disposable, hooded, one-piece, full-body coveralls constructed of spun-bonded olefin or polypropylene fabrics (e.g. Tyvek or equivalent)
- iii. Nitrile, neoprene or natural rubber gloves (when handling contaminated soils or water)
- iv. Gloves with cotton liners
- v. Safety (steel toe/shank) shoes or boots (Boot cover: optional)
- vi. If applicable, a USCG approved Personal Flotation Device

1.12.5 Respiratory Protection

The Contractor's SHM shall establish in writing, and implement a respiratory protection program in accordance with 29 CFR 1910.134, ANSI Z88.2. The Contractor shall provide each individual with respirators until lead exposure monitoring results indicate that respiratory protection can be modified. The Contractor’s SHM shall make all determinations regarding respiratory protection modifications that will be implemented for the work. All modifications shall be in accordance with the OSHA Lead in Construction Standard (29 CFR 1926.62).

1.12.6 PPE for Government Personnel

Five clean sets of PPE and clothing (excluding air-purifying negative-pressure respirators and safety shoes, which will be provided by individual visitors), as required for entry into the EZ and/or CRZ, shall be available at all times for use by the EPA’s Representative or official visitors. The items shall be cleaned and maintained by the Contractor and stored 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. Visitors shall be responsible for adhering to the requirements of their Safety and Health Plan as well as the Contractor’s Safety and Health Plan.

1.13 MEDICAL SURVEILLANCE

The SHM, in conjunction with the Occupational Physician or LHCP, shall detail, in the Contractor’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 or LHCP. The Contractor shall use the service of a licensed physician board-certified or board-eligible in occupational medicine to provide a medical surveillance program as required by OSHA regulations. This would be without cost to the employee, without loss of pay and at a reasonable time and place. Selection of medical tests is the responsibility of the physician or LHCP, who shall certify that such medical surveillance meets the requirements of OSHA Standard 29 CFR 1910.120, and 29 CFR 1926, Section 65. The contents of the exam shall include wearing the PPE specified for the Site. The protocol below is an example of requirements common in this industry. Final determination of tests should be made by the physician who performs the physical examination. The content of the medical examination shall be submitted to the EPA’s Representative and shall be relevant to the site conditions.

1.13.1 Frequency of Examinations

Employees shall have been provided with medical examinations as specified, within the last 12 months and shall receive exams annually thereafter (if contract duration exceeds one year); on termination of employment; reassignment in accordance with 29 CFR 1910, Section 120 (f)(3)(i)(C), 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 or LHCP 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 or LHCP 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.

Medical examinations must be repeated under the following conditions:

- At the discretion of the Contractor's Occupational Physician or LHCP, the EPA’s Representative, the SHM, or the SSHO
- At the request of an employee with demonstrated symptoms of exposure to toxic or hazardous materials
- Within 30 days of the completion of onsite work activities if the person is to leave the job site for periods greater than six months

Before work begins a copy of the physician’s written opinion of fitness for work for each employee and ability to wear required respiratory protection shall be obtained and furnished to the SHM and the employee.

1.13.2 Content of Examinations

The physical examination/consultation shall verify the following information about the medical surveillance program participants:

- Baseline health conditions and exposure history.
- Allergies, sensitivity and susceptibility to hazardous substances exposure.

- Ability to wear PPE inclusive of NIOSH-certified respirators under extreme temperature conditions.
- Fitness to perform assigned duties.

1.13.3 Information Provided to the Occupational Physician

The Contractor shall provide the Occupational Physician with the following information for each medical surveillance program participant:

- Information on the employee’s anticipated or measured exposure.
- A description of any PPE used or to be used.
- A description of the employee’s duties as they relate to the employee’s exposures (including physical demands on the employee and heat/cold stress).
- A copy of 29 CFR 1910, Section 120, or 29 CFR 1926, Section 65.
- Information from previous examinations not readily available to the examining physician.
- A copy of Section 5 of NIOSH Pub No. 85-115.
- Information required by 29 CFR 1910, Section 134.

1.13.4 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 SHM and the employee. The opinion shall address the employee’s ability to perform hazardous remediation work and shall contain the following:

- The physician’s verification of the employee’s fitness to perform duties as well as recommended limitations upon the employee’s assigned work and/or PPE usage.
- The physician’s opinion about increased risk to the employee’s health resulting from work.
- A statement that the employee has been advised about the results of the examination.

1.13.5 Employee Certificates

Employee certificates shall be provided for each worker performing cleanup operations with potential for contaminant-related occupational exposure. Employee certificates shall be signed by the SHM and the Occupational Physician indicating that the workers meet the contract requirements for training and medical surveillance.

1.13.6 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. The Contractor shall maintain all medical surveillance records for thirty years post-employment and make these records available to the EPA’s Representative or other regulatory agencies, as required.

1.14 EXPOSURE MONITORING AND AIR SAMPLING PROGRAM

1.14.1 General

1.14.1.1 The SSHP shall include the exposure monitoring/air sampling procedures for occupational exposures. The air monitoring, at minimum, shall include procedures to detect combustible gases, oxygen levels, airborne lead and dust. The exposure monitoring plan shall be designed to identify and quantify safety and health hazards and airborne levels of hazardous substances in order to ensure proper selection of engineering controls, work practices and PPE for affected site personnel. The plan shall provide enough information to allow the SSHO to recognize conditions that require changes in work practices or level of protection.

1.14.1.2 Initial exposure monitoring shall be conducted to determine if any workers may be exposed to lead at or above the action level. The exposure assessment shall be performed in accordance with 29 CFR 1926.62(d). During the exposure assessment, the Contractor shall meet requirements of 29 CFR 1926.62(d)(2)(v). Any modifications to respiratory protection shall be made based on the exposure assessment in accordance with 29 CFR 1926.62.

1.14.1.3 During excavation, unloading, and handling of excavated materials, the Contractor shall monitor air contaminant levels at least four times per shift on a daily basis (or at the discretion of the SSHO). The types of measurements to be collected shall be listed in the APP/SSHP with examples of the instruments to be used. After the initial phase of monitoring, if the SHM determines that a reduced level of monitoring is appropriate, the SHM shall decrease the monitoring requirements in consultation with the EPA’s Representative. The Contractor shall perform real-time air monitoring for an adequate period prior to commencement of work to establish baseline conditions for lead and respirable particulates.

1.14.1.4 Equipment used for air monitoring in accordance with this section shall be calibrated before and after each use and maintained as per specified methods, manufacturer’s recommendations, and good industrial hygiene practices. The Contractor shall document, in the Site log or site files, the regular calibration of each instrument used. Only individuals trained to operate this equipment shall do so.

1.14.1.5 The following publications define terms and establish contaminant evaluation and monitoring procedures discussed in this specification. These publications are incorporated into this specification by reference:

- Threshold Limit Values and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists (ACGIH) (current edition)
- Manual of Analytical Methods, 4th. Edition, Volumes 1 and 2, National Institute for Occupational Safety and Health (NIOSH)
- OSHA Technical Manual, U. S. Department of Labor, Occupational Safety and Health Administration (OSHA)
- Air Contaminants - Permissible Exposure Levels, 29 CFR 1910.1000

1.14.2 Meteorological Monitoring

1.14.2.1 The Contractor shall furnish and maintain a portable meteorological station for the continuous observation and recording of wind speed, wind direction, ambient air temperature, atmospheric pressure, atmospheric humidity, solar insolation, and atmospheric precipitation. The equipment and its placement shall be in conformance with EPA Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD). The station shall also include a continuous readout temperature gauge and a rainfall gauge.

1.14.2.2 The meteorological station shall be positioned by the SSHO to provide representative data on the overall atmospheric diffusion conditions at the Site. Visual wind direction indicators shall be established in a central location at each active work area. The meteorological station shall be installed in an area relatively free of trees and houses, at the office trailer or in the Support Zone of the Site. The station shall be capable of recording all measured parameters every 5 minutes. The station shall be able to produce a 24-hour average figure for each parameter so that the weather influences on the air samples can be characterized. The station shall also transmit real-time data back to a central location so that the real-time particulate monitoring can be correlated to wind direction.

1.14.2.3 Meteorological data collected by the station shall be effectively logged on each day of intrusive site work, so that the weather influences on the air samples can be characterized. The Contractor shall maintain records, written or electronic, of the meteorological monitoring results for the duration of the project. Meteorological monitoring results shall be documented in the Daily Safety Log by the SSHO.

1.14.2.4 The calibration, audit, data reduction, and document control of meteorological equipment and meteorological data shall be specified by the Contractor. For the purposes of this document, it is assumed that hourly averages of all meteorological parameters during the entire air monitoring program shall be collected, tabulated, and verified. Meteorological data shall be submitted with air monitoring data.

1.14.2.5 Visual wind direction indicators shall be established in a central location at each active work area.

1.14.3 Real-Time Air Monitoring

1.14.3.1 The Contractor shall furnish and maintain real-time air monitoring equipment and all necessary calibration/audit equipment and supplies to detect and monitor dust, combustible gas, and oxygen levels. All equipment shall be intrinsically safe. Perimeter air monitoring shall be performed in accordance with SECTION 01362 – PERIMETER AIR MONITORING.

1.14.3.2 The Contractor shall perform real-time air monitoring adjacent to each open excavation, staging and loading areas, and any contaminated liquids handling areas in the Exclusion Zones. This monitoring shall be performed in the breathing zone of the highest-risk employee in the Exclusion Zone.

1.14.3.3 The Contractor shall provide real-time monitoring for dust using a total airborne dust monitor (MIE-Ram-1 or equivalent), and with data logging capabilities, at the designated perimeter

stations and within 10 feet (downwind) of appropriate areas adjacent to soil excavation, staging and loading operations.

1.14.3.4 Onsite monitoring frequency total/respirable dust shall be every 30 minutes or less during onsite waste handling activities and at intervals consistent with the Contractor’s SSHP during all other activities to limit personal exposure. Real-time monitoring at each perimeter air monitoring station shall be performed a minimum of four times per shift.

1.14.3.5 See Table 01351-2 for minimum acceptable action levels under the Contractor’s SSHP and responses to their exceedance. The Contractor is responsible for analyzing specific project circumstances and requirements and developing appropriate action levels and responses. Action levels must be approved by the EPA’s Representative.

1.14.3.6 When working in confined spaces or excavations deeper than four feet, the Contractor shall utilize a combination of combustible gas indicator (CGI) and oxygen monitor to monitor combustible gas and oxygen levels. Should the combustible gas meter and oxygen monitor indicate levels outside the action levels shown on Table 01351-2, personnel should be evacuated from the space immediately.

1.14.3.7 A data sheet shall be developed and implemented by the SHM upon which the following real-time monitoring data will be recorded:

- Date and time of monitoring.
- Air monitoring location.
- Instrument, model number, serial number.
- Calibration/background levels.
- Results of monitoring.
- Safety and Health Specialist/Industrial Hygienist Technician signature.
- Interpretation of the data and any further recommendations by the SHM or the SSHO in consultation with the SHM.

The person conducting the monitoring must sign and date the data sheets as they are filled in. The SSHO, as appropriate, shall review then sign and date the data sheets weekly. These results shall be given verbally to the EPA’s Representative following each site scan for which concentrations exceed the action levels. This shall be documented in writing by the end of each work day with three copies provided to the EPA’s Representative.

1.14.3.8 The person obtaining the sample or conducting the monitoring must sign and date the data sheets as they are filled in. The SSHO, as appropriate, shall sign and date the data sheets weekly after their review. All measured air concentrations of particulates and exposure durations shall be recorded. Records of these exposures shall be placed in the employee’s permanent medical files.

1.14.3.9 Monitoring and exposure results shall be given verbally to the EPA’s Representative following each site scan that indicates concentrations in excess of the action levels, and documented in writing by the end of each work day with three copies provided

1.15 HEAT AND COLD STRESS MONITORING

The SHM shall develop a heat stress and cold stress-monitoring program for onsite 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. Heat and cold stress monitoring program shall be in accordance with NIOSH/ACGIH recommended procedures.

1.16 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. These shall include, but not be limited to, the following:

- General site rules/prohibitions for personal hygiene
- Lock out/tag out procedures in accordance with 29 CFR 1910.147
- Work permit requirements including documenting utility clearances on a Field Safety Checklist. An example of this checklist is at the end of this section
- Material handling procedures to be followed in the handling, storage, and disposal of solids and/or liquids
- Spill and discharge control procedures including a description of prevention measures, such as building berms or dikes, 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
- Drum and container handling procedures and precautions for the handling, storage, and disposal of encountered drums and containers
- Confined Space Entry procedures in compliance with 29 CFR 1910.146, “Permit Required Confined Spaces”, if required
- Hearing conservation measures
- Illumination measures
- Sanitation measures including toilet and potable water facilities
- Fire Prevention
- Excavation and trenching as described in Paragraph 1.17 – Excavation

1.17 EXCAVATION

1.17.1 The Contractor shall identify all buried utility lines within the work zones and take action to protect them before digging near them in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.

1.17.2 The Contractor shall erect a visible barrier or fence at the edge of any open excavation. Members of the general public shall be kept away from the excavation. Neither heavy equipment nor excavated material may be placed within two feet of an open excavation. All mobile equipment shall be provided with working back-up alarms, brakes, and shut-off switches. Operators shall not leave their equipment while it is running.

1.17.3 For trench excavation over 4 feet in depth, the Contractor shall comply with OSHA Confined Space Standards. The SSHO shall be required to approve the confined space entry procedures in compliance with 29 CFR 1910.146, “Permit-Required Confined Spaces,” with the assistance of the SHM.

1.17.4 Excavations shall comply with 29 CFR 1926 Subpart P and its appendices. The Contractor shall ensure proper sloping, shoring, benching and other applicable standards defined in Subpart P. The Contractor shall employ a Registered Professional Engineer to inspect and approve shoring or sloping prior to placing an individual into a trench or other excavation requiring compliance with this standard.

1.17.5 The form at the end of this section entitled “Excavation Safety Signoff Sheet” shall be completed by the Contractor, City, and utility representatives listed before excavation commences.

1.18 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 site control measures similar to those described in the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (NIOSH Pub No. 85-115). The SSHP shall describe the methodology to be used by the SHM 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, the EPA’s Representative, and visitors.

1.18.1 Work Zones

Initial anticipated work zone boundaries (Exclusion Zone, including restricted and regulated areas, Contaminant Reduction Zone, and Support Zone) and access points shall be established, and the boundary delineations shall be included 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 – Activity Hazard Analysis. As work progresses and field conditions are monitored, work zone boundaries may be modified with approval of the EPA’s Representative. 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 onsite office. Work zones shall consist of the following:

Exclusion Zone (EZ): The EZ 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 Contaminant Reduction Zone.

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

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

1.18.2 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 EZ (if applicable), and PPE used. 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, an example of which is included at the end of this section. This visitor information, including date, shall be recorded in the log.

1.18.3 Communications

The SSHP shall identify the method by which Contractor personnel shall communicate in the event of an emergency. Communications with the office trailer, if it is outside vocal range, shall be by radio. Two-way radio communication shall be required during construction activity. Communications between Contractor and other organizations (e.g., the EPA’s Representative, or the emergency response provider) shall be over the telephone. The EPA’s Representative shall direct safety and health correspondence to the SHM through the Contractor’s Project Manager. At a minimum, the following emergency telephone numbers must appear in the SSHP:

- Medical treatment facility and physician, including names and address
- Ambulance services
- Fire department
- Police department
- EPA Region 2
- EPA and NJDEP spill control
- EPA’s Representative
- National Response Center
- Site security

1.18.4 Signs

The Contractor shall provide, install, and maintain signs and other warning devices to inform site personnel and members of the public of hazards present on the site in accordance with SECTION 01580 - SIGNS.

The Contractor shall post the following warning signs in each work area where the lead action level is exceeded:

DANGER
LEAD
MAY DAMAGE FERTILITY OR THE UNBORN CHILD
CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM
DO NOT EAT, DRINK OR SMOKE IN THIS AREA

1.19 PERSONAL HYGIENE AND DECONTAMINATION

1.19.1 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 SZ from the EZ. 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.

1.19.2 A personnel decontamination facility shall be provided within the CRZ. This facility shall be used by both Contractor personnel and the EPA’s Representative. The following facilities shall be made available to all onsite personnel:

- Contained storage and legal disposal of used disposable outerwear.
- Hand and face washing facilities.
- A facility for changing into and out of and storing work clothing separate from street clothing.
- A lunch and/or break room.
- A smoking area.

1.19.3 Disposable PPE used in the work zone shall not be reused, and, when removed, shall be discarded into properly labeled PPE impermeable receptacles located in the CRZ.

1.19.4 Non-disposable PPE shall be washed with a low-sudsing detergent, rinsed with warm water, and then wiped dry with a disposable cloth. The Contractor shall evaluate the use of a qualified service to launder PPE. The decontamination wash water shall be collected, treated on site, and discharged to the Middlesex County Utilities Authority (MCUA) publicly owned treatment works (POTW) sanitary sewer system or to surface water. Decontaminated PPE shall be stored in a secure area of the SZ. All PPE worn onsite shall be decontaminated or properly stored or disposed of at the end of the work day. The Site Superintendent shall be responsible for ensuring all PPE is decontaminated before being reissued, and the SSHO shall verify that this task is performed. The following guidelines are minimum requirements for the Contractor’s personnel decontamination procedures:

Level C Decontamination

Station 1:	Equipment Drop	Deposit equipment (tools, sampling devices and containers, monitoring instruments, radios, clipboard, etc.) on plastic drop cloths. During hot weather, set up a cool down station within this area.
Station 2:	Outer Garment, Boots, and Gloves Wash and Rinse	Scrub outer boots, outer gloves, and splash suit with either decon solution or detergent water as appropriate. Rinse off using copious amounts of water.
Station 3:	Outer Boot and Glove Removal	Remove outer boots and gloves. Deposit in container with plastic liners.
Station 4:	Canister or Mask Change	If worker leaves EZ to change canister (or mask), this is the last step in the decontamination procedure. Worker’s canister is exchanged, new outer gloves and boot covers donned, joints taped, and worker returns to duty.
Station 5:	Boot and Outer Garment Removal	Remove and deposit in separate containers lined with plastic.
Station 6:	Facepiece Removal	Remove facepiece. Avoid touching face with fingers. Deposit facepiece on plastic sheets.
Station 7:	Gloves	Remove and deposit inner gloves in the container lined with plastic.
Station 8:	Field Wash	Thoroughly wash hands and face.

Modified Level D/Level D Decontamination

Station 1:	Equipment Drop	Deposit equipment used onsite (tools, sampling devices and containers, monitoring instruments, radios, clipboard, etc.) on plastic drop cloths. During hot weather operations, cool down station may be set up within this area.
Station 2:	Boots and Gloves Wash and Rinse	Scrub outer boots and gloves with either decon solution or detergent water as appropriate. Rinse off using copious amounts of water.
Station 3:	Outer Boot and Glove Removal	Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4:	Boot, Gloves, and Outer Garment Removal	Remove and deposit boots, chemical-resistant splash suit, and inner gloves in separate containers lined with plastic.
Station 5:	Field Wash	Thoroughly wash hands and face.

1.19.5 Smoking and chewing of tobacco or chewing gum shall be prohibited except in the designated smoking area, provided by the Contractor, in the SZ. Eating and drinking shall be prohibited except in the designated lunch or break area, provided by the Contractor, in the SZ. All outerwear shall be removed prior to entering the lunch area or smoking area, and prior to washing hands. Contractor personnel shall be required to thoroughly cleanse their hands and other exposed areas before entering the smoking or lunch area.

1.20 VEHICLE/EQUIPMENT DECONTAMINATION

1.20.1 Vehicles and equipment used in the EZ, and construction debris including stumps to be disposed of as clean materials shall be decontaminated in the CRZ prior to leaving the Site. The procedures for decontamination of vehicles, equipment and construction debris shall be addressed in the SSHP.

1.20.2 A decontamination station shall be constructed within the CRZ for decontaminating vehicles and equipment leaving the EZ. As a minimum, this facility shall include a high pressure wash area for equipment and vehicles and a steam cleaning system for use after the mud and/or site material has been cleaned from the equipment. At the decontamination pad, all visible contamination shall be removed with scrub brushes and high-pressure water sprays. The station shall be constructed to capture decontamination water, including overspray, and shall allow for collection and removal of the decontamination water using sumps, dikes and ditches as required. Decontamination water from these washing procedures shall be collected, treated on site, and discharged to the MCUA POTW or to surface water.

1.20.3 Procedures for equipment decontamination shall be developed and used to prevent the spread of contamination into the SZ and offsite areas. These procedures shall address disposal of contaminated products and spent materials used on the Site, including containers, fluids, oils, etc. Vehicles, equipment, and materials shall be decontaminated and inspected 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 offsite. Prior to exiting the Site, vehicles and equipment shall be monitored to ensure the adequacy of decontamination. Personnel engaged in vehicle decontamination shall wear protective equipment including protective clothing and respiratory protection consistent with the requirements of this specification and the SSHP.

1.20.4 A special "clean area" shall be established for performing equipment maintenance. This area shall be used when personnel are required by normal practices to expose themselves to contact with soil or sediment, (i.e., crawling under a vehicle to change engine oil). All equipment shall be decontaminated by washdown in the CRZ prior to maintenance work. Maintenance such as greasing heavy equipment need not require decontamination unless the job requires body contact with soil or sediment.

1.20.5 Seats of equipment and vehicles used in the EZ shall not be cloth-covered. They shall be free from cracks or holes that would allow dust to enter seat padding or shall be covered with a temporary sheet vinyl covering.

1.21 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:

- Advanced First Aid, including AED, equipment and supplies approved by the consulting physician
- Emergency eyewashes and showers which comply with ANSI Z358.1
- Emergency-use respirators. For rescue purposes, two positive pressure self-contained breathing apparatus (SCBA) shall be supplied. These shall be dedicated for emergency use only and maintained on site in the CRZ.
- Fire extinguishers with a minimum rating of 20-A:120-B:C shall be provided at site facilities and in all vehicles and at any other site locations where flammable or combustible materials present a fire risk.
- Spill control materials and equipment that are sufficient to meet the requirements described in Paragraph 1.23– Spill and Discharge Control.
- Water emergency and personal protective equipment.

1.22 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

An Emergency Response Plan (ERP) 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. This plan must present procedures the Contractor shall follow in the case of an injury or in case the Contractor observes an emergency unrelated to the field work. In the event of any emergency associated with the remedial action, the Contractor shall, without delay, alert all onsite employees that there is an emergency situation, take action to remove or otherwise minimize the cause of the emergency, alert the EPA’s Representative, and institute measures necessary to prevent repetition of the conditions or actions leading to, or resulting in, the emergency. 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 any revision shall be provided to the affected local emergency response agencies. The following elements, at a minimum, shall be addressed in the plan:

- Pre-Emergency Planning: The local emergency response agencies shall be contacted and met with during the preparation of the ERP, and the Contractor shall be required to conduct a site visit for the appropriate response agencies. Involvement of local fire, police, and rescue authorities is necessary to ensure better coordination and proper implementation of the plan. In all cases the site-specific Emergency Response Plan must be consistent with the community contingency plan regardless of whether local responders are used during remedial action. The form at the end of this section entitled “Agreement for Emergency Response Services” shall be used by the Contractor to develop an individual agreement between the Contractor, a local emergency responder, and EPA. The visit should provide the agencies with information on site layout, nature and scope of work, schedule, hazardous potentials of materials associated with site activities, onsite personnel locations, locations of utility lines, entrance and egress routes, emergency communications, decontamination procedures, response times, evacuation routes, the SSHP, response constraints, and ERP components.
- Acceptance letter of an Emergency Care Facility issued by SHM.

- Personnel roles, lines of authority, communications for emergencies and training.
- Emergency recognition and prevention.
- Site topography, layout, and prevailing weather conditions.
- 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).
- Specific procedures for decontamination and medical treatment of injured personnel.
- Route maps to nearest pre-notified medical facility. Site support vehicles shall be equipped with maps. The Contractor shall visit the hospital designated in the SSHP to determine whether they can handle the types of injury that might occur at the Site. At the beginning of project operations, drivers of the support vehicles shall become familiar with the emergency route and the travel time required.
- 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 SHM, the Site Superintendent, the EPA’s Representative and/or their alternates).
- Criteria for initiating community alert program, contacts, and responsibilities.
- 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 EPA’s Representative shall be verbally notified immediately and receive a written notification within 24 hours.
- Procedures for critique of emergency responses and follow-up.
- Site security and control for incidents.
- Procedures to monitor and respond to severe weather, flooding and blizzards.
- Procedures for dealing with fires, explosives and spills.
- Procedures for decontaminating emergency response vehicles and equipment.

Contingency Planning Procedures and Contractor personnel responsibilities for potential emergencies shall be identified in the SSHP. Emphasis in the contingency planning section shall be placed on procedures. Contingency planning shall include situations that will involve mobilization of the surrounding community. A meeting with the local emergency preparedness agency shall be scheduled by the Contractor to discuss the contingency measures that shall be followed in the event of a major emergency that may affect offsite areas. The EPA’s Representative, the Contractor and the SHM will all be required to attend. It shall be the responsibility of the Contractor to prepare an agenda and chair this meeting. This agenda shall be sent to all participating parties prior to the scheduled meeting. At this meeting, the Contractor shall present suggested guidelines and requirements for protecting local residents in the event of major fires and explosions and the offsite migration of releases from the Site. Contingency procedures shall be confirmed by consensus agreement of the attending parties. Elements of the discussion shall include:

- Names, responsibilities, and authority of personnel assigned to implement emergency actions and the contingency plan
- Procedures for detecting and quantifying airborne contamination that may migrate offsite in addition to air monitoring as required
- Site security in the event of an emergency
- Recordkeeping and reporting requirements
- Criteria for initiating the community contingency plan
- Emergency response procedures contained in the SSHP

The conclusions reached during the meeting discussion shall be formally documented.

1.23 SPILL AND DISCHARGE CONTROL

1.23.1 The SSHP shall describe Spill and Discharge Control procedures. These procedures shall address dewatering sediment, operational fluid, hazardous wastes, and material handling equipment, including a description of prevention measures, such as building berms or dikes, 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.

1.23.2 Storage of contaminated material or hazardous materials shall be appropriately bermed, diked and/or contained to prevent any spillage of material on uncontaminated soil. The Contractor shall respond to any spill of hazardous substances (as designated in 40 CFR 302), or pollutant or contaminant that is in custody or care of the Contractor, pursuant to this contract. Response shall be implemented within one hour, or as soon as practicable, following any accident or release of debris, as directed by the EPA’s Representative. Any direction from the EPA’s Representative 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, or local laws or regulations regarding any spill incident.

1.23.3 If the spill or discharge is reportable, and/or human health or the environment is threatened, the National Response Center, the State, and the EPA’s Representative shall be notified as soon as possible. Notification of the accident shall include location of the accident, resultant damage or injury, person involved, probable cause, amount of waste spilled, and any other pertinent information concerning the accident.

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 CRZ or EZ, 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 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 Safety Inspection Logs shall be attached to and submitted with the Daily Quality Control reports. Each entry shall include the 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 EPA’s Representative shall be notified. Within six working days of any reportable accident, an Accident Report shall be completed and submitted to the EPA’s Representative. An Accident Report form shall be included in the SSHP.

1.26 DUST CONTROL

Dust control shall be used throughout the work at the Site and off site. A proposed Dust Control Plan shall appear in the SSHP. The Dust Control Plan will identify materials, equipment, and methods to be used to control dust during project operations. The SSHO shall ensure that dust suppression practices are effective and being used. At a minimum, the following provisions shall be incorporated into the Dust Control Plan:

1.26.1 The Contractor shall implement dust control measures during all activities that may potentially generate airborne dust including, but not limited to, excavation, truck loading and transport. Visible, airborne dust shall be minimized at all times. The Contractor shall cease all dust generating activities when the wind speed, as measured by the onsite meteorological station, exceeds 15 mph for a sustained period of 15 minutes. Potential dust generating activities may resume based on the determination of the SSHO.

1.26.2 The Contractor shall use water as a dust-suppressing agent to prevent the creation and dispersion of dust. The Contractor shall avoid methods that generate slippery conditions or sticky mud.

1.26.3 Trucks in which the rubble and contaminated debris are carried shall be covered and sealed to control dust releases with a double, positive locking mechanism on the tailgates.

1.26.4 Haul roads will be treated as necessary to minimize dusty conditions.

1.26.5 The SSHO shall ensure that dust suppression practices are effective and are being utilized. Periodic and frequent visual surveillance shall be conducted at the active work site along transportation routes at least once a day. No visible dust emission shall be present.

1.27 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

1.27.1 Secure outside equipment and materials and place materials that could be damaged in protected areas. All equipment and materials shall be stored outside of the Flood Hazard Area limits.

1.27.2 Check the surrounding area for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.

1.27.3 Ensure that temporary erosion controls are adequate.

1.28 SEDIMENT CONTROL

The Soil Erosion and Sediment Control Plan will identify materials, equipment and methods to be used to control sediment during project operations, in accordance with the Soil Erosion and Sediment Control Plan certified by the Freehold Soil Conservation District and as detailed in SECTION 02370 -EROSION CONTROL AND STORMWATER MANAGEMENT.

1.29 DEWATERING

During the dewatering of surface water, the Contractor shall not perform any excavation work within 5 feet of the temporary cofferdam. In addition, the Contractor shall maintain the conditions around temporary cofferdam to avoid any sharp objects/material, formation of surface ice during winter months from penetrating the cofferdam liner (e.g. Portadam™).

1.30 IGNITION SOURCES

Refer to Paragraph 1.31, Fire Protection and Prevention and NFPA 241. A list of ignition sources shall be made and procedures documented to prevent fire as part of the pre-emergency planning. All sources of ignition shall be prohibited within 50 feet of operations with a potential fire hazard. Such areas shall be conspicuously and legibly posted: “NO SMOKING, MATCHES, OR OPEN FLAME.” Sufficient clearance and shielding shall be provided around heat sources to avoid ignition of combustible materials.

1.31 FIRE PROTECTION AND PREVENTION

Every member of the site team shall be responsible to observe and report fires and conditions that could lead to fires. The Contractor shall observe fire prevention and protection requirements including:

1.31.1 The Contractor shall not use fires or open flame devices.

1.31.2 The Contractor shall prohibit smoking within the Exclusion Zone.

1.31.3 The Contractor shall place at least four fire extinguishers, rated at least 2-A:40-B:C, within the Exclusion Zone. Another fire extinguisher shall be placed in the Support Zone.

1.31.4 The Contractor shall inspect and tag all fire extinguishers on a monthly basis per the requirements of NFPA 10.

1.31.5 Contractor personnel will fight fires onsite that cannot be controlled through the use of extinguishers only if the Contractor has designated and trained a fire brigade, as described in OSHA

Standard 29 CFR 1910.156 and 29 CFR 1926 Subpart F. Otherwise, Contractor personnel shall quickly evacuate the Site and notify the appropriate authorities.

1.32 ELECTRICAL SAFETY

Electrical installations and appliances used by the Contractor shall meet applicable 2014 National Electrical Code specifications. All electrical devices utilized by the Contractor or subcontractors on this project shall be grounded and utilize ground fault circuit interrupter (GFCI) protected outlets.

1.33 GUARDING OF MACHINERY AND EQUIPMENT

The Contractor shall secure their equipment onsite at the end of each workday. The Site shall have 24-hour security during non-work hours in accordance with SECTION 01540 – SECURITY.

1.34 LOCKOUT/TAGOUT

This shall be performed by competent employees only. Before an employee performs any servicing or maintenance on a system where the unexpected energizing, start up, or release of kinetic or stored energy could occur and cause injury or damage, the system shall be locked out/tagged out in accordance with 29 CFR 1910 Section 147. Hazardous energy control procedures shall be implemented for the protection of personnel and resources.

1.35 FALL PROTECTION

The Contractor shall provide fall protection measures in accordance with 29 CFR 1926 Subpart M.

1.36 ILLUMINATION

Illumination levels in the working zone shall be maintained at a minimum of 10 footcandles. If necessary, supplementary lighting shall be provided by the Contractor.

1.37 SANITATION

The Contractor shall provide the following items to maintain a sanitary work environment:

- Portable toilet facilities.
- A source of potable water for employee consumption.
- A source of water and a location at which employees may wash up.
- Clean locations for food storage and consumption, if food is consumed at the work site.

1.38 HEARING CONSERVATION

The Contractor shall measure and document the noise exposure of onsite personnel, at a minimum. If necessary, the Contractor shall make hearing protection available to all personnel involved with equipment operation.

1.39 ACCIDENT PREVENTION PLAN

An Accident Prevention Plan shall appear in the SSHP. The Contractor and its subcontractor(s) shall follow the approved Accident Prevention Plan throughout construction. The Accident Prevention Plan shall include a phased safety plan for each of the major tasks performed under these specifications. The phased safety plans shall address the safety and health procedures, protective equipment, personnel, and training requirements that are special to each task. These major tasks are described in Paragraph 1.3.1. In the Accident Prevention Plan, particular attention shall be paid to excavations, medical and first aid sanitation, PPE, fire prevention, electrical safety, public safety, and chemical, physical and biological occupational exposure prevention. The Accident Prevention Plan shall address, at a minimum, the following items:

- Safety Meetings
- Fire Prevention and Protection
- Site Housekeeping
- Mechanical Equipment Inspection
- Sanitation
- Daily Safety Inspections
- Accident Reporting
- Safety Equipment
- Medical Support
- Personal Protective Equipment
- Accident Prevention Signs and Signals
- Mandatory Site-specific Training
- Emergency Response Training
- Attendance

1.40 SAFETY AND HEALTH PHASE-OUT REPORT

A Safety and Health Phase-Out Report shall be submitted in conjunction with the project closeout report, prior to final acceptance of the work. The following minimum information shall be included:

- Summary of the overall performance of safety and health (accidents or incidents including near misses, unusual events, lessons learned, etc.)
- Final decontamination documentation including procedures and techniques used to decontaminate equipment, vehicles, and onsite facilities
- Summary of exposure monitoring and air sampling accomplished during the project
- Signatures of SHM and SSHO
- Copies of hazardous waste manifest forms indicating proper disposal of hazardous wastes was accomplished
- Initial and final physical/medical certifications
- Daily Safety Inspection Reports

Raritan Bay Slag Superfund Site – Margaret’s Creek Sector
Final Remedial Design

- Weekly Safety Reports
- Training Logs
- Accident Reports

PART 2 (NOT USED)

PART 3 (NOT USED)

EXAMPLE CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGMENT

PROJECT NAME: Raritan Bay Slag Superfund Site – Margaret’s Creek Sector
CONTRACT NO.:
PROJECT ADDRESS:
CONTRACTOR'S NAME:
EMPLOYEE'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 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 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 Signature: _____

Date: _____

Printed Name: _____

Social Security Number: _____

Contractor’s Site Safety and Health Officer Signature: _____

Date: _____

Printed Name: _____

Social Security Number: _____

FIELD SAFETY CHECKLIST

Work Location: Raritan Bay Slag Superfund Site - Margaret’s Creek Sector

1. Reviewed work plans with project engineer. _____
(initial/ date)
2. Requested maps of aboveground and underground utilities.

(initial/ date)
3. Reviewed utility maps: _____
(initial/ date)

(water supply, firewater, sewer, process sewer, electric, gas, telephone, other underground utilities)
4. Met with utilities representative to review utility locations and asked each representative the following questions: _____
(initial/ date)
 - a. Any underground utilities at work site location?
 - b. Any ongoing construction that would affect field activities?
 - c. Any chemical releases associated with utilities?
 - d. Any other hazards associated with utilities?
 - e. Any special requirements?

Name of utilities and their representatives:

Utility Company	Representative
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

FIELD SAFETY CHECKLIST (CONT'D)

5. Determined if any permits are required: _____
(initial/ date)
Type(s): _____
6. Obtained necessary permits: _____
(yes or no)
Permit Expiration date(s): _____
7. Requested SDS for any known or expected onsite chemical:

(initial/ date)
8. Client's established protocol, if any: _____

9. Obtained final approval for commencement of work: _____

Comments:

EXCAVATION SAFETY SIGNOFF SHEET
(TO BE COMPLETED BEFORE EXCAVATION COMMENCES)

Field location of monitoring well/boring/excavation at the Raritan Bay Slag Superfund Site - Margaret’s Creek Sector has been evaluated for clearance of underground utilities (i.e., electrical, sewers, firewater, and other piping) as well as 10-foot clearance from overhead power lines. Additionally, clearance has been received from client, property owner, and other affected parties.

In addition, the Contractor Site Safety Supervisor and the drilling/excavation foreman have familiarized themselves with the Site's safety and special considerations:

	Printed Name	Signature
Project Engineer	_____	_____
Excavation Foreman	_____	_____
Drilling Contractor	_____	_____
City Engineer	_____	_____
Gas & Water	_____	_____
Electric	_____	_____
Telephone	_____	_____
TV Cable	_____	_____

Note: Excavation will commence after all affected parties have signed off.

UTILITY CLEARANCE FOR FIELD ACTIVITIES

Action: All utilities for the Site are to be cleared by the appropriate parties prior to initiating any intrusive activity.

Utilities: Power lines and electrical duct banks, telephone lines, light circuits, data lines, cable television lines, fiber optic lines, fire water pipes, potable water pipes, industrial water supply pipes, sewers, drainage pipes, storage tank piping and ventilation pipes, steam pipes, natural gas pipelines, vaults, sump pits, etc.

Where: Every location where intrusive work is scheduled.

Who: Any person having responsibility for the intrusive work or who participates in the intrusive work, and the property owner and utility representatives.

When: Before work in the target area begins.

How: Contact “ONE CALL” agencies, property owner information, tools, eyes, and common sense. Perform a geophysical survey. Make records based on a “MEET” or a “LOCATE.”

Why: The minimum effort needed to protect life and property, and there is no excuse not to.

Contacts: New Jersey “One Call” System - 1-800-272-1000

Attachment to Emergency Response Plan

AGREEMENT FOR EMERGENCY RESPONSE SERVICES

This agreement certifies:

That the Department (local HAZMAT team, firefighting, police, emergency medical responder, health care providers, etc., organization responding at the Site) received and reviewed the Emergency Response Plan for the Raritan Bay Slag Superfund Site, located in Middlesex County, New Jersey.

That on [date], the representative from the [Department] participated in an onsite visit (or conducted a meeting, depending on the organization). During the visit, [Prime Contractor] explained the details of the Site’s Emergency Response Plan including, but not limited to, roads and evacuation routes, properties of hazardous materials handled at the Site, locations where site personnel would normally be working [add any other special provision], and expectations for emergency response support.

The [Prime Contractor] will notify in writing the [Department and EPA] of any amendment or significant change in the Emergency Response Plan.

If applicable:

That the U. S. Environmental Protection Agency (EPA) Region II provided (or will provide) the following:

- Description of any site-specific training.
- Description of equipment and serial numbers, with their specific location.

The above mentioned equipment will be fully available to the [Department] for training and familiarization, but will remain EPA’s property in accordance with SARA Title I Section 123 (b)(2).

- Location of information repository
- Reference material to be kept onsite

That through the above mentioned provisions the [Department] agrees to provide [service] in the event of an emergency or threat of an emergency at the _____site. This agreement will remain in effect for the duration of [Prime Contractor] contract or until 90 days after written notice is given by either party justifying cancellation.

Department

Prime Contractor

EPA (concurrence)

EPA’s Contracting Party (concurrence)

END OF SECTION

SECTION 01355

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 SCOPE OF WORK

This section covers the requirements for protection of the human and natural environment during site preparation, soil and sediment excavation, dewatering, and site restoration. This includes furnishing all labor, materials, equipment and incidentals required to provide environmental pollution and damage control.

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.

CODE OF FEDERAL REGULATIONS (CFR)

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 302	Designation, Reportable Quantities, and Notification
40 CFR 68	Chemical Accident Prevention Provisions
49 CFR 171 - 178	Hazardous Materials Regulations

1.3 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with a “EA” designation; submittals having an “FIO” designation are for information only. The following shall be submitted in accordance with SECTION 01330 - SUBMITTAL PROCEDURES:

1.3.1 Environmental Protection Plan; Pre-Construction Submittals; EA

An Environmental Protection Plan shall be submitted for review and approval within 21 calendar days prior to Pre-Work Conference. 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 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). Topics or issues which are not identified in this section, but which the Contractor considers necessary, shall be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, the Contractor shall meet with the EPA’s Representative for the purpose of discussing the implementation of the revisions to the plan including any reporting requirements, and methods for administration of the Contractor’s Environmental Protection Plan. The Environmental Protection Plan shall be current and maintained on site by the Contractor. The Environmental Protection Plan shall include, but shall not be limited to, the following:

1.3.1.1 Name of person within the Contractor’s organization who will be responsible for ensuring adherence to the Environmental Protection Plan.

1.3.1.2 Name and qualifications of person responsible for manifesting hazardous waste to be removed from the Site.

1.3.1.3 Name and qualifications of person responsible for training the Contractor’s environmental protection personnel.

1.3.1.4 Description of the Contractor’s environmental protection personnel training program.

1.3.1.5 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.

1.3.1.6 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. A copy of the Safety Data Sheets (SDS) 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.

1.3.1.7 A wastewater management plan that identifies the methods and procedures for management and/or discharge of wastewaters which are directly derived from construction activities, such as decontamination water, stormwater that comes into contact with contaminated sediment, and water generated from sediment dewatering.

1.3.1.8 A spill prevention and response plan that identifies methods and procedures for preventing spills and procedures for addressing spills that occur at the Site.

1.3.1.9 Appendix

Copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents shall be attached, as an appendix, to the Environmental Protection Plan.

1.3.2 Non-Hazardous Solid Waste Diversion Report; Product Data; FIO

The Contractor shall maintain an inventory of non-hazardous solid waste diversion and disposal of construction and demolition debris and report to the EPA’s Representative in accordance with 40 CFR 302. The following shall be included in the report:

1.3.2.1 Construction and demolition (C&D) debris disposed of in cubic yards (CY) or tons.

1.3.2.2 Construction and demolition (C&D) debris recycled in CY or tons.

1.3.2.3 Total C&D debris generated in CY or tons, as appropriate.

1.4 DEFINITIONS

1.4.1 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.

1.4.2 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; radiant energy and radioactive material as well as other pollutants.

1.4.3 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, and excess pesticides, and pesticide-contaminated equipment rinse water.

1.5 GENERAL REQUIREMENTS

1.5.1 The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. 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.

1.5.2 The Environmental Protection Plan shall not be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental 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 SUBCONTRACTORS

The Contractor shall ensure compliance with this section by subcontractors.

1.7 PROTECTION FEATURES

Prior to start of any on-site construction activities, the Contractor and the EPA’s Representative 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 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 submitted to the EPA’s Representative for approval. The Contractor shall protect those environmental features included in the survey report and any indicated on the Contract Drawings, regardless of interference which their preservation may cause to the Contractor’s work under the contract.

1.8 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the Contract Documents which may have an environmental impact will be subject to approval by the EPA’s Representative and may require an extended review, processing, and approval time. The Engineer reserves the right to disapprove alternate methods, even if they are more cost effective, if the EPA’s Representative determines that the proposed alternate method will have an adverse environmental impact.

1.9 NOTIFICATION

The Engineer 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 EPA’s Representative of the proposed corrective action and take such action when approved by the EPA’s Representative. The EPA’s Representative 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 EPA’s Representative may take under the contract, or in accordance with the Federal acquisition regulation or Federal law.

1.10 AIR MONITORING

For the protection of public health, monitor and control contaminant emissions to the air from remedial action area sources to minimize short-term risks that might be posed to the community during implementation of the remedial alternative in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE and SECTION 01362 – PERIMETER AIR MONITORING.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 ENVIRONMENTAL PERMITS AND COMMITMENTS

The Contractor shall be responsible for complying with all environmental permits and commitments required by Federal, State, regional, and local environmental laws and regulations.

3.2 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the Contract Documents. Prior to the beginning of any construction activity, the contractor shall identify any land resources to be preserved within the work area. Except in areas indicated on the Contract Drawings or specified to be cleared, the Contractor shall not remove, cut, deface, insure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, 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 operation commences.

3.2.2 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features 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 Control

Providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations is the Contractor’s responsibility. 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 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) in accordance with Soil Erosion and Sediment Control Plan certified by the Freehold Soil Conservation District and as specified in SECTION 02370 –EROSION CONTROL AND STORMWATER MANAGEMENT. BMPs may include, but are not limited to, vegetation cover, stream bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, and diversion channels and piping. The Contractor’s BMPs must also be in accordance with the New Jersey Pollutant Discharge Elimination System (NJPDES) Request for Authorization (RFA) for Stormwater Discharge during construction, which shall be reviewed by the Bureau of Nonpoint Pollution Control, Division of Water Quality, New Jersey Department of Environmental Protection (NJDEP). The Contractor shall remove any temporary measures after the area has been stabilized.

3.2.4 Contractor Facilities and Work Areas

The Contractor’s field offices, staging areas, sediment and soil containment and stockpile areas, and temporary buildings shall be placed in areas designated on the Contract Drawings or as directed by the EPA’s Representative. Temporary movement or relocation of Contractor facilities shall be made only when approved. Erosion and sediment controls shall be provided for disturbed earthen areas to prevent sediment from entering nearby water. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.3 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and groundwater. Toxic or hazardous chemicals shall not be applied to soil or vegetation unless otherwise indicated. All water areas affected by construction activities shall be monitored by the Contractor. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water when required by State- or Federally-issued Clean Water Act permits.

3.3.1 Dewatering Operations

Dewatering operations will be controlled at all times to maintain compliance with existing State water quality standards and designated uses of surface water bodies. Any water that comes into contact with contaminated material shall be treated by the water treatment system prior to discharge.

3.4 AIR RESOURCES

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

3.4.1 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 New Jersey and local rules.

3.4.2 Burning

Burning shall be prohibited on the project site.

3.4.3 Particulates

Dust particles, aerosols, and gaseous by-products from construction activities must be controlled at all times, including weekends, holidays and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, access roads and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, or local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Mulching, water sprinkling, temporary enclosures and other appropriate methods 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. Provide sufficient, competent equipment to accomplish these tasks. Properly maintain equipment to reduce gaseous pollutant emission.

3.5 AIR EMISSION CONTROL

The Contractor shall implement the air monitoring program in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE and SECTION 01362 – PERIMETER AIR MONITORING.

3.6 WASTE HANDLING, STORAGE AND DISPOSAL

3.6.1 Solid Wastes

Handling, storage, and disposal of solid waste shall be performed in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL and SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.

3.6.2 Chemicals and Chemical Wastes

Chemicals shall be dispensed ensuring no spillage to the ground or water. Periodic inspections of dispensing areas to identify leakage and initiate corrective action shall be performed and documented. This documentation will be periodically reviewed by the EPA’s Representative. Chemical waste shall be collected in corrosion-resistant, compatible containers. Collection

drums shall be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes shall be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations. Chemical accident prevention provisions shall be made in accordance with 40 CFR 68.

3.6.3 Contractor-Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. At a minimum, the Contractor shall manage and store hazardous waste in compliance with 40 CFR 262. Take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. Segregate hazardous waste from other materials and wastes, protect it from the weather by placing it in a safe covered location, and take precautionary measures such as berming or other appropriate measures against accidental spillage. Storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178 and State and local laws and regulations are the Contractor’s responsibility. Transport Contractor-generated hazardous waste in accordance with Environmental Protection Agency (EPA) and Department of Transportation (DOT) laws and regulations. Dispose of hazardous waste in compliance with Federal, State, and local laws and regulations. Spills of hazardous or toxic materials above the Superfund Reportable Quantities must be immediately reported to the EPA’s Representative, EPA, and National Response Center at 1-800-424-8802. Cleanup and cleanup costs due to spills are the Contractor’s responsibility. The disposal of Contractor-generated hazardous waste and excess hazardous materials is the Contractor’s responsibility.

3.6.4 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants and oil shall be managed and stored in accordance with all Federal, State, regional and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations.

3.6.5 Wastewater

3.6.5.1 Wastewater from construction activities, such as sediment dewatering and stormwater that comes into contact with contaminated sediments, shall not be allowed to enter waterways or to be discharged prior to being treated to remove pollutants. The Contractor shall dispose of the construction-related wastewater in accordance with all Federal, State and local laws and regulations.

3.6.5.2 The Contractor shall collect and treat wastewater at the on-site treatment system as necessary, and discharge treated water in accordance with the Middlesex County Utilities Authority (MCUA) Temporary Discharge Approval or the New Jersey Pollutant Discharge Elimination System (NJPDDES) permit.

3.7 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

If, during excavation or other construction activities, any previously unidentified or unanticipated historical, archaeological, and/or cultural resources are discovered, 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; rock or coral alignments, pavings, walls, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery, the Contractor shall immediately notify the EPA’s Representative so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special removal of the finds should be made. The Contractor shall cease all activities that may result in impact to or destruction of these resources. The Contractor shall secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.8 PREVIOUSLY USED EQUIPMENT

The Contractor shall clean all previously used construction equipment prior to bringing it onto the project site. The contractor shall ensure that the equipment is free from soil residuals, noxious weeds, and plant seeds.

3.9 MAINTENANCE OF POLLUTION FACILITIES

The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for the length of time construction activities creates pollutants.

3.10 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. Additional meetings shall be conducted for new personnel and when site conditions change. The training and meeting agenda shall include: method of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative cover, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemical or wastes, and other regulated contaminants; and recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitats that are known to be in the area.

3.11 POST CONSTRUCTION CLEANUP

The Contractor shall clean up and restore all areas used for construction. The Contractor shall, unless otherwise instructed in writing by the EPA’s Representative, obliterate all signs of temporary construction facilities such as work areas, storage areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction

prior to final acceptance of the work. The entire disturbed area shall be graded, filled and seeded unless otherwise indicated.

END OF SECTION

SECTION 01362

PERIMETER AIR MONITORING

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 This section describes the responsibilities of the Contractor for monitoring potentially contaminated particulates at the site perimeter fence line. This section is to be used in the preparation of Perimeter Air Monitoring Plan (PAMP). Work performed under these specifications will be actively managed so that airborne dust and contaminants generated by site activities are maintained below the applicable allowable levels established for general public exposure by the United States Environmental Protection Agency (EPA) and the New Jersey Department of Environmental Protection (NJDEP).

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. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA/625/R-96/010a Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air

EPA National Ambient Air Quality Standards (NAAQS)

Matters of interpretation of these standards associated with perimeter air monitoring shall be identified and submitted to the EPA’s Representative. All matters of interpretation shall be resolved before starting work. Where the requirements of this Specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

1.3 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals with an “FIO” designation are for information only. The Contractor shall submit the following to the EPA’s Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES. The Contractor shall maintain a copy of all documents described in this section on site at all times during construction.

1.3.1 Perimeter Air Monitoring Plan (PAMP); Pre-Construction Submittal; EA

The Contractor shall submit the PAMP to the EPA’s Representative for approval in accordance with Paragraph 1.5 of this Section.

1.3.2 Progress Reports; Test Report, FIO

The Contractor shall submit the following documents to the EPA’s Representative on a weekly basis during the course of the project site work:

1.3.2.1 Air Monitoring Log in accordance with Paragraph 1.9.5.1 of this Section, including (but not limited to):

1.3.2.1.1 Sample collection dates and times.

1.3.2.1.2 Sampling equipment and media.

1.3.2.1.3 Results of direct-reading instruments.

1.3.2.1.4 Summary printouts for instrumentation using automatic data logging.

1.3.2.1.5 Documentation of action level exceedances and corrective actions.

1.3.2.2 Air Sample Analysis Results – analytical results and accompanying laboratory quality control data/information.

1.3.2.3 Daily Perimeter Air Monitoring Summary Reports in accordance with Paragraph 1.9.5.2 of this Section.

1.4 REGULATORY REQUIREMENTS

Work performed under this contract shall comply with all applicable Federal, State, and local safety and occupational health laws and regulations.

1.5 PERIMETER AIR MONITORING PLAN

The Contractor shall develop, submit for review and implement after acceptance a written PAMP for Remedial Action operations.

1.5.1 Contents

A PAMP shall be prepared covering remediation activities to be performed by the Contractor and all subcontractors. The PAMP shall establish, in detail, the protocols necessary for the anticipation, recognition, evaluation, and control of emissions associated with each task

performed based upon site-specific conditions.

The PAMP shall be a stand-alone plan and shall include, but not be limited to, the following:

- 1.5.1.1 Protocols for control of airborne contaminant emissions.
 - 1.5.1.2 Air quality monitoring and sampling procedures.
 - 1.5.1.3 Protocols for collection of meteorological data.
 - 1.5.1.4 Detailed descriptions of equipment, O&M procedures, and calibration schedules.
 - 1.5.1.5 Organizational structure indicating personnel responsibilities.
 - 1.5.1.6 The qualifications of the Air Quality Monitoring Specialist.
 - 1.5.1.7 Plans for response if the action levels are exceeded.
- 1.5.2 Acceptance and Modification

The PAMP shall be submitted to the EPA’s Representative at least 14 calendar days prior to the Pre-Work conference for review and approval. Any deficiencies in the PAMP will be discussed at the pre-construction safety conference, and the PAMP shall be revised to correct the deficiencies and resubmitted for acceptance. On-site work shall not begin until the plan has been accepted by the EPA’s Representative.

The Contractor shall keep a copy of the written PAMP on-site for review by the EPA’s Representative. As work proceeds, the PAMP shall be adapted to new situations and new conditions. Changes and modifications to the accepted PAMP shall be made with the knowledge and concurrence of the Air Quality Specialist (AQS), the Site Superintendent, and the EPA’s Representative. The requested modification shall not be implemented until authorized in writing by the EPA’s Representative. Should the EPA’s Representative require a modification of any portion or provision of the PAMP, the EPA’s Representative will notify the Contractor in writing of such modifications.

The EPA’s Representative may stop all site work at any point if the Contractor shows any disregard for the provisions of this specification or the accepted PAMP.

1.6 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

Project site conditions are detailed in SECTION 01010 – SUMMARY OF WORK.

1.7 AIR QUALITY PROTECTION PRINCIPLES

The Contractor shall provide all equipment, materials, and personnel necessary to monitor and quantify dust and airborne lead concentrations at the site perimeter. The PAMP shall describe procedures, equipment, and training needed to monitor and quantify the amount of airborne particulate and lead generated by site work activities. The Contractor shall operate a program of equipment maintenance in accordance with the manufacturer's specifications. The EPA’s Representative may reject the use of equipment if, in its opinion, it provides less protection than that specified in the PAMP.

1.7.1 Action Levels

The Contractor shall perform remediation in a manner such that ambient air quality objectives at the site perimeter are achieved in accordance with the action levels presented in Table 01362-1. The action levels and required actions shall be presented in the PAMP in both text and tabular form in accordance with Table 01362-1.

1.8 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

The Contractor’s project team shall include:

1.8.1 Air Quality Specialist

The services of an AQS, who is experienced in air monitoring and sampling, shall be utilized. The Safety and Health Manager (SHM) can also serve as the AQS if he/she meets the qualification requirements of an AQS listed herein. This specialist shall be familiar with the Site’s hazards and the scope of this project. The Contractor shall document the specialist’s name and qualifications in the PAMP.

1.8.1.1 Qualifications

The Contractor shall demonstrate to the EPA’s Representative that this AQS has the following credentials:

1.8.1.1.1 At least three years of experience in air monitoring or sampling, including the following:

1.8.1.1.1.1 Serving in responsible professional charge on at least one project in which the impacts of site work on community air was measured.

1.8.1.1.1.2 At least 100 hours of hands-on experience (each) in taking ambient air measurements and samples by EPA methods.

TABLE 01362-1 - Perimeter Air Monitoring/Sampling Requirements

Analyte	Action Level ^{1, 2}	Frequency per location	Analytical Method	Action Required
Real Time Respirable Dust (PM10)	150 µg/m ³ (<u>15 minute</u>) 100 µg/m ³ (work shift)	Continuously during the work day, and for 1 hour before and after. Log 15-minute averages.	Direct-reading dust meter with data logger, e.g. MIE-DR-4	15 minutes: Evaluate engineering controls, implement dust control. 60 minutes: Stop dust-generating activities and notify the EPA’s Representative. Increase dust control measures.
<i>Air Sampling³ - Excavation and handling of contaminated soil</i>				
Particulate (PM 10)	150 µg/m ³	Once on each of the first two days of contaminated material excavation in a new area, then once a week for four weeks. Once a month thereafter.	EPA IO-2.1 (PM 10) ⁴	Investigate and recommend corrective action. As deemed necessary, modify real-time air monitoring action levels to achieve contaminant compliance.
Lead	1.2 µg/m ³		EPA IO-3.4 (ICP) ⁴	

- 1 Total and compound-specific action levels are evaluated using data corrected for background values.
- 2 Downwind concentrations at fence line, over background.
- 3 To be performed during excavation activities and handling of contaminated materials only.
- 4 Analytical methods from the Compendium of Methods for the Determination of Inorganic Compounds in Air EPA/625/R-96/010a

1.8.1.1.2 A scientific or engineering college degree that included the study of air quality issues. The EPA’s Representative may accept equivalent training at its sole discretion.

1.8.1.1.3 Appropriate credentials for working on the Site under the SSHP.

1.8.1.1.4 Professional certification appropriate to this effort.

1.8.1.1.4.1 Although the EPA’s Representative may accept other credentials, the Certified Industrial Hygienist credential offered by the American Board of Industrial Hygiene and the Qualified Environmental Professional credential offered by the Institute for Professional Environmental Practice are both deemed appropriate.

1.8.1.2 Responsibilities

The AQS shall be responsible for:

1.8.1.2.1 Preparing the air monitoring and sampling protocols for the site work.

1.8.1.2.2 Selecting the equipment to be used for air monitoring and sampling.

1.8.1.2.3 Determining the times, durations, and locations of air measurements and samples.

1.8.1.2.4 Developing protocols to determine upwind location and to adjust monitoring and sample results for ambient background.

1.8.1.2.5 Approving the qualifications of any technicians that will collect air measurements or samples.

1.8.1.2.6 Interpreting the results of the air monitoring and sampling effort.

1.8.1.2.7 Approving and signing reports of air quality that the Contractor provides to the EPA’s Representative.

1.8.1.2.8 Periodically evaluating if the selected equipment and protocols are adequately representing perimeter conditions.

1.8.1.2.9 Periodically auditing the implementation of the PAMP, and taking corrective action when necessary.

1.8.2 Air Monitoring and Sampling Technician (AM&ST)

During intrusive activities by the Contractor, an AM&ST shall perform the air monitoring activities as specified in the PAMP. The Site Safety and Health Officer (SSHO) can also serve as the AM&ST, if the AQS approves. The AM&ST shall have appropriate training approved by the AQS.

1.9 AIR QUALITY MONITORING AND SAMPLING

1.9.1 General

1.9.1.1 The monitoring specified in the PAMP shall detect and quantify dust and airborne lead.

1.9.1.1.1 The Contractor shall collect, at minimum, the number of air quality measurements and samples as shown in Table 01362-1. The Contractor shall use monitoring and analytical sampling / methods that accurately measure at detection limits that are consistent with the action levels listed in Table 01362-1. Air monitoring methods and equipment locations shall be proposed by the Contractor in the PAMP. The Contractor shall ensure that the air monitoring equipment proposed are consistent with monitoring objectives and associated action levels presented in Table 01362-1.

1.9.1.2 The continuous air monitoring equipment shall be capable of providing the following:

1.9.1.2.1 Downloadable data capable of providing continuous graph of readings.

1.9.1.2.2 Auto-Dialer, emergency lights or other alerting systems to promptly and effectively notify the Contractor that action levels have been exceeded.

1.9.1.3 The AQS shall certify that the air monitoring equipment proposed is consistent with Perimeter Air Monitoring objectives and associated action levels presented in Tables 01362-1. Air monitoring methods and equipment locations shall be proposed by the Contractor in the PAMP.

1.9.1.4 Sampling shall be conducted at the frequencies defined in Table 01362-1 and in accordance with SECTION 01351 – SAFETY, HEALTH AND EMERGENCY RESPONSE. The EPA’s Representative may direct a change in air sampling frequency.

1.9.1.5 Equipment utilized for air monitoring or sampling in accordance with this section shall be calibrated before and after each use, as required, and maintained as per specified methods, manufacturer's recommendations, and good industrial hygiene practices. Test instruments used in the calibration of air sampling equipment shall be calibrated and traceable to National Institute of Standards and Technology standards.

1.9.1.6 The Contractor shall document, in the site log or site files, the regular calibration of each instrument used. Only individuals trained to operate this equipment shall do so.

1.9.2 Meteorological Monitoring

1.9.2.1 The Contractor shall furnish, install, and maintain a portable meteorological station in accordance with SECTION 01351 – SAFETY, HEALTH AND EMERGENCY RESPONSE.

Meteorological data shall be recorded and utilized in accordance with the same.

1.9.3 Real-time Air Monitoring

The Contractor shall collect each air measurement over a duration that the AQS determines will yield an accurate representation of the air quality at that time and location. The Contractor may collect measurements more frequently than required herein or utilize other appropriate sampling techniques with approval of the EPA’s Representative.

1.9.4 Air Sampling

The sampling and analytical procedures to be followed for the collection, handling, and analysis of air samples are those prescribed by EPA Analytical Procedures listed in Table 01362-1. Air samples shall be collected by drawing a known volume of air into a collector as specified in the EPA sampling guide. The analytical results shall be compared to Action Levels established in Table 01362-1 standards and, if appropriate, action shall be undertaken (i.e., evaluation of work practices). The calibration protocols described in the EPA methods shall be followed. A qualified laboratory shall perform analysis by EPA methods described in Table 01362-1 within 48 hours. A laboratory is “qualified” if it holds certificates required by the NJDEP for analysis of air samples for the contaminants of interest. NOTE: Monthly samples shall be analyzed with a seven-day turnaround time.

1.9.5 Perimeter Air Sampling and Monitoring Results Reporting

1.9.5.1 Air Sampling Log

The Contractor shall maintain an up-to-date log for all sampling activities. A copy of the log shall be submitted to the EPA’s Representative weekly during the course of the project site work. The log shall contain sufficient information to verify that proper procedures were followed, and confirm the accuracy of results.

1.9.5.2 Daily Perimeter Air Monitoring Summary Report

The Daily Perimeter Air Monitoring Summary Report shall discuss calibration, calibration check, general observations, weather conditions, and discussion of all required corrective action. In addition, the report shall contain additional information where real-time sampling is utilized.

1.9.5.2.1 A summary of real-time monitoring results shall be presented in tabular form. The table shall include results from all monitoring locations including background and at the minimum contain the following:

1.9.5.2.1.1 For dust, peak 15-minute average and daily time-weighted average with all results exceeding action levels clearly delineated and associated corrective action described.

1.9.5.2.1.2 Comparison of results corrected for background to peak 15-minute average, and time-weighted average action levels.

1.9.5.2.1.3 Summary of meteorological conditions during the sampling period.

1.9.5.3 Within 5 working days of month's end, the Contractor shall compile and submit copies of each Daily Perimeter Air Monitoring Summary Report and the weekly air sampling results, for which results were received from the previous calendar month.

1.10 RESPONSE TO AIR EMISSIONS

The Contractor shall compare the highest of direct reading measurements for dust and airborne lead downwind of the Site (minus the value upwind) to the action levels in Table 01362-1. If the wind is blowing from a direction for which there is no monitor, the upwind value shall be assumed to be the lowest of the values collected by any of the monitors.

When the ambient air monitoring system reveals that action level has been exceeded for 15 or more minutes, the Contractor shall evaluate its engineering controls, and implement emission controls. If its process modifications succeed, contractor shall report the exceedance in its Daily Perimeter Air Monitoring Summary Report.

When the air monitoring system reveals that the action level has been exceeded for an hour or more, the Contractor shall temporarily suspend intrusive activities, notify the EPA’s Representative, and implement corrective action to reduce site-related emissions to below required action levels. The adequacy of these controls is subject to acceptance by the EPA’s Representative prior to restarting intrusive activities. The Contractor shall report the exceedance in its Daily Perimeter Air Monitoring Summary Report.

Site emissions control measures that may be needed to reduce the emissions to below action levels may include, but are not limited to:

- Adding moisture to the soil
- Applying a vapor barrier (plastic) to the soil or soil piles
- Using a misting system
- Reducing the speed of equipment that disturbs the soil
- Installing barriers to reduce wind speed
- Limiting the rate of excavation

When the ambient air sampling system reveals that action level has been exceeded, the AQS shall use that information to modify the action levels to which the direct-reading measurements are compared so that they will protect the community.

1.11 INSPECTIONS

The Contractor shall perform daily inspections of the job site and the surrounding work in progress in accordance with SECTION 01351 – SAFETY, HEALTH AND EMERGENCY

RESPONSE to ensure compliance with PAMP. The EPA’s Representative may stop all site work at any point if the Contractor shows any disregard for the provisions of this specification or the accepted PAMP.

1.12 DUST AND EMISSION CONTROL

Dust control shall be used throughout the work at the Site and off-site in accordance with the Contractor’s approved Dust Control Plan, as specified in SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.

PART 2 PRODUCTS

The Contractor shall provide all necessary sampling devices, pumps and collection media, and support equipment to perform the sampling per the approved Perimeter Air Monitoring Plan.

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01380

PROJECT PHOTOGRAPHS

PART 1 GENERAL

1.1 SCOPE OF WORK

The Contractor shall furnish all labor, equipment, materials, and incidentals required to provide photographic documentation of construction activities.

1.2 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals having an “FIO” designation are for information only. The Contractor shall submit the following items in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.

1.2.1 Pre-Construction, Progress, and Post-Construction Photographs; Product Data; FIO

The Contractor shall submit project photographs as specified in Paragraph 3.2 – ELECTRONIC FILES FOR DIGITAL PHOTOGRAPHS. The Contractor shall also include photocopies of the logbook documentation as specified in Paragraph 3.3 - LOGBOOK AND GPS DOCUMENTATION OF DIGITAL PHOTOGRAPHS.

PART 2 PRODUCTS

2.1 DIGITAL CAMERA

The Contractor shall use a digital camera to produce project photographs. The digital camera shall be capable of transferring digital photographs to a “JPEG” or “TIFF” electronic file format. The digital camera shall be an auto-focusing type, with a minimum image resolution of 8 megapixels (3,264 x 2,448 pixels) or better with 48 Bit Color Depth. The digital camera shall be equipped with a flash for low-light conditions.

2.2 PHOTOGRAPHIC LOGBOOK

The Contractor shall keep all written documentation concerning project photographs in a photographic logbook. The logbook shall be constructed of water-resistant paper and bound along the left edge.

PART 3 EXECUTION

3.1 PROJECT PHOTOGRAPHS

3.1.1 The Contractor shall furnish a minimum of 50 digital photographs in an electronic file format approved by the EPA’s Representative, taken with a digital camera by an experienced photographer using suitable equipment, to record the important features of the site

prior to the commencement of work, during construction, and after the work has been completed.

3.1.2 Pre-Construction Photographs: Before work begins, the Contractor shall take digital photographs of existing site conditions. Coverage shall include, but not be limited to, property boundary lines, all existing roadways and access roads, aboveground utilities, landscaping, trees, signage and other physical features located within the zone of influence of the construction. The coverage may be expanded if directed by the EPA’s Representative.

3.1.3 Progress Photographs: After construction operations have been started at the site, the Contractor shall photographically record the project. Each progress photograph shall be a separate electronic file and shall include coverage of:

- Site Preparation Activities
- Clearing and Grubbing
- Sediment Containment Area Construction
- Stockpiling and Loadout Area Construction
- Soil Erosion and Sediment Control Measures
- Installation of Temporary Drainage Features
- Installation and Operation of Temporary Wastewater Treatment and Discharge System
- Decontamination Area and Exclusion Zone Setup
- Pre-Excavation, Post-Excavation, and Waste Characterization Sampling
- Excavation
- Dewatering
- Backfilling and Grading
- Site Restoration
- Decontamination of Personnel, Tools, and Equipment
- Unanticipated Events or Accidents

In addition, at each successive period of photography, at least one digital photograph from the same reference point shall be taken.

3.1.4 The actual number and location of views of progress photographs to be taken will be as directed by the EPA’s Representative; however, it is anticipated that approximately 200 project photographs will be required.

3.1.5 Post-Construction Photographs: After completion of work, the Contractor shall take a minimum of 50 digital photo-graphs of the site. The locations shall be designated by the EPA’s Representative and shall be similar to the photographs showing the site condition prior to commencement of construction activities.

3.2 ELECTRONIC FILES FOR DIGITAL PHOTOGRAPHS

3.2.1 At a minimum, the Contractor shall download digital photographs from the digital camera to a personal computer daily during photographic sessions for transfer to an electronic file format. The electronic file shall be either “JPEG” or “TIFF” format.

3.2.2 The Contractor shall rename each downloaded electronic file at the time of download with a distinct filename that corresponds to the photographic logbook specified in Paragraph 3.3. The filename shall have the following format as defined below:

yyyy-mm-dd_hhnn_xxx

- “yyyy” is the year the photograph was taken.
- “mm” is the month the photograph was taken.
- “dd” is the day the photograph was taken.
- “hh” is the hour the photograph was taken using military time nomenclature.
- “nn” is the minute the photograph was taken using military time nomenclature.
- “xxx” is a three digit sequential number starting with 001 for each photograph taken during the preceding time period.

3.2.2.1 An example of the above filename format is 2015-12-15_1845_002. This example photograph filename would have been the second photo taken at 6:45 p.m. on December 15, 2015.

3.2.3 The Contractor shall copy the electronic files to a compact disc after renaming as described in Paragraph 3.2.2 is completed. The compact disc shall be a “CD-R” or “CD-RW” format. The Contractor shall submit two sets of digital photographs, each on a separate “CD-R” or “CD-RW” format compact disc.

3.2.3.1 The copy process shall be completed the same day the photographs are downloaded, except as approved by the EPA’s Representative.

3.2.3.2 If the EPA’s Representative allows the copy process to be delayed, the Contractor shall backup the electronic files on at least one storage device other than the hard drive of the personal computer storing the electronic files until the copy process is completed.

3.2.4 The Contractor shall submit compact discs containing electronic files of digital photographs a minimum of once monthly during photographic sessions.

3.2.5 All digital photographs and related electronic files are U. S. Government property and shall not be released by the Contractor to the public or news media.

3.3 LOGBOOK AND GPS DOCUMENTATION OF DIGITAL PHOTOGRAPHS

3.3.1 The Contractor shall record pertinent information concerning digital photographs in a photographic logbook as specified in Paragraph 2.2. Writing shall be done in a waterproof ink.

3.3.2 The following information shall be recorded on the front cover of the logbook:

- Project name
- Contract number
- Contractor name

3.3.3 The following information shall be included for each photographic entry, at a minimum:

- Date
- Time
- Photograph filename
- Location
- Direction
- Description

3.3.4 The Contractor shall geotag pictures from certain locations, as directed by the EPA’s representative by using a separate Global Positioning System (GPS) device or GPS enabled digital camera.

3.4 VIEWS REQUIRED

3.4.1 Prints shall illustrate condition and location of work and the state of progress.

3.4.2 At successive periods of photography, the Contractor shall take at least one photograph from the same reference point as previously required.

3.4.3 The Contractor shall consult with the EPA’s Representative at each period of photography for recommendations concerning views required.

END OF SECTION

SECTION 01381

VIDEOTAPING

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 This specification defines the requirements for video recording of the site premises. The Contractor shall furnish all labor, materials and equipment required to provide color, high-quality video/audio of the project site recording the site features prior to the commencement of work and after the work has been completed, and any important site features during construction. Under no circumstances shall construction begin until the EPA’s Representative has received and accepted the pre-construction video recording. This recording will be used for reference during restoration, and as a record of pre-existing conditions should disputes or litigation arise.

1.1.2 The EPA’s Representative reserves the right to reject the recording because of poor quality, unintelligible audio or uncontrolled pan or zoom. Any recording rejected by the EPA’s Representative shall be re-recorded at no cost to the Government.

1.2 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals with an “FIO” designation are for information only. The Contractor shall submit the following to the EPA’s Representative in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.

1.2.1 Pre-Construction, Progress, and Post-Construction Video; Product Data; FIO

The Contractor shall furnish to the EPA’s Representative two copies of each recording. Each recording shall be continuous, in color and recorded in a digital format stored on Digital Video Disc (DVD) media. The disks shall be written in accordance with the ISO-9660 Level 2 specification. Each disk shall be labeled with the appropriate identification of its content.

1.3 VIDEO QUALITY

1.3.1 At a minimum, the video recording camera should be able to produce a resolution of 640 (pixel) x 480 (pixel) with a frame rate of 30 frames per second. Video files shall be stored in an industry standard Moving Pictures Expert Group (MPEG) format transferable to a DVD or to an external computer capable of playing MPEG files.

1.3.2 Video recording shall be performed by a qualified, established video recording firm knowledgeable in construction practices and experienced in the implementation of established inspection procedures.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 VIDEO SURVEY

3.1.1 The Contractor shall furnish a continuous, color videotape recording along the construction limits.

3.1.2 Coverage shall include, but not be limited to, all existing roadways, structures, aboveground utilities, landscaping, trees, signage, fencing, and other physical features located within the construction limits and any other adjacent properties. Video coverage shall extend a minimum of 500 feet in each direction from the site entrance. The coverage may be expanded if directed by the EPA’s Representative.

3.1.3 A representative of the Contractor shall accompany the videographer during recording sessions to indicate the adjacent areas of potential construction activity and identify items and conditions to be recorded. The construction limits shall be flagged for identification, and excavation areas shall be physically marked with survey stakes and/or high-visibility paint, prior to production of audio/video recordings.

3.1.4 All recording shall be done during daylight hours. No recording shall be performed if weather is not acceptable to the EPA’s Representative.

3.1.5 To produce the proper detail and perspective, artificial lighting shall be required where it is necessary to illuminate the shaded area caused by trees, utility poles, road signs, and other such objects.

3.2 AUDIO AND VIDEO

3.2.1 Audio/video media shall be professional-grade DVD in National Television Standards Committee (NTSC) format.

3.2.2 Each DVD shall be labeled with the contract name and number, Contractor’s name, date, and location information such as street name, direction of travel, viewing side, etc.

3.2.3 Information appearing on the DVD must be continuous, and no editing or overlaying of information at a later date will be acceptable.

3.2.4 The following information shall appear on each video recording:

3.2.4.1 Upper left portion:

3.2.4.1.1 Name of Contractor.

3.2.4.1.2 Day, date, and time.

3.2.4.1.3 Name of project.

3.2.4.2 Lower left portion:

3.2.4.2.1 Route of travel.

3.2.4.2.2 Viewing side.

3.2.4.2.3 Direction of travel.

3.2.5 Time must be accurate to within 1/10 of a second and continuously generated.

3.2.6 Written documentation must coincide with the information each DVD to facilitate easy retrieval of information.

3.2.7 Audio shall be recorded in a clear, professional and concise manner at the same time as the video recording and shall include the same information as displayed on the screen. Special commentary shall be given for unusual conditions of streets, wetlands, brook, structures, trees, etc.

3.2.8 All DVDs and their containers shall bear labels with the following information:

3.2.8.1 DVD Number.

3.2.8.2 Project Name and Number.

3.2.8.3 Project Site.

3.2.8.4 Date of Recording.

3.2.8.5 Location and Standing Limit of DVD.

END OF SECTION

SECTION 01450

CHEMICAL DATA QUALITY CONTROL

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 This section covers requirements for the Contractor’s Chemical Data Quality Control (CDQC) for Remedial Action (RA) at Raritan Bay Slag Superfund Site – Margaret’s Creek Sector. This section is to be used to prepare a Uniform Federal Policy Quality Assurance Project Plan, booking laboratory(ies), monitoring of subcontract laboratory performance, data validation, data reporting, and preparation of a chemical data final report, as defined in this section. The UFP-QAPP shall contain the necessary technical detail and directions for all sampling and field measurements and specifies all quality assurance (QA) and quality control (QC) procedures required for planning, implementation and assessment of the RA.

1.1.2 Field measurements and samples shall be collected by the Contractor to delineate soil and sediment contamination prior to excavation; generate surface water monitoring baseline data; characterize cleared material, excavated waste material, backfill materials, and topsoil; characterize water generated from dewatering operations if necessary; verify that discharge water samples meet the Middlesex County Utilities Authority (MCUA) publicly owned treatment works (POTW) Temporary Discharge Approval or New Jersey Pollutant Discharge Elimination System (NJPDDES) Discharge to Surface Water (DSW) requirements; obtain post-excavation/closure data; and to obtain data from beneath the sediment containment and soil stockpile areas to confirm no leakage occurred during dewatering activities or stockpiling.

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. Where reference is made to one of the standards below, the revision in effect at the time of contract award shall apply.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- | | |
|---------------|---|
| ASTM D2216-10 | Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass |
| ASTM D5268-13 | Standard Specification for Topsoil Used for Landscaping Purposes |

CODE OF FEDERAL REGULATIONS (CFR)

- | | |
|------------|---|
| 40 CFR 261 | Identification and Listing of Hazardous Waste |
|------------|---|

ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 450/4-89/015	Data Quality Objectives for Ambient Air Monitoring Around Superfund Sites (Stages I and II)
EPA 450/4-89/005	Data Quality Objectives for Ambient Air Monitoring Around Superfund Sites (Stage III).
EPA 402/B-04/001A	Multi-Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual, Volume I.
EPA/240/B-06/001	Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G-4. February 2006.
EPA/240/R-02/009	Guidance for Quality Assurance Project Plans, EPA QA/G-5. December 2002.
EPA/240/B-01/003	EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5. March 2001. Reissued May 2006.
EPA Region 2/SOP HW-3a, HW-3b, HW-3c	SOPs for (Metals) ICP-AES /ICP-MS Data Validation, Mercury and Cyanide Data Validation. July 2015.
EPA Region 2 HW-33A, 34A, 35A, 36A and 37A	Hazardous Waste Support Section SOPs for Data Validation Low/Medium Volatile , Trace Volatile, Semivolatile, Pesticide and Polychlorinated Biphenyl (PCB) Aroclor. Revisions 0/1. June 2015.
EPA Region 2 SOP HW-32	Policy for Implementing the National Strategy for Procuring Analytical Services for all OSWER Programs Standard Operating Procedure (SOP), Revision 7. August 2009.
EPA 540/P-87/001B	A Compendium of Superfund Field Operation Methods.
EPA 540/R-013/001	EPA Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Superfund Data Review, August 2014
EPA 540/R-014/002	EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, August 2014
EPA 540/R-014/013	Contract Laboratory Program Guidance for Field Samplers. October 2014
EPA 600/R-96/055	Guidance for the Data Quality Objective Process, August 2000
EPA SW-846	(Rev 0; updates I, II, IIA, IIB, III, IIIA, IIIB, IVA, and IVB) Test Methods for Evaluating Solid Waste (Vol. IA, IB, IC, and II)

EPA 505/B-04/900A	Intergovernmental Data Quality Task Force (IDQTF), Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP) Part 1 - Evaluating, Assessing, and Documenting Environmental Data Collection and Use Programs. March 2005.
EPA 505/B-04/900B	Intergovernmental Data Quality Task Force (IDQTF), Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP) Part 2B – Quality Assurance/Quality Control Compendium: Minimum QA/QC Activities. March 2005.
EPA 505/B-04/900C	Intergovernmental Data Quality Task Force (IDQTF), Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP) Part 2A – Workbook for UFP for QAPP (March 2005). Optimized UFP-QAPP Worksheets. March 2012.
EPA 600/R-04/003	National Environmental Laboratory Accreditation Conference (NELAC) Standard, Chapter 5 – Quality Systems, June 2003 (or the 2009 NELAC Institute standards if already implemented by the applicable state accrediting body)
EPA 600/4-79/020	Methods for Chemical Analysis of Water and Wastes. March 1983.
Directive 9240.0-2C	Analytical Services Tracking System (ANSETS) directive for reporting non-CLP analytical services,
Directive 9240.0-05A	EPA Specifications and Guidance for Contaminant-Free Sample Containers, EPA/540/R-93/051, Office of Solid Waste and Emergency Response.
Directive 9200.1-103	Inclusion of Scribe into the Role of Tracking Superfund Sampling Data
EPA	EPA Superfund Analytical Services/Contract Laboratory Program Statement of Work (SOW).
EPA	EPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods, Multi-Media, Multi-Concentration (ISM02.3).
EPA	EPA Contract Laboratory Program Statement of Work for Organics Analysis (Multi-Media, Multi-Concentration), SOM02.3.
EPA	EPA Region 2 Electronic Data Deliverable Comprehensive Specification Manual (current edition), http://www.epa.gov/region2/superfund/medd.htm

1.3.4 Analytical Data; Test Reports; FIO

Hard copy and electronic copy of all the analytical data collected at the site shall be submitted to the EPA’s Representative in accordance with Paragraph 1.7.

1.3.5 Non-Conformance Reports; Test Reports; FIO

Reports shall be submitted within 48-hours of the occurrence of any significant problem with sampling, analytical procedures, instrument calibration and maintenance, and project quality control. Significant problems shall include, without limitation, the items specified herein as requiring corrective actions by the Contractor.

1.3.6 Chemical Data Final Report (CDFR); Test Reports; EA

The CDFR as described in Paragraph 3.6 shall be submitted to the EPA’s Representative within 30 calendar days of completing work at the site and before final payment. Each report shall be labeled with the contract number, project name, and location.

1.4 ACRONYMS

The definition of acronyms used by the Contractor that pertain to CDQC shall be clearly defined for all contract related products and communications.

1.5 CHEMISTRY REQUIREMENTS

Chemical data shall be acquired, documented, verified and reported in a manner that assures that the precision, accuracy, and completeness requirements are achieved, as specified in the Contractor’s approved UFP-QAPP. The Contractor must demonstrate the analytical chemistry methods’ ability to meet the project data quality objectives (DQOs). Where national standard methods are not available for the medium, methods published by reputable technical organizations (e.g., ASTM) shall be utilized. Sampling, analysis and measurement requirements listed in the following subsections shall be included in the UFP-QAPP.

1.5.1 Data Quality Objectives

1.5.1.1 Project Objective

The overall project objective is to remove the contaminated material (slag, battery casings, associated wastes, soil, and sediment) from the Site and backfill the excavation with clean fill material in accordance with the Contract Documents.

1.5.1.2 Sampling Objectives

Samples shall be acquired, and chemical parameter measurements shall be performed in such a manner that the resulting data meets and supports data use requirements. Both definitive and field screening data are anticipated for this project, as defined by the EPA Guidance for Systematic Planning (EPA 240/B-06/001). Field screening quality data shall be generated for health and safety purposes, but can be used to identify media or samples that may be subject to further analysis. Definitive level quality data shall be used to delineate soil and sediment contamination, collect surface water baseline data, characterize cleared material, characterize

excavated material, demonstrate backfill and topsoil quality, characterize water prior to discharge, verify that discharge water samples meet the MCUA Temporary Discharge Approval requirements, verify that the site cleanup criteria have been met, and determine if contamination occurred below sediment containment or soil stockpile areas as a result of remedial activities. Definitive quality data shall be acquired, documented, verified and reported to ensure that the specified data quality indicators (DQIs) (precision, accuracy, representativeness, comparability, completeness and sensitivity) measurement performance criteria are achieved. Sampling objectives are discussed in detail to ensure that the data obtained will be of sufficient quality and quantity to meet the DQOs.

1.5.1.2.1 Pre-excitation samples shall be collected for the following media and for the parameters listed in Paragraph 1.5.2.1.

- Soil/sediment – Samples shall be collected to vertically and horizontally delineate the primary excavation limits, and to initially characterize the soil/sediment for disposal purposes.
- Wood Tissue –Samples shall be collected from trees trunks to characterize material designated for clearing and chipping and determine if the material may be reused on site. Sample data shall be compared to the NJDEP Residential Direct Contact Soil Remediation Standards (RDCSRS), NJAC 7:26D (Table 01450-2). If results exceed the RDCSRS, the cleared material shall not be reused onsite.
- Surface Water – Samples shall be collected to generate baseline data for surface water monitoring.

1.5.1.2.2 Waste characterization samples from excavated soil and sediment shall be analyzed in accordance with disposal facility sampling requirements. The analytical results obtained by the Contractor shall be sufficient to address any and all requirements of the selected disposal facility. The sampling requirements to be contained in the Contractor’s UFP-QAPP shall include specific disposal facility requirements for sampling, analysis and reporting.

1.5.1.2.3 Samples of topsoil and backfill materials from each offsite source shall be collected and analyzed for the parameters listed in Paragraph 1.5.2.3.2. Sample data shall be sufficient to demonstrate that topsoil and backfill materials do not contain contaminant levels that are hazardous to human health or the environment. The Contractor shall compare chemical sample data to the NJDEP RDCSRS. Radiological sample data shall be compared to the criteria specified in Paragraph 1.5.2.3.3. Sample results exceeding the RDCSRS (Table 01450-2) and radiological criteria specified herein, where those numbers are not below method detection levels, shall be unacceptable as topsoil or backfill. The gamma spectroscopy sample summary shall include all detectable radionuclides. No backfill or topsoil shall be brought to the Site without written approval from the EPA’s Representative.

1.5.1.2.4 Dewatering water samples shall be collected and analyzed for parameters as directed by MCUA to obtain approval for the application for discharge to the POTW. The Contractor shall contact MCUA to determine requirements in accordance with SECTION 02140 – DEWATERING AND DRAINAGE.

1.5.1.2.5 Process water samples from the onsite temporary treatment system shall be collected and analyzed to monitor treatment plant performance and refine operating conditions. Effluent samples (water) shall be collected and analyzed in accordance with discharge permit equivalency requirements (MCUA POTW discharge or surface water discharge). The sampling requirements to be contained in the Contractor’s UFP-QAPP shall include effluent limits for all compounds required under the discharge permit equivalency.

1.5.1.2.6 Post-excavation soil and sediment samples shall be analyzed for lead to confirm the final limits of excavation. The analytical results obtained by the Contractor shall be sufficient to confirm the final limits of excavation. The sampling requirements to be contained in the Contractor’s UFP-QAPP shall include specific chemical concentrations as stated in the remediation goals defined in Table 01450-1.

1.5.1.2.7 Samples from beneath the sediment containment and soil stockpile areas shall be collected after removal of the containment areas to verify that no cross-contamination has occurred in the area due to leakage. The samples shall be analyzed for lead and shall be compared to the site cleanup criterion of 400 milligrams per kilogram (mg/kg). Areas where sample results exceed the above criteria shall be excavated to remove the contamination in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL and be re-sampled.

1.5.1.2.8 Air samples shall be analyzed, and conditions shall be monitored in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE and SECTION 01362 – PERIMETER AIR MONITORING. The analytical results obtained by the Contractor shall be sufficient to assess worker and resident health risks associated with site activities. The sampling requirements to be contained in the Contractor’s Safety and Health Plan shall include specific compound concentrations for upgrading levels of protection and stopping work, and specific reporting requirements.

1.5.1.3 Chemical DQO

Chemical data shall be acquired, documented, verified and reported in a manner that ensures that the precision, accuracy, and completeness requirements provided in Table 01450-3 are achieved. The UFP-QAPP shall comply with the DQO process requirements as specified in EPA 600/R-96/055.

1.5.2 Sampling, Analysis, and Measurement Requirements

Sampling, analysis, and measurement requirements listed in the following subsections shall be included in the UFP-QAPP.

1.5.2.1 Pre-Excavation Sampling Requirements

1.5.2.1.1 Soil and Sediment

Pre-excavation soil and sediment samples shall be collected as per SECTION 02100 – PRE-EXCAVATION SAMPLING AND SITE PREPARATION and as shown on the Contract

Drawings prior to the initiation of excavation activities. The soil and sediment samples shall be analyzed for lead and selected composite soil samples shall be analyzed for parameters listed in Paragraph 1.5.2.2.1.

1.5.2.1.2 Wood Tissue

Wood tissue samples shall be collected as stated in SECTION 02100 – PRE-EXCAVATION SAMPLING AND SITE PREPARATION and sent to an offsite laboratory for target analyte list (TAL) metals analysis. The Contractor shall ensure sufficient volume is collected for laboratory analysis.

1.5.2.1.3 Surface Water

Surface water monitoring samples shall be collected in accordance with SECTION 02100 – PRE-EXCAVATION SAMPLING AND SITE PREPARATION PLAN and as shown on the Contract Drawings. The samples shall be sent to an offsite laboratory for TAL metals analysis.

1.5.2.2 Waste Characterization Sampling Requirements

Samples from excavated contaminated soil, sediment, slag, and battery casing shall be collected and analyzed in accordance with the Contractor’s approved disposal facility requirements. Samples shall be analyzed for waste characteristics to determine handling, transportation, and disposal requirements. The number and volume of samples will be determined by the disposal facility.

1.5.2.2.1 Standard analytical requirements for waste characterization samples are listed below:

- a. Paint Filter Liquid Test
- b. Corrosivity
- c. Ignitability
- d. Reactivity – Hydrogen Cyanide
- e. Reactivity – Hydrogen Sulfide
- f. Toxicity Characteristic Leaching Procedure (TCLP) – Metals
- g. TCLP – Volatile Organic Compounds (VOCs)
- h. TCLP – Semi-volatile Organic Compounds (SVOCs)
- i. TCLP – Pesticides
- j. TCLP – Herbicides
- k. Polychlorinated Biphenyls (PCBs)
- l. Moisture Content

Analytical methods for the above parameters are included in Table 01450-4.

1.5.2.2.2 The Contractor shall ensure that all the disposal facility requirements are met prior to shipment of the waste. EPA approval is required to utilize a disposal facility for hazardous/non-hazardous waste generated from the Site.

1.5.2.3 Backfill and Topsoil Sampling Requirements

1.5.2.3.1 Clean backfill and topsoil material samples shall be collected as stated in SECTION 02201 – BACKFILL, COMPACTION, AND GRADING and NJDEP guidance document “Alternative and Clean Fill Guidance for SRP Sites, Version 3.0” to ensure that they are free of chemical contamination.

1.5.2.3.2 Analytical parameters to verify that backfill and topsoil are free of chemical contamination include:

- a. EPA TAL metals, mercury and cyanide
- b. EPA Target Compound List (TCL) compounds + Acrolein, Acrylonitrile, Benzidine, 1,2-Diphenylhydrazine, N-Nitrosodimethylamine and Tertiary Butyl Alcohol
- c. Extractable Petroleum Hydrocarbon (EPH)
- d. Radium-226 (Gamma Spectroscopy)
- e. Gamma Radiation Exposure Rate (Field Screening)
- f. Soil pH (using method SW-846 9045D)

Analytical methods for the above parameters are included in Table 01450-4.

1.5.2.3.3 The criteria for backfill to be free of radiological contamination are listed below:

- a. Radium-226 < 3 picoCuries per gram (pCi/g) (assuming background level of 1 pCi/g)
- b. Gamma Radiation Exposure Rate < 30 micro Roentgen per hour ($\mu\text{R/hr}$)

1.5.2.3.4 Analytical parameters for topsoil shall include, at a minimum, total organic carbon, pH and nutrients (nitrogen, phosphate, and potassium). Sample data shall be sufficient to demonstrate that topsoil materials meet the NJDOTSS 917.01 and ASTM D5268 requirements in accordance with SECTION 02921 – UPLAND SEEDING.

1.5.2.4 Water Characterization Sampling Requirements

If water characterization sampling is required, sampling parameters and methods shall meet MCUA requirements.

1.5.2.5 Process Water Sampling Requirements

The Contractor shall collect and analyze all treated water samples in accordance with the discharge permit (MCUA or NJPDES DSW). The Contractor shall prepare a table that shows effluent criteria for each chemical analyte/compound/test parameter included in the water testing program.

1.5.2.6 Post-Excavation Sampling Requirements

Post-excavation samples shall be collected as per SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL and as shown on the Contract Drawings. The samples shall be sent to the offsite laboratory for lead analysis to confirm or revise excavation requirements in accordance with EPA Cleanup Criteria listed in Table 01450-1.

1.5.2.7 Sediment Containment and Stockpile Area Sampling Requirements

Samples from beneath the sediment containment and soil stockpile areas shall be collected after removal of the containment area and stockpile materials to verify that no cross-contamination has occurred in these areas due to leakage. The samples shall be collected as per SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. The samples shall be sent to the offsite laboratory for lead analysis to verify the results are below the EPA Cleanup Criteria listed in Table 01450-1.

1.5.2 Air Monitoring Sampling Requirements

The Contractor shall conduct air monitoring throughout the project. Air monitoring, including sampling, shall be performed as outlined in SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE and SECTION 01362 – PERIMETER AIR MONITORING.

1.6 QUALITY ASSURANCE (QA)/QUALITY CONTROL (QC) ELEMENTS

The Contractor shall be responsible for the following QA/QC elements necessary to monitor and ensure the quality of chemical data produced.

1.6.1 Analytical Testing Laboratories

1.6.1.1 General

1.6.1.1.1 The Contractor shall comply with the Superfund Field and Analytical Services Teaming Advisory Committee (FASTAC) policy as detailed in SOP HW-32 in selecting and implementing analytical services for this project. This policy requires use of the tiered decision tree for procuring Superfund analytical services for all non-time critical data collection projects. The decision tree tiers are as follows:

- Tier 1: EPA Region II Division of Environmental Science and Assessment (DESA) Laboratory including Environmental Services Assessment Team (ESAT) support
- Tier 2: National Analytical Services Contract Laboratories Program (CLP)
- Tier 3: Region Specific Analytical Services (SAS) Contract laboratories
- Tier 4: Contractor, Interagency Agreement (IAG) and Field Contractor Subcontract laboratories

1.6.1.1.2 The Contractor shall submit the analytical service request (ASR) form to the EPA Regional Sample Control Center (RSCC) a minimum of four weeks prior to mobilization of the sampling event. The ASR shall be submitted to EPA’s Sharepoint site.

1.6.1.1.3 The Contractor shall propose analytical subcontract laboratories in the UFP-QAPP for analytical services that cannot be accommodated through the DESA and/or CLP. The use of subcontract laboratories shall be approved by the EPA’s Remedial Project Manager (RPM). The Contractor shall provide justification for use of a subcontract laboratory to the EPA RPM along with the ASR indicating the required analyses, turnaround times, special requests, etc. The subcontract laboratory shall meet the certification requirements listed in Paragraph 1.6.1.3.

1.6.1.2 Subcontracted Laboratory Analytical Requirements

The Contractor shall provide chemical analyses for all parameters by methods specified in the project specification to achieve the project DQOs.

1.6.1.3 Subcontract Laboratory Certification

Environmental laboratory services are to be provided only by laboratories compliant with the most recently published version of the DOD Quality Systems Manual (QSM), including the National Environmental Laboratory Accreditation Conference (NELAC) Standard Chapter 5 and Appendix requirements (EPA/600/R-04/003), holding a current National Environmental Laboratory Accreditation Program (NELAP) accreditation for all appropriate fields-of-testing, and certified by the State of New Jersey. Before testing services can be performed by the laboratory, the Contractor shall verify the candidate laboratory’s acceptability by reviewing their certifications. NELAP accreditation information is to be provided annually. The laboratory shall notify the EPA’s Representative immediately of any change in status of laboratory operations that may affect ongoing compliance with these requirements. The EPA may, at any time, conduct audits (including requests for pertinent data or information) that support an environmental laboratory’s self-declaration of compliance with this policy. If the EPA finds the laboratory is in non-compliance, the Contractor shall utilize alternate, compliant laboratory services until such time as compliance is again demonstrated. Before performing environmental testing, the laboratory shall have access to the approved UFP-QAPP.

1.6.1.4 Subcontracted Laboratory Performance

The Contractor shall provide oversight to ensure continued acceptable analytical performance and shall establish a procedure to address data deficiencies noted by review and/or quality control sample results. The Contractor shall provide and implement a mechanism for providing analytical laboratories with the UFP-QAPP, for monitoring the laboratory's performance and for performing corrective action procedures. The Contractor shall acquire analytical services with NELAP-accredited and State of New Jersey-certified laboratories.

1.6.2 Contractor QC Sample Collection and Analysis

QC samples shall be collected and analyzed by the Contractor in accordance with the Contract Laboratory Program Guidance for Field Samplers (EPA 540/R-014/013) and other guidance documents and the Contractor’s approved UFP-QAPP. QC samples shall be collected as described in the Contractor’s approved UFP-QAPP. The following summarizes the minimum QC sampling requirements:

- Field duplicates shall be collected at a rate of at least one per every 20 samples to assess the overall precision of the field sampling technique.
- One trip blank shall be included with each daily shipment that contains aqueous samples collected for VOC analysis to verify the presence or absence of cross contamination in VOC samples during handling and shipment from the field to the laboratory.
- One field (or equipment/rinsate) blank shall be collected at a frequency of one per decontamination event, not to exceed one per day, for each equipment type and for each sample matrix to assess the effectiveness of equipment decontamination.
- One cooler temperature indicator or “temperature blank” will be placed in each cooler containing samples (solid and aqueous) for analysis to verify that samples have been maintained at 0-6° C.
- One matrix spike/matrix spike duplicate (MS/MSD) will be collected at a rate of one per sample delivery group (SDG), as defined by the Contract Laboratory Program Guidance for Field Samplers to demonstrate the accuracy of laboratory analysis. MS/MSDs are not required for VOC and SVOC analysis in EPA Region 2.

1.6.3 Documentation of Sample Collection and Analysis

1.6.3.1 CLP Laboratory

The Contractor shall submit a trip report to the EPA RSCC within seven days of collection of the final sample in a CLP case for samples analyzed by a CLP laboratory. The trip report shall include sample locations, dates of collection and shipment, identification of QC samples, and names of laboratories to which samples were submitted. The trip report shall be submitted via email or hardcopy mail to the RSCC coordinator, Ms. Christina Leung, at the EPA Region 2 office, MS-215, 2890 Woodbridge Avenue, Edison, New Jersey 08837.

1.6.3.2 Subcontract Laboratory

The Contractor shall submit an ANSETS Data Requirement Form documenting analytical services provided by any subcontracted laboratory. (Attachment 5, Exhibit 1 of EPA Region II SOP HW-32). The form shall include the laboratory name and location, number of samples, analytical methods, and costs and be submitted at the end of each month, by the 5th of the next month following sample collection, via email to Christina Leung, Jennifer Feranda, and Robert Toth. Concurrent with submission to the EPA RSCC, the ANSETS Form shall be submitted to the EPA PM.

1.6.4 Review of Primary Laboratory Data

The Contractor shall be responsible for the independent review of the entire data set.

1.6.5 Data Validation

The Contractor shall validate analytical data for samples analyzed by the Contractor’s subcontract laboratory. The data shall be evaluated in accordance with EPA SOPs HW-3a, HW-3b, HW-3c, HW-33A, HW-35A, HW-36A, and HW-37A, as appropriate or accordance with EPA Contract Laboratory Program National Functional Guidelines referenced in Section 1.2. The Contractor shall provide validation SOPs for any methods not covered by these documents. Radionuclide data shall be evaluated in accordance with MARLAP Chapter 8, Section 5 (EPA/402/B-04/001A). Items listed below shall be assessed as part of the data validation. The data validation criteria shall be consistent with project DQOs and discussed in the approved UFP-QAPP. The Contractor shall prepare a data validation report, which shall include a summary of the independent data reviewer’s findings. The summary shall consist of a table listing each QC result outside of established criteria, the established criteria, and the validation actions. Comments shall be included on how these data affect the validity of analytical results of the samples including data qualifiers used. The data validation report shall include, but not be limited to, the following parameters:

- Data completeness
- Method blank and field blank results
- Holding time including sample integrity
- Surrogate recovery results
- Instrument calibration
- Matrix spike results
- Continuing calibration verification
- Laboratory and field duplicate results
- Laboratory control samples
- Verification of sample results

The Contractor shall have the laboratory data validated by an organization independent of the organization generating the data. The data validation reports shall be submitted as an appendix to the Chemical Data Final Report discussed in Paragraph 3.6.

1.7 ANALYTICAL DATA

1.7.1 Hard Copy

The chemistry data packages shall be reproduced and provided to the EPA’s Representative no later than 4 weeks after receipt of the analytical data package from the laboratory. The chemistry data package shall contain information to demonstrate that the project's DQO have been fulfilled.

1.7.2 Electronic Data Deliverables (EDD)

The Contractor shall prepare and submit to EPA a final EDD for all samples collected by the Contractor in accordance with the procedures and requirements set forth in the Comprehensive Specification Manual (current edition) and as described at the following website.

<https://www.epa.gov/superfund/epa-superfund-electronic-data-submission-multi-regions-edd>

The EDD shall include sample information including sample locations (horizontal coordinates and surface elevation) and sample results. The EDD shall also include an updated geo-referenced electronic base map in AutoCAD drawing exchange (DXF) format showing site features, monitoring well locations, and updated site grades following the soil remediation program.

The Contractor shall provide the EPA’s Representative with a copy of the transmittal letter for all EDD submissions, identifying what data were provided in the EDD. The Contractor shall also provide the EPA’s Representative with a copy of the notice from EPA that the EDD submittal was successfully uploaded.

1.8 QUALIFICATIONS

1.8.1 Chemical Quality Control Officer

As a minimum, the Contractor’s Chemical Quality Control Officer shall have a Bachelor’s Degree (B.A. or B.S.) in Chemistry, three years of experience with Hazardous Toxic and Radioactive Waste (HTRW) Quality Control including hazardous waste manifesting. The Chemical Quality Control Officer shall ensure that all chemistry-related requirements 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 the EPA’s Representative and Contractor personnel.

1.8.2 Environmental Sampler

As a minimum, the Contractor’s Environmental Sampler shall have a B.A. or B.S. degree in Chemistry or closely related scientific/technical field, 1 year of experience in and knowledge of EPA methods for collecting environmental and hazardous waste samples and 1 year of experience in calibration and operation of field screening equipment e.g. photo-ionization detector (PID) flame ionization detector (FID). The Environmental Sampler shall collect all onsite samples and perform all field-screening tests. 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 excavation and stockpiling operations involving soil to be checked for contamination.

1.8.3 Project Chemist

At a minimum, the Contractor’s Project Chemist shall have: a B.A. or B.S. degree in chemistry; 3 years of experience related to investigations, studies, design and remedial actions at Hazardous, Toxic, and Radioactive Waste (HTRW) sites; 2 field seasons of experience in calibrating and

operating various field monitoring devices; and 2 years of sample analysis experience in HTRW program and activities. The Project Chemist shall ensure that all chemistry-related goals of the program are attained.

1.9 COORDINATION MEETING

Before start of construction, the Contractor shall meet with the EPA’s Representative at the construction site to discuss the Contractor Quality Control (CQC) Plan and the UFP-QAPP. The coordination meeting shall be simultaneous to any CQC coordination meeting required in SECTION 01451 - CONTRACTOR QUALITY CONTROL unless otherwise indicated or directed. A list of definable features of work that involve chemical measurements shall be agreed upon. At a minimum, each matrix (soil, water, air, instrumental chemical parameter measurement, etc.) shall be a definable feature of work. Management of the chemical data quality system including project DQOs, 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 serve to establish an interrelationship between the Contractor's chemical data quality management and EPA chemical quality assurance requirements. Minutes of the meeting shall be documented by the Contractor and shall be signed by both the Contractor and the EPA’s Representative. The minutes shall include any or all unresolved chemical issues along with the conditions for resolution and 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.

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 CDQC. An effective CDQC system that meets the requirements for the chemical measurement DQO applicable to the project shall be established. The chemical data QC system shall consist of a chemical Quality Management staff responsible for the UFP-QAPP, analytical procedures, minimum data reporting requirements and the organization necessary to produce the required chemical data. 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, minimize the amount of excavated material requiring temporary storage, prevent dilution of contaminated soils with clean soils, and ensure completion of work within the required time.

3.2 CONTRACTOR QUALITY CONTROL 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.

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 at 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 QC 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 of the staff 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 QAPP.

3.3 UNIFORM FEDERAL POLICY QUALITY ASSURANCE PROJECT PLAN (UFP-QAPP)

3.3.1 General

The UFP-QAPP shall describe all chemical parameter measurements for all phases of the remedial action. The Contractor must provide sufficient detail for the project team to obtain data that meet the DQOs of the project. The Contractor’s QAPP shall be in accordance with the UFP-QAPP Manuals referenced in Paragraph 1.2.

3.3.2 Level of Detail

The UFP-QAPP shall contain necessary technical detail and direction such that field and laboratory personnel understand all sampling and field measurement requirements. It shall document all aspects of the project, planning, implementation, assessment, corrective actions and reconciliation of completed tasks with documented planned objectives. It shall contain sufficient direction and detail that onsite personnel can perform all onsite activities required to

attain project DQOs, including collection of samples for offsite chemical analysis, shipment of samples for offsite analyses, performance of onsite instrument measurements, and documentation and reporting requirements. The level of detail in the UFP-QAPP shall be such that any technically competent personnel unfamiliar with the Site can follow the plan and perform all required work. It shall contain sufficient direction and detail that analytical laboratory personnel understand the analytical methods required and project-required reporting limits, project DQOs measurement performance criteria, and project data validation and reporting requirements.

3.3.3 Appendices

The Appendices section of the UFP-QAPP shall contain all contractor standard forms, project figures and tables, and SOPs, and all references pertaining to the project requirements included in the UFP-QAPP relating to project DQOs, standard and non-standard measurement methods, equivalency data, U.S. Government and regional agency guidance and regulatory documents, existing site-related documents, and other contract-related chemical analysis documents. Reference to all applicable SOPs from EPA/540/P-87/001B, Compendium of Superfund Field Operations Methods, or Contractor SOPs, where applicable, shall be included.

3.3.4 Content

The UFP-QAPP shall meet the requirements of the UFP-QAPP Manual and shall cover, at a minimum, the following topics:

- Distribution List
- Title and Approval Page
- Project Description
- Introduction, including Summary of Scope and Objectives, Site History and Contaminants
- Existing Site Data Summary - Evaluation of Secondary Data and Use Limitations
- Project Description/Problem Definition/Site-Specific Analysis Problems
- Project Objectives/Systematic Planning Documentation/Data Quality Objectives
- Sampling Design and Rationale
- Scope and Objectives
- Project Schedule and Timelines
- Project Organization and Responsibility
- Personnel Responsibilities, Qualifications and Special Training Requirements
- Field Activities and Standard Operation Procedures (SOPs)
- Field and Laboratory QC Samples
- Sampling Procedures and Container/Preservation Requirements

- Sample Custody, Chain-of-Custody/Sample Documentation
- Sample Handling/Identification
- Field Logbooks and Contents; Documentation Procedures
- Sample Packaging and Shipping
- Equipment Decontamination
- Contractor Quality Control
- Daily Quality Control Reports
- Field Quality Control and Corrective Actions
- Sampling Apparatus and Field Instrumentation
- Data Quality Objectives and Measurement Performance Criteria
- Sample Custody and Holding Times
- Analytical Procedures
- Reference Limits and Evaluation of Quantitation Limit Goals
- Laboratory Calibration Procedures and Frequency
- Internal QC Checks
- Calculation of Data Quality Indicators
- Laboratory Corrective Actions
- Data Reduction, Review, Validation and Reporting
- Laboratory Reporting Requirements
- Preventive Maintenance (Field and Laboratory)
- Performance and System Audits
- QC Reports to Management
- Appendices

The UFP-QAPP shall include a table of contents; crosswalk showing that all UFP-QAPP elements have been addressed; definitions, acronyms, and references pertaining to the project; and other related chemical analysis documents such as the data validation SOPs.

3.3.5 The “Sampler’s Guide: Contract Laboratory Program Guidance for Field Samplers” (EPA 540/R-014/013), October 2014 procedures shall be followed for sample packing and shipment.

3.3.6 All Department of Transportation (DOT) regulations under 40 CFR 261 shall be followed regarding shipment of the samples.

3.4 CONTROL OF CHEMICAL DATA QUALITY

3.4.1 General

Contractor CDQC 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 DQO and the requirements of the QAPP. The Contractor shall utilize the three phased 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. When possible, the three phase chemical data control process shall be combined with that under SECTION 01451 - CONTRACTOR QUALITY CONTROL.

3.4.2 Three Phase Process

3.4.2.1 The preparatory phase shall include a review of the specification, UFP-QAPP, and all relevant SOPs for the chemical parameter measurement and/or chemical sample acquisition and shipment. It shall include a physical examination of all required forms, materials and equipment to ensure conformance with the UFP-QAPP and that all materials are on site. It shall include a demonstration of sampling procedures by the Contractor's field sampling personnel.

3.4.2.2 The initial phase shall be performed at the initiation of each definable feature of work by the CQC Representative to confirm compliance with the UFP-QAPP, including: instrument calibration, operation and performance checks, sample acquisition, labeling, and shipment in accordance with required SOPs, sampling equipment decontamination, and completion of all required documentation.

3.4.2.3 The follow up phase shall require daily inspections to ensure compliance with the UFP-QAPP.

3.5 SUBCONTRACT ANALYTICAL TESTING LABORATORIES

3.5.1 General

The Contractor shall propose the analytical laboratories to be used for the sample analyses in case of DESA or CLP cannot accept the samples. Laboratory certification requirements shall be in accordance with Paragraph 1.6.1. The Contractor may utilize its own laboratory or utilize subcontract laboratories to achieve the required sample analyses.

3.5.2 Laboratory Analytical Requirements

The Contractor shall provide the chemical analyses specified in this specification through the DESA/CLP and/or subcontractor’s laboratory. The Contractor shall provide chemical analyses for all parameters by methods specified in the project specifications to achieve the project DQOs.

3.5.3 Laboratory Performance

The Contractor shall monitor and ensure continued acceptable analytical performance and shall establish a procedure to address data deficiencies noted by review and/or quality assurance sample results. The Contractor shall provide and implement a mechanism for providing analytical laboratories with the QAPP, for monitoring the laboratories’ performance and for performing corrective action procedures. The Contractor shall acquire analytical services with NELAP-accredited and State of New Jersey-certified laboratories in case of DESA or CLP cannot accept the samples.

3.6 CHEMICAL DATA FINAL REPORT (CDFR)

The CDFR shall be produced after project completion; it shall include a summary of quality control practices employed and all chemical parameter measurement activities. This includes, but is not limited to, all data analyzed by the Contractor’s subcontract laboratories, if any, and shall include all definitive data. At a minimum, the CDFR shall contain the following:

- Summary of project scope and description
- Summary of any deviations from the design chemical parameter measurement specifications
- Summary of chemical parameter measurements performed as contingent measurements
- Summary discussion of resulting data including achieving data reporting requirements
- Summary of DQO parameters including achieving sampling project specific DQO
- Presentation and evaluation of the data to include an overall assessment on the quality of the data for each method and matrix
- Internal QC data generated during the project, including tabular summaries correlating sample identifiers with all blank, matrix spikes, surrogates, duplicates, laboratory control samples, and batch identifiers
- A list of the affected sample results for each analytes (indexed by method and matrix) including the appropriate data qualifier flag (J, U, UJ, and R), where sample results are potentially impacted by quality control outliers
- 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
- Conclusions and recommendations
- Appendices containing chemistry data packages for all subcontract laboratory data (hardcopy and electronic copy on disk) and data validation reports.

3.7 NOTIFICATION OF NON-COMPLIANCE

The EPA’s Representative will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice.

TABLE 01450-1
Record of Decision Remediation Goals for Soil and Sediment

Contaminant of Concern	Cleanup Criteria (mg/kg)
Lead	400

Source: Raritan Bay Slag Superfund Site Record of Decision, 2013

TABLE 01450-2
Residential Direct Contact Soil Remediation Standards

Contaminant	CAS No.	Residential Direct Contact Soil Remediation Standard (mg/kg)
Acenaphthene	83-32-9	3,400
Acenaphthylene	208-96-8	NA
Acetone (2-Propanone)	67-64-1	70,000
Acetophenone	98-86-2	2
Acrolein	107-02-8	0.5
Acrylonitrile	107-13-1	0.9
Aldrin	309-00-2	0.04
Aluminum	7429-90-5	78,000
Anthracene	120-12-7	17,000
Antimony	7440-36-0	31
Arsenic	7440-38-2	19*
Atrazine	1912-24-9	210
Barium	7440-39-3	16,000
Benzaldehyde	100-52-7	6,100
Benzene	71-43-2	2
Benzidine	92-87-5	0.7
Benzo(a)anthracene (1,2-Benzanthracene)	56-55-3	0.6
Benzo(a)pyrene	50-32-8	0.2
Benzo(b)fluoranthene (3,4-Benzofluoranthene)	205-99-2	0.6
Benzo(ghi)perylene	191-24-2	380,000
Benzo(k)fluoranthene	207-08-9	6
Beryllium	7440-41-7	16
1,1'-Biphenyl	92-52-4	3,100
Bis(2-chloroethyl)ether	111-44-4	0.4
Bis(2-chloroisopropyl)ether	108-60-1	23
Bis(2-ethylhexyl)phthalate	117-81-7	35
Bromodichloromethane (Dichlorobromomethane)	75-27-4	1
Bromoform	75-25-2	81
Bromomethane	74-83-9	25
2-Butanone (Methyl ethyl ketone) (MEK)	78-93-3	3,100
Butyl benzyl phthalate	85-68-7	1,200
Cadmium	7440-43-9	78
Caprolactam	105-60-2	31,000
Carbazole	86-74-8	24
Carbon disulfide	75-15-0	7,800

TABLE 01450-2
Residential Direct Contact Soil Remediation Standards (continued)

Contaminant	CAS No.	Residential Direct Contact Soil Remediation Standard (mg/kg)
Carbon tetrachloride	56-23-5	0.6
Chlordane (alpha and gamma)	57-74-9	0.2
Chlorobenzene	108-90-7	510
Chloroethane (Ethyl chloride)	75-00-3	220
Chloroform	67-66-3	0.6
Chloromethane (Methyl chloride)	74-87-3	4
2-Chlorophenol (o-Chlorophenol)	95-57-8	310
Chrysene	218-01-9	62
Cobalt	7440-48-4	1,600
Copper	7440-50-8	3,100
Cyanide	57-12-5	1,600
4,4'-DDD	72-54-8	3
4,4'-DDE	72-55-9	2
4,4'-DDT	50-29-3	2
Dibenz(a,h)anthracene	53-70-3	0.2
Dibromochloromethane (Chlorodibromomethane)	124-48-1	3
1, 2-Dibromo-3-chloropropane	96-12-8	0.08
1,2-Dibromoethane	106-93-4	0.008
1,2-Dichlorobenzene (o-Dichlorobenzene)	95-50-1	5,300
1,3-Dichlorobenzene (m-Dichlorobenzene)	541-73-1	5,300
1,4-Dichlorobenzene (p-Dichlorobenzene)	106-46-7	5
3,3'-Dichlorobenzidine	91-94-1	1
Dichlorodifluoromethane	75-71-8	490
1,1-Dichloroethane	75-34-3	8
1,2-Dichloroethane	107-06-2	0.9
1,1-Dichloroethene	75-35-4	11
1,2-Dichloroethene (cis) (c-1,2-Dichloroethylene)	156-59-2	230
1,2-Dichloroethene (trans) (t-1,2-Dichloroethylene)	156-60-5	300
2,4-Dichlorophenol	120-83-2	180
1,2-Dichloropropane	78-87-5	2
1,3-Dichloropropene (cis and trans)	542-75-6	2
Dieldrin	60-57-1	0.04
Diethyl phthalate	84-66-2	49,000
2,4-Dimethyl phenol	105-67-9	1,200
Di-n-butyl phthalate	84-74-2	6,100

TABLE 01450-2
Residential Direct Contact Soil Remediation Standards (continued)

Contaminant	CAS No.	Residential Direct Contact Soil Remediation Standard (mg/kg)
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	534-52-1	6
2,4-Dinitrophenol	51-28-5	120
2,4-Dinitrotoluene	121-14-2	0.7
2,6-Dinitrotoluene	606-20-2	0.7
2,4-Dinitrotoluene/2,6-Dinitrotoluene (mixture)	25321-14-6	0.7
Di-n-octyl phthalate	117-84-0	2,400
1,2-Diphenylhydrazine	122-66-7	0.7
Endosulfan I and Endosulfan II (alpha and beta)	115-29-7	470
Endosulfan sulfate	1031-07-8	470
Endrin	72-20-8	23
Ethyl benzene	100-41-4	7,800
Fluoranthene	206-44-0	2,300
Fluorene	86-73-7	2,300
alpha-HCH (alpha-BHC)	319-84-6	0.1
beta-HCH (beta-BHC)	319-85-7	0.4
Heptachlor	76-44-8	0.1
Heptachlor epoxide	1024-57-3	0.07
Hexachlorobenzene	118-74-1	0.3
Hexachloro-1,3-butadiene	87-68-3	6
Hexachlorocyclopentadiene	77-47-4	45
Hexachloroethane	67-72-1	35
Indeno(1,2,3-cd)pyrene	193-39-5	0.6
Isophorone	78-59-1	510
Lead	7439-92-1	400
Lindane (gamma-HCH) (gamma-BHC)	58-89-9	0.4
Manganese	7439-96-5	11,000
Mercury	7439-97-6	23
Methoxychlor	72-43-5	390
Methyl acetate	79-20-9	78,000
Methylene chloride (Dichloromethane)	75-09-2	34
2-Methylnaphthalene	91-57-6	230
2-Methylphenol (o-Creosol)	95-48-7	310
4-Methylphenol (p-Creosol)	106-44-5	31
Methyl tert-butyl ether	1634-04-4	110
Naphthalene	91-20-3	6
Nickel (Soluble salts)	7440-02-0	1,600

TABLE 01450-2
Residential Direct Contact Soil Remediation Standards (continued)

Contaminant	CAS No.	Residential Direct Contact Soil Remediation Standard (mg/kg)
2-Nitroaniline	88-74-4	39
Nitrobenzene	98-95-3	31
N-Nitrosodimethylamine	62-75-9	0.7
N-Nitrosodi-n-propylamine	621-64-7	0.2
N-Nitrosodiphenylamine	86-30-6	99
Pentachlorophenol	87-86-5	3
Phenanthrene	85-01-8	NA
Phenol	108-95-2	18,000
Polychlorinated biphenyls (PCBs)	1336-36-3	0.2
Pyrene	129-00-0	1,700
Selenium	7782-49-2	390
Silver	7440-22-4	390
Styrene	100-42-5	90
Tertiary butyl alcohol	75-65-0	1,400
1,1,2,2-Tetrachloroethane	79-34-5	1
Tetrachloroethene (PCE) (Tetrachloroethylene)	127-18-4	2
Thallium	7440-28-0	5
Toluene	108-88-3	6,300
Toxaphene	8001-35-2	0.6
1,2,4-Trichlorobenzene	120-82-1	73
1,1,1-Trichloroethane	71-55-6	290
1,1,2-Trichloroethane	79-00-5	2
Trichloroethene (TCE) (Trichloroethylene)	79-01-6	7
Trichlorofluoromethane	75-69-4	23,000
2,4,5-Trichlorophenol	95-95-4	6,100
2,4,6-Trichlorophenol	88-06-2	19
Vanadium	7440-62-2	78
Vinyl chloride	75-01-4	0.7
Xylenes	1330-20-7	12,000
Zinc	7440-66-6	23,000

Source: NJAC 7:26D, Table 1A

NA = Standard not available

* The direct contact standard for arsenic is based on natural background

**TABLE 01450-3
 Data Quality Objectives for Chemical Parameters**

Data Use	Parameter	Precision (RPD)		Accuracy		Completeness
		Field Duplicate	Laboratory Duplicate	Lab LCS ¹	Lab MS ²	
Waste Characterization	TCLP Analytes ³	NA	<25	80-120%	75-125%	90 %
	PCBs	≤100	≤25	50-130%	40-140%	
	RCRA Characteristic Parameters ⁴	NA	<25	NA	NA	
Pre-Excavation (Soil and Sediment), Post-Excavation, and Sediment Containment and Stockpile Area Sampling	Lead	<100	<25	90-110%	75-125%	
Pre-Excavation Surface Water	TAL Metals	≤50	≤20	70-130%	75-125%	
Pre-Excavation Wood Tissue	TAL Metals	≤50	≤20	70-130%	75-125%	
Backfill and Topsoil Characterization	TCL VOCs	≤50	≤25	90-110%	75-125%	
	TCL SVOCs	≤50	≤25	50-130%	30-150%	
	TCL Pesticide/PCBs	≤50	≤25	50-130%	40-140%	
	TAL Metals, Mercury and Cyanide	≤100	≤25	90-110%	75-125%	
	EPH	≤50	≤25	50-130%	30-150%	
	Radium-226	≤50	≤25	80-110%	NA	
	Nutrients	<100	<25	NA	NA	
	pH	NA	<25	NA	NA	

Footnotes:

1. The laboratory established control limits may be used in place of the listed control limits.
2. Limits are advisory. The laboratory must calculate and document the precision (lab duplicate) and accuracy of the sample matrix spike results from this site.
3. TCLP analytes include TCLP VOCs, SVOCs, pesticides, herbicides, and metals.
4. RCRA characteristic parameters are listed in Paragraph 1.5.2.2.1.

TABLE 01450-3
Data Quality Objectives for Chemical Parameters (continued)

EPH	extractable petroleum hydrocarbons	RPD	Relative Percent Difference
MS	Matrix Spike	TAL	Target analyte list of EPA Contract Laboratory Program
TCLP	Toxicity Characteristic Leaching Procedure	TCL	Target compound list of EPA Contract Laboratory Program
NA	Not Applicable	VOC	Volatile Organic Compound
LCS	Laboratory Control Sample	SVOC	Semi-Volatile Organic Compound
PCBs	Polychlorinated Biphenyls		

**TABLE 01450-4
 Analytical Methods for Chemical Parameters**

Data Use	Parameter	Analytical Method (All methods are based on SW-846 except as noted)	
		Extraction	Analysis
Waste Characterization	TCLP VOC	1311, 5030B	8260B
	TCLP SVOC	1311, 3510C/ 3520C	8270D
	TCLP Pesticide	1311, 3510C/ 3520C	8081B
	TCLP Herbicide	1311, 8151A	8151A
	TCLP Metals	1311, 3010A	6010C, 7471A
	PCBs	3540C/3541	8082A
	Paint Filter Test	NA	9095B
	Reactivity, Corrosivity, and Ignitability	NA	Reactivity-Cyanide-9014; Reactivity-Sulfide-9034 Corrosivity –1110A/9040C; Ignitability – 1010A
Moisture Content	NA	ASTM D 2216 - 10	
Pre-Excavation (Soil and Sediment), Post-Excavation, Sediment Containment and Stockpile Area Sampling	Lead	3050B	6010C, 7471B
Pre-Excavation Wood Tissue	TAL Metals	3050B	6010C, 7471B
Pre-Excavation Surface Water	TAL Metals	NA	ISM02.3
Backfill and Topsoil Characterization	TCL VOC ¹	5030B/5031	8260B
	TCL SVOC	3540C	8270D
	TCL Pesticide/PCBs	Pesticide: 3510C/3520C PCBs: 3540C/3541	Pesticides – 8081B PCBs – 8082A
	TAL Metals including Mercury and Cyanide	3050B; Cyanide - 9013	Metals – 6010C, 7471B; Cyanide – 9012B/ 9010C
	EPH	NA	NJDEP EPH Method Revision 3
	Radium- 226	NA	HASL-300 or EPA approved method

TABLE 01450-4
Analytical Methods for Chemical Parameters (continued)

Data Use	Parameter	Analytical Method (All methods are based on SW-846 except as noted)	
		Extraction	Analysis
Backfill and Topsoil Characterization (continued)	Nutrients	Potassium and phosphate – 3050B or Mehlich Nitrogen – KCl	Potassium and phosphate - 6010D Nitrogen - KCl-extraction/Cd-reduction or other approved method
	pH	NA	9045D, ASTM D 4972

Footnotes:

1. Additional analytes to be analyzed with TCL compound list include Acrolein, Acrylonitrile, Benzidine, 1,2-Diphenylhydrazine, N-Nitrosodimethylamine and Tertiary Butyl Alcohol

BOD	biological oxygen demand	TDS	total dissolved solids
COD	chemical oxygen demand	TOC	total organic carbon
EPH	extractable petroleum hydrocarbons	TSS	total suspended solids
NA	not applicable	VOC	volatile organic compound
PCBs	polychlorinated biphenyls	SM	Standard Methods
TAL	target analyte list of EPA Contract Laboratory Program	SVOC	semi-volatile organic compound
TCL	target compound list of EPA Contract Laboratory Program ¹		

END OF SECTION

SECTION 01451

CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.1 SCOPE OF WORK

Furnish the labor, supervision, materials, equipment and services required to prepare a Contractor Quality Control (CQC) Plan for approval by the EPA’s Representative and to perform Contractor quality control in accordance with the approved CQC Plan.

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. Where reference is made to one of the standards below, the revision in effect at the time of contract award shall apply.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740 Standard Practice for 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 Standard Specification for Agencies Engaged in Construction Inspection, Testing, and/or Special Inspection

1.3 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with a “EA” designation; submittals having an “FIO” designation are for information only. The Contractor shall provide each of the following documents to the EPA’s Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES. The Contractor shall maintain a copy of all documents described in this section onsite at all times during construction.

1.3.1 CQC Plan; Pre-Construction Submittals; EA

The Contractor shall develop and submit to the EPA’s Representative for approval, a detailed CQC Plan, as specified in Paragraph 3.2 - QUALITY CONTROL PLAN.

1.3.2 CQC Organizational Changes; Product Data; EA

Any CQC organizational changes made during the Contract Period shall be submitted to the EPA’s Representative for acceptance.

1.3.3 CQC Reports; Product Data; FIO

The Contractor shall submit CQC reports, as specified in Paragraph 3.9 - DOCUMENTATION.

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. The CQC 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 on-site and off-site, and shall be keyed to the proposed construction sequence. In this section the term “construction” shall include all items of work, activities, materials, and equipment as indicated in the Contract Documents. Other sections of the Contract Documents may also require separate, specially qualified individuals in such areas as chemical data acquisition, sampling and analysis, medical monitoring, industrial hygiene, safety officer, etc. The CQC organization shall coordinate the activities of these individuals. The EPA’s Construction Management Contractor, herein referred to as the Remedial Action (RA) Contractor shall be held responsible for the quality of work on the job and is subject to removal by the EPA’s Representative for non-compliance with quality requirements specified in the contract. The RA Contractor in this context shall mean the on-site individual with the responsibility for the overall management of the project including logistics and production.

3.2 QUALITY CONTROL PLAN

3.2.1 General

The Contractor shall furnish for review by the EPA’s Representative, not later than 21 calendar days prior to the Pre-Work Conference, the Contractor Quality Control Plan proposed to implement the requirements herein. The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. 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 definable 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 aspects of the design and construction operations, both on-site and off-site, including work by subcontractors, suppliers, and purchasing agents:

3.2.2.1 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 the RA contractor, the CQC Manager and alternate as defined in Paragraph 3.5.2, and a Subcontractor Quality Control (SQC) Manager. The SQC Manager shall report to an officer in the Contractor’s organization above the Contractor’s superintendent and is responsible for both quality and production.

3.2.2.2 The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

3.2.2.3 A copy of the letter to the RA Contractor signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the RA Contractor, including authority to stop work which is not in compliance with the contract. The RA Contractor 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 EPA’s Representative.

3.2.2.4 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.

3.2.2.5 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 be approved by the EPA’s Representative. The Contractor shall incorporate all tests required by the Contract Documents (including systems commissioning and operating tests) to derive the above list of testing information which shall be presented in matrix form as part of the CQC Plan. This matrix shall be suitable for use by the Contractor and the EPA’s Representative as a checklist to control testing to be done on the contract.

3.2.2.6 Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation. Provide matrix of Preparatory and Initial Inspections including specification reference paragraph, the name of the Definable Feature of Work, and spaces for date performed, results, and names of attendees.

3.2.2.7 Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will establish verification that identified deficiencies have been corrected.

3.2.2.8 Reporting procedures, including proposed reporting formats.

3.2.2.9 A list of the definable features of work. A definable feature of work is a task that is separate and distinct from other tasks and has separate control requirements. It could be identified by different trades or disciplines, or it could 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 is frequently more than one definable feature under a particular section. This list shall cover all features of work on the project, and shall be agreed upon during the coordination meeting.

3.2.2.10 A brief explanation of the duties of the CQC organization with respect to safety. A separate Accident Prevention Plan and Hazards Analysis is required for submission and acceptance within the Site Safety and Health Plan.

3.2.2.11 Contractor’s plan for training all CQC personnel.

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 EPA’s Representative 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 EPA’s Representative in writing of any proposed changes. Proposed changes are subject to acceptance by the EPA’s Representative.

3.3 QUALITY CONTROL OF DESIGN ACTIVITIES

All design work products shall undergo thorough and continuous checking in accordance with the Contractors approved CQC Plan. Checking shall be done by staff who are knowledgeable in the work being checked and independent of the specific work product.

The reviewer's name and date shall be printed on each work product. Whenever practical, work shall be performed on standard computation sheets, which contains a header requiring this information. The title box of drawings also requires this information. The reviewer’s name and date are considered evidence that work products have been checked, and shall be provided to the technical reviewer of the design report.

3.3.1 Checking Calculations, Tables, Charts, and Data Sheets

Calculations, tables, charts, and data sheets shall be checked by an independent reviewer. Checking shall be performed throughout the design process. The complete thought process and mathematics shall be reviewed. The applicable formulas and design criteria shall be referenced on the computation paper or spreadsheets, and reviewed during the checking process. Corrections shall be clearly noted on the calculations and erroneous figures shall be crossed out. Revisions shall be reviewed with the individual who made the original calculations.

3.3.2 Checking Drawings, Maps, and Sketches

Drawings, maps, and sketches shall be checked by an independent reviewer. Checking of all drawings, maps, and sketches shall be performed prior to the design submittals. Questions or corrections shall be clearly noted and discussed with the preparer of the work product.

3.3.3 Technical Review

All work including shop drawing submittals shall be subject to independent technical reviews. Technical reviews of all documents shall be performed prior to submission. Technical document review is a critical review of work by one or more qualified reviewers who are independent of the document reviewed. The review is performed to ensure technical accuracy, accomplishment of project objectives, and conformance to established requirements.

3.4 PRE-CONSTRUCTION QUALITY CONTROL CONFERENCE

After the Pre-Work Conference, before start of construction, and prior to acceptance by the EPA’s Representative of the CQC Plan, the Contractor shall meet with the EPA’s Representative and discuss the CQC system. 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 on-site and off-site work, and the interrelationship of Contractor’s management and control with the EPA’s Quality Assurance. Minutes of the meeting shall be prepared by the Contractor in accordance with SECTION 01201- PRE-CONSTRUCTION AND PRE-WORK CONFERENCES and signed by both the Contractor and the EPA’s Representative. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences shall 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.

3.5 QUALITY CONTROL ORGANIZATION

3.5.1 General

The requirements for the CQC organization are a CQC Manager and sufficient number of additional qualified personnel to ensure contract compliance. The number of CQC personnel shall be increased as required during times of high construction workload. The Contractor shall provide a CQC organization that shall be at the Site at all times during progress of the work and with complete authority to take any action necessary to ensure compliance with the contract. All CQC staff members shall be subject to acceptance by the EPA’s Representative. 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 to maintain these documents and records at the site at all times, except as otherwise acceptable to the EPA’s Representative.

3.5.2 CQC Manager

The Contractor shall identify as CQC Manager an individual within his organization at the site of the work who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC Manager shall be a graduate engineer, graduate architect, or a graduate of construction management, or shall hold a state Professional Engineer's license, with a minimum of 2 years construction experience on construction similar to this contract, one year of which as a QC Representative. The CQC Manager may also be a construction person with a minimum of 4 years in related work, one year of which as a QC

Representative. This CQC Manager shall be on the site at all times during construction and shall be employed by the Contractor. An alternate for the CQC Manager shall be identified in the CQC Plan to serve in the event of the CQC Manager’s absence. The requirements for the alternate shall be the same as for the designated CQC Manager. The CQC Manager shall be assigned no duties other than Quality Control.

3.5.3 Organizational Expertise

The CQC organization must as a minimum possess general corporate technical knowledge of all aspects of the project, and must successfully execute the CQC System on all aspects of the project. Individuals possessing experience in specialized areas shall be added to the organization as required during periods when such specialty areas are being executed. Examples of such specialized areas would include heating, ventilation, and air-conditioning (HVAC), electrical distribution and substations, roofing, tele-communication systems, fire protection and alarm systems, computer installations, specialized welding, specialized finishes, pre-cast concrete installation, modular housing, surveying, chemical data acquisition, hazardous material removal and disposal, medical monitoring, etc., depending on the nature of the particular project. The Contractor must demonstrate that such additional qualified personnel have received sufficient training and indoctrination into the CQC System, and that these personnel properly execute the requirements of the CQC System within their areas of expertise.

3.5.4 Additional Requirement

In addition to the above experience and education requirements the RA Contractor shall have completed within the last five years the course titled "Construction Quality Management for Contractors". This course is given at a cost of \$125 by Government personnel and is of two-day duration. The Government shall provide one instruction manual for the course.

3.5.5 Organizational Changes

The Contractor shall maintain the CQC Organization at full strength at all times. When it is necessary to make changes to the organization, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the EPA’s Representative for acceptance.

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. At least three phases of control shall be conducted by the RA Contractor for each definable feature 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, and shall include:

- 3.6.1.1 A review of each paragraph of applicable specifications, references, codes and standards. A copy of those sections of referenced codes and standards applicable to the 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 EPA’s Representative until final acceptance of the work.
- 3.6.1.2 A review of the Contract Drawings.
- 3.6.1.3 A check to assure that all materials and/or equipment have been tested, submitted, and approved.
- 3.6.1.4 Review of provisions that have been made to provide required control inspection and testing.
- 3.6.1.5 Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
- 3.6.1.6 A physical examination of required materials, equipment, and sample work to ensure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
- 3.6.1.7 A review of the appropriate activity hazard analyses to assure safety requirements are satisfied.
- 3.6.1.8 Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.
- 3.6.1.9 A check to ensure that the portion of the plan for the work to be performed has been approved by the EPA’s Representative.
- 3.6.1.10 Discussion of the initial control phase.
- 3.6.1.11 The EPA’s Representative shall be notified at least 48 hours in advance of beginning the preparatory control phase meeting. This phase shall include a meeting conducted by the RA Contractor and attended by other CQC personnel (as applicable), and the superintendent responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC Manager and attached to the daily CQC report. The Contractor shall clearly indicate its intent and plan for communication of the results of the preparatory phase to applicable workers, to include materials, construction methods, workmanship standards, safety considerations and procedures, and preparatory phase meeting minutes.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a Definable Feature of Work (DFW) when the accomplishment of a representative sample of the work is impending. The following shall be accomplished:

3.6.2.1 A check of the portion of work done to ensure that it is in full compliance with contract requirements.

3.6.2.2 Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

3.6.2.3 Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

3.6.2.4 Resolve all differences.

3.6.2.5 Check safety to include compliance with and upgrading of the Site Safety and Health Plan. Review the activity hazard analysis with each worker.

3.6.2.6 The EPA’s Representative shall be notified at least 48 hours in advance of beginning the initial phase meeting. This phase shall include a meeting conducted by the RA Contractor and attended by other CQC personnel (as applicable), and the superintendent responsible for the definable feature and the work crew(s) for the appropriate DFW. Separate minutes of this phase shall be prepared by the CQC Manager and attached to the daily CQC report. Exact location (i.e. CQC Report number) of initial phase shall be indicated for future reference and comparison with follow-up phases.

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 or conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same DFW 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.

3.6.5 Definable Feature of Work: Definition and Discussion

A DFW is a portion of work consisting of materials, equipment, supplies and procedures which are closely related to each other, have the same control and shall be accomplished by the same work crew to completion. A DFW must be sufficiently small so that control of the work (i.e. communication of requirements to workers, inspection of materials and workmanship and correction of deficiencies) will be easily accomplished. Some examples for various types of DFWs are:

- Topographic and excavation survey
- Site preparation/clearing and grubbing
- Sediment containment area and stockpile/loadout area construction
- Soil erosion and sediment control
- Installation of temporary drainage features
- Installation and operation of temporary wastewater treatment and discharge system
- Decontamination area and exclusion zone setup
- Sampling and chemical data acquisition
- Excavation
- Sediment dewatering
- Soil/sediment disposal
- Backfilling, soil compaction testing, and grading
- Wetlands and upland site restoration

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 EPA’s Representative duplicate samples of test specimens for possible testing by EPA. Testing includes operation and/or acceptance tests when specified. The Contractor shall perform the following activities and record and provide the following data:

3.7.1.1 Verify that testing procedures comply with contract requirements.

3.7.1.2 Verify that facilities and testing equipment are available and comply with testing standards.

3.7.1.3 Check test instrument calibration data against certified standards.

3.7.1.4 Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

3.7.1.5 Results of all tests performed, both passing and failing tests, shall be recorded on the CQC report for the date performed. Specification paragraph reference, location where tests were performed, and the sequential control number identifying the test shall be given. If approved by the EPA’s Representative, actual test reports may be submitted later with a reference to the test number and date performed. An information copy of tests performed by an off-site or commercial test facility shall be provided directly to the EPA’s Representative. 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 and calibration 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 shall meet criteria detailed in ASTM D 3740 and ASTM E 329. A capability check of the laboratory that the Contractor proposes to perform tests on soils shall be performed and document.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor shall be assessed a charge to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory.

3.7.3 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 EPA’s Representative shall be delivered to the EPA-designated Quality Assurance (QA) laboratories.

Coordination of each specific test, exact delivery location, and dates shall be made through the EPA-designated QA laboratories. The Contractor shall ensure that sufficient notice is given to EPA prior to sample delivery.

3.8 COMPLETION INSPECTION

3.8.1 Completion inspections will be performed at two stages during the construction.

3.8.1.1 The first set of inspections shall be conducted after all pre-excavation site construction work is complete, including construction of soil erosion and sediment controls, stormwater diversion features, and the temporary wastewater treatment. At this stage, performance of the water treatment system shall be demonstrated through successful completion of start-up testing, during which the RA Contractor shall demonstrate that the water treatment system is capable of meeting the discharge criteria as specified in SECTION 13300 – WATER TREATMENT SYSTEM. Excavation operations shall not commence until all testing and

inspection of site construction has been completed to the satisfaction of the EPA’s Representative.

3.8.1.2 The second set of inspections will be conducted after site restoration activities are complete and prior to demobilization.

3.8.2 Punch-Out Inspection

Near the completion of all work or any increment thereof established by the EPA’s Representative or stated elsewhere in the specifications, the CQC Manager shall conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings and specifications. Such a list of deficiencies shall be included in the CQC documentation as required herein, and shall include the estimated date by which the deficiencies will be corrected. The CQC 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 EPA’s Representative that the facility is ready for the "Pre-Final" inspection.

3.8.3 Pre-Final Inspection

The EPA’s Representative will perform this inspection to verify that the requirements detailed in the Contract Documents have been met. A "Pre-Final Punch List" will be developed as a result of this inspection. The Contractor shall ensure that all items on this list have been corrected and shall notify the EPA’s Representative so that a "Final" inspection with the EPA 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.

3.8.4 Final Inspection

The Contractor's Quality Control Inspection personnel, plus the RA Contractor or other primary management person and the EPA’s Representative will be in attendance at this inspection. Additional Government personnel including, but not limited to, those from EPA, and State and local officials may also be in attendance. The Final Inspection will be formally scheduled by the EPA’s Representative based upon results of the Pre-Final Inspection. Notice shall be given to the EPA’s Representative at least 14 calendar days prior to the Final Inspection and 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, shall be complete and acceptable by the date scheduled for the Final Inspection.

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 the applicable forms, Daily CQC Reports, List of Outstanding Deficiencies, CQC Test Report List, and Record of Preparatory and Initial Inspections that includes, as a minimum, the following information:

- 3.9.1 Contractor/subcontractor and their area of responsibility.
- 3.9.2 Operating plant/equipment with hours worked, idle, or down for repair.
- 3.9.3 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.
- 3.9.4 Test and/or control activities performed with results and references to Contract Document requirements. The control phase should be identified (Preparatory, Initial, and Follow-up). List deficiencies noted along with corrective action.
- 3.9.5 Quantity of materials received at the site with statement as to acceptability, storage, and reference to Contract Document requirements.
- 3.9.6 Submittals reviewed, with contract reference, by whom, and action taken.
- 3.9.7 Offsite surveillance activities, including actions taken.
- 3.9.8 Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- 3.9.9 Instructions given/received and conflicts in the Contract Documents.
- 3.9.10 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. “N/A” shall be entered into any field for which no entry is intended. 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 EPA’s Representative daily within 24 hours after the date(s) covered by the report, except that reports need not be submitted for days on which no work is performed. At a minimum, one report shall be prepared and submitted for every seven days of no work 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 Contractor. The report from the RA Contractor shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel. All documentation is expected to be legible and complete.

3.10 SAMPLE FORMS

- 3.10.1 The 2-page form at the end of the section shall be used for the basic CQC Report. CQC personnel shall attach continuation sheets as required for any entries that cannot fit on the basic form. Preparatory and Initial Inspections, when performed, shall be indicated on the basic CQC report and minutes for each inspection shall be attached. Minutes shall consist of a list of

specific requirements for materials, procedures or equipment to be employed and shall also include any understandings reached or items of special importance discussed.

3.10.2 In addition, outstanding deficiencies shall be listed on the form "List of Outstanding Deficiencies" at the end of this section and shall be attached to each CQC report. As deficiencies are corrected, they are to be acknowledged on the basic CQC report and shall be deleted from the list.

3.10.3 The form at the end of this section titled "CQC Test Report List" shall be used by the Contractor to track testing to be done as the project progresses, and also to summarize the Contractor's Quality Control testing to be reported on the CQC Plan.

3.10.4 Form "Record of Preparatory and Initial Inspections" at the end of this section shall be used by the Contractor to track Preparatory and Initial inspections as the project progresses and also to summarize these required inspections as part of the CQC Plan.

3.10.5 Additional reporting forms pertaining to specialized activities may be included herein or elsewhere in the contract, and shall be used for reporting as indicated.

3.11 NOTIFICATION OF NONCOMPLIANCE

The EPA’s Representative 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 EPA’s Representative 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. Deficiencies cited and verbal instructions given to the Contractor by the EPA’s Representative shall be entered into that day's CQC Report.

END OF SECTION

1. Project Title: _____

Location: _____ Contract No.: _____

2. List Contractors and Subs Working This Day and Areas of responsibility of each

3. Weather:

4. Description and Location of Work of the Project (Also indicate days of no work and reasons for delay)

5. Labor and Equipment Breakdown by Trade (Attach Continuation)

6. Preparatory Phase Inspections Held (See attached minutes)

7. Initial Phase Inspections Held (See attached minutes)

CQC TEST REPORT LIST

CQC REPORT# _____ Page _____ of _____ DATE: _____

CONTRACTOR: _____ CONTRACT #: _____

PROJECT TITLE: _____ LOCATION: _____

SPEC REF OR DWG#	TYPE OF TEST	DATE PERFORMED	RESULTS	REMARKS

NOTE: THIS FORM SHALL BE USED BY THE CONTRACTOR TO TRACK CQC TESTING. PROVIDE ATTACHMENTS AS REQUIRED.

SECTION 01500

TEMPORARY CONSTRUCTION FACILITIES AND UTILITIES

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 The Contractor shall provide all the temporary construction support facilities required to execute this Contract and comply, at minimum, with the requirements specified herein. All structures installed under this section shall be removed at the completion of the project.

1.1.2 Facilities shall be temporary structures or rented permanent structures and shall consist of the following:

- EPA’s site office
- Contractor’s site office
- Equipment and material storage areas
- On-site sanitary facilities for workers
- Decontamination facility
- Parking area

1.1.3 Temporary facilities shall be located at the staging area shown on the Contract Drawings or as approved by the EPA’s Representative.

1.2 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals having an “FIO” designation are for information only. The following shall be submitted in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.

1.2.1 Temporary Site Facility Layout Plan; Shop Drawings, EA

The Contractor shall submit a Temporary Site Facility Layout Plan to the EPA’s Representative for approval at least 30 days prior to field mobilization for on-site construction. At a minimum, the Contractor’s Site Layout drawing shall include the following information:

1.2.1.1 General layouts of temporary site facilities including trailers, emergency medical facilities, equipment storage area, and other staging areas.

1.2.1.2 Trailer(s) - floor plans, fixtures, and materials of construction.

1.2.1.3 Electricity supply and lighting shop drawings - source point, layout locations, fixtures and materials.

1.2.1.4 Water supply, contaminated wastewater handling, and sanitary facilities - locations, layout, fixtures, materials, and methods of sanitary waste disposal.

1.2.1.5 Fences - proposed location and dimensions, avenues of ingress/egress and details of installation.

1.3 REGULATORY REQUIREMENTS

1.3.1 The Contractor shall obtain all necessary construction, building, zoning permits required by local authorities.

1.3.2 The Contractor shall provide notification to the EPA’s Representative regarding all permits required by the local authorities prior to pursuing and obtaining such permits.

PART 2 PRODUCTS

2.1 GENERAL

2.1.1 All structures other than storage sheds installed under this section shall be provided with, at a minimum, the following services:

2.1.1.1 Lighting. Electric light, non-glare type luminaries to provide a minimum illumination level of 50 foot-candles at desk height level.

2.1.1.2 Heating and Cooling. Adequate equipment to maintain an ambient air temperature of 70-degrees Fahrenheit (F) +/- 3 degrees.

2.1.1.3 Potable bottled water.

2.1.1.4 Fire Extinguisher - Non-toxic, dry chemical, fire extinguisher meeting Underwriters Laboratories, Inc., approval for Class A, Class B and Class C fires with a minimum rating of 2A; 10B; and 10C.

2.1.1.5 First Aid Kit. At a minimum, the first aid kit shall include an antiseptic kit, eyewash solution, bandages, insect sting medication, aspirin and acetaminophen, and cold pack(s).

2.1.1.6 Automated external defibrillator (AED) approved by the United States Food and Drug Administration.

2.1.1.7 Janitorial services on a daily basis including but not limited to sweeping, emptying wastebaskets, servicing of toilets, weekly mopping of floors, sanitizing toilet seats, providing towels and soap to the lavatories and monthly washing of floors and windows (inside and out). The time of the cleaning shall be coordinated with the EPA’s Representative.

2.1.1.8 Sufficient supply of electrical outlets.

2.1.2 All parking areas shall be provided with adequate outdoor lighting as specified herein.

2.1.3 All structures and facilities shall be designed for year-round operation.

2.2 EPA’S FIELD OFFICE

2.2.1 The Contractor shall provide a temporary office trailer for use by the EPA’s Representative. The office trailer shall have two offices and one partitioned meeting area. At a minimum, the office trailer shall be outfitted with the following items, which may be rented, used, or new:

- Two desks
- Four chairs
- One oversize desk surface for drawings
- Lockable file cabinets
- Wastebasket
- Bulletin board
- Microwave
- Mini-fridge
- Coffee Maker
- Paper Shredder
- Two-way radios
- One office conference table with eight chairs

2.2.2 A minimum of four telephone lines, one dedicated to fax, one dedicated to modem (DSL) and two dedicated to voice shall be installed for the EPA temporary site office. All telephone and internet connection costs including installation, service charged and discontinuance are the responsibility of the Contractor. If high speed internet service is not available, the Contractor shall provide a wireless high speed internet connection service for computers.

2.2.3 In addition to the above, the Contractor shall provide the following office equipment, and other items for use by the EPA’s Representative during the contract. No separate payment will be made for providing the following items and all costs in connection therewith will be considered the obligation of the Contractor.

2.2.3.1 Personal Computer Accessories Requirements:

The Contractor shall provide a computer docking station, monitor, and key board compatible with the EPA’s Representative’s personal computers. The Contractor shall verify the proper make/model with the EPA’s Representative at the time of purchase so all accessories will be compatible. The accessories shall have the following requirements:

- 6 outlet surge protector
- All required connecting cables and plugs

2.2.3.2 Printer:

A multi-function color printer, including scanner and copier functions. Supply of paper and toner shall be replenished by the Contractor as required by the EPA’s Representative.

2.2.3.3 Copier:

Plain-paper, desktop, auto feed, reduction, enlargement, sorting, stapling, monochrome, minimum 10 copies per minute (may be shared by Contractor and EPA’s Representative if approved by EPA’s Representative). The copier shall be equipped with individual trays for 8.5” x 11”, 8.5” x 14”, and 11” x 17” paper. The supply of paper and toner shall be replenished by the Contractor as required by the EPA’s Representative. The Contractor shall also provide copier service as required.

2.2.3.4 Fax Machine:

Monochrome, minimum feed three 8.5” x 11” pages per minute. Capable of receiving on plain white paper (may be shared by Contractor and EPA’s Representative if approved by EPA’s Representative).

2.2.3.5 Telephone:

2-line phone with conferencing and speaker phone capabilities compatible with phone service.

2.2.3.6 Telephone Answering Machine (or voice mail):

Standard, compatible with standard telephone line and local service, with remote message retrieval capability.

2.2.3.7 First Aid Kit:

As a minimum the kit shall include an antiseptic kit, eyewash solution, bandages, insect sting medication, aspirin and acetaminophen, and cold pack(s).

2.3 CONTRACTOR'S TEMPORARY FACILITIES

2.3.1 Administrative Field Office

The Contractor shall provide and maintain an administrative field office and facilities at the Site. The field offices shall be outfitted to the discretion of the Contractor. At minimum, continuous, hardline telephone service shall be provided for emergencies.

2.3.2 Parking

Contractor employees shall park privately owned vehicles in an area designated by the EPA’s Representative. This area will be within reasonable walking distance of the Site. All parking areas shall be provided with adequate outdoor lighting.

2.3.3 Equipment Storage/Lunch Area

The Contractor shall provide a separate, uncontaminated lunch area of sufficient size for all Contractor on-site personnel. Such an area may be combined with equipment storage, as specified below. The Contractor shall furnish all the furniture required in the lunch room to accommodate the maximum number of Contractor personnel working on any single day.

A separate or partitioned equipment storage area shall also be provided and shall have access through a lockable door. The area for equipment storage shall not be less than 96 square feet. Sufficient shelving shall be installed for storage and inventory control of small items. In addition, this area shall contain one four-drawer lockable filing cabinet and a wooden lockable locker sufficient for the storage of surveying and testing instruments.

2.4 DECONTAMINATION FACILITIES

2.4.1 The Contractor shall provide the equipment and materials necessary to properly decontaminate all on-site equipment that comes in contact with contaminated materials. The decontamination facility shall be constructed as shown on the Contract Drawings or in accordance with the Contractor’s approved plan. Decontamination facilities shall, at a minimum, be constructed with a berm and liner for containment of decontamination fluids and sediment. Decontamination equipment shall, at minimum, include pressure washing equipment and wire brushes. Any temporary decontamination area, if determined to be necessary, shall be constructed in accordance with the Contractor’s approved plan.

2.4.2 All wash water shall be conveyed from the decontamination pad, treated on site, and discharged to the Middlesex County Utilities Authority publicly owned treatment works or to surface water.

2.5 OUTDOOR LIGHTING

2.5.1 The Contractor shall furnish and install a complete operating outdoor lighting system through the designated support zone. The lighting system shall include wood pole mounted 400-watt high-pressure sodium luminaires supported on 4-foot steel arms with 30-foot mounting height above grade. The system shall include all equipment and materials and conductors. Shop drawings shall be submitted showing the layout, equipment and material details, and circuits prior to installation.

2.6 SANITARY WASTE SYSTEM

2.6.1 On-site sanitary facilities shall consist of chemical type toilets. No toilet facilities shall be provided in areas proposed for excavation. The Contractor shall periodically empty wastes, which shall be disposed of at an approved facility. Waste may be emptied to a municipal, district or station sanitary sewer if approval from the system owner is obtained.

2.6.2 The Contractor shall provide a portable wash unit and collection system for hand washing, and as specified elsewhere.

PART 3 EXECUTION

3.1 LOCATION

The Contractor shall utilize the Contractor’s Staging Area shown on the Contract Drawings for all temporary facilities or as approved by the EPA’s Representative.

3.2 MAINTENANCE

The Contractor shall maintain all temporary construction facilities and shall perform all necessary repairs, replacement, cleaning and any other maintenance required as directed by the EPA’s Representative. Included in this maintenance shall be sweeping and any other cleaning necessary to keep the project vicinity area free of soil, dust and debris.

END OF SECTION

SECTION 01540

SECURITY

PART 1 GENERAL

1.1 SCOPE OF WORK

The Contractor shall furnish all labor, materials, equipment and incidentals necessary to provide security for the duration of the project. Work shall be performed as specified herein and in the approved Contractor’s Security Plan.

1.2 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals having an “FIO” designation are for information only. The Contractor shall submit the following to the EPA’s Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.

1.2.1 Security Plan; Pre-Construction Submittal; EA

Prior to the commencement of construction operations the Contractor shall submit for approval a Security Plan, detailing the proposed security program for the Site.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

3.1.1 The Contractor shall be responsible for maintaining site security and furnishing all labor, materials, equipment and incidentals to provide security for the project site, 24 hours a day, seven days a week, including holidays, throughout the duration of the contract.

3.1.2 The Contractor shall establish a security program prior to any field construction activities.

3.1.3 The Contractor shall be both responsible and liable for site security.

3.1.4 Maintain/erect warning and security signs around the site perimeter.

3.1.5 The Contractor shall provide control of all persons and vehicles entering and leaving the Site.

3.1.6 The Contractor shall provide security identification specific to the Site, for all onsite personnel and Contractor personnel authorized to enter the Site.

3.2 SECURITY PROGRAM

3.2.1 Security Program Objectives

The principal objectives of the Security Program are:

3.2.1.1 Deter, restrict, and/or control financial losses to the Government and the Contractor. This includes prevention or detection of theft, vandalism, sabotage, and arson.

3.2.1.2 To keep unauthorized people from entering the Site and receiving any injuries.

3.2.1.3 To keep unauthorized people from entering the Site and removing equipment or hazardous substances.

3.2.1.4 To keep unauthorized people from taking action on the Site that might exacerbate the environmental problem or interfere with its remediation.

3.3 SECURITY PERSONNEL

Conditions of employment for all site Security Officers shall include the following:

3.3.1 Detailed pre-employment history establishing moral character and dependability.

3.3.2 Applicant shall submit to a current physical examination conducted by the Contractor’s designated physician. This physical shall include drug testing, and a list of all medicines applicant is currently taking or has taken during the last year. Physical shall also include vital statistics and tests to ensure the capability of the applicant to function on site without health restrictions.

3.3.3 Investigation that clears applicant of felony convictions.

3.3.4 Failure to maintain attentive and alert status in performance of duties, which includes sleeping while on duty, intoxication on the job, and bringing unauthorized personnel onsite, is completely unacceptable and shall be grounds for not employing or for terminating employment.

3.3.5 In general, Site Security Officers shall be physically fit, literate in the English language, experienced, stable, reliable, and possess the physical and psychological skills that are necessary to control unauthorized persons on the Site.

3.3.6 If the Security Officer carries a weapon consisting of side arms and/or shotgun or rifle, weapon(s) shall be catalogued, including type, model, caliber, and serial number and inspected by the security firm. The Security Officer shall have proficiency training and maintain proficiency rating with the particular type of weapon carried, as required by State law.

3.4 SITE SECURITY REQUIREMENTS

3.4.1 A Security Officer shall be on the Site during non-working hours on weekdays and 24 hours per day during holidays, weekends, and days when no activities are in progress for the entire duration of the construction activities. A Security Officer shall patrol the Support, Contamination Reduction, and Exclusion Zones. The Contractor shall be responsible for establishing security during working hours on workdays. Working hours are defined in SECTION 01310 – JOBSITE ADMINISTRATION.

3.4.2 A Security Center Office shall be established in the Support Zone. A small, temporary trailer or office building shall be equipped with a telephone, two-way radios, lights, and a desk. The office shall be established for the purposes of record-keeping and administering security.

3.4.3 The Contractor shall maintain a log of all security incidents. This log shall be furnished to the EPA’s Representative upon request.

3.4.4 The EPA’s Representative will have the right of approval and rejection of any and all security-assigned personnel of the Contractor for the duration of the contract. If approved by the EPA’s Representative, the Contractor may designate a member of its staff as Site Security Officer during normal working hours. The EPA’s Representative may revoke this approval without cause or justification, at which time the Contractor shall immediately provide independent site security.

3.4.5 Gates in all fences shall remain closed, except when in use by authorized personnel.

3.4.6 Security Officers shall be responsible for touring the perimeter of the Site on an hourly basis when there is no construction activity being performed for the entire contract duration. The exact timing of the hourly tours shall be varied as to not allow a definable routine to develop. There shall be a log of the tours, with observed conditions recorded, maintained at the Security Center Office.

3.4.7 Security Officers shall be responsible for controlling conditions to ensure against any unauthorized entry. Should persons attempt unauthorized entry, the Security Officer shall be responsible for warning the individuals. If unauthorized persons ignore the warnings, the Security Officer shall notify appropriate law enforcement personnel to remove the persons.

3.4.8 The EPA’s Representative will maintain a list of personnel approved to be present on the job site. A copy of the list will be provided to the Contractor. Only authorized personnel may make changes to the job site list.

3.4.9 A copy of the emergency checklist, providing all emergency numbers for hospitals, ambulance service, law enforcement, paramedics, and fire departments, shall be posted in all onsite offices and at the designated project information board.

3.4.10 Temporary lighting shall be provided to ensure effective surveillance at night at active construction areas.

3.5 PERSONNEL IDENTIFICATION

3.5.1 The Contractor shall provide security identification specific to the Site for all onsite personnel and Contractor personnel entering the Site, showing:

3.5.1.1 Name of individual

3.5.1.2 Occupation

3.5.1.3 Name of employer

3.5.2 The Contractor shall be responsible for and guarantee that security identification is worn by each individual and visible at all times while the individual is on site. Badge assignments shall be based on criteria included in the Contractor’s Site Safety and Health Plan (SSHP) or as established by the EPA’s Representative.

3.5.3 Improperly identified personnel shall be excluded from the Site.

3.6 ENTRANCE CONTROL

The Contractor shall provide control of all persons, equipment, and vehicles entering and leaving the Site as follows:

3.6.1 Require each person to display proper identification.

3.6.2 Require all personnel and visitors having access to the Site to sign in and sign out, and maintain a log of all site access.

3.6.3 Vehicular access within the Site shall be restricted to authorized vehicles only. Use of site-designated parking areas shall be restricted to vehicles of the EPA’s Representative, Government personnel, Contractor, subcontractors, on-duty service personnel assigned to the Site and visitors approved by the EPA’s Representative.

3.6.4 The Contractor shall accommodate and coordinate visits with local law enforcement agencies, including police, sheriff, highway patrol, emergency medical care units, fire department, and utility emergency teams.

3.6.5 Site visitors shall not be permitted to enter active work areas unless approved by the EPA’s Representative.

3.6.6 The Contractor shall maintain a list of persons authorized for site entry and submit a copy of the list to the EPA’s Representative on request.

3.7 BONDING AND UNIFORM REQUIREMENTS

3.7.1 The security firm shall be bonded.

3.7.2 Each Security Officer shall wear a uniform that displays the name of the security firm. These uniforms are to be complete, including hat, shirt, trousers, belt, and boots. Uniforms shall be pressed and boots shined. Each officer shall present a neat, professional appearance.

3.7.3 During patrols, security personnel shall be in proper safety attire, including steel-toe boots and additional PPE as required by site conditions/activities.

3.8 VISITOR CONTROL

3.8.1 All visitors must be approved by the EPA’s Representative.

3.8.2 All visitors shall be required to read and sign an approved synopsis of the SSHP prior to entering the Site.

3.8.3 Visitors shall be escorted at all times, except EPA and NJDEP employees and representatives.

3.9 TRAFFIC CONTROL

3.9.1 The Contractor shall be responsible for controlling vehicular traffic on and through the Site in order to ensure safe and efficient operations. Traffic control shall be performed in accordance with SECTION 01585 – TRAFFIC CONTROL.

3.9.2 Parking areas shall be regulated to ensure free entry and egress to and from the Site.

3.10 NON-PERMITTED PROCEDURES

3.10.1 The Security Officer shall remain on the Site until the next shift replacement arrives. The Site shall not be left unsecured.

3.10.2 Security personnel shall, in general, monitor, authorize entry to, and inspect all areas of the project on a continuing basis and shall not serve any production work effort of the project.

3.10.3 In scheduling the site security personnel, the same employee shall not be scheduled for consecutive shifts.

END OF SECTION

SECTION 01550

SURVEYING

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 The Contractor shall furnish all labor, materials, equipment and incidentals required to provide surveying services prior to remedial activities, after remedial activities, and as measurement during remediation activities.

1.1.2 The Contractor shall verify the existing conditions, contours, and locations of structures within the construction limits defined on the Contract Drawings.

1.1.3 The Contractor shall establish the exact position or location of all work control points. All work shall be referenced to and established from the control points, re-established where necessary and maintained throughout the life of the contract. Any error or apparent discrepancies found on the Contract Drawings or Specifications shall be called to the attention of the EPA’s Representative for interpretation prior to proceeding with the work.

1.1.4 The Contractor shall prepare a pre-excavation survey prior to site preparation activities and shall prepare As-Built Drawings detailing the actual conditions of surface and subsurface construction upon the completion of work.

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. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.

UNITED STATES FEDERAL GEODETIC CONTROL COMMITTEE (FGCC)

FGCC Standards and Specifications for Geodetic Control Networks

1.3 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals with an “FIO” designation are for information only. The Contractor shall submit the following to the EPA’s Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.

1.3.1 Pre-Excavation Survey; Pre-Construction Submittal; FIO

Submit a pre-excavation topographic and utility survey prior to site preparation activities.

1.3.2 Surveyor Qualifications; Product Data; FIO

The Contractor shall submit the name, address, New Jersey Land Surveyor registration number, and telephone number of the surveyor to the EPA’s Representative before starting survey work.

1.3.3 Survey Accuracy Documentation; Product Data; FIO

1.3.3.1 On request, documentation verifying accuracy of survey work shall be submitted to the EPA’s Representative by the Contractor.

1.3.3.2 Certificates signed by the surveyor stating that elevations and locations of site construction features are in conformance, or nonconformance, with Contract Documents shall be submitted to the EPA’s Representative at the completion of work requiring services of the surveyor.

1.3.4 Surveyor Field Notes; Product Data; FIO

Copies of the surveyor’s field notes, calculations, and graphical layouts shall be submitted to the EPA’s Representative as requested.

1.3.5 Compliance Surveys; Closeout Submittals; FIO

Submit compliance surveys of all excavation, backfill, and wetland restoration operations.

1.3.6 As-Built Drawings; Closeout Submittals; EA

As-Built Drawings shall be submitted in accordance with Paragraph 3.3.5.

1.4 QUALITY CONTROL

1.4.1 The Contractor shall be responsible for all of the surveying done at the site. The surveyor shall be a qualified and Registered Land Surveyor in the State of New Jersey. The Contractor’s surveyor shall also have a minimum of two years of experience in construction surveying, and layout and maintenance of As-Built Construction Drawings, with a record of performing horizontal and vertical control requirements as stated in this section.

1.4.2 The surveyor shall check all equipment including, but not limited to electronic survey instruments, compasses, transits, and levels for accuracy and maintain records of such checks. The Subcontractor shall make records of the checks available to the Contractor upon request.

1.4.3 All survey work will be according to third-order accuracy standards as specified by the FGCC in the “Standards and Specifications for Geodetic Control Networks”, published September 1984. The units of measure shall be U.S. Survey Feet.

1.5 PROJECT RECORD DOCUMENTS

1.5.1 A complete, accurate log of control and survey work as it progresses shall be maintained at the work site by the Contractor.

1.5.2 Upon completion of the work, all record documents must be submitted to the EPA’s Representative.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 INSPECTION

The Contractor shall verify locations of site reference and survey control points prior to starting work. The EPA’s Representative must be promptly notified of any discrepancies discovered.

3.2 SURVEY REFERENCE POINTS

3.2.1 The Contractor shall locate and/or establish all site reference points for completion of site survey.

3.2.2 The Contractor shall take all reasonable measures to protect site reference points prior to starting site work. Reference points shall not be relocated without prior written approval of the EPA’s Representative.

3.2.3 The EPA’s Representative will be immediately notified of loss, damage, or destruction of any reference point, or any relocation required because of changes in grade or other reasons.

3.2.4 Temporary monuments shall be set as necessary to perform the surveying. They may be wood, metal or marks scribed on permanent site features. All monuments shall be described in the field notes and marked on site maps for future reference.

3.2.5 X, Y, and Z coordinates of benchmarks and survey control points shall be determined and recorded with a maximum permissible error of 0.10 feet in any coordinate direction.

3.3 SURVEY REQUIREMENTS

3.3.1 The Contractor shall establish the exact position or location of all work control points. All work shall be referenced to and established from the control points, re-established where necessary and maintained throughout the life of the contract. Any error or apparent discrepancies found in the Contract Documents shall be called to the attention of the EPA’s Representative for interpretation prior to proceeding with the work.

3.3.1.1 All horizontal coordinates shall be referenced to North American Datum of 1983

(NAD83) New Jersey State Plane Coordinate System, Zone 2900, U.S. Survey Foot. The elevation shall be referenced to the North American Vertical Datum of 1988 (NAVD88), U.S. Survey Foot.

3.3.1.2 The survey shall be sufficient to generate digital topographic mapping on 1-foot contour intervals. For the pre-excavation survey, survey points shall document existing elevations every 50 feet along the center of the wetland remediation work areas if this requirement is more stringent than elevations to generate 1-foot contour intervals.

3.3.1.3 The topographic map accuracy shall meet the U.S. National Map Accuracy Standards. If bathymetric surveying equipment is used to complete the survey transects, boat-based echo sounding data shall be corrected to compensate for water-level fluctuations caused by surface waves and astronomical tides.

3.3.2 The Contractor shall verify the existing conditions, contours and locations of structures within the clearing and excavation limits defined on the Contract Drawings.

3.3.3 The Contractor shall establish lines and levels, and locate and lay out by instrumentation and similar appropriate means, all site features to be constructed or executed. These include, but are not limited to, the following:

3.3.3.1 Support zone facility layout.

3.3.3.2 Temporary discharge point for discharge or to the Middlesex County Utilities Authority (MCUA) publicly owned treatment works (POTW) or surface water.

3.3.3.3 Sediment containment area.

3.3.3.4 Stockpile and loadout area.

3.3.3.5 Water treatment system area.

3.3.3.6 Decontamination area.

3.3.3.7 Access roads.

3.3.3.8 Fence lines.

3.3.3.9 Excavation depths and limits.

3.3.3.10 Final site grading.

3.3.3.11 Limits of wetland restoration.

3.3.4 The Contractor shall re-verify layouts periodically during construction by same means.

3.3.5 As-built Drawings

3.3.5.1 The Contractor shall prepare an As-Built Drawing that identify the features listed in Paragraph 3.3.3 above. All areas disturbed and restored shall be clearly identified.

3.3.5.2 The drawing shall also include as-built features of the temporary treatment system. The drawing shall show the as-built position, size, and arrangement of, but not be limited to, treatment equipment, piping, controls, instrumentation, and containment structures.

3.3.5.3 The Contractor shall submit one (1) electronic copy and two (2) paper copies. The submittal shall include the Contractor’s standard title block with the surveyor’s subtitle block, signature and Land Surveyor’s seal. The drawing size shall be 34 inches by 44 inches and the cut lines shall be discussed with the Contractor prior to performing the work. The paper copies shall be exact duplicates of the electronic files and shall be signed and sealed by a New Jersey Licensed Surveyor. All survey data shall be compiled and digitized for use with AutoCAD 2016. A tabulated delimited text or excel file of the survey points shall also be submitted. The file shall include the description, horizontal and vertical coordinates and unique point number for each point.

END OF SECTION

SECTION 01580

SIGNS

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 The Contractor shall furnish all labor, equipment, materials and incidentals required to provide and erect a U.S. Environmental Protection Agency (EPA) project site sign, safety signs and a bulletin board.

1.1.2 The Contractor shall provide and erect an EPA project site sign and safety signs meeting the requirements of this section, at a location to be determined by EPA. The sign requirements are shown at the end of this section. Wording to be included on the sign shall be provided by the EPA’s Representative after award.

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 the basic designation only. Where reference is made to one of the standards below, the revision in effect at the time of contract award shall apply.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1903 Inspections, Citations, and Proposed Penalties

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Materials shall conform to the requirements as shown on the Drawings at the end of this section and shall be suitable for use in an unprotected exterior environment.

2.1.2 Dollar amounts and wording changes shall be provided by the EPA’s Representative after award.

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall place signs on the work area fence that bear the legend, in letters at least four inches high:

WARNING
HAZARDOUS WORK AREA
DO NOT ENTER UNLESS AUTHORIZED

The Contractor shall post hazard warning banners at areas of special hazard including, but not limited to the perimeter of the Exclusion Zone. The Contractor shall provide all signs required on the Contract Drawings. Letters shall be at least four inches high.

3.2 INSTALLATION REQUIREMENTS

The EPA project site sign and the safety signs are to be mounted on 4-inch by 4-inch by 8-foot treated timbers and set firmly into the ground above prevailing grade to permit public viewing and shall be installed during site mobilization.

3.3 BULLETIN BOARD

3.3.1 Immediately upon beginning of work, the Contractor shall provide a weatherproof glass-covered bulletin board not less than 36-inches by 48-inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, the Wage Rate Information poster and other information approved by the EPA’s Representative. The bulletin board shall be located at the project site in a conspicuous place easily accessible to all employees, as approved by the EPA’s Representative. 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.

3.3.2 The Contractor shall post and keep posted a notice or notices, to be furnished by the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor, informing employees of the protections and obligations provided for in the Occupational Safety and Health Act as per OSHA 29 Code of Federal Regulations 1903.2(a)(1). The Contractor shall post such notice or notices in a conspicuous place or places where notices to employees are customarily posted. The Contractor shall take steps to ensure that such notices are not altered, defaced, or covered by other material.

3.4 CLOSURE REQUIREMENTS

The EPA project, bulletin board and the safety signs are to be removed from the site after contract completion or as approved by the EPA’s Representative.

END OF SECTION

01580-3

MITER EDGE AT ALL CORNERS

8'-0"



United States Environmental Protection Agency
Region 2

YELLOW NO. 13655

BLUE NO. 15180

4'-0"

SUPERFUND PROJECT

A A

BLUE NO. 15180

RARITAN BAY SLAG SUPERFUND SITE

BLACK NO. 17038

BLUE NO. 15180

AN EQUAL EMPLOYMENT
OPPORTUNITY PROJECT

FEDERAL DOLLARS

BLACK NO. 17038

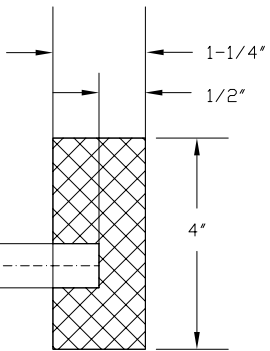
LEFT BORDER SHALL BE DETERMINED USING THE LONGEST
LINE CENTERED ON THE SIGN PROVIDING EQUAL BORDERS

PROVIDE ADEQUATE SUPPORTS FOR SIGN AS SITE CONDITIONS
MAY REQUIRE AND KEEP SIGN A PROPER DISTANCE ABOVE
PREVAILING GRADE TO PERMIT PUBLIC VIEWING.

GRADE



COLOR NUMBERS REFER TO FEDERAL COLOR STANDARDS NO. 595a (1-68), WHICH ARE AVAILABLE FROM GSA SUPPLIES.



EXTERIOR TYPE HIGH DENSITY OVERLAID PLYWOOD
OR APPROVED MATERIAL SUITABLE FOR SIGNS

SECTION "A-A"

BACKGROUND AND ALL OTHER
SIGN COMPONENTS NOT DESIGNATED
ARE PAINTED WHITE NO. 17886.

SECTION 01585

TRAFFIC CONTROL

PART 1 GENERAL

1.1 SCOPE OF WORK

The Contractor shall furnish all labor, materials, equipment and incidentals required to provide traffic control during the remediation. Traffic control shall include, but not be limited to: notification and coordination with local police, fire, and emergency response authorities; traffic control signage and devices to maintain safe traffic around the Site and as necessary to safely route traffic along New Jersey Route 35 during heavy equipment and truck movements to and from the site.

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 the basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.

CODE OF FEDERAL REGULATIONS (CFR)

23 CFR 655F Traffic Control Devices on Federal-Aid and Other Streets and Highways

UNITED STATES DEPARTMENT OF TRANSPORTATION (DOT)

DOT Manual on Uniform Traffic Control Devices (MUTCD)

1.3 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals with an “FIO” designation are for information only. The Contractor shall submit the following to the EPA’s Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.

1.3.1 Traffic Control Plan; Pre-Construction Submittals; EA

Prior to the commencement of construction operations the Contractor shall submit for approval a Traffic Control Plan, detailing the proposed traffic control details for the maintenance of traffic and access around the Site.

PART 2 PRODUCTS

2.1 All traffic control devices shall conform to DOT MUTCD.

PART 3 EXECUTION

3.1 Traffic control shall be accomplished in accordance with 23 CFR 655F.

3.2 The Contractor shall provide traffic control at the entrance to the Site, along Route 35, during heavy equipment movement to and from the Site, and as otherwise necessary to meet local requirements. Note that Route 35 is a divided highway, and the Site can only be accessed via northbound Route 35. The nearest legal U-Turn for trucks is located approximately 0.5 miles south at Raritan Boulevard/Birchwood Drive.

3.3 The Contractor shall coordinate with, notify, and obtain written approval from Township of Old Bridge and all local emergency response authorities (police, fire, etc.) prior to the remediation or restricting traffic on emergency fire access road or any roads.

3.4 The Contractor shall conduct construction operations in such a manner as to offer the least possible obstruction to the safe and satisfactory movement of traffic over the existing roads during the life of the contract.

3.5 The Contractor shall be responsible for providing, erecting, maintaining, and removal of all traffic signs, barricades, and other traffic control devices necessary for maintenance of traffic.

3.6 All barricades, warning signs, lights, temporary signals, other devices, and signaling devices shall meet or exceed the minimum requirements of the local DOT requirements.

END OF SECTION

SECTION 01670

GREEN REMEDIATION REQUIREMENTS

PART 1 GENERAL

1.1 SCOPE OF WORK

The Contractor shall incorporate green remediation practices during construction activities whenever feasible in accordance with the EPA Region 2 “Clean & Green” Policy, issued on March 17, 2009, and updated on March 11, 2010. This section covers the requirements for performing green remediation practices at the Site, including furnishing all labor, materials, equipment and incidentals required to complete the work described herein.

1.2 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals with an “FIO” designation are for information only. The Contractor shall submit the following to the EPA’s Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.

1.2.1 Renewable Energy Program; Product Data; EA

The Contractor shall submit details regarding the renewable energy program that will be used to purchase renewable energy through the local energy supplier for all site activities, including name of the renewable energy supplier; type and percentage of renewable energy to be used (solar, wind, etc.); and method of supply (direct or Renewable Energy Certificates [RECs]).

1.2.2 Fuel; Product Data; EA

The Contractor shall submit details regarding the fuel providers and types of fuel, including sulfur content, to be purchased during the construction activities.

1.2.3 Paper Product Literature; Product Data; EA

The Contractor shall submit product literature for all copy papers, file folders, and other paper office supplies indicating that the supplies meet the minimum requirements for recycled content as specified herein.

1.2.4 Green Remediation Documentation; Certificates; FIO

The Contractor shall submit documentation to support the green remediation activities implemented, including, but not limited to:

1.2.4.1 Receipts for energy purchased.

1.2.4.2 Receipts for fuel purchased.

1.2.4.3 Disposal certificates for waste sent to recycling and regeneration facilities.

1.2.4.4 Receipts for paper products purchased.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 RENEWABLE ENERGY

3.1.1 The Contractor shall purchase 100 percent renewable energy through the local utility provider, Public Service Electric and Gas Company (PSE&G), for all electricity used during the remedial construction.

3.1.2 The Contractor shall submit receipts to document that 100 percent renewable energy was used for all electricity consumed during the remedial construction.

3.2 FUEL

3.2.1 Only ultra-low sulfur diesel (ULSD) fuel shall be used during the remedial construction. The Contractor and its subcontractors shall supply receipts for purchase of all fuel to document that only ULSD fuel was consumed.

3.2.2 Vehicle idling shall not be allowed for longer than 5 minutes during remedial construction, including, but not limited to, drill rigs and earth moving equipment.

3.2.3 Local labor shall be used when possible to reduce fuel consumption associated with driving to the site. Locally supplied materials shall be used when possible.

3.2.4 The number of field mobilizations shall be minimized when possible to reduce fuel consumption.

3.2.5 Sequencing and scheduling shall be performed in such a manner to minimize transportation and/or shipping fuel consumption whenever possible. This shall include consideration for sample shipments, transportation of waste material for off-site disposal, import of clean material, and on-site handling of materials during removal and restoration activities.

3.3 MATERIAL REUSE, REDUCTION, AND RECYCLING

3.3.1 Non-hazardous construction waste generated during remediation shall be sent to an approved recycling facility. The Contractor shall submit disposal certificates documenting that the waste was sent to a recycling facility.

3.3.2 Cleared material which is demonstrated through analytical sampling in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL to be below New Jersey Department of Environmental Protection (NJDEP) Residential Direct Contact Soil Remediation Standards shall be chipped and reused onsite as specified in SECTION 02230 – CLEARING AND GRUBBING and SECTION 02900 – SITE RESTORATION.

3.3.3 One hundred percent of the copy papers, file folders, and other paper office supplies shall come from recycled sources. Required recovered materials content ranges shall be as recommended by EPA’s Comprehensive Procurement Guidelines (CPGs) at <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>. The Contractor shall submit receipts indicating that the purchased products contain the required recycled content.

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 The Contractor shall furnish all labor, materials, equipment and incidentals required to maintain accurate and comprehensive records of all site activities.

1.1.2 The Contractor shall maintain accurate and comprehensive records of all site activities as well as all additions, substitutions of materials, variations in work and any other revisions to the Contract Documents.

1.1.3 The Contractor shall maintain at the Site for the EPA’s Representative one record copy of:

- Record drawings showing Progress of Work
- Technical Specifications
- Addenda
- Modifications to the Contract
- EPA’s Representative’s Directives
- Written reports of any significant quality assurance problems
- Progress Meeting Minutes
- Final As-Built Drawings
- Daily work activity summary reports, including:
 - a) DVD videos and photographs
 - b) Reports on any emergency response actions
 - c) Reports on all daily site activities
 - d) Chain-of-custody documents
 - e) Construction schedule and progress chart of work
 - f) Change orders and other modifications to the contract
 - g) All laboratory analytical results
 - h) Meteorological records
 - i) Air monitoring data
 - j) All safety and accident reports
 - k) All spill incident reports
 - l) Daily construction quality control reports
 - m) Truck load tickets
 - n) Treated water discharge volume

- o) Records of quantity of contaminated and uncontaminated material removed from the Site
- p) All waste disposal manifests
- q) Other items as required by the EPA’s Representative

1.1.4 Where appropriate, one copy of all project record documents shall be maintained on compact disc compatible with the EPA’s Representative’s software.

1.2 MAINTENANCE OF DOCUMENTS

1.2.1 The Contractor shall store record documents and samples in the Contractor's Field Office apart from documents used for construction work.

1.2.2 The Contractor shall provide files and racks for the storage of documents; storage space that can be secured and locked; and a storage area that is clean and dry. Documents and samples should be filed to facilitate retrieval.

1.2.3 The Contractor shall make documents available at all times for inspection by EPA’s Representative.

1.2.4 The Contractor shall keep up-to-date a complete record set of red-line drawings, which shall be corrected daily to show every change, and the approved shop drawings. This set shall be legibly marked.

1.2.5 The Contractor shall keep up-to-date a complete set of specifications and addenda to record changes made by directive or by change order. This set shall be legibly marked.

1.2.6 The set shall be submitted to the EPA’s Representative at the completion of construction.

1.2.7 The Contractor shall be responsible for final handling and storage of project record documents, including boxing, labeling, and shipping to a final destination as determined by EPA. If approved by the EPA’s Representative, the Contractor may instead scan project record documents for electronic storage to eliminate physical storage costs.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01780
PROJECT CLOSEOUT

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 This specification outlines the project closeout activities for which the Contractor shall be responsible.

1.1.2 The work activities shall include, but not be limited to, the following:

1.1.2.1 Decontamination and removal of all equipment operated by the Contractor

1.1.2.2 Cleaning the project site

1.1.2.3 Disconnection and removal of temporary utilities and facilities

1.1.2.4 Collection and disposal of all Contractor-generated contaminated equipment on the site for which decontamination is inappropriate

1.1.2.5 Restoration of any disturbed areas outside of the Exclusion Zone

1.1.2.6 Submittal of the Remedial Action Report.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publication is referred to in the text by basic designation only. Where reference is made to one of the standards below, the revision in effect at the time of contract award shall apply.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

Office of Solid Waste
and Emergency Response
(OSWER) Directive 9320.2-22

Close Out Procedures for National Priorities List Sites

1.3 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals having an “FIO” designation are for information only. The Contractor shall submit the following to the EPA’s Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES:

1.3.1 Remedial Action (RA) Report; Closeout Submittal; EA

The Contractor shall submit the RA Report to the EPA’s Representative within 90 calendar days of the Final Inspection, as specified in Paragraph 3.5.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 DECONTAMINATION

3.1.1 All contaminated material and equipment shall be decontaminated by the Contractor prior to final removal from the Site.

3.1.2 Tools and items for which decontamination is difficult or unachievable shall remain on site until completion of the work for subsequent packing and disposal by the Contractor at an approved disposal facility. Examples of such items are wire, rope, lumber, PPE and apparel.

3.1.3 Prior to removal from the Site, all decontaminated equipment and material shall be inspected and approved by the Site Safety and Health Officer (SSHO) and the EPA’s Representative.

3.1.4 Certification of decontamination shall be attested to by the SSHO.

3.1.5 A copy of each decontamination certificate shall be provided to the EPA’s Representative.

3.2 TEMPORARY FACILITIES AND UTILITIES

3.2.1 The Contractor shall remove all temporary facilities and associated utilities from the Site within 30 days of completion of the project or as directed by the EPA’s Representative.

3.2.2 The Contractor shall coordinate with the appropriate utility owners to disconnect the temporary telephone cable and electric service, and remove all associated aboveground wires.

3.3 SITE CLOSURE

At the completion of the work, the Contractor shall restore all areas affected by the construction activities to conditions equivalent to or better than the original conditions or as indicated on the Contract Drawings.

3.4 FINAL ACCEPTANCE INSPECTION

Prior to final inspection, the Contractor shall submit a list of completed final clean-up activities to the EPA’s Representative. The Contractor and the EPA’s Representative shall jointly perform a Final Acceptance Inspection, which shall include an inspection of the Site to ensure that all work was completed as outlined in the Contractor’s list of final clean-up activities, SECTION

01010 – SUMMARY OF WORK, SECTION 01451 – CONTRACTOR QUALITY CONTROL, and the Contract Drawings. The Contractor shall address any deficiencies immediately.

3.5 REMEDIAL ACTION REPORT

The Contractor shall provide a RA report and data to the EPA’s Representative in accordance with OSWER Directive 9320.2-22, including, but not limited to, the following, within 90 calendar days of the Final Inspection.

3.5.1 Site background information.

3.5.2 Step-by-step summary of construction activities including the following:

3.5.2.1 Site preparation activities, including temporary facilities, clearing and grubbing, sanitary and potable water supply, electrical and telecommunication installation, site security, fencing, construction of sediment containment area, construction of stockpile/loadout area, construction of decontamination pad, and temporary drainage features.

3.5.2.2 Installation of temporary water treatment system including containment area and effluent piping. Quantity of water treated and discharged. Operation and maintenance procedure and data including operator information.

3.5.2.3 Construction activities, including dewatering methods, excavation methods and quantities, sampling methods and data, dust control, erosion control, work zone air monitoring, and perimeter air monitoring and sampling.

3.5.2.4 Off-site treatment and/or disposal of all waste types including copies of all manifests and land disposal restriction notifications, copies of all certifications of final disposal signed by the responsible disposal facility official, and copies of waste profile sheets.

3.5.2.5 Soil, sediment, and water sampling results, including collection data such as date and time of collection, and sample chain-of-custody forms.

3.5.2.6 Site restoration including source of backfill material and quantity including physical and chemical tests performed and results; removal of sediment containment area, stockpile/loadout area, water treatment system containment area; final site grading and wetland restoration.

3.5.3 List of chronological events.

3.5.4 Assessment and discussion of performance standards and analytical data, including quality assurance and quality control procedures followed.

3.5.5 All inspection and certification reports including punch list items for pre-final and final inspections.

3.5.6 Operation and maintenance activities including institutional controls.

- 3.5.7 Contact information for the major design and remediation contractors, EPA oversight contractors, and the project managers for EPA and the State of New Jersey.
- 3.5.8 Copies of all decontamination certifications.
- 3.5.9 Pre/Post-construction and progress photographs and videos.
- 3.5.10 Copies of all permits.
- 3.5.11 Construction logs.
- 3.5.12 As-built drawings.
- 3.5.13 Observations and lessons learned.

END OF SECTION

SECTION 02100

PRE-EXCAVATION SAMPLING AND SITE PREPARATION

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 The Contractor shall furnish all labor, materials and equipment required to perform all pre-excitation sampling and site preparation activities as specified herein and presented on the Contract Drawings.

1.1.2 The Contractor shall obtain all permits required for site preparation work prior to proceeding with the work. All local permit requirements shall be coordinated in advance with the EPA’s Representative.

1.1.3 The Contractor shall perform pre-excitation sampling of soil, sediment, surface water, and tree trunks during a separate mobilization event prior to other site preparation activities specified herein. Any clearing required to access pre-excitation soil, sediment, or surface water sample locations shall be performed at the same time. Remaining clearing and grubbing shall be performed at the time of other site preparation activities.

1.1.4 Subsequent to pre-excitation sampling and prior to performing any site preparation activities, the Contractor shall document existing site conditions via photographs, in accordance with SECTION 01380 - PROJECT PHOTOGRAPHS and SECTION 01381 - VIDEOTAPING, and shall report in writing to the EPA’s Representative prior to the commencement of any site preparation work. The Contractor shall also field verify the existing site conditions in accordance with SECTION 01550 - SURVEYING. Any significant difference between the assumed existing conditions and actual conditions at the time of construction shall be discussed with the EPA’s Representative prior to the work.

1.1.5 The Contractor shall be responsible for notifying the Old Bridge Municipal Utilities Authority (OBMUA) of the planned remedial excavation prior to beginning excavation in order to address any concerns raised by OBMUA regarding sewer pipe protection.

1.1.6 The Contractor shall ensure that all work is performed safely in accordance with the safety requirements of SECTION 01351 - SAFETY, HEALTH, AND EMERGENCY RESPONSE

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.

NEW JERSEY ADMINISTRATIVE CODE (N.J.A.C.)

N.J.A.C. 7:26

Solid and Hazardous Waste Management Regulations

1.3.2 Site Preparation Plan; Pre-Construction Submittals; EA

Site Preparation Plan shall be submitted at least 21 calendar days prior to Pre-Construction conference. The Site Preparation Plan shall address in detail all the work listed under PART 3 of this specification. In addition, it shall include a drawing showing the proposed sediment containment area, stockpile and loadout area, decontamination area, access point and roads, staging area including trailers and parking, concrete barriers, and stormwater diversion features. A proposed layout plan is shown on the Contract Drawings.

1.3.3 Herbicide Application Plan; Pre-Construction Submittals; EA

The Herbicide Application Plan shall be submitted at least 21 calendar days prior to Pre-Construction conference. The Herbicide Application Plan shall address in detail all the work listed under Section 3.10 of this specification section. The plan components shall comply with, and the proposed work shall be implemented pursuant to, N.J.A.C. 7:30 Subchapters 1-13: Pesticide Control Code.

1.3.4 Crushed Stone Aggregate Certificate of Compliance; Certificates; EA

The Contractor shall submit certificates of compliance, furnished by the crushed stone facilities, stating the physical properties of the crushed stone to be used on site meet the specification requirements as described in Paragraph 2.1 – CRUSHED STONE AGGREGATE.

1.3.5 No. 2 Stone Certificate of Compliance; Certificates; EA

The Contractor shall submit certificates of compliance, furnished by the No. 2 Stone facilities, stating the physical properties of the No. 2 Stone to be used on site meet the specification requirements as described in Paragraph 2.2 – NO. 2 STONE.

1.3.6 Dense Graded Aggregate Certificate of Compliance; Certificates; EA

The Contractor shall submit certificates of compliance, furnished by the dense graded aggregate (DGA) facilities, stating the physical properties of the DGA to be used on site meet the specification requirements as described in Paragraph 2.3 – DENSE GRADED AGGREGATE.

1.3.7 Non-woven Geotextile Filter Fabric Certificates of Compliance; Certificates; EA

The Contractor shall submit certificates of compliance, furnished by the geotextile fabric manufacturer or supplier, stating the physical properties of the geotextile fabric to be used on site meet the specification requirements as described in Paragraph 2.4 – NON-WOVEN GEOTEXTILE FABRIC.

1.3.8 Geomembrane Liner Certificates of Compliance; Certificates; EA

The Contractor shall submit certificates of compliance, furnished by the geomembrane liner manufacturer or supplier, stating the physical properties of the geomembrane liner to be used on site meet the specification requirements as described in Paragraph 2.5 – GEOMEMBRANE

LINER.

1.3.9 Permits; Certificates; FIO

Copies of all permits obtained not submitted under other sections.

PART 2 PRODUCTS

2.1 CRUSHED STONE AGGREGATE

Crushed stone shall be sound, hard, and durable and shall meet the following gradation requirements and shall conform to ASTM C 33 Size No. 57.

<u>U.S. Sieve Size</u>	<u>Percent Finer by Weight</u>
1-½ inch	100
1-inch	95-100
½-inch	25-60
No. 4	0-10
No. 8	0-5

2.2 NO. 2 STONE

No. 2 Stone shall be hard, durable, clean crushed angular stone and shall meet the following gradation requirements and shall conform to ASTM C 33 Size No. 2.

<u>U.S. Sieve Size</u>	<u>Percent Finer by Weight</u>
3-in	100
2-1/2-in	90-100
2-in	35-70
1-1/2-in	0-15
3/4-in	0-5

2.3 DENSE GRADED AGGREGATE

DGA shall be hard, durable, rounded, or sub-angular particles of proper size and gradation, and shall be free from sand, loam, clay, excess fines, and other deleterious materials. DGA shall be graded within the following limits:

<u>U.S. Sieve Size</u>	<u>Percent Finer by Weight</u>
2-in	100
1-1/2-in	70-100
¾-in	50-85
No. 4	30-55
No. 50	8-24
No. 200	3-10

2.4 NON-WOVEN GEOTEXTILE FABRIC

The geotextile fabric shall be a non-woven fabric consisting only of continuous chain polymer filaments or yarns of polyester, formed into a stable network by needle punching. The fabric shall be mildew and rot resistant. The fabric shall contain the properties listed in Table 02100-1.

**Table 02100-1
 Non-woven Geotextile Fabric Properties**

<i>Fabric Property</i>	<i>Test Method</i>	<i>Minimal Physical Properties</i>
Fabric Weight	ASTM D 5261	8.0 oz/yd ³
Fabric Thickness	ASTM D 5199	105 mils
Grab Strength	ASTM D 4632	230 lbs
Puncture Resistance	ASTM D 4833	100 lbs
Water Flow Rate	ASTM D 4491	90 gpm/ft ²
Permeability, K	ASTM D 4491	0.34 cm/sec
Apparent Opening Size	ASTM D 4751	Sieve Size 70

2.5 GEOMEMBRANE LINER

The geomembrane liner shall be High Density Polyethylene (HDPE) 60 Smooth black style as manufactured by Layfield Geosynthetics and Industrial Fabrics Ltd. or equal. The surface on which the geomembrane is to be placed shall be free of rocks greater than 0.5 inches in diameter and any other objects, which could damage the membrane. The seams shall be water tight. The material shall be laid loosely but with intimate contact with soil as to not stretch or tear the liner. Geomembrane liners that are exposed to direct sunlight shall be UV-resistant. The geomembrane liner shall contain the properties listed in Table 02100-2.

**Table 02100-2
 Geomembrane Properties**

<i>Membrane Property</i>	<i>Test Method</i>	<i>Minimal Physical Properties</i>
Thickness	ASTM D 5199	60 mil
Tensile Strength at Break	ASTM D 638	225 ppi
Tear Resistance	ASTM D 1004	42 lbs
Dimensional Stability	ASTM D 1204 Max Change	±2%
Puncture Resistance	ASTM D 4833	108 lbs

PART 3 EXECUTION

3.1 PRE-EXCAVATION SAMPLING

3.1.1 As a part of pre-excitation sampling, the Contractor shall collect soil, sediment, wood tissue, and surface water samples at the locations shown on the Contract Drawings and in accordance with the Contractor’s approved plan. The soil and sediment samples shall be used to supplement existing sample results from the previous investigations to horizontally and

vertically delineate contaminated soil in primary and secondary excavation areas and areas where current delineation is not sufficient. Wood tissue samples shall be used to characterize material designated for clearing and grubbing and determine if cleared material may be reused on site. Surface water samples shall be used as baseline data for surface water monitoring.

3.1.2 All soil and sediment samples shall be collected in 6-inch intervals, coarse material and any observed slag material shall be removed, and the sample shall be homogenized and sent to an off-site laboratory for analysis with a quick turn-around-time (TAT) of 48 hours.

3.1.3 In addition, the Contractor shall collect a total of 9 composite samples (8 soil and 1 sediment) to pre-characterize the excavated soil for disposal purposes from the locations and depths specified in Table 02100-3. Prior to homogenizing, samples shall be visually inspected for slag, and if identified this material shall be removed. The composited samples shall be analyzed on a standard TAT.

**Table 02100-3
 Pre-Excavation Soil and Sediment Composite Samples**

<i>Excavation Areas</i>	<i>Number of Composite Samples</i>	<i>Location ID</i>	<i>Sample Depth for Composite (feet below ground surface)</i>
Area C, Area F and Area T	1	SE-P-001	0 - 2
		SE-P-006	0 - 2
		SE-P-013	0 - 1
Area D and Area H	1	SB-P-011	0 - 4
		SB-P-054	0 - 7
		SB-P-055	0 - 7
Area G and Area H	1	SB-P-053	0 - 4
		SB-P-062	0 - 7
Area H	1	SB-P-044	0 - 6
		SB-P-045	0 - 6
		SB-P-046	0 - 6
	1	SB-P-048	0 - 6
		SB-P-049	0 - 7
		SB-P-052	0 - 6
Area J and L	1	SB-P-004	0 - 5
		SB-P-039	2 - 6
Area L and Y2	1	SB-P-001	0 - 3
		SB-P-002	0 - 5
Area P, Area Q and Area V	1	SB-P-015	0 - 4
		SB-P-016	0 - 9
		SB-P-017	0 - 9
		SB-P-028	0 - 6
		SB-P-030	0 - 6

**Table 02100-3
 Pre-Excavation Soil and Sediment Composite Samples (continued)**

<i>Excavation Areas</i>	<i>Number of Composite Samples</i>	<i>Location ID</i>	<i>Sample Depth for Composite (feet below ground surface)</i>
Area S, Area U and Area W	1	SB-P-021	0 - 6
		SB-P-026	0 - 5
		SB-P-037	0 - 2

3.1.4 Surface water samples shall be collected at the locations indicated on the Contract Drawings or as directed by the EPA’s Representative. Samples shall be sent to an off-site laboratory for analysis with standard TAT.

3.1.5 Two wood tissue samples shall be collected from two tree trunks located within Excavation Area S. The trees selected shall have a breast height diameter of 8 inches or greater, and shall be of different species from one another or as directed by the EPA’s Representative. Samples shall be collected using a tree increment borer, at a height of one foot above ground surface and extending as close to the center of the trunk as possible. The Contractor shall be responsible for determining the number of increment coring required to collect sufficient sample volume for the analytical laboratory. If samples cannot be collected from Area S based on field conditions, samples may be collected from trees within Area V or as directed by the EPA’s Representative.

3.1.6 All sampling and analysis procedures and sample locations for Pre-Excavation Sampling shall be included in the Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP) as specified in SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.

3.1.7 All analytical results shall be submitted to the EPA’s Representative. If necessary, the EPA’s Representative shall notify the Contractor regarding revisions to excavation limits and/or modifications to water pretreatment or discharge.

3.1.8 Clearing required to access pre-excavation sample locations shall be performed prior to sample collection.

3.2 CLEARING AND GRUBBING

Clearing and grubbing shall be performed in accordance with SECTION 02230 – CLEARING AND GRUBBING and as specified on the Contract Drawings prior to remaining site preparation activities.

3.3 STAGING AREA AND DECONTAMINATION FACILITIES

The staging area and decontamination facilities shall be constructed at the locations shown on the Contract Drawings and in accordance with SECTION 01500 - TEMPORARY CONSTRUCTION FACILITIES AND UTILITIES. The crushed stone shall be underlain by geotextile filter fabric meeting the requirements specified herein.

3.4 ACCESS ROADS

3.4.1 The Contractor shall ensure emergency access is available at all times for emergency and OBMUA vehicles during construction using the OBMUA fire access road and/or secondary access road.

3.4.2 The Contractor shall add additional No. 2 stone to the secondary access road at the entrance from Route 35 to the limits shown on the Contract Drawings to support construction traffic, and shall add DGA as necessary to repair and supplement the secondary access road as necessary and as determined by the Contractor to the limits shown on the Contract Drawings. The Contractor shall restore and maintain previously established stabilized construction access pads in these locations as necessary throughout construction.

3.4.3 The OBMUA fire access road and secondary access road shall be used for waste hauling as indicated on Contract Drawings during remedial excavation. The secondary access road shall be used for Contractor site access.

3.5 STORMWATER DIVERSION

Stormwater shall be diverted around the excavation areas in accordance with SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT and the Contractor’s approved plan.

3.6 PROTECTION

3.6.1 Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction operations by the erection of barriers or by such other means as the circumstances require.

3.6.2 The Contractor shall repair all damage to trees, shrubs, and plants scheduled to remain, by properly dressing, cutting and painting, or replace those items that cannot be repaired.

3.6.3 The Contractor shall seed all grassed areas, beyond the limits of construction shown on the Contract Drawings, which have been damaged as a result of the Contractor's operation in accordance with SECTION 02921 – UPLAND SEEDING.

3.6.4 The Contractor shall not destroy or damage trees and shrubs outside the limits of construction, without the authorization of the EPA’s Representative.

3.6.5 The OBMUA sanitary sewer pipe, manholes and air vents located within excavation areas shall be protected in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.

3.6.6 All monitoring wells located within excavation areas shall be protected in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.

3.7 SEDIMENT CONTAINMENT AREA

3.7.1 A sediment containment area shall be constructed as shown on the Contract Drawings to dewater sediment prior to off-site transportation. The sediment containment area shall be constructed in accordance with the Contract Drawings or Contractor’s approved plan and shall be made fully operational prior to dredging activities.

3.7.2 The sediment containment area shall be impervious as to prevent contamination of clean soils underneath. The area shall be contained using a minimum 3-foot high pre-cast concrete Jersey barrier wall extending to a minimum elevation of 14.5 feet above mean sea level. The wall shall be lined with a geomembrane liner to prevent leakage. If the sediment containment area is constructed at a location other than the location shown on the Contract Drawings, the elevation of the Jersey barrier wall shall be set a minimum of 0.5 feet above the flood hazard area elevation. The geomembrane line shall be covered with a 2-inch layer of sand, a layer of non-woven geotextile fabric, and an 8-inch layer of DGA to promote sediment drainage within the containment area.

3.7.3 The liner system shall be sloped to a sump area for the collection of the water for on-site treatment as necessary and discharge to the MCUA POTW or to surface water.

3.7.4 The Contractor shall construct access ramps to the sediment containment area as shown on the Contract Drawings.

3.8 STOCKPILE/LOADOUT AREA

3.8.1 A stockpile area shall be constructed as shown on the Contract Drawings to drain excavated material and segregate soils based on waste classification prior to off-site transportation. The stockpile area shall be constructed in accordance with the Contract Drawings or Contractor’s approved plan and shall be made fully operational prior to excavation. The stockpile area shall be constructed in the previously remediated area indicated on the Contract Drawings. Liner and barrier requirements specified herein shall apply to any revised or expanded area.

3.8.2 Stockpile pile area including vehicle access point shall be contained using a minimum 3-foot high pre-cast concrete Jersey barrier wall extending to a minimum elevation of 14.5 feet above mean sea level. If the stockpile/loadout area is constructed at a location other than the location shown on the Contract Drawings, the elevation of the Jersey barrier wall shall be set a minimum of 0.5 feet above the flood hazard area elevation. The geomembrane liner shall be as specified in Paragraph 2.5 shall be placed under the stockpiles and adhered to the Jersey barriers as shown on the Contract Drawings where the potential exists for water to infiltrate the site soil within the stockpile area.

3.8.3 The liner system shall be sloped to a sump area to allow for the collection of water from the stockpiled area. Water shall be treated on site as necessary and discharged to the MCUA POTW or surface water.

3.9 WASTE HANDLING AND DISPOSAL

3.9.1 Construction and demolition debris shall be loaded into roll-off containers for off-site disposal. The Contractor shall dispose of materials and debris from site preparation operations at an approved off-site disposal facility in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.

3.9.2 Burning of any materials for disposal of refuse/debris, or other fires for any reason, will not be permitted.

3.9.3 No rubbish or debris of any kind shall be buried on the project site.

3.9.4 The Contractor shall be responsible for all wastes until they are accepted by the disposal facility. It is the Contractor’s responsibility to ensure that all waste shipments comply with the disposal facility’s requirements at the time of receipt of the shipments at the disposal facility.

3.10 HERBICIDE APPLICATION PLAN

3.10.1 The purpose of herbicide application is to eradicate or kill back living stands of Common Reed (*Phragmites australis*) present in the work area prior to clearing and grubbing. The Contractor shall submit an Herbicide Application Plan prepared in accordance with N.J.A.C. 7:30 Subchapters 1-13 Pesticide Control Code, and industry best practices to achieve this goal.

3.10.2 The Herbicide Application Plan shall identify the proposed herbicide or mix of herbicides for this purpose and approved for use in and adjacent to aquatic environments, e.g. Glyphosate or a mix of Imazapyr and Glyphosate. The Herbicide Application Plan shall also present the proposed application method and equipment required for proposed method for the application.

3.10.3 The Contractor shall apply approved herbicide 6 to 8 weeks prior to cutting common reed (*Phragmites australis*) to allow the herbicide to be translocated to the roots and rhizomes to kill the plants. If the Contractor proposes less than a 6 week absorption and translocation time, the Contractor shall provide assurances that effectiveness will be the same as applying 6 weeks prior to cutting.

END OF SECTION

SECTION 02111

EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 The purpose of this section is to provide the Contractor with the minimum requirements and constraints for excavation and handling of contaminated soil and sediment and collection and analysis of post-excavation samples as specified in this section and as shown on the Contract Drawings, specified herein, and in accordance with the Contractor's approved Excavation and Handling Plan.

1.1.2 The work shall include, without limitation, excavation of contaminated soil and sediment; drying of contaminated sediment; potential temporary storage of contaminated soil and sediment; segregation of different wastes identified herein and in the Contract Drawings; and collection and off-site analysis of post-excavation verification soil and sediment samples.

1.1.3 Excavation shall extend to the widths and depths shown in the Contract Drawings or as specified herein and shall include side slopes as shown in the Contract Drawings and specified herein.

1.1.4 All required sampling and chemical analysis shall be conducted in accordance with the requirements of SECTION 01450 - CHEMICAL DATA QUALITY CONTROL.

1.1.5 No site personnel shall be allowed to enter the excavated area unless the excavation is performed in accordance with Occupational Safety and Health Administration (OSHA) regulations as specified in 29 CFR 1926, Subpart P.

1.1.6 The Contractor shall obtain the services of a New Jersey-licensed Surveyor to document the limits of excavation for the purposes of measurement and payment, and for preparation of As-Built drawings.

1.2 DESIGN AND PERFORMANCE RESPONSIBILITY

1.2.1 The Contractor is responsible for the design and execution of the means and methods to achieve the target excavation depths, dewatering, and minimize disturbance to the local ecology.

1.2.2 The Contractor is responsible for any damage to properties, structures, sewers and other utility installations, roadways, and work that may result from excavation and associated operations.

1.2.3 The Contractor is responsible for monitoring the water quality and controlling the impact to the water bodies affected by the work specified herein.

1.2.4 Any design review and field monitoring activities performed by the EPA’s Representative shall not relieve the Contractor of responsibility for the work.

1.3 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. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.

NEW JERSEY ADMINISTRATIVE CODE (NJAC)

NJAC 7:26E Technical Requirements for Site Remediation

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION (NJDEP) – SITE REMEDIATION PROGRAM

NJDEP Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil

CODE OF FEDERAL REGULATION (CFR)

29 CFR 1926, Subpart P Safety and Health Regulations for Construction - Subpart P: Excavations

40 CFR 261 Identification and Listing of Hazardous Waste

40 CFR 264 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

1.4 SUBMITTALS

The Contractor shall submit the following to the EPA’s Representative in accordance with SECTION 01330 - SUBMITTAL PROCEDURES:

1.4.1 Excavation and Handling Plan; Pre-Construction Submittals; EA

The Contractor shall submit an Excavation and Handling Plan at least 14 calendar days prior to the Pre-Construction Conference. The Contractor should note that adverse conditions (heavy rain or snow) may be encountered during excavation operations and provisions should be made for such an event. No work at the site, with the exception of site inspections, surveys, and pre-excavation sampling shall be performed until the plan is approved. The Contractor shall allow 30 calendar days in the schedule for review by the EPA’s Representative. No adjustment for time or money will be made if resubmittals of the plan are required due to deficiencies in the plan. At a minimum, the Excavation and Handling Plan shall include all elements listed below.

- a. Excavation approach
- b. Personnel requirements
- c. Equipment and methods of excavation and backfill
- d. Excavation and backfill sequence
- e. Coordinating site dewatering activities as detailed in the Dewatering and Drainage Plan in accordance with SECTION 02140 – DEWATERING AND DRAINAGE. Measures to divert surface water from the excavation area, and collect stormwater that accumulates in the excavation area after precipitation events.
- f. Storage methods and locations for liquid and solid contaminated material. Methods for prevention of cross-contamination at the stockpile area to be built in clean areas.
- g. Coordinating waste segregation and stockpiling logistics with the Waste Management and Transportation Plan.
- h. Handling of contaminated material
- i. Shoring, bracing, and sloping. Applicable OSHA requirements
- j. Coordinating with the Site Safety and Health Plan for spill and discharge control
- k. Post-excavation verification sampling and analysis procedures
- l. Coordination of haul routes with Waste Management and Transportation Plan
- m. Surveying of excavated areas and determination of excavation quantities
- n. Drying agents which shall be used if necessary to meet requirements of the selected disposal facility requirements and which will not raise the waste disposal classification of excavated material

1.4.2 Post-Excavation Confirmation Sampling Results; Test Reports; FIO

The Contractor shall provide the post-excavation confirmation sampling results in a format consistent with the requirements of NJAC 7:26E. The analysis and reporting shall meet the requirements of SECTION 01450 - CHEMICAL DATA QUALITY CONTROL.

1.5 REGULATORY REQUIREMENTS

1.5.1 Permits and Licenses

The requirements governing transportation, administrative requirements and methods of treatment and disposal of hazardous wastes, and all other applicable Federal, State or local laws, codes and ordinances which govern or regulate hazardous wastes shall apply to the work of this section. The Contractor shall be responsible for obtaining any and all permits necessary for excavation, dewatering, stockpiling and any other features of work associated with the excavation of contaminated material.

1.5.2 Air Emissions

Air emissions shall be monitored and controlled in accordance with SECTION 01351-SAFETY, HEALTH, AND EMERGENCY RESPONSE and SECTION 01362 – PERIMETER AIR MONITORING.

1.6 DEFINITIONS

1.6.1 Hazardous Waste

A waste that meets criteria established in Resource Conservation and Recovery Act (RCRA) or specified by the EPA in 40 CFR 261 or which has been designated as hazardous by a RCRA authorized state program.

1.6.2 Non-hazardous Waste

Any waste that does not meet the criteria of hazardous waste.

1.6.3 Post-Excavation Verification Sample

Soil sample collected subsequent to primary and secondary excavation to confirm that the Remediation Goals have been met.

1.6.4 In-the-Dry

"In-the-Dry" means soil conditions where groundwater is drawn down at least two feet below the bottom of any soil subgrade and no standing water exists on soil subgrades. The drawdown shall be sufficient to prevent disturbance or softening of the subgrade during all anticipated construction activities and collection of post-excavation verification samples.

1.7 SITE REMEDIATION GOAL

The Remediation Goal for this project for lead is 400 milligrams per kilogram (mg/kg).

1.8 POST-EXCAVATION SAMPLING CRITERIA

All excavations require verification in accordance with the NJDEP post remedial action requirements defined in N.J.A.C. 7:26E, Subchapter 5.2, and NJDEP Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil.

1.8.1 One sidewall sample for every 30 linear feet of excavation sidewall, with a minimum of one sample located on each sidewall. Excavation sidewalls to be sampled include the overall perimeter sidewalls and interior sidewalls between adjoining excavations when there is a change in PE elevation of two feet or greater. Adjacent excavations with less than a two feet differential between PE elevations shall not be considered for sidewall sampling. For excavation depth more than two feet deep, collect sample at the top and bottom of each sidewall sample to demonstrate vertical compliance with the remediation standards.

1.8.2 One bottom sample from the excavation bottom for every 30 by 30 foot grid, or every 900 square feet of excavation floor.

1.9 WASTE TYPES

The following types of wastes are expected from the excavation operation:

TABLE 02111-1

Waste Type	Waste Definition
Hazardous – RCRA, No Treatment	Soils/sediment/water treatment residuals with lead concentrations greater than or equal to Toxicity Characteristic Leaching Procedure (TCLP) criteria and less than 10 times Universal Treatment Standard (UTS) criteria
Hazardous – RCRA, Treatment	<ul style="list-style-type: none"> ▪ Soils/sediments with lead concentrations greater than or equal to TCLP criteria and at least 10 times UTS criteria ▪ Slag material ▪ Battery casings
Non-Hazardous – Subtitle D	<ul style="list-style-type: none"> ▪ Soils/sediment/water treatment residuals with lead concentrations below TCLP criteria but greater than site cleanup criteria ▪ Tree stumps from grubbing operations ▪ Trees and vegetation from clearing operations if pre-excavation wood tissue (tree trunk) sample results are above NJDEP Residential Direct Contact Soil Remediation Standards (RDCSRS)
Non-Hazardous – Municipal Landfill or Subtitle D	Construction debris
Recyclable – Non-hazardous	Trees and vegetation from clearing operations if pre-excavation wood tissue (tree trunk) sample results are below NJDEP RDCSRS

1.10 SURVEYS

Surveys shall be performed immediately prior to and after excavation of contaminated material to determine the volume of contaminated material removed. Surveys shall also be performed after backfill showing final grade. Locations of pre-excavation and post-excavation confirmation samples shall also be surveyed and shown on the drawings. Surveys shall be performed in accordance with SECTION 01550 – SURVEYING.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXISTING STRUCTURES AND UTILITIES

3.1.1 Excavation at the Raritan Bay Slag – Margaret’s Creek Sector site is bordered on the northwest by the Margaret’s Creek and on the southeast by private residences. According to

Old Bridge Municipal Utilities Authority (OBMUA), an active 30-inch ductile iron sewer pipe, abandoned 30-inch sewer pipe, and active 20-inch forcemain are located within the Site boundaries as shown on the Contract Drawing. The active sewer pipe (30-inch ductile iron sewer pipe) is located approximately parallel to the secondary access road in the southwestern portion of the Site and parallel to the fire access road in the northeastern portion of the Site, and the top of the pipe is buried approximately 7 to 15 feet below ground surface (bgs) along this length. The abandoned sewer pipe crosses the fire access road, and the top of the pipe is buried approximately 12 and 13.5 feet bgs in this area. The 20-inch forcemain is outside the proposed excavation areas.

3.1.2 The Contractor shall take necessary precautions to ensure no damage occurs to the OBMUA sewer pipes, manholes and air vents, other existing utilities, or monitoring wells.

3.1.3 The Contract Drawings identify two areas where the top of the active sewer pipe is located within four feet of the bottom depth of adjacent excavation areas (Areas Q and V). The Contractor shall field verify the sewer pipe location prior to excavation in these excavation areas and shall be responsible for protection of the pipe, including any areas where secondary excavation is required.

3.1.4 The Contractor shall take the necessary precautions to ensure no damage occurs to existing structures (manholes, existing fences to remain, adjacent property items, etc.) and utilities outside the excavation limits that are not part of the scope of work. Damage to existing structures and utilities outside the scope of work shall be repaired at no additional cost to the Government.

3.1.5 Unexpected active utilities encountered during excavation shall not be disturbed without written approval from the EPA’s Representative.

3.2 CONSTRUCTION SEQUENCING

Excavation shall be conducted in a phased approach. The purpose of this phased approach is to effectively coordinate the different aspects of the remedial activities. As shown on the Contract Drawings, the overall remedial excavation is divided into three distinct stages, as follows:

3.2.1 Stage 1: Remediate a portion of Area A (OBMUA fire access road) to prepare this area for installation of the decontamination facility. Excavated material shall be stockpiled on-site in the previously remediated area shown on the Contract Drawings. Construct decontamination facility.

3.2.2 Stage 2: Implement dewatering measures and temporary cofferdams for sediment excavation areas. Collect and treat water using the temporary water treatment system and discharge to the Middlesex County Utilities Authority (MCUA) publicly owned treatment works (POTW) or to surface water in accordance with the applicable approved permit equivalency. Dewater and remediate sediment in Areas C, F, and T. The dewatering and temporary water treatment system shall be fully operational prior to the start of excavation in these areas. Contain sediment within the sediment containment area and till as necessary to facilitate drying. Load dried sediments from containment area and dispose of off-site.

3.2.3 Stage 3: Remediate the remainder of the Site to the excavation limits shown on the Contract Drawings. Implement dewatering measures as necessary. To the extent possible, segregate slag and battery casings from soil. In general, the excavation shall proceed from north to south or in accordance with Contractor’s approved Excavation and Handling Plan. Inspect excavation bottoms and sidewalls using visual observations and perform post-excavation sampling and any required secondary excavation prior to backfill. Load excavated material from sediment containment area and soil stockpile/loadout area and dispose of off-site.

3.3 EXCAVATION GENERAL

3.3.1 An electronic copy of the Contract Drawings will be provided to the Contractor to establish sampling locations and the corners of all primary excavation areas, as shown on the Contract Drawings. The Contractor shall use New Jersey state plane coordinates to lay out sample locations and the limits of excavation, using the services of a NJ State Licensed Surveyor.

3.3.2 The Contractor shall provide surveying services, by a NJ State Licensed Surveyor, to lay out the limits of the excavation shown on the Contract Drawings. The Contractor shall perform all excavations to the lines, grades, and elevations shown on the Contract Drawings. The survey work to measure quantities shall be performed by the Contractor prior to backfilling the excavation, and shall be accurate to the nearest 0.1 ft.

3.3.3 The Contractor shall be responsible for benching or sloping the excavation, as necessary, or for providing other temporary supports to prevent soil slippage along the side slopes and any other slope stability issues in accordance to the Contractor’s approved Excavation and Handling Plan. All Contractor-designed sloping shall comply with the requirements of OSHA 1926, Subpart P. The soil type shall be considered Type C.

3.3.4 All slopes shall be inspected daily by a qualified staff member for cracks in the soil at the head or along the face of the slopes and other changed conditions such as bulges or sloughs on the slopes. Inspection results shall be documented in a Daily Inspection Log and any unusual or changed conditions shall be brought to the attention of the EPA’s Representative.

3.3.5 The Contract Drawing shows the minimum slope of 2H:1V for excavation of each area exceeding 4 feet in depth. However, if the excavation is to remain open for an extended period of time, or if groundwater is present, the Contractor shall stabilize the slope to 3H:1V or flatter.

3.3.6 The Contractor shall maintain an excavation of sufficient size to allow workers ample room to complete the work.

3.3.7 The Contractor shall be responsible for dewatering excavations in accordance with SECTION 02140 - DEWATERING AND DRAINAGE and the Contractor’s approved Dewatering and Drainage Plan. The work area shall be kept in-the-dry during excavation and backfilling until the work has been completed to such extent that the fill area will not be damaged by allowing water levels to return to natural levels.

3.3.8 Sediment shall be contained within the sediment containment area built in accordance with SECTION 02100 – PRE-EXCAVATION SAMPLING AND SITE PREPARATION. The Contractor shall be responsible for implementing drying measures such as tilling as necessary to facilitate drying or propose the addition of drying agents, for approval by the EPA’s Representative, prior to off-site disposal. The stockpiles shall be covered prior to any storm events to prevent re-saturation of dried material. Contaminated stockpiles shall meet the regulations defined in 40 CFR 264.250.

3.3.9 Because of the variation of contaminant concentration in the waste material, the Site Safety and Health Officer (SSHO) shall direct the rate and manner of excavation to ensure the safety of all on-site personnel.

3.3.10 Blasting shall not be permitted.

3.3.11 Loading and transporting contaminated material shall be in accordance with SECTION 02120 - TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL. Following the receipt of waste characterization sample results collected in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL, the Contractor may perform direct loading of all non-sediment excavation materials for off-site transport and disposal, unless moisture conditions require stockpiling and drying. The stockpile area shall be built in accordance with SECTION 02100 – PRE-EXCAVATION SAMPLING AND SITE PREPARATION.

3.3.12 Dust control and mitigation, and air monitoring shall be performed in accordance with the Contractor’s approved Accident Prevention Plan, as specified under SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.

3.3.13 Areas being excavated shall be maintained in a clean condition, free from leaves, brush, sticks, trash, and other debris. Organic materials including stumps, roots, and debris encountered during excavation shall be considered grubbed material and shall be disposed as a contaminated material in accordance with 02120 - TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.

3.3.14 All items having any apparent historical or archeological interest which are discovered in the course of any construction activities shall be carefully preserved. The Contractor shall leave the archeological find undisturbed and shall immediately report the find to the EPA’s Representative so that the proper authorities may be notified. Historical or archeological finds that might require work stoppages are not anticipated to occur during construction. Contaminated finds shall be decontaminated by the Contractor prior to removal from the Site.

3.3.15 Surface water shall be directed away from open excavation and construction areas so as to prevent soil erosion, surface water runoff from coming in contact with contaminated material, and the accumulation of surface water in excavation areas. Diversion ditches, dikes, and grading shall be provided as necessary and soil erosion controls shall be implemented in accordance with SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT and the Soil Erosion and Sediment Control Plan certified by the Freehold Soil

Conservation District. The Contractor shall stop work and reduce the exposed surface when heavy rain is predicted.

3.3.16 At the completion of both the excavation and backfilling stages of construction, all trapped sediment in the Contamination Reduction Zones shall be collected and removed as contaminated material.

3.3.17 All vehicles and equipment used for excavation shall be decontaminated in accordance with the Contractor’s approved Site Safety and Health Plan, prior to entering into clean areas.

3.3.18 If turtles or other wildlife are identified within work areas, the Contractor shall immediately notify the EPA’s Representative of their presence. The Contractor shall cease site operations if directed by EPA’s Representative.

3.4 PRIMARY EXCAVATION

3.4.1 In total, 29 primary excavation areas have been designed to remove the observed contamination as shown on the Contract Drawing, Excavation Plan.

3.4.2 The Contractor shall conduct excavation based on the approved Excavation and Handling Plan to the limits and depths shown on the Contract Drawings. Excavation areas shall be excavated to within 0.2 feet of the final elevation or depths, and extent shown on the Contract Drawings or as directed by the EPA’s Representative.

3.4.3 The EPA’s Representative shall be notified as soon as possible but no later than 24 hours, if hazardous material (slag or battery casings) or visual contamination is discovered that has not been identified on the Contract Documents. Any visible sign of contamination, and slag or battery casing encountered during excavation shall be maintained for each area of excavation. The EPA’s Representative shall then notify the Contractor whether this material shall be excavated.

3.4.4 In Area AA, the contractor shall scrape the top 4 inches of road surface material to remove surface battery casings noted by the EPA Emergency Response and Removal Branch for work performed after Hurricane Sandy. Surface battery casings were covered with geotextile liner and stone. The Contractor shall remove additional surface material, if necessary, to remove battery casing found based on visual observations.

3.4.5 The Contractor shall segregate the mixture of battery casings and soil within Area A to the extent possible unless otherwise directed by the EPA’s Representative.

3.4.6 The Contractor shall install and implement the dewatering system prior to Stage 2 excavations in accordance with SECTION 02140 – DEWATERING AND DRAINAGE and the Contractor’s approved plan.

3.4.7 The Contractor shall ensure emergency access is available at all times for emergency and OBMUA vehicles during construction using the OBMUA fire access road and/or secondary access road.

3.5 POST-EXCAVATION SAMPLING AND SECONDARY EXCAVATION

3.5.1 The Contractor shall collect post-excitation bottom and sidewall samples at the locations shown on the Contract Drawings. Samples shall be sent to an off-site laboratory for lead analysis with a quick turn-around-time (TAT) of 48 hours. All post-excitation sample results shall be compared to the site Remediation Goal.

3.5.2 Secondary Excavation beyond the Primary Excavation Limits shown on the Contract Drawings shall be performed based solely on analytical results of post-excitation samples and/or visual observations of soil contamination, slag and battery casings. Secondary Excavation shall be performed only with the approval from the EPA’s Representative.

3.5.3 If analytical results of a bottom post-excitation sample exceed the Remediation Goal, the Contractor shall perform secondary excavation in 1-foot vertical increments within that grid, and then collect a new bottom sample. This process shall be repeated until the Remediation Goals are met, or as otherwise directed by the EPA’s Representative. Additional sidewall post-excitation samples shall be collected for every 4 vertical feet of new sidewall exposed during secondary excavation.

3.5.4 If analytical results of a sidewall sample exceed the Remediation Goal, the Contractor shall perform secondary excavation of the entire sidewall of that sampling grid, shown on the Contract Drawing, in 1-foot horizontal increments, and then collect new post-excitation sidewall samples. This process shall be repeated until the Remediation Goals are met, or as otherwise directed by the EPA’s Representative. As the excavation expands horizontally, the Contractor shall monitor the overall excavation area to determine whether additional bottom samples are required to ensure that the post-excitation sampling criteria listed herein are met.

3.5.5 All required sampling and chemical analysis shall be conducted in accordance with the Contractor’s approved UFP-QAPP and the requirements of SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.

3.6 WASTE HANDLING

3.6.1 The Contractor shall segregate the excavated material into distinct stockpiles corresponding to their respective categories listed in Table 02111-1. All excavated material shall be transported off site and routed to the appropriate disposal facilities for treatment and/or disposal in accordance with SECTION 02120 - TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.

3.6.2 Segregated soil from Area A shall be handled and disposed separately from battery casings based on the results of waste characterization sampling. If waste characterization results indicate soil from Area A is a RCRA hazardous waste, both soil and battery casing material shall be treated as RCRA waste.

3.7 UNDERGROUND STORAGE TANKS (USTs)

No known USTs are present within the Site. If an UST is encountered during the course of excavation, the EPA’s Representative shall be immediately notified.

3.8 SAMPLING BENEATH THE SEDIMENT CONTAINMENT AND SOIL STOCKPILE AREAS

3.8.1 Samples from beneath the sediment containment area and soil stockpile/loadout areas that are located over remediated areas shall be collected after removal of the sediment and soil stockpiles to verify that no cross-contamination has occurred in the area due to leakage. Samples shall be collected at a frequency of one per 900 square feet of disturbed area, from a depth interval of 0 to 0.5 feet. Samples shall be collected from biased areas based on visual indications of potential leaks. Samples shall be analyzed for lead only in accordance with the requirements of SECTION 01450 - CHEMICAL DATA QUALITY CONTROL.

3.8.2 Areas showing lead sample results above the cleanup criterion of 400 mg/kg shall be excavated to remove the contamination and re-sampled.

END OF SECTION

SECTION 02120

TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL

PART 1 GENERAL

1.1 SUMMARY

1.1.1 The purpose of this section is to provide the Contractor with the minimum requirements for the transportation and disposal of contaminated materials.

1.1.2 The Contractor shall be responsible for obtaining all permits required for off-site transportation of waste in accordance with applicable Federal, State and local regulations.

1.1.3 At a minimum, the Contractor shall be required to furnish all labor, material, equipment, and incidentals necessary for on-site preparation and off-site transportation, treatment, and disposal of materials from the remediation and associated activities. Waste generated shall be treated and disposed of at approved Resource Conservation and Recovery Act (RCRA) Treatment, Storage, and Disposal Facilities (TSDFs), RCRA Subtitle C landfill(s), Subtitle D landfill(s), or a Construction and Demolition (C&D) landfill, depending on waste characteristics.

1.1.4 The Contractor shall prepare and maintain waste shipment records and manifests required by RCRA, U.S. Federal Department of Transportation (DOT), and State transportation department.

1.1.5 The Contractor shall be required to perform all sampling required for landfill acceptance of excavated slag, battery casings, soil, sediment, and debris. The Contractor shall also be required to provide all waste profile information to the landfill, per their requirements.

1.1.6 The Contractor shall ensure that all operations for loading and hauling of wastes comply with Federal and State DOT regulations, and all other applicable Federal, State, and local requirements.

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. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.

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

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 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 302	Designation, Reportable Quantities, and Notification
49 CFR 107	Hazardous Materials Program Procedures
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans
49 CFR 173	Shippers - General Requirements for Shipments and Packagings

NEW JERSEY ADMINISTRATIVE CODE (N.J.A.C.)

N.J.A.C. 7:26	Solid and Hazardous Waste Management Regulations
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UNITED STATES CODE (U.S.C.)

33 U.S.C. 2701 et seq.	Oil Pollution Act (OPA)
42 U.S.C. 6901 et seq.	Resource Conservation and Recovery Act
42 U.S.C. 9601 et seq.	Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
49 U.S.C. 1801 et seq.	Hazardous Materials Transportation Act (HMTA)

1.3 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals with an “FIO” designation are for information only. The Contractor shall submit the following to the EPA’s Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.

1.3.1 Waste Management and Transportation Plan; Pre-Construction Submittals; EA

The Contractor shall prepare and submit to the EPA’s Representative for approval at least 21 days prior to the Pre-Work Conference a Waste Management and Transportation Plan. Deficiencies in the Waste Management and Transportation Plan will be discussed at the Pre-Work Conference. The Contractor shall make all necessary amendments required by the EPA’s Representative and resubmit it for approval. This procedure shall continue until the EPA’s Representative gives final written approval. The Contractor shall make necessary effort so that only one resubmittal is required. The plan shall include, at a minimum, the following:

1.3.1.1 Procedures for contaminated material management on site and the management practices to be utilized.

1.3.1.2 Waste minimization methods.

1.3.1.3 Soil stockpile area and sediment containment area where contaminated material is to be handled.

1.3.1.4 Proposed landfill facilities for waste disposal, including alternate facilities in the event that the primary facility cannot accept the waste.

1.3.1.5 Names, certificates, permits, licenses, EPA identification (ID) numbers, locations, and telephone numbers for the proposed disposal facility/facilities and waste haulers.

1.3.1.6 RCRA waste classification and volume estimates for the waste types, if existing sample results are sufficient for landfill acceptance. Otherwise, the Contractor shall conduct waste characterization sampling to meet landfill acceptance requirements.

1.3.1.7 Letters of commitment from the proposed waste haulers and disposal facilities, certifying acceptance of the Raritan Bay Slag Superfund Site waste.

1.3.1.8 Methods and equipment to be used to ensure accurate weight measurements of waste material.

1.3.1.9 Waste manifesting procedures.

1.3.1.10 Locations and procedures for the on-site waste handling areas.

1.3.1.11 Types of transport vehicles to be used for each type of material.

1.3.1.12 Packaging and transporting requirements for each type of waste, including any special requirements of the disposal facility.

1.3.1.13 Proposed truck routes from the worksite to the disposal facility/facilities. The route(s) to and from the disposal facility shall be in accordance with the disposal facility/facilities requirements and all Federal, State and local regulations, laws, ordinances, and weight restrictions.

1.3.1.14 Methods to contain and clean up spills.

1.3.1.15 Procedures for incident response, including details of manpower and equipment available and the coordination necessary to mobilize forces in an emergency.

1.3.1.16 The Emergency Response Name and Telephone number that will be available on a 24/7 basis during the shipment period, and this information will be included in the Shipments Manifests as per the USDOT Regulations.

1.3.2 Notices of Non-Compliance and Notices of Violation; Product Data; EA

Notices of non-compliance or notices of violation issued 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 EPA’s Representative. The Contractor shall also furnish all relevant documents regarding the incident and any information requested by the EPA’s Representative, and shall coordinate its response to the notice with the EPA’s Representative prior to submission to the notifying authority. The Contractor shall also furnish a copy to the EPA’s Representative of all documents submitted to the regulatory authority, including the final reply to the notice, and all other materials, until the matter is resolved.

1.3.3 Contaminated Material Stockpile Reports; Product Data; EA

When contaminated materials are in interim storage, submit on a weekly basis, an inventory of the types, quantity, and locations of all contaminated materials in interim storage, and a record of the date, quantity, source and disposition of all contaminated materials placed into or taken out of interim storage. Report all test results from sampling of stored material.

1.3.4 Annual and Biennial Reports; Test Reports; EA

Information necessary to file State annual or EPA biennial reports for waste transported, treated, stored, or disposed of under this contract shall be submitted to the EPA’s Representative at the specified time and shall not be forwarded directly to the regulatory agency. The submittal shall contain all the information necessary for filing of the formal reports in the form and format required by the governing Federal, State and local regulatory agency. A cover letter shall accompany the data including the contract number, Contractor name and project locations.

1.3.5 Spill Response; Test Reports; EA

In the event of a spill or release of a pollutant, contaminant, hazardous substance (as designated in 40 CFR 302), or oil (as governed by 33 U.S.C. 2701 et seq.), the Contractor shall notify the EPA’s Representative immediately. If the spill exceeds a reporting threshold, the Contractor shall follow the pre-established procedures for immediate reporting to the EPA’s Representative.

1.3.6 Manifest Exception Reports; Test Reports; EA

In the event that a manifest copy documenting receipt of waste at the disposal facility is not received within 35 days of shipment initiation, the Contractor shall prepare and submit an exception report to the EPA’s Representative within 37 days of shipment initiation.

1.3.7 Certification; Certificates; EA

Copies of the current certificates of registration required by 49 CFR 107, Subpart G issued to the Contractor and/or Subcontractors or written statements certifying exemption from these requirements.

1.3.8 Transportation and Disposal Coordinator; Certificates; EA

Transportation and Disposal Coordinator qualifications including proof of at least one year specialized experience in management and transportation of hazardous wastes; proof of current Department of Transportation Hazardous Materials Training Certification.

1.3.9 Training; Certificates; EA

Documentation that employees preparing or transporting hazardous materials have been trained, tested, and certified per 49 CFR 172, Subpart H, including general security awareness requirements and, where applicable, site-specific security plan requirements.

1.3.10 EPA Off-Site Policy; Certificates; EA

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 300.440. This certification shall be provided for wastes from sites governed by 42 U.S.C. 6901 et seq. or 42 U.S.C. 9601 et seq. A sample Off-Site Policy certification memo is provided in Attachment A.

1.3.11 Transport Certification; Certificates; FIO

The Contractor shall submit certification that all operators and vehicles used to transport contaminated material meet all existing Federal, State and local regulations for vehicle operations.

1.3.12 Certificates of Disposal; Certificates; EA

Certificates documenting the ultimate disposal of CERCLA remediation wastes are required within 180 days of initial shipment. Receipt of these certificates will be required for final payment.

1.3.13 Shipping Documents; Certificates; EA

Submit all transportation-related shipping documents to the EPA’s Representative for review including draft waste manifests, draft bills of lading, lists of corresponding proposed labels, packages, marks, and placards to be used for shipment, waste profiles, supporting waste analysis documents, for review a minimum of 14 calendar days prior to the anticipated shipping date. Packaging assurances shall be furnished prior to transporting the material, “generator copies” of hazardous waste manifests, bill of landings, and supporting waste analysis documents shall be furnished when shipments are originated. “Receipt copies” of waste manifests at the designated disposal facility shall be furnished no later than 35 days after acceptance of the shipment.

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; completion of waste profiles, hazardous waste manifests, bill of ladings, 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 and have been DOT-certified under 49 CFR 172, Subpart H.

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, including samples, shall be trained, tested, and certified in accordance with 49 CFR 172, Subpart H, including security awareness and any applicable security plans. Contractor employees making determinations that shipments do not constitute DOT regulated hazardous materials shall also be trained, tested, and certified in accordance with 49 CFR 172, Subpart H.

1.5 LAWS AND REGULATORY REQUIREMENTS

1.5.1 Work shall meet or exceed the minimum applicable requirements established by

Federal, State, and local laws and regulations. These requirements are amended frequently and the Contractor shall be responsible for complying with amendments as they become effective. In the event that compliance exceeds the scope of work or conflicts with specific requirements of the contract, the Contractor shall notify the EPA’s Representative immediately. At a minimum the requirements stipulated in the regulations referenced in Paragraph 1.2 – REFERENCES shall be met.

1.5.2 The Contractor shall comply with the Land Disposal Restrictions (LDR) 40 CFR 268 when treating and disposing of hazardous wastes.

1.5.3 The Contractor shall comply with 40 CFR 268.49, Alternative LDR Treatment Standards for Contaminated Soil, when treating and disposing contaminated soil.

1.6 DEFINITIONS

1.6.1 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 49 U.S.C. 1801 et seq. The term includes materials designated as hazardous materials under the provisions of 49 CFR 172.101 and 49 CFR 172.102, and materials that meet the defining criteria for hazard classes and divisions in 49 CFR 173. EPA-designated hazardous wastes are also hazardous materials.

1.6.2 Hazardous Waste

A waste that meets criteria established in RCRA or specified by the EPA in 40 CFR 261, or that has been designated as hazardous by a RCRA-authorized state program.

1.6.3 Non-Hazardous Waste

Any waste that does not meet the criteria of hazardous waste.

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 and non-hazardous wastes 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 Spill Response Materials

The Contractor shall provide spill response materials including, but not limited to, containers, adsorbent, shovels, and personal protective equipment. Spill response materials shall be available at all times during which wastes are being handled or transported. Spill response

materials shall be compatible with the type of material being handled.

2.2 CONTAINERS

2.2.1 Shipping Containers

Impermeable containers shall be suitable to receive and retain contaminated materials until they are disposed of at an approved facility. The containers shall meet the standards of a “Strong, Tight Container” and conform to DOT Standard 49 CFR 173.24. Containers in a shipment must be loaded and braced securely to prevent shifting and damage during transport. Cover systems shall meet the criteria for a closed transport vehicle as specified in 49 CFR 173.403.

2.3 EQUIPMENT AND TOOLS

The Contractor shall provide miscellaneous equipment and tools necessary to handle wastes in a safe and environmentally sound manner. The Contractor shall provide equipment that is appropriate to accomplish this type of work and shall maintain and use of it in strict compliance with Occupational Safety and Health Administration (OSHA) requirements. The Contractor shall take all necessary precautions for safe operation of the equipment and the protection of the public from injury and damage from such equipment.

2.4 FACILITIES

The Contractor shall provide, install, and maintain any temporary loading facilities as required for the material handling operations as show on the Contract Drawings.

2.5 LABELING

The Contractor shall provide primary and subsidiary labels for materials/wastes consistent with the Federal, State and local 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.

2.6 PLACARDS

For each off-site shipment of materials/wastes, the Contractor shall provide primary and subsidiary placards as required by Federal, State and local regulations. Placards shall be provided for each side and each end of bulk packaging, freight containers, and transport vehicles requiring such placarding. Placards may be plastic, metal, or other material capable of withstanding, without deterioration, a 30 day exposure to open weather conditions.

2.7 TARPAULINS

Waterproof tarpaulins (tarps) shall be nylon vinyl-coated on both sides with a tearing strength of 70 lbs conforming to ASTM D 1117, or equal. All edges shall be hemmed, with reinforced grommets on maximum 4 feet on centers.

PART 3 EXECUTION

3.1 GENERAL

3.1.1 The Contractor shall ensure that all transport vehicles containing waste are covered with tarps before leaving the Site.

3.1.2 The Contractor shall coordinate the schedule for vehicle arrival and material deliveries at the construction site to meet the approved project schedule. The schedule shall be compatible with the availability of equipment and personnel for material handling operations. No claims shall be made by the Contractor for additional compensation due to a delay in the schedule related to vehicle arrival or material availability.

3.1.3 The Contractor shall organize and maintain the material shipment records required by the Federal and the State of New Jersey regulations.

3.1.4 The Contractor is responsible for obtaining and filling out waste profile sheets required by the disposal facility. The quantity of sheets per contained waste shall be in accordance with Federal, State or local regulations. The Contractor shall submit each profile sheet to the EPA’s Representative.

3.1.5 The Contractor shall notify the EPA’s Representative immediately upon learning that a job related accident has occurred. Notification of the accident shall include location of the accident, resultant damage or injury, person(s) involved, probable cause, amount of waste spilled, and any other pertinent information concerning the accident.

3.1.6 Accident cleanup operations shall be performed as directed by the EPA’s Representative at the expense of the Contractor. Cleanup shall be performed immediately.

3.1.7 The Contractor shall provide transportation of the waste directly to the disposal facility/facilities.

3.1.8 The Contractor shall provide all sampling and analytical services necessary for disposal in accordance with disposal facility requirements, and all applicable Federal, State, and local regulations, and as specified in SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.

3.2 CHARACTERIZATION AND SEGREGATION OF WASTE MATERIALS

3.2.1 The Contractor shall excavate contaminated material, direct load and/or stockpile material, and collect waste disposal samples per disposal facility requirements and in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.

3.2.2 The Contractor shall utilize the existing data found in Appendix A to the maximum extent possible for landfill acceptance. The Contractor shall perform additional waste characterization sampling and testing required by the landfill for acceptance.

3.2.3 The Contractor shall be responsible for segregating all wastes generated as a result of construction and remedial activities. Excavated materials shall be segregated as described in SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.

3.2.4 Temporary stockpiles of both non-hazardous and hazardous materials shall be covered with plastic sheeting or equivalent material to protect waste from adverse weather conditions and to prevent dust emissions. Erosion and sedimentation controls shall be installed around all stockpiles.

3.3 NON-HAZARDOUS WASTE MANAGEMENT

3.3.1 Non-hazardous waste from the Raritan Bay Slag Superfund Site shall be disposed of off-site in an approved landfill in accordance with the approved Waste Management and Transportation Plan and N.J.A.C. 7:26.

3.3.2 Contaminated sediment, soil, water treatment residuals, and construction debris (if encountered) that passes Toxicity Characteristic Leaching Procedure (TCLP) testing shall be considered non-hazardous and disposed of at an approved Subtitle D landfill.

3.3.3 Non-hazardous wastes above cleanup criteria shall not be used as backfill. The following non-hazardous wastes are expected from the Raritan Bay Slag Site:

- Dewatered sediment that passes TCLP testing
- Excavated soil that passes TCLP testing
- Vegetative debris from clearing activities
- Water treatment residuals that pass TCLP testing
- Construction debris, if encountered

3.4 HAZARDOUS WASTE MANAGEMENT

The Contractor shall be responsible for ensuring compliance with all Federal, State, and local hazardous waste laws and regulations and shall verify those requirements when preparing reports, waste shipment records, hazardous waste manifests, or other documents.

3.4.1 Hazardous Waste Classification

3.4.1.1 The Contractor shall be required to perform any and all sampling required for landfill acceptance of excavated soil, dewatered sediments, slag, battery casings, water treatment residuals, and debris. The Contractor shall also be required to provide all waste profile information to the landfill, per their requirements. Sampling and field screening methods shall be in accordance with disposal facility requirements and applicable Federal, State and local regulations. The Contractor shall complete the waste profile information and submit it to the EPA’s Representative for approval prior to sending it to the disposal facility.

3.4.1.2 The Contractor, in consultation with the EPA’s Representative, shall identify all hazardous waste codes applicable to each hazardous waste stream based on requirements set forth in this section, 40 CFR 261, and applicable state and local laws or regulations. The

Contractor shall also identify all applicable treatment standards in 40 CFR 268 and state LDRs 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 the EPA’s Representative for review and approval.

3.4.1.3 Solid waste material other than slag, battery casings, soil, and sediment, including vegetative debris and other debris encountered in excavations areas, shall be stockpiled, covered, and disposed of with non-hazardous soil and sediment.

3.4.1.4 The EPA is the owner and generator of the hazardous wastes for the Raritan Bay Slag Superfund Site. Based on the available historical information and investigation results, the following hazardous wastes are expected from the remedial activities from the Raritan Bay Slag Site:

- RCRA, No Treatment: Soils/sediment/water treatment residuals with lead concentrations greater than or equal to TCLP criteria and less than 10 times Universal Treatment Standard (UTS) criteria
- RCRA, Treatment: Slag, battery casing, and soils/sediments with lead concentrations greater than or equal to TCLP criteria and at least 10 times UTS criteria

3.4.2 Stockpiles

3.4.2.1 The Contractor shall attempt to load hazardous soil directly from the excavation to the extent possible or otherwise as specified in SECTION 02111 - EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. If it appears, during excavation, that the material is becoming mixed, and it is not possible to segregate the waste, then stockpiling of soil may be necessary to minimize the amount of RCRA waste requiring treatment. Also, stockpiling may be required if it is necessary to provide for drainage of excess liquid from soil prior to shipment. Solid waste material shall be stockpiled and covered or loaded into roll-off containers using a loading system approved by the EPA’s Representative. Sediment dewatering and stockpiling will be performed irrespective of soil stockpiling within the sediment containment area.

3.4.2.2 Stockpiles shall be constructed to isolate stored contaminated material from the environment. If multiple stockpiles are required, each unit shall be clearly labeled with an identification number.

3.4.2.3 The combined volume of all stockpiles shall be a size that is manageable and not create excess odors.

3.4.2.4 Stockpiles of excessive size shall be subject to approval of the EPA’s Representative.

3.4.2.5 The stockpiles shall be constructed in accordance with SECTION 02100 - PRE-EXCAVATION SAMPLING AND SITE PREPARATION and shall meet the regulation defined in 40 CFR 264.250.

3.4.2.6 Creation and maintenance of stockpiles shall not interfere with the excavation, dewatering, and other on-site activities.

3.4.3 Liquid Storage

Liquid collected from excavations and stockpiles shall be contained and piped to the on-site water treatment system for treatment prior to discharge to the Middlesex County Utilities Authority sewer system or to surface water.

3.4.4 Sampling of Stored Material

Samples of contaminated material shall be collected at a frequency consistent with the requirements of the off-site disposal facility. The contractor shall analyze the stored material for disposal purposes. Analytical levels for material to be shipped to the off-site disposal facility shall conform to Federal, State and local criteria as well as to the requirements of the off-site disposal facility. Documentation of all analyses performed shall be furnished to the EPA’s Representative.

3.4.5 Waste Management and Transportation Plan

The Contractor shall prepare a plan detailing the manner in which hazardous wastes will be managed and describing the types and volumes of hazardous wastes anticipated to be managed as well as the management practices to be utilized. The plan shall identify the method to be used to ensure accurate piece counts and/or weights of shipments; shall identify waste minimization methods; shall propose facilities to be utilized for treatment, storage, and/or disposal; shall identify areas on site where hazardous wastes are to be handled; shall identify whether transfer facilities are to be utilized; and if so, how the wastes will be tracked to ultimate disposal.

3.4.6 Disposal Facility and Transporter

The Contractor shall provide the EPA’s Representative with EPA ID numbers, names, locations, and telephone numbers of disposal facilities and transporters. This information shall be contained in the Waste Management and Transportation Plan and shall be approved by the EPA’s Representative prior to waste disposal.

3.4.7 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 a state authorized by the Environmental Protection Agency to administer the RCRA permit program. Additionally, prior to using a TSDF, the Contractor shall contact the EPA Regional Office specified in 40 CFR 300.440 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 EPA’s Representative.

3.4.8 Shipping Documents and Packaging Certification

The Contractor shall be responsible for obtaining all permits and shipping documents to ship contaminated soil off site.

Prior to shipment of any hazardous material off site, the Contractor's TDC shall provide written certification to the EPA’s Representative that hazardous materials have been properly packaged, labeled, and marked in accordance with Department of Transportation and EPA requirements. The Contractor's TDC shall also provide written certification regarding waste minimization efforts documenting that efforts have been taken to reduce the volume and toxicity of waste to the degree economically practicable and that the method of treatment, storage, or disposal selected minimizes threats to human health and the environment.

3.4.9 Vehicle Inspection

3.4.9.1 Vehicles may be inspected by the EPA’s Representative at the Site prior to loading to ensure that the vehicles have no fluids leaks, no unusually noisy mufflers or tailpipes, tires that are in good condition, and operational brakes, horn, steering, operating controls, and safety devices. Vehicles shall be free of excess dirt, debris, oil, grease, and excessive rust. Vehicle beds used for hauling shall be free from drain holes, cracks, or other conditions that might permit waste material or contaminated water to leak from the vehicle beds. If the vehicle used for hauling has tailgates for dumping, the Contractor shall demonstrate to the EPA’s Representative that the tailgates can be sealed watertight during operation. Any vehicle bed not providing an adequate leakproof seal shall be repaired or replaced as required. Tarpaulin covers shall be placed over all vehicle beds during waste transport to the disposal facility. Covers shall be placed over trucks, trailers or other conveyances used for bulk shipment to avoid spillage of the waste material and entrance of rain or snow during transport. The covers shall completely enclose the bulk shipment with no open areas along the sides or openings on the top. Cover systems shall meet the criteria for a closed transport vehicle as specified in 49 CFR 173.403. Failure of the shipping container, liner, seals, hatches, doors, or tarpaulin system to meet the above requirements which causes material to be rejected by disposal facility shall be addressed at the Contractor's expense.

3.4.9.2 The Contractor shall coordinate recording quantities of waste leaving the Site with the EPA’s Representative.

3.4.9.3 Vehicles/containers, either empty or loaded, shall not remain at the Site, unless specific arrangements are made otherwise. Immediately after loading, they shall be sealed, weighed and transported directly to the disposal facility.

3.4.9.4 The Contractor shall provide clean containers/hauling vehicles for loading during normal work hours.

3.4.9.5 Each vehicle/container shall be monitored for external contamination by the Contractor prior to leaving the worksite. The Contractor shall perform and document decontamination procedures prior to leaving the worksite and again before leaving the disposal site.

3.4.10 Transportation

3.4.10.1 The Contractor shall meet all existing Federal, State, and local regulations for vehicle operations in transporting the waste on public roads and highways. All construction vehicles shall be decontaminated prior to leaving the Site using the temporary decontamination facility. All haul and access roads shall be maintained in a clean condition so that no dirt or contamination is tracked onto clean areas or public roads and highways.

3.4.10.2 Manifests requiring shipper’s certification number shall be signed by the EPA’s Representative. Copies of all manifests and waste profiles shall be submitted to the EPA’s Representative within five days following shipment, and within five days after notification of receipt at the permitted disposal facility. Any manifest discrepancies shall be reported immediately to the EPA’s Representative and resolved by the Contractor. A detail report documenting the final disposal of all materials removed from the Site shall be submitted to the EPA’s Representative.

3.4.10.3 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 EPA’s Representative for review and approval.

3.4.10.4 The Contractor shall prepare a bill of lading for each shipment of hazardous waste which fulfills the shipping paper requirements. The bill of lading shall satisfy the requirements of 49 CFR 172, Subpart C, and any applicable state or local law or regulation, and shall be submitted to the EPA’s Representative for review and approval. Bill of ladings requiring shipper’s certifications shall be signed by the Contractor.

3.4.10.5 The Contractor shall be responsible for any and all actions necessary to remedy situations involving material spilled or leaked in transit on or off site, or mud and dust tracked off site. This cleanup shall be accomplished at the Contractor's expense.

3.4.10.6 Transportation routes to and from project areas shall be in accordance with the approved Waste Management and Transportation Plan. No deviation from transportation routes shall be allowed without prior written approval from the EPA’s Representative.

3.4.10.7 The Contractor shall be responsible for all repair costs for damages to structures, roads, bridges and any other features affected by the Contractor’s off-site transportation and disposal operations.

3.4.11 Treatment and Disposal of Hazardous Wastes

3.4.11.1 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 propose the TSDFs via submission of the Waste Management and Transportation Plan, subject to the approval of the EPA’s Representative.

3.4.11.2 RCRA Subtitle C permitted facilities shall meet the requirements of 40 CFR 264 or

facilities operating under interim status which meet the requirements of 40 CFR 265. All TSDFs must be accepted by the EPA. Off-site treatment, storage, and/or disposal facilities with significant RCRA violations or compliance problems (such as facilities known to be releasing hazardous constituents into groundwater, surface water, soil or air) shall not be used.

3.4.11.3 The Contractor shall not deliver waste to any facility other than those listed on the shipping manifest.

3.4.11.4 In the event that an identified and approved facility ceases to accept the stated materials or ceases operations, it is the Contractor’s responsibility to locate an alternate facility and make the necessary arrangements to utilize the alternate facility. The alternate facility must be approved in writing by EPA in the same manner and with the same requirements as the original facility.

3.4.11.5 The Contractor shall ensure wastes are treated to meet land disposal requirement standards in 40 CFR 268 prior to land disposal. Selected treatment facilities for treatment of slag/battery casings or contaminated soil shall be responsible for the ultimate disposal of the treated wastes or soil. Under no condition shall the treated wastes or soil be returned to the Site to be used as fill material.

3.5 HAZARDOUS MATERIALS MANAGEMENT

The Contractor, in consultation with the EPA’s Representative, 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, etc., as described below.

3.5.1 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 EPA’s Representative in the form of draft shipping documents for review and approval.

3.5.2 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: The US Environmental Protection Agency
Manifest Document Number _____".

3.6 SHIPPING DOCUMENTS

The Contractor shall ensure that each shipment of waste sent off site is accompanied by properly completed shipping documents as specified in Paragraph 3.4.8. This includes shipments of samples that may potentially meet the definition of a Department of Transportation regulated hazardous material. Documents shall be submitted to the EPA’s Representative for review and approval.

3.7 EPA ID NUMBERS

EPA Region II will provide waste generator identification number for use on the manifest.

3.8 RECORDKEEPING

The Contractor shall organize and maintain the material shipment records/manifests required by 42 U.S.C. 6901 et seq., the State of New Jersey, and the state in which the disposal facility is located.

3.9 SPILL RESPONSE

The Contractor shall respond to any spills of hazardous material or hazardous waste which are in the custody or care of the Contractor, pursuant to this contract. Any direction from the EPA’s Representative 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, or local laws or regulations regarding any spill incident.

3.10 EMERGENCY CONTACTS

The Contractor shall be responsible for complying with the emergency contact provisions in 49 CFR 172.604. Whenever the Contractor ships hazardous materials, the Contractor shall provide a 24-hour, 7-day a week monitoring telephone service emergency response contact. The person must be 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 are placed on all hazardous material shipping documents. The Contractor shall designate an emergency coordinator and post the following information at areas in which hazardous wastes are managed:

- Emergency coordinator’s name
- Emergency coordinator’s phone number
- Local fire department phone number
- Fire extinguishers and spill control materials location

Attachment A

SAMPLE OFF-SITE POLICY CERTIFICATION MEMO

Project/Contract #: _____
Waste Stream: _____
Primary TSDF, EPA ID # and Location: _____
Alter. TSDF, EPA ID # and Location: _____

EPA Region Contact

I	(617) 918-1752
II	(212) 637-4130
III	(214) 814-5267
IV	(404) 562-8591
V	(312) 353-8207
VI	(214) 665-2282
VII	(913) 551-7154
VIII	(303) 312-6419
IX	(415) 972-3304
X	(206) 553-2859

EPA representative contacted: _____
EPA representative phone number: _____
Date contacted: _____
Comment: _____

The above EPA representative was contacted on _____. As of that date, the above site was considered acceptable in accordance with the Off-Site Policy in 40 CFR 300.440.

Signature: _____ Date: _____

Phone number: _____

END OF SECTION

SECTION 02140

DEWATERING AND DRAINAGE

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 The Contractor is responsible for permitting, management, testing and disposal of all water from dewatering operations and stormwater encountered at the Site.

1.1.2 Design, furnish, install, operate, monitor, maintain and remove a temporary dewatering system as required to lower and control water levels during excavation, backfill, and sampling. The dewatering system shall ensure safe and dewatered subsurface conditions for all areas in which work of this Contract shall be performed.

1.1.3 The Contractor shall perform dewatering in accordance with the Contractor’s approved Dewatering and Drainage Plan as described in Paragraph 1.4.1 herein.

1.1.4 Design, furnish, install, monitor, maintain and remove a temporary cofferdam system to prevent wetland water from entering the excavations.

1.1.5 Furnish, maintain and remove temporary surface water control measures adequate to drain and remove surface water entering excavations.

1.1.6 Retain the services of a Professional Engineer registered in the State of New Jersey to prepare dewatering, temporary cofferdam, and drainage system designs and submittals described herein.

1.1.7 The Contractor is solely responsible for the means, methods and cost associated with the collection, storage, testing, and disposal of all dewatered water and stormwater.

1.1.8 Repair damage caused by dewatering and drainage system operations.

1.2 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.

NEW JERSEY STATE SOIL CONSERVATION COMMITTEE (SSCC)

SSCC

Standards for Soil Erosion and Sediment Control

OLD BRIDGE MUNICIPAL UTILITIES AUTHORITY (OBMUA)

OBMUA Rules and Regulations for the Old Bridge Municipal Utilities Authority, Sewer Division, September 2006

MIDDLESEX COUNTY UTILITIES AUTHORITY (MCUA)

MCUA Rules and Regulations of the Middlesex County Municipal Utilities Authority, Wastewater Division, November 2010

1.3 DESIGN AND PERFORMANCE RESPONSIBILITY

1.3.1 The Contractor is responsible for design and execution of methods for controlling surface water and groundwater.

1.3.2 The Contractor is responsible for damage to properties, sewers and other utility installations, pavements and work that may result from dewatering or surface water control operations.

1.3.3 Any design review and field monitoring activities performed by the EPA’s Representative shall not relieve the Contractor of Contractor’s responsibilities for the work.

1.4 SUBMITTALS

The Contractor shall submit the following to the EPA’s Representative in accordance with SECTION 01330 - SUBMITTAL PROCEDURES:

1.4.1 Dewatering and Drainage Plan; Pre-Construction Submittals; EA

The Contractor shall submit shop drawings, design calculations for the Contractor-designed cofferdam system to the EPA’s Representative. The Dewatering and Drainage Plan shall include the Contractor’s proposed means and methods for the containment, collection, storage, testing, and ultimate discharge or disposal of all water from dewatering operations and stormwater. The plan shall identify the anticipated area influenced by the dewatering system. Include any dewatering system design calculations, shop drawings, and technical literature in the plan. The Dewatering Plan shall be signed and sealed by a licensed Professional Engineer registered in the State of New Jersey. The Contractor remains responsible for the adequacy and safety of construction means, methods and techniques.

1.4.2 Cofferdam Design; Shop Drawings; EA

The Contractor shall also submit shop drawings, design calculations for the Contractor-designed cofferdam system to the EPA’s Representative for review and approval at least 30 days prior to field mobilization for on-site construction. Submittals shall indicate the following, at a minimum: plan layout of the system, show the method and sequence of installation and removal of the cofferdam system; and proved details, arrangement, and equipment requirements. Include the design calculations including loads on the cofferdam supports.

1.4.3 Analytical Results; Test Reports; FIO

The Contractor shall provide the discharge water sampling results. The analysis and reporting shall meet the requirements of SECTION 01450 - CHEMICAL DATA QUALITY CONTROL.

1.5 REGULATORY REQUIREMENTS

1.5.1 The Contractor shall obtain, pay for all other permits and comply with conditions and terms of the applicable permits unless directed otherwise by the EPA’s Representative. Original permits shall be prominently displayed on the Site prior to constructing dewatering and drainage systems.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

3.1.1 The Contractor shall control surface water and water generated from excavated sediments such that water is contained on site and within the work limits established in the project documents.

3.1.2 The Contractor shall install piping to convey water to the point of discharge in accordance with the manufacturer's recommendations. If the conveyance piping is installed above ground, or above the frost line below ground, the Contractor shall take measures to prevent the pipes from freezing.

3.2 SURFACE WATER CONTROL

3.2.1 The Contractor shall construct surface water control measures, including dikes, ditches, sumps and other methods to prevent, as necessary, flow of surface water in the temporary staging and drying areas and excavation areas in accordance with SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT and maintain these measures as necessary during construction.

3.3 DEWATERING

3.3.1 Methods of groundwater control may include but are not limited to perimeter trenches and sump pumping, perimeter groundwater cutoff, well points, ejectors, deep wells and combinations thereof.

3.3.2 Water entering the work areas from precipitation or surface runoff shall be collected in shallow ditches around the perimeter of the work limits, and drained to sump. Water that comes into contact with contaminated soil or sediment shall be collected and disposed of as described herein.

3.3.3 Sediment removed from wetlands area shall be dewatered by gravity drainage within the sediment containment area shown in the Contract Drawings.

3.3.4 All water collected from the dewatering activities shall be treated on site and discharged to the MCUA publicly owned treatment works (POTW) or to surface water. The MCUA POTW is identified as the primary discharge location.

3.3.5 The Contractor shall be responsible for submitting to MCUA the application for Temporary Discharge Approval. The Contractor shall also be responsible for contacting MCUA to confirm water sampling requirements for the application and performing all sampling required. In addition, the Contractor is responsible for obtaining approval from OBMUA for conveyance of water through sewer pipes owned by OBMUA during transport to the POTW. The Contractor shall comply will all requirements of the MCUA and OBMUA Rules and Regulations during application and discharge.

3.3.6 EPA will be responsible for obtaining a New Jersey Pollution Discharge Elimination System (NJPDDES) Discharge to Surface Water (DSW) permit equivalent. Obtaining all other construction permits shall be the sole responsibility of the Contractor unless noted elsewhere within the Contract Documents.

3.3.7 The discharge of water collected during dewatering activities will be permitted only if it meets the discharge criteria specified by the applicable permit after sampling as specified herein and in SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.

3.3.8 Should the Contractor be required to shut down the dewatering for a violation of a discharge, it will not in any case constitute a right to a delay claim or associated change order.

3.4 ANALYTICAL SAMPLING

3.4.1 Discharge Water Sampling

3.4.1.1 The Contractor shall collect discharge water samples from dewatering and drainage operations prior to discharge to the MCUA POTW or to surface water. Prior to discharge, the Contractor shall collect discharge water samples in accordance with MCUA Temporary Discharge Approval.

3.4.1.2 All required sampling and chemical analysis shall be conducted in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.

3.4.1.3 If sample results indicate water exceeds the permit requirement for any compounds, discharge shall not be performed, water shall be containerized, and pretreatment shall be modified in order to ensure compliance of all containerized and generated water during discharge.

3.5 TEMPORARY COFFERDAMS

3.5.1 The Contractor shall construct temporary cofferdams to prevent, as necessary, flow of surface water from wetlands into excavations. The temporary cofferdams shall be installed no more than 10 feet outside the secondary excavation extents as shown on Contract Drawings.

3.5.2 Temporary cofferdams shall be Portadam™ or approved equal.

3.5.3 The Contractor shall work on one excavation area at a time where a temporary cofferdam is required. The Contractor shall remove the temporary cofferdam and re-use to the extent possible for the subsequent excavation area requiring temporary cofferdam.

3.5.4 Temporary cofferdams shall be installed in accordance with the New Jersey SSCC Standards for Soil Erosion and Sediment Control.

END OF SECTION

P.E. CERTIFICATION FORM

The undersigned hereby certifies that he/she is a Professional Engineer registered in the State of New Jersey and that he/she has been employed by

(Company Name)

to design dewatering and drainage systems and cofferdam systems in accordance with Specification Section 02140 for the Raritan Bay Slag Superfund Site located in Old Bridge Township, New Jersey.

The undersigned further certifies that he/she has performed the said design in conformance with all applicable local, state and federal codes, rules and regulations; and, that his/her signature and P.E. stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the EPA’s Representative within seven days following written request by the EPA’s Representative.

P.E. Name

Company Name

Signature

Date

P.E. Registration Number

Title

Address

Address

SECTION 02201

BACKFILL, COMPACTION, AND GRADING

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 The purpose of this section is to provide the Contractor with the minimum requirements and constraints for backfill and compaction of earthen material in the excavated areas, and site-wide grading as defined in this section.

1.1.2 The Contractor shall furnish all labor, materials, equipment and incidentals necessary to perform all backfilling, compaction, and grading cover presented on the Contract Drawings and specified herein.

1.1.3 All earthen materials used for backfill and final grading shall be suitable for use as backfill, as specified in this section. In addition, all backfill shall be analyzed by an off-site laboratory and certified clean in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.

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. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 421	Standard Practice for Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants
ASTM D 422	Standard Test Method for Particle-Size Analysis of Soils
ASTM D 1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³ (2,700 kN-m/m ³))
ASTM D 2487	Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

1.3.1 Samples of Proposed Fill and Topsoil; Samples; EA

The Contractor shall submit samples of earthen materials weighing approximately 50 pounds. The Contractor shall not use these materials as part of the contract work until receiving written authorization from the EPA’s Representative.

1.3.2 Laboratory and Field Test Results; Test Reports; EA

The Contractor shall submit the results of all laboratory and field testing, as specified in Paragraph 3.5, SOIL TESTING, within 24 hours of receipt. These shall include the results of all chemical testing, sieve analyses performed, in-place density testing, moisture-density testing, shear strength and bearing capacity testing, and all other testing performed of backfill materials and compaction requirements.

1.3.3 Backfill Materials Sources and Certification; Certificates; EA

The Contractor shall submit the proposed source for all backfill materials including common fill, structural fill, rip rap, dense graded aggregate, and top soil. The Contractor shall include certificates of compliance attesting that materials meet the specified requirements for particle size, pH, organic matter content, textural class, soluble salts, chemical, and mechanical analyses.

1.3.4 Laboratory Certification Credentials; Certificates; EA

The Contractor shall submit licenses or certifications of qualifications of the commercial testing laboratory and/or associated personnel for the Contractor’s testing facilities, for the performance of field and laboratory testing.

1.4 DEFINITIONS

1.4.1 Satisfactory materials

1.4.1.1 Satisfactory materials for common fill shall comprise any uncontaminated off-site materials classified by ASTM D 2487 as GW, SW, GC, GM, SC, or SM.

1.4.1.2 The testing requirements for classifying materials shall be in accordance with the standards of ASTM D 422. Material shall be free of organic material, frozen material, rubbish, or other unsuitable materials. Satisfactory materials shall meet the criteria outlined in Paragraph 1.5, CERTIFICATION OF MATERIALS, and shall meet the requirements of PART 2 – PRODUCTS of this specification.

1.4.1.3 Structural backfill

Any fill to be used beneath the access road shall be considered structural backfill.

1.4.1.4 Common fill

Fill used for upland grading and restoration, as base fill in the wetlands, and other areas specified as common fill in the Contract Drawings, as well as anywhere else not otherwise specified shall be considered common fill.

1.4.2 Unsatisfactory Materials

Unsatisfactory materials shall comprise any materials not meeting the standards of Paragraph 1.4.1 SATISFACTORY MATERIALS. This shall include any contaminated materials/soils, trash/refuse, materials containing frozen or excessive organic matter, or materials classified by ASTM D 2487 as PT, OH and OL.

1.5 CERTIFICATION OF MATERIALS

1.5.1 All materials used as fill, including structural fill, common fill, standard topsoil, and organic-rich loam topsoil shall be tested to ensure they are free from chemical and radiological contamination as defined in NJAC 7:26D, Table 1A – Residential Direct Contact Health Based Criteria and Soil Remediation Standards, and as specified in SECTION 01450 - CHEMICAL DATA QUALITY CONTROL. Results shall be certified in writing. The EPA’s Representative will accompany the Contractor to visit all backfill sources. A minimum of one chemical test shall be performed per 5,000 cubic yards (CY) of material and no less than one test per borrow area. Additional tests shall be performed at a frequency of one sample per 5,000 CY of material or as requested by the EPA’s Representative.

1.5.2 Analytical parameters to verify that fill materials are free of chemical contamination are included in SECTION 01450 - CHEMICAL DATA QUALITY CONTROL.

1.6 DELIVERY, STORAGE AND HANDLING

If granular fill materials are delivered to the Site prior to placement approval, materials shall be stockpiled on site as directed by the EPA’s Representative. Provisions shall be implemented to minimize surface water impact on the stockpile. Removal and placement of granular fill material shall be done in a manner to minimize intrusion of soils adjacent to and beneath the stockpile.

PART 2 PRODUCTS

2.1 COMMON BACKFILL

Off-site common fill shall meet the requirements of Paragraph 1.4.1 – SATISFACTORY MATERIALS, and shall meet the following gradation requirements:

<u>U.S. Sieve Size</u>	<u>Percent Passing</u>
2-inch	100
1-inch	85 – 100
3/8-inch	70 – 100
No. 10	50 – 100
No. 30	30 – 100
No. 60	15 – 65
No. 200	0 – 5

2.2 STRUCTURAL BACKFILL

Structural fill shall meet the requirements of Paragraph 1.4.1 – SATISFACTORY MATERIALS, and shall be well graded within the following limits:

<u>U.S. Sieve Size</u>	<u>Percent Finer by Weight</u>
2-in	100
No. 4	20-70
No. 40	5-40
No. 200	0-20

2.3 DENSE GRADED AGGREGATE

Dense Graded Aggregate (DGA) to be used for the access road restoration shall be as specified in SECTION 02100 – PRE-EXCAVATION SAMPLING AND SITE PREPARATION.

2.4 RIP RAP

Rip rap shall be used to protect the 24-inch drainage pipe inlet as shown on the Contract Drawing as part of site restoration. The Contractor shall be responsible for the design of rip rap to prevent scouring, erosion or sloughing of the drainage pipe. Rounded stones, boulders, sandstone, or similar soft stone will not be acceptable. Stone shall be free from overburden, spoil, shale and organic material.

2.5 TOPSOIL

2.5.1 Upland Area Topsoil

Topsoil shall meet the requirements of NJDOTSS 909.10 and ASTM D 5268. Topsoil material shall not contain slag, cinders, stones, lumps, roots, plant parts, trash, or similar objects larger than 1.5-inch in any dimension and shall have not less than a 5.8 pH value. Topsoil material

shall have a minimum organic content of 2.75 percent by weight. Topsoil shall be tested for determining the particle size, pH, organic matter content, textural class, chemical analysis, soluble salts analysis, nutrient analysis, and mechanical analysis. Certificates of compliance for the above parameters shall be provided from the source facility and submitted to the EPA’s Representative. If certificates are not available for any parameter, the Contractor shall be responsible for providing soil testing by an off-site laboratory to determine the material in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL. The soil shall be free from debris, noxious weeds, toxic substances, or other materials harmful to plant growth. Soil testing shall determine the quantities and types of soil amendments required to meet the local growing conditions of the seed species identified in SECTION 02921 – UPLAND SEEDING.

2.5.2 Wetland Area Topsoil

For wetland areas, topsoil shall be as specified in SECTION 02955 – FRESHWATER WETLAND RESTORATION and SECTION 02957 – BRACKISH MARSH RESTORATION.

2.6 WOVEN GEOTEXTILE FILTER FABRIC

The geotextile fabric shall be a woven fabric made of 100% polypropylene slit film yards and shall be suitable for stabilization and separation applications, containing the properties listed in Table 02201-1.

**Table 02201-1
 Woven Geotextile Fabric Properties**

<i>Fabric Property</i>	<i>Test Method</i>	<i>Minimal Physical Properties</i>
Tensile Strength	ASTM D 4632	315 lbs
Elongation at Break	ASTM D 4632	15%
CBR Puncture	ASTM D 6241	1,000 lbs
UV Resistant at 500 hours	ASTM D 4355	70%
Apparent Opening Size	ASTM D 4751	Between Sieve Size 30 and 40

Geotextile fabric for silt fences shall meet the requirements of SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT.

PART 3 EXECUTION

3.1 GENERAL

3.1.1 All backfill material brought on site shall be clean, in accordance with Paragraph 1.5 – CERTIFICATION OF MATERIALS. Written certification attesting to this shall be submitted to the EPA’s Representative.

3.1.2 The Contractor shall coordinate the delivery of backfill materials with the performance of backfilling work to minimize the quantities of materials requiring on-site stockpiling. In cases where stockpiling of backfill material on site is unavoidable, the Contractor shall place all such materials upon a 10 mil thick sheet of plastic, which will be stretched across the ground surface in a location approved by the EPA’s Representative. Fill materials shall be stored in a manner that prevents the clean fill from becoming saturated, airborne, or mixed with contaminated soil in accordance with the Contractor’s approved Waste Management and Transportation Plan and SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.

3.1.3 The Contractor shall be responsible for scheduling the delivery of all backfill materials with the overall project schedule such that no delays in construction occur.

3.1.4 The Contractor shall be responsible for maintaining excavation dewatering and surface water controls in place prior to and during backfilling operations to ensure that no water accumulates in open excavations. Backfill material shall not be placed on surfaces that are muddy, frozen, contain frost or standing water.

3.2 SUBGRADE PREPARATION

Prior to the placement of any backfill, the ground surface on which fill is to be placed shall be stripped of any vegetation, rubbish, debris, and any other unsatisfactory materials, including contaminated materials. The subgrade shall then be prepared, as necessary to allow for an adequate bond between the subgrade and backfilled material. When necessary, the Contractor shall plow, disc, or otherwise break up the existing soil to a depth of 6 inches, and moisten or aerate the subgrade as necessary to achieve the specified moisture content and density for proper compaction, taking care not to damage any existing structures or utilities. When subgrades are less than the specified density, the ground surface shall be scarified and compacted to a depth of 6 inches to the same density as the fill to be placed over it (common fill).

3.3 BACKFILL PLACEMENT AND COMPACTION

3.3.1 Clean fill material shall be backfilled to the specified lines, grades, sections and elevations shown on the Contract Drawings to restore all excavations performed by the Contractor, making due allowance for settlement of the material. No excavated material shall be used as backfill. Backfilling shall proceed according to this specification and the applicable referenced sections of the NJDOTSS. Wetland restoration areas shall be backfilled with common fill to approximately one foot below final grade and upland restoration area to be seeded shall be backfilled with common fill to approximately six inches below final grade, as shown on the Contract Drawings.

3.3.2 Backfill shall not be placed on snow, ice, standing water, or frozen ground surfaces. Backfill shall not be placed over contaminated material. Backfill shall not be placed when the material is too wet either from rain or from excess application of water. At such times, work shall be suspended until the previously placed and new materials have thawed and/or dried sufficiently to permit proper compaction.

3.3.3 Each lift of common fill and structural fill shall be placed in horizontal layers not exceeding 12 inches and 8 inches, respectively, in loose thickness.

3.3.4 Structural fill shall be placed underneath the fire access road, as shown on the Contract Drawings. Structural backfill can be assumed to provide an allowable bearing capacity of 2,000 psf with total settlements of less than 1 inch under full load. Common fill is to be used in all other areas, which will not support significant loading.

3.3.5 Upon completion of the backfill operations, the surface of the fill shall be sloped to facilitate surface drainage. This grade shall be maintained throughout backfilling operations except where controlled by other specified grade and elevations. The final finish grade shall be as specified in Paragraph 3.8 – GRADING. Grading shall be performed to promote surface drainage away from the access road.

3.3.6 Settlement or washing that occurs in graded, topsoiled, or backfilled areas prior to acceptance of the work shall be repaired and grades reestablished to the required elevations and slopes. The Contractor shall notify the EPA’s Representative of unexpected subsurface conditions and discontinue work in the affected area until notified to resume work.

3.4 COMPACTION

3.4.1 The Contractor shall compact each lift of backfill as specified herein. Compaction in soil areas shall be accomplished by sheepsfoot rollers, pneumatic tired rollers, steel wheeled rollers, or other approved equipment well suited to the soil being compacted. Material shall be moistened or aerated as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used.

3.4.2 The Contractor shall be responsible for providing appropriate compaction effort to achieve the Minimum Percent of Laboratory Maximum Density (Modified Proctor) as outlined in this specification. Access road restoration within Excavation Area A shall be backfilled with structural fill and compacted to 95 percent of the Laboratory Maximum Density (Modified Proctor) prior to placement of DGA in this area. DGA shall be placed on compacted structural fill in access road restoration within Excavation Area A and on existing stone within Excavation Area AA. For the remainder of the Site, backfill shall be compacted to 85 percent of the Laboratory Maximum Density (Modified Proctor).

3.4.3 Common fill used as backfill in sediment excavation areas, when excavation is deeper than 12-inch, shall be placed and spread with low-ground pressure equipment. Compaction shall be accomplished by tracking the equipment over the fill surface of the sediment excavation areas.

3.4.4 If the EPA’s Representative determines that added moisture is required, water shall be applied by sprinkler tanks or other sprinkler systems, which shall ensure uniform distribution of the water over the area to be treated, and give complete and accurate control of the amount of water to be used. If too much water is added, the area shall be permitted to dry before compaction is continued.

3.4.5 The Contractor shall supply all hose, piping, valves, sprinklers, pumps, sprinkler tanks, hauling equipment, and all other materials and equipment necessary to place the water in the fill in the manner specified. Water shall be provided and obtained at the Contractor’s expense.

3.4.6 Approved compacted subgrades that are disturbed by the Contractor's operations or adverse weather shall be scarified and recompacted to the required density, prior to further construction.

3.5 SOIL TESTING

Initial conformance testing shall be performed to show that the backfill materials meet the specification requirements and to identify the compaction properties of the soils. Testing shall be performed by an approved commercial testing laboratory or may be performed by the Contractor subject to approval by the EPA’s Representative. The Contractor shall submit to the EPA’s Representative for approval licenses or certifications of qualification for the performance of field and laboratory testing. At a minimum, the tests listed below shall be conducted for each material and submitted as initial conformance test results. In addition, periodic conformance testing shall be conducted by the Contractor’s Quality Control Laboratory on common fill soils prior to their use on the project. The EPA’s Representative reserves the right to reject material based on the results of these conformance tests and/or independent quality assurance testing conducted by the EPA’s Representative. Rejected materials shall be removed from the Site at no additional cost.

3.5.1 Chemical Testing

Prior to the use of any backfill on site, the Contractor shall be responsible for performing chemical testing, by an off-site laboratory, of the proposed borrow material, in accordance with SECTION 01450 - CHEMICAL DATA QUALITY CONTROL.

3.5.2 Sieve Analysis

Sieve analysis shall be performed in accordance with ASTM D 421 and ASTM D 422. A retest for classification shall be performed at a minimum of every 5,000 cubic yards.

3.5.3 Density Testing

Field in-place density tests shall be performed in accordance with ASTM D 6938. A minimum of one test shall be performed per 500 cubic yards of material placed, with no less than one test per lift. Calibration curves shall be checked and adjusted if necessary by the procedure described in ASTM D 7013 and D 7759. The calibration checks of both the density and moisture gauges shall be made at the beginning of each working day and for each different type of material encountered. Calibration for in-place density testing shall consist of determining in-place density in accordance with ASTM D 1556.

3.5.4 Moisture-Density Test

A moisture-density relationship for the soil shall be determined in accordance with ASTM D 1557 (Modified Proctor). A minimum of one test per 5,000 cubic yards shall be performed, but no less than one test per borrow area. The EPA’s Representative may direct additional tests should soil materials change during the course of work.

3.5.5 Imported Material Acceptance

If tests indicate that the material does not meet Specification requirements, material placement shall be terminated until corrective actions are taken. Material that does not conform to the Specification requirements and is placed in the work shall be removed and replaced at the Contractor’s sole expense. The presence of any compound above the requirements of Section 1.5.1 herein shall be reason to reject the source, regardless of other test results.

3.6 SPREADING TOPSOIL

3.6.1 Areas where fill material has been placed and will be seeded shall be covered with a minimum topsoil thickness of 6 inches using the material specified in Paragraph 2.5.1 – UPLAND AREA TOPSOIL. Wetland restoration areas shall be covered with a minimum topsoil thickness of 12 inches using the material specified in Paragraph 2.5.2 – WETLAND AREA TOPSOIL.

3.6.2 The surface shall be free of materials that would hinder planting or maintenance operations. The subgrade shall be pulverized to a depth of 2 inches by disking or plowing for the bonding of topsoil with the subsoil. Topsoil shall then be uniformly spread, graded, and compacted to the thickness, elevations, and slopes shown, and left free of surface irregularities. Topsoil shall be compacted by one pass of a cultipacker, roller, or equivalent. Topsoil shall not be placed when the subgrade is frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to seeding, planting, or proper grading.

3.7 RIPRAP

3.7.1 Method of Placement

A rip rap apron shall be placed on the influent side of the 24-inch drainage pipe within Excavation Area Q. Apron width and length shall be at a minimum five feet. Prior to placing rip rap, a woven geotextile fabric shall be placed under the rip rap location. Then place rip rap materials carefully on the geotextile fabric based on the rip rap design prepared by the Contractor or as directed. The riprap shall be placed in such a manner as to produce a reasonably well-graded mass of rock with the minimum practicable percentage of voids. Any damage to the geotextile fabric resulting from riprap placement shall be repaired as directed by the EPA’s Representative before continuing with the work. Compaction of the riprap materials is not required, however, the rearranging of individual riprap stones by mechanical equipment or by hand shall be required to the extent necessary to obtain a reasonably even finished surface. Riprap placement equipment, or any other heavy equipment, will not be permitted on

the geotextile or riprap. If discharge to surface water is performed, rip rap shall also be installed at the discharge point to prevent erosion.

3.7.2 Distribution of Riprap Stone Size

Placing the riprap by dumping into chutes or by similar method likely to cause segregation of the various sizes shall not be permitted. The desired distribution of the various sizes of stone throughout the mass shall be obtained by controlled placement of successive loads during final placement, or by other methods of placement which will produce the specified results.

3.8 GRADING

3.8.1 The Contractor shall uniformly smooth and grade all filled areas to provide a finished surface that is reasonably smooth, compacted to the specified project requirements, free from irregular surface changes, and sloped to drain properly. Grading shall not create swales or areas where ponding of water will occur. The finished surface shall be essentially as indicated on the Contract Drawing Restoration Plan, as confirmed by surveying operations. Grading tolerances shall be plus or minus 0.1 feet for all exposed surfaces of backfill unless otherwise indicated on the Contract Drawings.

3.8.2 During the process of grading, the area to be graded shall be maintained in such condition that it shall be well drained at all times. When directed, temporary drains and drainage ditches shall be installed to intercept or divert surface water that may affect the execution or condition of the work.

3.8.3 If at the time of grading it is not possible to place any material in its final location, it shall be stockpiled in approved areas for later use. No extra payment will be made for the stockpiling or double handling of excavated material.

3.8.4 The right is reserved to make minor adjustments or revisions in lines or grades if found necessary as the work progresses, in order to obtain satisfactory construction. After grading is completed and accepted by the EPA’s Representative, no further filling or grading shall be permitted except with the approval of and inspection by the EPA’s Representative.

3.9 ACCESS ROAD

3.9.1 Within the access road restoration boundaries within Excavation Area A, the Contractor shall place structural backfill as needed to raise the subgrade elevation to 8 inches below the proposed final grade shown on the Contract Drawing Restoration Plan.

3.9.2 The subgrade for the access road within Excavation Area A shall be scarified, proof rolled and re-compacted to 95 percent or greater prior to placement of the woven geotextile fabric or DGA material.

3.9.3 Woven geotextile fabric shall be placed on top of the compacted backfill. An 8-inch layer of DGA shall be placed on the road surface and compacted to 95 percent of the maximum density as determined by ASTM D1557. The Contractor shall uniformly smooth and grade

access road to provide finished surface that is reasonably smooth, compacted, and sloped to drain properly.

3.9.4 Within the access road restoration boundaries within Excavation Area AA, the Contractor shall place DGA on top of existing stone.

3.10 QUALITY CONTROL PROGRAM

An independent soils testing laboratory shall be retained by the Contractor and approved by the EPA’s Representative to provide fill materials conformance and compaction testing as indicated herein.

3.11 SOIL EROSION AND SEDIMENT CONTROLS

Newly-graded areas shall be protected from erosion by installing soil erosion and sediment controls, as specified in SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT and Soil Erosion and Sediment Control Plan certified by the Freehold Soil Conservation District.

3.12 SOIL TREATMENT

No treatment of the backfill material with insecticides or herbicides is necessary as part of this remedial action.

END OF SECTION

SECTION 02230

CLEARING AND GRUBBING

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 The Contractor shall furnish all labor, equipment, materials and incidentals required to complete the work described herein.

1.1.2 This work consists of clearing and grubbing the Site as required for construction activities, chipping and spreading cleared material below New Jersey Department of Environmental Protection (NJDEP) Residential Direct Contact Soil Remediation Standards (RDCSRS) on-site outside of Site clearing limits with the exception of *Phragmites*, and removing and disposing of *Phragmites*, cleared material not meeting the NJDEP RDCSRS and grubbed material off-site, except for objects that the EPA’s Representative designates to remain.

1.1.3 The Contract Drawings designate clearing areas from where all trees, shrubs, plants, grass and other items are to be removed and subsequently replaced. All other areas, beyond what is shown on the Contract Drawings, shall be protected against damage by the Contractor, unless otherwise approved by the EPA’s Representative.

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. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.

NEW JERSEY DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS
(NJDOTSS)

NJDOTSS Division 200 - Earthwork and Division 800 - Landscaping

NEW JERSEY ADMINISTRATIVE CODE (N.J.A.C.)

N.J.A.C. 7:26 Solid and Hazardous Waste Management Regulations

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

All clearing and grubbing shall be performed in accordance with the requirements of Sections 201, 801, and 802 of the NJDOTSS, unless otherwise indicated herein. Prior to clearing, wood tissue samples shall be collected and analyzed in accordance with SECTION 02100 - PRE-EXCAVATION SAMPLING AND SITE PREPARATION and Section 01450 - CHEMICAL DATA QUALITY CONTROL.

3.1 CLEARING

3.1.1 Clearing shall consist of the felling, trimming, cutting into sections, and chipping of trees. Trees, stumps, roots, brush, and other vegetation to be cleared shall be cut 6 inches above ground surface. Any limbs and branches to be trimmed nearby the excavation or staging area shall be neatly cut close to the bole of the tree or main branches. Trees and vegetation designated to remain shall be protected from damage incident to clearing, grubbing, and construction operations, in accordance with the requirements of Paragraph 3.3 - PROTECTION.

3.1.2 Trees shall be felled in such a manner as to avoid damage to trees left standing, and with due regard for the safety of employees and others.

3.1.3 Clearing also consists of the satisfactory chipping other vegetation designated for removal, including down timber, timber piles, snags, brush, and rubbish in the areas to be cleared.

3.1.4 During site clearing, the Contractor shall also save clean 12 tree trunks 12 inches or greater in diameter and cut into lengths of no less than 8 feet long, for use in the wetland restoration areas. The salvaged trees shall be placed flat in the restored wetland areas to help promote habitat restoration, in accordance with SECTION 02955 - FRESHWATER WETLAND RESTORATION. Salvaged trees shall be taken from upland areas to be cleared that are outside of the excavation limits.

3.1.5 Herbicide shall be applied to marsh *Phragmites* 6 to 8 weeks prior to beginning clearing and excavation in areas where *Phragmites* are present in accordance with the Contractor’s approved Herbicide Application Plan and SECTION 02100 - PRE-EXCAVATION SAMPLING AND SITE PREPARATION. Prior to starting each excavation area, *Phragmites* within the excavation limits shall be cut at the surface, cleared, and chipped on site to increase the surface area for drying. The chippings shall be stockpiled directly in areas that have not yet been excavated and allowed to dry for at least 2 weeks prior to transfer to the loadout area for disposal. The *Phragmites* piles shall remain covered at all times during stockpiling and transport to prevent the spreading of seeds. *Phragmites* shall be handled as contaminated in accordance with the requirements of Paragraph 3.4 - DISPOSAL OF MATERIALS.

3.1.6 Clearing shall be performed prior to any remedial excavation.

3.2 GRUBBING

3.2.1 Grubbing shall consist of the removal and disposal of stumps, roots, buried logs, and all tap roots, lateral roots, or other projections over 1.5 inches in diameter within the area of excavation. Material to be grubbed shall not be removed below the depth of excavation indicated on the Contract Drawings, or as otherwise directed by the EPA’s Representative.

3.2.2 Grubbing shall be done in phases incidental to the remedial excavation phase to reduce the potential for soil erosion.

3.3 PROTECTION

3.3.1 Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction using barriers or other means as the circumstances require.

3.3.2 The Contractor shall repair all damage to trees, shrubs, and plants scheduled to remain, by properly dressing, cutting and painting with an acceptable tree wound paint, or replacing items that cannot be repaired.

3.3.3 The Contractor shall, at no additional expense, seed all grassed areas, beyond the limits of construction shown on the Contract Drawings, which have been damaged as a result of the Contractor's operation.

3.3.4 The Contractor shall not destroy or damage trees and shrubs outside the limits of construction without the authorization of the EPA’s Representative.

3.4 DISPOSAL OF MATERIALS

3.4.1 Cleared Material

Cleared and chipped material shall be considered uncontaminated unless the pre-excavation wood tissue samples indicate exceedances of NJDEP RDCSRS. Cleared and chipped material below NJDEP RDCSRS with the exception of *Phragmites* shall be spread in areas outside of the Site clearing limits or as directed by the EPA’s Representative.

Phragmites and any other cleared material which is determined not be used on site shall be handled as contaminated material and disposed of at an approved Subtitle D landfill facility pursuant to N.J.A.C. 7:26-1 et seq. Chipped material shall be transported in such a manner as to contain the spread of *Phragmites* seeds during off-site transportation and disposal, such as covering chipped material with non-hazardous material during transport.

3.4.2 Grubbed Material

Grubbed material shall be assumed to be contaminated and shall be chipped to a maximum size of 2 inches by 2 inches. The chippings shall be consolidated and containerized with other contaminated material, or otherwise handled as required by the receiving disposal facility.

END OF SECTION

PART 2 PRODUCTS

2.1 TEMPORARY SEEDING AND MULCHING

Temporary seeding, mulching, fertilizing, and erosion control matting shall be used as needed to reduce erosion as specified in SECTION 02921 – UPLAND SEEDING.

2.2 BALED HAY OR STRAW CHECKS

Baled hay or straw erosion checks are temporary measures to control erosion and prevent siltation. Bales shall be either hay or straw containing 5 cubic feet or more of material. The bales shall be free from noxious weeds.

2.3 TEMPORARY DIVERSION FENCES

2.3.1 Diversion fence material shall be a black, multi-ply, high-density polyethylene, impermeable geomembrane. The membrane shall be reinforced with a non-woven grid of high strength fiber cord having a uniform tear resistance in all directions. Reinforcing shall be a heavy-duty nylon cord in a diamond pattern.

2.3.2 The material shall be attached to the upstream side of the fence to retain the suspended silt particles found in the runoff water and divert the water away from areas of excavation.

2.4 TEMPORARY SILT FENCES

The siltation fence fabric shall be a geotextile material suitable for siltation control use with a minimum tensile strength of 100 pounds, meeting ASTM D 4632. The equivalent opening size shall be between the No. 50 and No. 70 sieve size. A 12-gauge metal fence with 4-inch by 4-inch openings shall be provided as support for the fence fabric.

2.5 GEOMEMBRANE LINER

The geomembrane liner shall be as specified in SECTION 02100 – PRE-EXCAVATION SAMPLING AND SITE PREPARATION.

2.6 NON-WOVEN GEOTEXTILE FABRIC

The non-woven geotextile fabric shall be as specified in SECTION 02100 – PRE-EXCAVATION SAMPLING AND SITE PREPARATION.

2.7 EROSION CONTROL BLANKET

Erosion control blanket shall be in accordance with SECTION 02921 - UPLAND SEEDING.

PART 3 EXECUTION

3.1 SILTATION AND EROSION CONTROL

3.1.1 Siltation and erosion control practices shall be consistent with procedures outlined in NJAC 2:90-1 and New Jersey Standards for Soil Erosion and Sediment Control.

3.1.2 If the Contractor desires to stockpile construction materials such as stone, earth, etc., the location of these materials and the protection measures required shall be in accordance with the approved Soil Erosion and Sediment Control Plan.

3.1.3 The Contractor shall not be permitted to divert stormwater onto adjacent properties. The known 24-inch drainage channel along the fire access road shall be diverted during excavation of Area Q using pumps or other means, as approved by the EPA’s Representative. Stormwater shall be diverted around individual excavation areas using diversion fencing.

3.1.4 All stormwater that comes in contact with contaminated soils shall be collected, treated on site, and discharged to the Middlesex County Utilities Authority (MCUA) Publicly Owned Treatment Works (POTW) or to surface water. All other site run-off water shall be diverted to the on-site streams via the control measures (e.g., baled hay or straw check/silt fence filtration) as approved by the EPA’s Representative.

3.2 CONSTRUCTION REQUIREMENTS

3.2.1 The EPA’s Representative has the authority to limit the surface area of erodible earth material exposed by grubbing, as well as the surface of erodible earth material exposed by excavation and fill operations, and to direct the Contractor to provide immediate, permanent, and/or temporary pollution control measures to prevent contamination of adjacent properties, streams, or other watercourses. Such work may involve the use of temporary mulches, mats, seeding, or other control devices or methods as necessary to control erosion. Cut and fill slopes shall be seeded and mulched as the excavation proceeds, to the extent directed by the EPA’s Representative.

3.2.2 The Contractor shall be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in its accepted schedule. Temporary pollution control measures shall be used to correct conditions that develop during construction, prior to installation of permanent pollution control features, or temporarily to control erosion that develops during normal construction practices.

3.2.3 The EPA’s Representative has the authority to limit the area of excavation and fill operations in progress commensurate with the Contractor’s capability and progress in keeping the finished grading, mulching, seeding and other such temporary or permanent pollution control measures current, in accordance with the accepted schedule. Should seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified.

3.2.4 In the event of conflict between these requirements and pollution control laws, rules or regulations, or other Federal, State, or local agencies, the more restrictive laws, rules, or regulations shall apply.

3.3 CONSTRUCTION OF CONTROL MEASURES

3.3.1 Baled Hay or Straw Erosion Checks

3.3.1.1 Baled hay or straw checks shall be used where the existing ground slopes toward or away from an embankment, along the toe of slopes, in ditches, or other areas where the Contractor deems necessary to prevent siltation, erosion or water runoff problems.

3.3.1.2 Hay or straw erosion checks shall be embedded in the ground 6 inches to prevent water from flowing under them. The bales shall also be anchored securely to the ground, as shown on the Contract Drawings. Bales and anchoring shall be removed after they have served their purpose, as determined by the EPA’s Representative. The Contractor shall keep the checks in good condition by replacing broken or damaged bales immediately after damage occurs. Normal debris cleanout shall be considered routine maintenance.

3.3.2 Temporary Diversion Fences and Silt Fences

3.3.2.1 Temporary silt fences shall be placed on the natural ground, at the bottom of fill slopes, in ditches, or at other areas where siltation is a problem. Silt fences are constructed of material designed for that application or some other approved material on the up-grade side of the fence, and anchored into the soil.

3.3.2.2 Temporary diversion fences shall be embedded in the ground 6 inches to prevent water from flowing under them. Diversion fences shall be placed upstream of excavations to divert water away from excavations and adjacent properties and into the existing stormwater system.

3.3.2.3 The Contractor shall be required to maintain diversion fencing and silt fencing in a satisfactory condition for the duration of the project or until removal is approved by the EPA’s Representative. The silt accumulation at the fences shall be removed and properly disposed of as directed by the EPA’s Representative. The diversion fencing and silt fencing becomes the property of the Contractor whenever the fence is removed.

3.3.2.4 The fence shall be fastened to the fence posts with metal clips 12 inches on center or an approved equal compatible with the fence material. The filter material shall be fastened to the fence at the top, center, and bottom with metal fasteners (nails or staples) and a high-strength reinforcement material (nylon webbing, grommets, washers, etc.) placed between the fastener and the geotextile fabric.

3.3.2.5 Silt fence at locations meeting cofferdams shall meet the requirements of the Contract Drawings.

3.3.3 Cofferdams

Cofferdam use shall be in accordance with SECTION 02140 – DEWATERING AND DRAINAGE and the Contractor’s approved Dewatering and Drainage Plan.

3.3.4 Erosion Control Blanket

Erosion control blanket shall be installed in diversion drainage channels as directed by the EPA’s Representative. The Contractor shall follow the manufacturer’s installation instructions for high flow applications.

3.3.5 Construction Entrance

The two points of entrance and exit to the Old Bridge Municipal Utilities Authority (OBMUA) fire access road and secondary access road shall be maintained in a condition that will prevent tracking or flowing of sediment onto Route 35. This may require periodic top dressing with additional stone as required in order to maintain previously established stabilized construction access conditions. All construction vehicles shall be decontaminated and wheels washed out prior to leaving the Site at the temporary decontamination facility. No soil or sediment shall be spilled, dropped, washed, or tracked onto Route 35.

3.4 MAINTENANCE

The temporary erosion control features installed by the Contractor shall be acceptably maintained by the Contractor until no longer needed or until permanent erosion control methods are installed. The erosion and stormwater control features shall be inspected daily. Required repairs shall be performed in a timely manner. Any related materials removed shall become the property of the Contractor.

END OF SECTION

SECTION 02900

SITE RESTORATION

PART 1 GENERAL

1.1 SCOPE OF WORK

The Contractor shall furnish all labor, equipment, material, and incidentals necessary to restore the Site as specified herein and/or as directed by the EPA’s Representative.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 The Contractor shall remove all equipment and materials used during the project operation including, but not limited to, water treatment system, trailers, sediment containment area, soil stockpile area, silt fence, construction fence, stormwater diversion structures, electrical wiring, staging area, decontamination pad, etc., prior to demobilization from the Site.

3.2 Prior to demobilization, all equipment shall be decontaminated in accordance to SECTION 01351 - SAFETY, HEALTH, AND EMERGENCY RESPONSE.

3.3 All materials removed during the site restoration activities shall be disposed of at an approved off-site disposal facility by the Contractor.

3.4 The wetland area shall be restored as shown in the Contract Drawings and as specified in SECTION 02955 – FRESHWATER WETLAND RESTORATION and SECTION 02957 – BRACKISH MARSH RESTORATION. All other areas shall be seeded as shown on the Contract Drawings and as specified in SECTION 02921 – UPLAND SEEDING.

3.5 Disturbed areas of the Old Bridge Municipal Utilities Authority (OBMUA) fire access road shall be restored in accordance with the Contract Drawings and specified in SECTION 02201 – BACKFILL, COMPACTION, AND GRADING.

3.6 Cleared and chipped material below New Jersey Department of Environmental Protection Residential Direct Contact Soil Remediation Standards shall be spread outside of the project clearing limits as directed by the EPA’s Representative.

3.7 The Contractor shall restore all areas affected by the extent of the excavation and other areas damaged during remedial action work.

3.8 The Contractor shall vacate the Site in an orderly manner and to the satisfaction of the EPA’s Representative.

END OF SECTION

SECTION 02921

UPLAND SEEDING

PART 1 GENERAL

1.1 SCOPE OF WORK

The Contractor shall furnish all labor, materials, equipment and incidentals necessary to provide seeding in upland areas as required by the Contract Documents. Upland areas are defined as areas outside of the wetland restoration limits.

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. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C602 Standard Specification for Agricultural Liming Materials

CODE OF FEDERAL REGULATIONS (CFR)

7 CFR 201 Federal Seed Act Regulations

NEW JERSEY DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS
(NJDOTSS)

NJDOTSS Division 800 - Landscaping

NJDOTSS Division 900 - Materials

NEW JERSEY STATE SOIL CONSERVATION COMMITTEE (SSCC)

SSCC Standards for Soil Erosion and Sediment Control

1.3 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals with an “FIO” designation are for information only. The Contractor shall submit the following to the EPA’s Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.

1.3.1 Seeding Schedule; Product Data; FIO

The Contractor shall submit the schedule for the seed establishment and any modification to the schedule.

1.3.2 Seed Certification; Certificates; EA

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following: classification, botanical name, common name, percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content, and date tested.

1.3.3 Soil Amendments; Certificates; FIO

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following:

1.3.3.1 pH Adjuster. Calcium carbonate equivalent and sieve analysis.

1.3.3.2 Fertilizer. Chemical analysis and composition percent.

1.3.3.3 Soil Conditioner. Composition and source.

1.3.4 Maintenance Record; Closeout Submittals; FIO

A record of each site visit shall be furnished as specified in this section.

1.4 INSPECTION, STORAGE, AND HANDLING

1.4.1 Inspection

Seed shall be inspected upon arrival at the job site for conformance to species and quality. Seed that is wet, moldy, or bears a test date 5 months or older, shall be rejected. Other materials shall be inspected for compliance with specified requirements. Unacceptable materials shall be removed from the job site.

1.4.2 Storage

Materials shall be stored in designated areas. Seed shall be stored in cool, dry locations away from contaminants.

1.4.3 Handling

Materials shall not be dropped or dumped from vehicles.

1.4.4 Time Limitation

Hydroseeding time limitation for holding seed in the slurry shall be a maximum of 24 hours.

PART 2 PRODUCTS

2.1 SEED

2.1.1 Seed Classification

State-certified seed of the latest season’s crop shall be provided in original sealed packages bearing the producer’s guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with 7 CFR 201 and applicable state seed laws.

2.1.2 Temporary Seed Species

Temporary seedings may be necessary to provide cover when permanent seedings are likely to fail due to mid-summer heat or drought. Temporary seed species shall be as specified by SSCC (Table 7-2) according to season of installation.

2.1.3 Permanent Seed Species and Mixtures

Seed species and mixtures and application rates shall be as shown in Table 02921-1 or as recommended by manufacturer. Seed must be sourced from 150 miles of the project site, if practicable.

**Table 02921-1
Permanent Seed Species and Mixtures**

Upland Seed Mix #1: For Upland Areas (20 lbs/acre)

% Pure Live Seed	Latin Name	Common Name	Wetland Indicator Status
15	<i>Tridens Flavus</i>	Purpletop	FACU
10	<i>Andropogon ternarius</i>	Split-beard bluestem	FACU
10	<i>Eragrostis spectabilis</i>	Purple lovegrass	FACU
10	<i>Panicum virgatum</i>	Switchgrass	FAC
10	<i>Sorghastrum nutans</i>	Indiangrass	FACU
10	<i>Schizachyrium scoparium</i>	Little false bluestem	FACU
5	<i>Solidago nemoralis</i>	Gray goldenrod	NI
5	<i>Solidago canadensis</i>	Canada goldenrod	FACU
5	<i>Lespedeza virginica</i>	Slender lespedeza	NI
5	<i>Lespedeza frutescens</i>	Shrubby bushclover	NI
5	<i>Asclepias syriaca</i>	Common milkweed	UPL
4	<i>Monarda fistulosa</i>	Wild bergamot	FACU
3	<i>Chamaecrista fasciculata</i>	Partridge pea	FACU
3	<i>Rudbeckia triloba</i>	Brown-eyed Susan	FACU

Upland Seed Mix #2: For Wetland Transition Zone Areas (20 lbs/acre)

% Pure Live Seed	Latin Name	Common Name	Wetland Indicator Status
15	<i>Panicum virgatum</i>	Switchgrass	FAC
15	<i>Andropogon gerardii</i>	Big bluestem	FAC
10	<i>Andropogon virginicus</i>	Broomsedge	FAC
10	<i>Elymus canadensis</i>	Canada wild rye	FAC
10	<i>Panicum amarum</i>	Bitter panic grass	FAC
10	<i>Tridens flavus</i>	Purpletop	FACU
10	<i>Symphotrichum prenanthoides</i>	Zigzag aster	FAC
5	<i>Eutrochium purpureum</i>	Sweet Joe Pye weed	FAC
5	<i>Liatris spicata</i>	Blazing star	FAC
5	<i>Penstemon digitalis</i>	Foxglove beardtongue	FAC
5	<i>Solidago rugosa</i>	Wrinkleleaf goldenrod	FAC

Upland Seed Mix #3: Trees and Shrubs Seed Mix for Upland Areas (10 lbs/acre)

% Pure Live Seed	Latin Name	Common Name	Wetland Indicator Status
20	<i>Quercus alba</i>	White oak	FAC
20	<i>Nyssa sylvatica</i>	Black gum	FAC
10	<i>Prunus serotina</i>	Black cherry	FACU
10	<i>Quercus rubra</i>	Red oak	FAC
10	<i>Ceanothus americanus</i>	New Jersey tea	NI
10	<i>Tridens flavus</i>	Purpletop	FAC
10	<i>Cornus racemosa</i>	Gray dogwood	FAC
5	<i>Morella cerifera</i>	Southern bayberry	FAC
5	<i>Viburnum dentatum</i>	Southern arrowwood	FAC

2.1.4 Seed Quality

Weed seed shall be a maximum 1 percent by weight of the total mixture.

2.1.5 Seed Mixing

The mixing of seed may be done by the seed supplier prior to delivery, or on site as directed by the EPA’s Representative.

2.1.6 Seed Substitutions

Substitutions will not be allowed without written request and approval from the EPA’s Representative.

2.2 WATER

Water shall be the responsibility of the Contractor, unless otherwise noted. Water shall not contain elements toxic to plant life or the environment. Surface water or water generated from site operations shall not be used for watering seed.

2.3 SOIL AMENDMENTS

Soil amendments shall consist of pH adjuster, fertilizer and soil conditioners meeting the following requirements. Vermiculite shall not be used.

2.3.1 pH Adjuster

If required, the pH adjuster shall be an agricultural liming material in accordance with ASTM C602. These materials may be burnt lime, hydrated lime, or ground limestone. The pH adjuster shall be used to create a favorable soil pH for the plant material specified. The pH adjuster shall be applied at a rate as recommended based on the results of the soil test.

2.3.1.1 Burnt Lime

Burnt lime shall contain a minimum calcium carbonate equivalent of 140 percent. A minimum of 95 percent shall pass through a No. 60 sieve.

2.3.1.2 Hydrated Lime

Hydrated lime shall contain a minimum calcium carbonate equivalent of 110 percent. A full 100 percent shall pass through a No. 8 sieve and a minimum of 97 percent shall pass through a No. 60 sieve.

2.3.1.3 Limestone

Limestone material shall contain a minimum calcium carbonate equivalent of 80 percent. A minimum of 95 percent shall pass through a No. 8 sieve and a minimum of 55 percent shall pass through a No. 60 sieve. To raise soil pH, ground limestone shall be used.

2.3.2 Fertilizer

Fertilizer shall consist of a nitrogen-phosphorus-potassium ratio of 10-10-10 or equivalent with 50% water insoluble nitrogen in accordance with the SSCC Standard for Permanent Vegetative Cover unless a soil test indicates otherwise. Fertilizer shall be of controlled release commercial grade, free flowing, and uniform in composition. The fertilizer shall be derived from sulphur-coated urea, urea formaldehyde, plastic or polymer-coated pills, or isobutylenediurea (IBDU). Fertilizer shall be balanced with the inclusion of trace minerals and micronutrients. Fertilizer shall be applied as recommended based on the results of the soil test.

2.3.3 Soil Conditioner

Soil conditioner shall be for single use or in combination to meet requirements for topsoil. Gypsum shall be commercially packaged, free flowing, minimum 95 percent calcium sulfate by volume.

2.3.4 Hay Mulch

Hay mulch shall consist of cured hay. When air dried in the loose state, the contents of a representative bale shall lose not more than 15 percent of the resulting air dry weight of the bale. It shall be free from primary noxious weed seeds and rough or woody materials.

2.3.5 Straw Mulch

Straw mulches shall be stalks from oats, wheat, rye, barley, or rice and shall be furnished in air-dry condition and with a consistency for placing with commercial mulch blowing equipment. Mulches shall be free from weeds, mold, and other deleterious materials, in addition to meeting the requirements of the NJDOTSS, Sections 809 and 917.

2.3.6 Fiber Mulch

Fiber mulch shall be a specially processed cellulose fiber containing no growth or germination-inhibiting factors. It shall be manufactured in such a manner that after addition and agitation in slurry tanks with water, the fibers in the material become uniformly suspended to form a homogeneous slurry. When sprayed on the ground, the material shall allow absorption and percolation of moisture. Each package of the cellulose fiber shall be marked by the manufacturer to show the air dry weight content. Fiber mulch shall meet the requirements of the NJDOTSS, Sections 809 and 917.

2.3.7 Erosion Control Materials

Soil erosion control shall conform to the following subparagraphs.

2.3.7.1 Soil Erosion Control Blanket

Seventy percent agricultural straw and 30 percent coconut fiber matrix stitched with degradable nettings, designed to degrade within 12 months.

2.3.7.2 Soil Erosion Control Fabric

Knitted construction of polypropylene yarn with uniform mesh openings 0.75-inch to 1-inch square with strips of biodegradable paper. Filler paper strips should last 6 to 8 months.

2.3.7.3 Erosion Control Net

Net shall be heavy, twisted jute mesh, weighing approximately 1.22 pounds per linear yard and 4 feet wide with mesh openings of approximately 1-inch square.

PART 3 EXECUTION

3.1 SEEDING TIME AND CONDITIONS

3.1.1 Seeding Time

3.1.1.1 Prior to any construction, the Contractor shall mark the areas that will not be disturbed under this contract. Isolated areas within the general work area that are to be saved and protected shall also be marked or fenced. The Contractor and his/her subcontractor’s personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.1.1.2 Seeding, mulching, and conditioning shall be performed at times established by common practice for the necessary establishment period. Seeding for the permanent seed mixes shall be between March 15 and April 30 or September 1 to October 15.

3.1.2 Seeding Conditions

Seeding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the seeding operations, proposed alternate times shall be submitted for approval.

3.1.3 Equipment Calibration

Immediately prior to the commencement of seeding operations, calibration tests shall be conducted on the equipment to be used. These tests shall confirm that the equipment is operating within the manufacturer’s specifications and will meet the specified criteria. The equipment shall be calibrated a minimum of once every day during the operation.

3.1.4 Soil Test

3.1.4.1 Delivered topsoil, existing soil in smooth graded areas, and stockpiled topsoil shall be tested and meet the requirements of SECTION 01450 – CHEMICAL DATA QUALITY CONTROL and SECTION 02201 – BACKFILL, COMPACTION, AND GRADING. Sample collection on site shall be random over the entire site. Sample collection for stockpiled topsoil shall be at different levels in the stockpile and shall be done once prior to use. A separate set of soil tests shall be performed for each area of a given soil condition and type of seeding. The Contractor shall use the minimum levels of application rates for applying fertilizer, lime and other soil amendments as indicated by the various soil tests.

3.2 SITE PREPARATION

3.2.1 Finished Grade and Topsoil

The Contractor shall verify that finished grades are as indicated on the Contract Drawings, and the placing of topsoil, smooth grading, and compaction requirements have been completed in accordance with SECTION 02201 – BACKFILL, COMPACTION, AND GRADING, prior to the

commencement of the seeding operation. Topsoil shall be placed to a minimum compacted depth of 6 inches in all disturbed areas not covered with stone or gravel surfaces.

3.2.2 Tillage

Soil on slopes up to maximum 3-horizontal-to-1-vertical shall be tilled to a minimum 4-inch depth. Rototillers shall be used where soil conditions and length of slope permit. Drainage patterns shall be maintained as indicated on the Contract Drawings. Areas compacted by construction operations shall be completely pulverized by tillage. Soil used for repair of surface erosion or grade deficiencies shall conform to topsoil requirements. The pH-adjuster, fertilizer, and soil conditioner may be applied during this procedure.

3.2.3 Prepared Surface

3.2.3.1 Preparation

The prepared surface shall be a maximum of 1 inch below the adjoining grade of any surfaced area. New surface shall be blended to existing areas. The prepared surface shall be completed with a light raking to remove debris.

3.2.3.2 Lawn Area Debris

Debris and stones over a minimum 5/8-inch in any dimension shall be removed from the surface.

3.2.3.3 Protection

Areas with the prepared surface shall be protected from compaction or damage by vehicular or pedestrian traffic and surface erosion.

3.3 INSTALLATION OF SEED

Prior to installing seed, any previously prepared surface compacted or damaged shall be reworked to meet the requirements of Paragraph 3.2 herein. Seeding operations shall not take place when the wind velocity will prevent uniform seed distribution.

3.3.1 Installing pH Adjuster and Fertilizer

After the topsoil is placed and before it is raked to true lines and rolled, limestone shall be spread evenly over the loam surface and worked into the soil with a disc, spring-tooth harrow, or other suitable equipment to at least half the depth of the topsoil. The pH adjuster shall be applied at a rate of 3.3 tons per acre, or as determined by the soil test to bring the topsoil pH within the range of 6.0 to 7.0. If possible, pH adjuster shall be applied 2 to 3 months before the application of fertilizer. The pH adjuster shall not be mixed with fertilizer for application and shall be applied a minimum 2 weeks prior to fertilizer application.

The fertilizer shall be applied at the rate recommended by the soil test. Fertilizer shall be incorporated into the soil to a maximum 4 inch depth or may be incorporated as part of the

tillage operation. Fertilizer shall not be included with the hydroseeding operations. The Contractor shall use the minimum levels of application rates for applying fertilizer as indicated by the various soil tests.

3.3.2 Installing Seed

Apply Upland Seed Mix 3 prior to applying Upland Seed Mixes 1 and 2. Upland Seed Mix 3 may be hand broadcast if even coverage can be ensured. Upland Seed Mixes 1 and 2 may be applied by broadcast seeding or hydroseeding. Seeding procedure shall ensure even coverage. Gravity feed applicators, which drop seed directly from a hopper onto the prepared soil, shall not be used because of the difficulty in achieving even coverage, unless otherwise approved. Absorbent polymer powder shall be mixed with the dry seed at the rate recommended by the manufacturer. Do not broadcast seed, or hydroseed, when the wind velocity is such as to prevent uniform seed distribution.

3.3.2.1 Broadcast Seeding and Rolling

3.3.2.1.1 Seed shall be uniformly broadcast using broadcast seeders. Half the total rate of seed application shall be broadcast in one (1) direction, with the remainder of the seed rate broadcast at 90 degrees from the first direction.

3.3.2.1.2 After all seed mixes for an area are applied, the entire area shall be firmed with a roller not exceeding 90 pounds per foot of roller width. Steep slopes (over a maximum 3-horizontal to 1-vertical) shall not be rolled.

3.3.2.2 Hydroseeding

Seed and fertilizer shall be added to water and thoroughly mixed. The time period for the seed to be held in the slurry shall be a maximum 24 hours. Slurry shall be uniformly applied under pressure over the entire area. Mulch shall not be included in the tank with the seed. The hydroseeded area shall not be rolled.

3.3.3 Mulch

3.3.3.1 Mulch Application

Hay or straw mulch shall be spread uniformly at a rate of 2 to 2.5 tons per acre, or between 90 and 115 pounds per 1,000 square feet. Fiber mulch shall be spread uniformly at a rate of 1 ton per acre, or 45 pounds per 1,000 square feet. Mulch shall be spread by hand, hydraulically, using a blower-type mulch spreader, or by another approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of steep slopes, and continued uniformly until the area is covered. The mulch shall not be bunched or clumped. Sunlight shall not be completely excluded from penetrating to the ground surface. All areas installed with seed shall be mulched on the same day as the seeding to minimize the loss by wind or water. Mulch shall be bound in place with one of the binders described below or as specified by the SSCC Standards for Soil Erosion and Sediment Control.

3.3.3.2 Mechanical Anchor

Mechanical anchor shall be a V-type-wheel land packer; a scalloped-disk land packer designed to force mulch into the soil surface; or other suitable equipment.

3.3.3.3 Non-Asphaltic Adhesive Tackifier

Hydrophilic colloid shall be applied at the rate recommended by the manufacturer, using hydraulic equipment suitable for thoroughly mixing with water. A uniform mixture shall be applied over the area.

3.3.3.4 Watering Seed

Watering shall be started immediately after completing the seeding of an area. Water shall be applied to supplement rainfall at a rate sufficient to ensure moist soil conditions to a minimum depth of 1 inch. Run-off and puddling shall be prevented. Watering trucks shall not be driven over turf areas, unless otherwise directed by the EPA’s Representative. Watering of other adjacent areas or plant material shall be prevented.

3.4 SURFACE EROSION CONTROL

Where necessary, surface erosion control material shall be installed in accordance with the manufacturer’s instructions. Placement of the material shall be accomplished without damage to installed material or without deviation to finished grade. Non-biodegradable erosion control materials may only be used temporarily and must be removed prior to permanent seeding and planting.

3.4.1 Temporary Seeding

When there are contract or weather delays in the seeding operation, areas designated for permanent seeding that that will remain exposed for more than 30 days shall be straw mulched with a temporary seed mixture and non-asphaltic tackifier to prevent erosion, as directed by the EPA’s Representative. Areas shall be permanently seeded as soon as possible once conditions permit. Areas to receive temporary seeding shall be protected against erosion and washout as follows:

3.4.1.1 Apply limestone and fertilizer at the rate recommended by the soil test.

3.4.1.2 Work lime and fertilizer into the ground.

3.4.1.3 Apply temporary seed mixture as specified in Paragraph 2.1.2.

3.4.1.4 Apply fiber mulch at a rate of 45 pounds per 1,000 square feet.

3.4.2 Temporary Stabilization with Mulch Only

Areas that will be exposed for less than 30 days may be stabilized against erosion using only straw mulch or equivalent, as directed by the EPA’s Representative. Mulch shall be spread uniformly at a rate of 2 to 2.5 tons per acre and in accordance with the NJDOTSS.

3.5 QUANTITY CHECK

For materials provided in bags, the empty bags shall be retained for recording the amount used. For materials provided in bulk, the weight certificates shall be retained as a record of the amount used. The amount of material used shall be compared with the total area covered to determine the rate of application used. Differences between the quantity applied and the quantity specified shall be adjusted as directed by the EPA’s Representative.

3.6 RESTORATION AND CLEAN UP

3.6.1 Restoration

Existing turf areas, pavements, and facilities that have been damaged from the seeding operation shall be restored to original conditions.

3.6.2 Clean Up

Excess and waste material shall be removed from the seeded areas and shall be disposed of off-site. Adjacent paved areas shall be cleaned.

3.7 PROTECTION OF INSTALLED AREAS

Immediately upon completion of the seeding operation in an area, the area shall be protected from traffic or other use.

3.8 SEED ESTABLISHMENT PERIOD

3.8.1 Commencement

The seed establishment period to obtain a healthy stand of plants shall end 3 months after the last day of the seeding operation. Written calendar time period shall be furnished for the seed establishment period. When there is more than one seed establishment period, the boundaries of the seeded area covered for each period shall be described. The seed establishment period shall be modified for inclement weather, shut down periods, or for separate completion dates of areas.

3.8.2 Satisfactory Stand of Plants

Plants shall be evaluated for species and health when the plants are a minimum of 1 inch high. A satisfactory stand of plants from the seeding operation shall be a minimum 20 plants per square foot. Bare spots shall be a maximum 6 inches square. The total bare spots shall be a maximum 2 percent of the total seeded area.

3.8.3 Maintenance During Establishment Period

Maintenance of the seeded areas shall include eradicating weeds, insects and diseases; protecting embankments and ditches from surface erosion; maintaining erosion control materials and mulch; protecting installed areas from traffic; mowing; watering; and post-fertilization.

3.8.3.1 Post-Fertilization

A maximum of 0.5 pound of actual available nitrogen per 1,000 square feet shall be provided to the plants. The application shall be timed prior to the advent of winter dormancy and shall be made without burning the installed plants.

3.8.3.2 Herbivory Control

Measures shall be taken during the establishment period to prevent excessive herbivory of the seed and establishing plants.

3.8.3.3 Repair or Reinstall

Unsatisfactory stand of plants and mulch shall be repaired or reinstalled, and eroded areas shall be repaired in accordance with Paragraph 3.2 herein.

3.8.3.4 Maintenance Record

A record of each site visit shall be furnished, describing the maintenance work performed; areas repaired or reinstalled, and diagnosis for unsatisfactory stand of grass plants.

3.9 FINAL ACCEPTANCE

At the end of the Seed Establishment Period, a final inspection will be made. Final acceptance of the turf will be based upon a satisfactory stand of turf as defined in Paragraph 3.8, SEED ESTABLISHMENT PERIOD. Rejected areas shall be replanted or repaired as directed by the EPA’s Representative, at the Contractor’s expense.

END OF SECTION

SECTION 02955

FRESHWATER WETLAND RESTORATION

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 Freshwater Wetland Restoration refers to those areas identified on the Contract Drawings to be restored as Forested Wetland and Freshwater Emergent Wetland. The terms “freshwater wetlands” or “wetlands” when used herein shall refer to all wetlands except the Brackish Marsh as indicated on the Contract Drawings. Wetland restoration is required for wetlands altered by construction activities and if the Contractor infringes upon freshwater wetland areas beyond the identified limit of work.

1.1.2 Furnish all labor, materials, equipment and incidentals required to install erosion control measures, place organic rich loam, finish grade, apply soil amendments, install plant stock, apply seed and maintain the restoration areas as specified herein and depicted on the Contract Drawings.

1.1.3 Restore all freshwater wetland areas (forested wetlands and freshwater emergent wetlands) that are indicated to be restored or are temporarily altered by construction activities including herbicide application, clearing, excavation, and trenching of freshwater wetlands during the course of construction to equal or better than that condition which existed previous to construction. At a minimum, freshwater wetland restoration areas shall achieve 75% cover by native wetland plant species one year after construction. All restoration work shall be as indicated.

1.1.4 The work includes:

1.1.4.1 Supply organic-rich loam as specified in Paragraph 2.1 for all freshwater wetland restoration areas.

1.1.4.2 Grade all freshwater wetland areas to match pre-construction grades or as depicted on the Contract Drawings.

1.1.4.3 Excavate planting pits.

1.1.4.4 Furnish and plant trees, shrubs, and ground cover.

1.1.4.5 Prune plant materials as specified.

1.1.4.6 Furnish and sow wetland area seed mix.

1.1.4.7 Install and maintain deer fencing around forested wetland restoration areas and freshwater emergent restoration areas to ensure survival of plants and seedlings. Install additional herbivore deterrents as needed during Maintenance and Monitoring periods to prevent damage by other wildlife (such as geese, muskrats, moles, and other animals). Fencing shall be maintained until the end of 5-year Monitoring Period.

1.1.4.8 Maintenance.

1.1.4.9 Final cleanup and all other work required to complete the requirements of this section.

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. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z60.1 American Standard for Nursery Stock

UNITED STATES COMPOSTING COUNCIL (USCC)

TMECC Test Method for the Examination of Composting and Compost

INTERNATIONAL SOCIETY OF ARBORICULTURE (ISA)

ISA Tree and Shrub Transplanting Manual

UNITED STATES DEPARTMENT OF AGRICULTURE (USDA) PLANTS DATABASE

USDA DATABASE The PLANTS Database (<http://plants.usda.gov>). National Plant Data Team, Greensboro, NC 27401-4901 USA.

UNITED STATES ARMY CORPS OF ENGINEERS TECHNICAL REPORTS (TR)

TR-Y-87-1 Corps of Engineers Wetlands Delineation Manual

U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER ENVIRONMENTAL LABORATORY (ERDC/EL) TECHNICAL REPORTS (TR)

ERDC/EL TR-10-20 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Plain Region (Version 2.0)

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION (NJDEP)

NJDEP CHECKLIST NJDEP Mitigation Project Monitoring Reports Checklist for Completeness (dated January 2, 2013), or more recent NJDEP checklists as appropriate and as approved by NJDEP for use on this project.

1.3 SUBMITTALS

Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals with an “FIO” designation are for information only. The Contractor shall submit the following to the EPA’s Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.

1.3.1 Wetland Restoration Plan; Pre-Construction Submittals; EA

The Contractor shall submit a Wetland Restoration Plan at least 90 calendar days prior to the start of planting. No wetland restoration work shall be performed until the Wetland Restoration Plan is approved. At a minimum, the Plan shall include all elements listed below:

- 1.3.1.1 Planting schedule tied into the overall construction schedule.
- 1.3.1.2 Personnel requirements.
- 1.3.1.3 Planting stock (type, size, quantity) based on the Contract Documents, along with the name, address and contact phone number of the nursery/nurseries supplying the plant materials.
- 1.3.1.4 Figure showing planting locations of individual trees, shrubs, and ground cover plantings.
- 1.3.1.5 Nursery sources.
- 1.3.1.6 Wetland seed mixtures: sources and specifications.
- 1.3.1.7 Deer and goose deterrent manufacturer and proposed installation layout and procedures.
- 1.3.1.8 Maintenance plan and schedule for the wetland maintenance period.
- 1.3.1.9 Wetland Monitoring Plan, as specified herein.
- 1.3.1.10 Delivery schedule of plants and seed for the wetland restoration.

1.3.1.11 Calendar time period for the wetland plant and seed establishment periods. When there is more than one establishment period, the boundaries of the planted areas covered for each period shall be described.

1.3.1.12 Herbivory Control Plan (if needed)

If additional herbivory control products are needed beyond the deer fence to prevent damage, submit a description of the proposed product(s), vendor specifications, and plan for implementation.

1.3.2 Material Samples; Samples; EA

Samples of all materials to be used in the wetland restoration shall be submitted for inspection and approval upon the EPA’s Representative’s request.

1.3.3 State Nursery Inspection Certificates and Samples; Certificates; EA

State Nursery Inspection Certificates and samples of material for all wetland plantings shall be submitted for inspection and approval.

1.3.4 Plant Stock Certifications; Certificates; FIO

Certification by the landscaping contractor that all wetland plant stock obtained for this Work is the plant indicated and of quality as specified.

1.3.5 Wetland Scientist Certification; Certificates; EA

Documentation showing the certification of the proposed Wetland Scientist assigned to the project has at least 5 years of experience designing and/or monitoring wetland restoration and replication projects.

1.3.6 Maintenance Instructions; Operation and Maintenance Data; EA

Complete written instructions to maintain the wetland plants, seeded areas, and restoration materials, for EPA’s Representative use after the Contractor’s one-year maintenance period expires.

1.3.7 Wetland Restoration Inspection Reports; Operation and Maintenance Data; EA

Complete and submit Wetland Restoration Inspection Reports, as specified in Paragraph 3.9.5.

1.3.8 Wetland Restoration Monitoring Reports; Operation and Maintenance Data; EA

Complete and submit Wetland Restoration Monitoring Reports during the 5-year monitoring period, as specified in Paragraph 3.9.6.

1.4 CERTIFIED WETLAND SCIENTIST

The Contractor shall provide the services of a Wetland Scientist (WS) to supervise wetland restoration work.

1.5 PERMITS

The Contractor shall be responsible for complying with all requirements of permits from NJDEP Division of Land Use Regulation (DLUR), including, but not limited to, the Freshwater Wetlands General Permit 4 and Coastal General Permit 11 and any others applicable permits. EPA will obtain freshwater and coastal wetlands permits and will provide them to the Contractor.

PART 2 PRODUCTS

Restoration of the freshwater wetlands shall include the following material product specifications for the freshwater wetland topsoil, plantings, seeding, mulch, and deer fencing.

2.1 WETLAND TOPSOIL - ORGANIC RICH LOAM

2.1.1 Organic rich loam and any amendments used therein shall be tested to ensure they are free from chemical and radiological contamination as specified in SECTION 01450 - CHEMICAL DATA QUALITY CONTROL.

2.1.2 Organic rich loam shall be used as topsoil to achieve final contours in the freshwater wetland restoration zones. The final grades shall be achieved using 1 foot of organic rich loam in all wetland areas. Organic rich loam shall be friable and capable of promoting and supporting healthy plant growth when mixed with soil conditioners as specified. Organic rich loam shall be manufactured by mixing loam and organic amendments for loam, as specified, to raise the organic content to between 12 percent and 14 percent (per the NJDEP minimum requirement of 12 percent). If manufactured topsoil is used, it must meet the requirements specified by the NJDEP Mitigation Project Monitoring Reports Checklist for Completeness (dated January 2, 2013), or more recent NJDEP checklists as appropriate and as approved by NJDEP for use on this project.

2.1.3 Loam shall be imported material free of slag, stones 1-inch or greater in largest dimension, plants or their roots, sticks, clay clods, toxic substances or any material harmful to plant growth.

2.1.4 Organic rich loam for use in the forested wetlands shall be classified as a sandy loam (with no more than 70% sand), loam, or sandy clay loam, using the following USDA textural classification system based on the percentage of clay (<0.002 mm), silt (0.05 to 0.002 mm) and sand (2 mm-0.05 mm) in the fine earth fraction. Mineral soil content above 2 mm shall be less than 10 percent. This loam composition shall also be used for brackish marsh restoration in accordance with SECTION 02957 - BRACKISH MARSH RESTORATION.

Texture	% Sand	% Silt	% Clay
Sandy Loam	43-70	0-50	0-20
Loam	23-52	28-50	7-27
Sandy Clay Loam	45-80	0-28	20-35

2.1.5 Organic rich loam for use in the freshwater emergent wetlands shall be loam or sandy clay loam using the following USDA textural classification system based on the percentage of clay (<0.002 mm), silt (0.05 to 0.002 mm) and sand (2 mm-0.05 mm) in the fine earth fraction. Mineral soil content above 2 mm shall be less than 10 percent.

Texture	% Sand	% Silt	% Clay
Loam	23-52	28-50	7-27
Sandy Clay Loam	45-80	0-28	20-35

2.1.6 The organic matter content for organic rich loam shall be by weight as determined by loss on ignition of moisture free test samples oven dried to a constant weight at a temperature of 100 degrees Centigrade. To adjust organic matter content, the loam may be amended with organic amendments.

2.1.7 Organic rich loam shall have a pH between 5.5 and 7.5

2.1.8 Soluble salts shall not be greater than 160 ppm.

2.1.9 Organic amendments for loam

2.1.9.1 Compost material may be used as an organic amendment. The compost shall be a stable, humus-like material produced from the aerobic decomposition of organic residues. The residues may include biosolids as well as yard wastes and agricultural wastes. The compost shall be of a dark brown to black color and be capable of supporting plant growth. The composted material shall have been stabilized so as not to have an unpleasant odor. An organic amendment not stabilized as specified herein and having an objectionable odor will be rejected.

2.1.9.2 The compost moisture content shall be such that no visible free water or dust is produced when handling it and the carbon:nitrogen ratio shall be in the range of 11:1 to 15:1.

2.1.9.3 Stability must be assessed by a respirometry test or Solvita test. Protocols for the respirometry test are specified in USCC TMECC 05.08-B. For the respirometry test, the compost respiration shall be no more than 2 milligrams CO₂-C/gram organic matter/day. For the Solvita test, compost must have a minimum Solvita maturity index of 7. Compost that does not meet one of these criteria shall not be used.

2.1.9.4 The compost shall contain at least 40 percent organic matter (dry weight) and 100 percent of the material should pass a 3/8-inch (or smaller) sieve. Debris, such as metal, glass, plastic, wood (other than residual chips), asphalt or masonry, is not acceptable and compost containing such material will be rejected.

2.2 PLANT MATERIALS

2.2.1 Trees, shrubs, and herbaceous plants shall be as indicated on the plant schedule presented on the Contract Drawings. Purple Loosestrife, reed canary grass, *Phragmites*, or any other species listed in the NJDEP Checklist shall not be planted in any of the wetland areas. Any proposed substitutions, if needed due to lack of availability, must be native to the region of the Site. If practicable, plant material shall be sourced from within a 150-mile radius of the planting site and grown within the 6A to 7B (inclusive) USDA Hardiness Zones. If practicable, plant material shall also be sourced from US EPA Ecoregion 84C (Barrier Islands – Coastal Marshes) or Ecoregion 84D (Inner Coastal Plain) as mapped at <https://www.epa.gov/ecoresearch/ecoregion-download-files-state-region-2#pane-28>. If material cannot be sourced from these areas, then it shall be sourced from as close to the Site as practicable. Plants shall be nursery grown under climatic conditions similar to those in the locality of the Site and shall conform to the variety and sizes indicated. Plants shall conform also to the indicated botanical names and standards of size, culture and quality for the highest grades and standards as adopted in ANSI Z60.1.

2.2.2 All plants shall be container grown or dug for this project. Plants shall be dug with firm natural balls of earth, of sufficient diameter and depth to include most of the fibrous roots and conforming to the standards of ANSI Z60.1. No heeled in plants or plants from cold storage shall be used. Plants shall be healthy and vigorous, well branched and densely foliated when in leaf; shall be free of disease, insect pests, eggs or larvae and shall have healthy, well developed root systems. All parts of the plant shall be moist and shall show active green cambium when cut to demonstrate plants are healthy and vigorous.

2.2.3 The height or caliper of trees shall not be less than the minimum size indicated on the Contract Drawings. The trunk of each tree shall be a single trunk growing from a single un-mutilated crown of roots. No part of the trunk shall be conspicuously crooked as compared with normal trees of the same variety. The trunk shall be free from sun scald, frost cracks, or wounds resulting from abrasions, fire, or other causes. No pruning wounds shall be present having a diameter of more than 2 inches and such wounds must show vigorous bark on all edges.

2.2.4 Container-Grown Stock shall have been grown in a container long enough for the root system to have developed sufficiently to hold its soil together, firm, and whole. No plants shall be loose in the container.

2.2.5 Balled and burlapped stock shall be dug with a firm natural ball of earth in which the stock is grown and then wrapped and tied according to ANSI Z60.1. Balls shall be drum laced for sizes 30-inch or greater. Ball size shall be in accordance with ANSI Z60.1 for the tree type and size.

2.2.6 If larger plants are used, the spread of roots or ball of earth shall be increased in proportion to the size of the plant.

2.2.7 All plant stock shall be labeled by common name and botanical name and certified as the correct species by the plant supplier, and conform with the stock indicated in the Contract Documents and the Contractor's approved Wetland Restoration Plan.

2.2.8 Inspection of plant materials

2.2.8.1 Plants shall be inspected by the WS before digging.

2.2.8.2 Plants may also be inspected and approved by the EPA's Representative upon delivery for conformance to specified requirements as to quality, size and variety. Such approval shall not impair the right of inspection and rejection during the progress of the Work.

2.2.8.3 Plants shall be accompanied by State Nursery inspection certificates.

2.2.8.4 No plants will be accepted with plastic wrap or if the ball is cracked or broken.

2.3 FRESHWATER WETLAND SEED

2.3.1 Freshwater wetland seed shall be received in the manufacturer's original unopened container bearing the date of the last germination test, which date shall be within a period of six months prior to commencement of seeding operations. Seed shall be from same or previous year's crop; each variety of seed shall have a purity of not less than 85 percent, a percentage of germination not less than 90 percent, shall have a weed content of not more than 1 percent and contain no noxious weeds. The wetland seed mixture for freshwater wetland restoration areas shall be as shown on the Contract Drawings.

2.3.2 Any proposed substitutions, if needed due to lack of availability, must be native to the region of the Site. If practicable, seed shall be sourced from within a 150-mile radius of the planting site and grown within the 6A to 7B (inclusive) USDA Hardiness Zones. If practicable, seed shall also be sourced from US EPA Ecoregion 84C (Barrier Islands - Coastal Marshes) or Ecoregion 84D (Inner Coastal Plain) as mapped at <https://www.epa.gov/eco-research/ecoregion-download-files-state-region-2#pane-28>. If seed cannot be sourced from these areas, then it shall be sourced from as close to the Site as practicable.

2.3.3 The seed mix shall contain none of the following:

- Reed Canary grass (*Phalaris arundinacea*)
- Common Reed (*Phragmites australis*)
- Purple Loosestrife (*Lythrum salicaria*)
- Any invasive species listed in the NJDEP Checklist

2.3.4 The seed shall be furnished and delivered premixed. A manufacturer's certificate of compliance to the specified mixes shall be submitted by the manufacturer for each seed type. These certificates shall include the guaranteed percentages of purity, weed content and germination of the seed and also the net weight and date of shipment. No seed may be sown until the certificates have been submitted and approved.

2.4 ORGANIC MULCH

Organic mulch shall be used at the base of planted trees and shrubs. Organic mulch materials shall be native to the region and consist of recycled mulch, shredded bark, wood chips, or ground bark. Mulch shall be free from weeds, mold, and other deleterious materials. Mulch from diseased vegetation may not be used. Mulch from vegetation infested with emerald ash borer (*Agrilus planipennis*), southern pine beetle (*Dendroctonus frontalis*), or any other exotic insect pest may not be used.

PART 3 EXECUTION

3.1 GENERAL

3.1.1 The Contractor shall restore all disturbed freshwater wetland areas. Freshwater wetland restoration shall include restoring disturbed freshwater wetland areas to pre-construction contours or as indicated on the Contract Drawings, placement of organic rich loam topsoil to restore final grades to pre-construction condition; application of soil amendments as necessary to meet freshwater wetland topsoil organic matter content specifications, the planting of trees, shrubs, and ground cover as shown on the Contract Drawings, the application of wetland seed mix throughout the disturbed freshwater wetland area, maintenance of the wetland restoration for one year at no cost to the Government, and monitoring and maintenance for the 5-year monitoring period as required by NJDEP permits.

3.1.2 After contaminated soil removal is completed, the subgrade will be restored with clean fill to 1 foot below final grades in accordance with SECTION 02201 - BACKFILL, COMPACTION, AND GRADING. The subgrade shall be restored such that a minimum of 12 inches of organic rich loam may be placed without exceeding existing grades or as indicated in the Contract Drawings, where final grades differ from existing grades. The clean backfill subgrade shall be covered by temporary erosion cover netting if it will remain exposed for 7 or more consecutive days to prevent subgrade erosion prior to topsoil placement and the finished grade establishment, in accordance with SECTION 02370 - EROSION CONTROL AND STORMWATER MANAGEMENT.

3.1.3 All restored freshwater wetland areas altered during construction shall be temporarily stabilized as specified in SECTION 02370 - EROSION CONTROL AND STORMWATER MANAGEMENT.

3.1.4 The Contractor shall not utilize equipment in the freshwater wetland area that will damage any final restored surfaces.

3.2 WETLAND TOPSOIL PLACEMENT

3.2.1 The finished grade shall be established using organic rich loam as specified in Paragraph 2.1 above.

3.2.2 Prior to placing organic rich loam, biodegradable temporary erosion cover netting and any other biodegradable erosion control materials shall be thoroughly incorporated into the subgrade by discing. Non-biodegradable erosion control materials, including photodegradable materials, shall be removed from all wetland restoration areas.

3.2.3 Finished areas shall be rolled with a hand roller weighing not more than 100 pounds per foot of width and then raked smooth. The finish grades shall match pre-construction contours except as shown on the Contract Drawings and transition smoothly to the surrounding undisturbed wetland and/or upland contours with a maximum vertical:horizontal slope of 1:3. The loam shall be placed over prepared areas so that after natural settlement and light rolling, the completed work shall conform said pre-construction contours.

3.2.4 No organic rich loam shall be spread in water or while frozen or muddy.

3.2.5 After organic rich loam has been spread, it shall be prepared by scarifying or harrowing and hand raking. Remove and dispose of all stiff clods, lumps, roots, litter, and other foreign material. The area shall also be free of stones 1-inch or greater in largest dimension.

3.2.6 Previously established grades (such as in areas where work has been completed) shall be maintained in a true and even condition throughout the wetland restoration process.

3.3 FRESHWATER WETLAND PLANTING AND SEEDING SCHEDULE

3.3.1 Planting or seeding shall be done within ten days following freshwater wetland topsoil placement, unless otherwise approved by the EPA's Representative.

3.3.2 Submit schedules to the EPA's Representative for approval 30 days prior to freshwater wetland planting and seeding. The restoration areas will be planted and seeded as follows unless otherwise approved by the EPA's Representative: Forested wetlands shall be planted and seeded between March 30 and June 15 or September 15 to November 30. Freshwater emergent wetlands shall be planted and seeded between April 30 and June 15. Planting or seeding of any wetland area during the dry season between June 15 and September 15 will require EPA's Representative approval and additional watering and irrigation as necessary. In all cases, herbaceous material must be planted at least 30 days before the average first frost date of October 15. Hydroseed and straw mulch shall not be applied when weather conditions prevent installation at specified coverages.

3.3.3 Planting and seeding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the planting and seeding operations, proposed alternate times shall be submitted for approval.

3.4 FRESHWATER WETLAND PLANTING

3.4.1 After final grades are established, the Contractor shall plant trees, shrubs, and ground cover, throughout the Forested Wetland and Freshwater Emergent Wetland areas as indicated on the Contract Drawings.

3.4.2 The Contractor shall also randomly place twelve salvaged tree trunks 12 or more inches in diameter from the clearing operations, which are greater than 8 feet long, throughout the freshwater wetland restoration areas for the purposes of habitat restoration. Salvaged tree trunks shall be tested and comply with the requirements of SECTION 01450 - CHEMICAL DATA QUALITY CONTROL.

3.4.3 Stake out locations as indicated and secure the EPA's Representative's approval before excavating tree and shrub pits.

3.4.4 Plants which cannot be planted immediately upon delivery shall be set on the ground and be protected with soil, bark mulch, or other acceptable material. Roots or balls of plants shall be protected at all times from sun and from drying winds.

3.4.5 No plant shall be bound with wire or rope at any time so as to damage the bark or break branches. All bounding materials (burlap, twine, etc.) shall be removed from the plants prior to planting and disposed of off site. Remove and dispose of any containers prior to planting.

3.4.6 All plant pits shall be excavated with sloped sides. Plant pits shall be three times as wide as the rootball with sloped sides and sufficiently deep to allow for the rootball to sit directly upon undisturbed soil. Backfill material for all pits shall consist of the existing material (loam) as excavated from the pit.

3.4.7 To encourage immediate root development, the outer one-half inch of the root ball shall be gently loosened.

3.4.8 Plants shall be set in center of pits plumb and straight and at such a level that after settlement, the crown of the plant ball will be at the surrounding finished grade.

3.4.9 When balled and burlapped plants are set, loam shall be tamped lightly. Loam shall not be packed so firmly as to drive out all the fine air spaces needed for a well aerated soil. All burlap, ropes or wires shall be removed from root balls.

3.4.10 Loam shall be backfilled within planting pits in layers of not more than 9-inches and each layer shall be watered sufficiently to settle before the next layer is put in place.

3.4.11 To complete backfilling, ensure that trunk flare is completely exposed and that the top of the rootball is not covered with loam. Immediately after the plant pit is backfilled, a saucer or shallow basin slightly larger than pit shall be formed with a ridge of soil to facilitate and contain watering.

3.4.12 When shrubs are set, loam shall be tamped lightly. Loam shall not be packed so firmly as to drive out all the fine air spaces needed for a well aerated soil.

3.4.13 Plantings shall be flooded with water twice within the first 24 hours of the time of planting.

3.4.14 While wetland plugs are being distributed in planting beds or are awaiting planting after distribution, the Contractor shall protect the roots from drying out; the means employed shall be satisfactory to the EPA’s Representative. Planting of plugs shall be performed using a hand trowel; dibble bars shall not be used. The Contractor shall excavate planting holes to a depth which will allow the top of the plug soil to be planted even with the surrounding ground surface. Care shall be taken to firm the soil around the plugs’ roots so as to anchor the plants well, while not compressing the root systems. Care shall be exercised in setting the plants plumb.

3.4.15 After the installation of plant plugs is completed in the freshwater emergent wetland restoration area, install deer fencing to surround the area per the Wetland Restoration Plan submitted per Paragraph 1.3.1.

3.4.16 After the installation of trees and shrubs in the forested wetland restoration areas is completed, install deer fencing to surround the areas per the Wetland Restoration Plan submitted per Paragraph 1.3.1.

3.5 FRESHWATER WETLAND SEEDING

3.5.1 After planting is completed in the forested wetlands and freshwater emergent wetlands, the areas shall be stabilized with the Forested Wetland and Freshwater Emergent Wetland Seed Mix as indicated on the Contract Drawings. The seed shall meet all standards of purity and packaging requirements as specified above. Seed shall be spread at the rate indicated on the Contract Drawings.

3.5.2 Prior to seeding, the freshwater wetland seeded areas shall be prepared by scarifying or harrowing the wetland topsoil surface by hand raking.

3.5.3 Seed application may be accomplished by broadcast seeding or hydroseeding. Seeding procedure shall ensure even coverage. Gravity feed applicators, which drop seed directly from a hopper onto the prepared soil, shall not be used because of the difficulty in achieving even coverage, unless otherwise approved. Tar tack shall not be used in the wetlands.

3.5.4 If broadcast seeding is used, seed shall be uniformly spread by broadcasting half the total rate of seed application in one (1) direction, and then broadcasting the remainder of the seed at 90 degrees from the first direction. The entire area shall then be firmed with a roller not exceeding 90 pounds per foot of roller width. Steep slopes shall not be rolled.

3.5.5 If hydroseeding is used, then the seed and fertilizer shall be added to water and thoroughly mixed. The time period for the seed to be held in the slurry shall be a maximum 24

hours. Slurry shall be uniformly applied under pressure over the entire area. The hydroseeded area shall not be rolled. Wood cellulose fiber, paper fiber, or recycled paper shall be applied as part of the hydroseeding operation, in accordance with the manufacturer’s recommendations.

3.5.6 After the Forested Wetland and Freshwater Emergent Wetland Seed Mix has been applied to the forested wetland restoration areas, overseed the forested wetland restoration areas with the Forested Wetland Tree and Shrub Seed Mix at the rate specified on the Contract Drawings. The Forested Wetland Tree and Shrub Seed Mix may be broadcast by hand so long as even coverage can be achieved.

3.5.7 After seeding for the Forested Wetland areas has occurred, install a minimum of a 3-inch thick layer of wood mulch in a 3-foot radius under each tree and shrub.

3.5.8 Any washouts which occur shall be regraded and reseeded until a stabilized slope is established.

3.6 PRUNING

3.6.1 Each plant shall be pruned at the time of planting in accordance with ISA Standards.

3.6.2 Pruning shall be done with clean, sharp tools.

3.7 WATERING

3.7.1 The Contractor shall water the freshwater wetland plantings and seed as necessary for establishment during the wetland maintenance period, in accordance with their approved Wetland Restoration Plan.

3.7.2 Watering shall be started immediately after completing the seeding of an area. Water shall be applied to supplement rainfall at a rate sufficient to ensure moist soil conditions to a minimum depth of 1 inch. Run-off shall be prevented. Watering trucks shall not be driven in the marsh, unless otherwise directed by the EPA’s Representative.

3.7.3 Irrigation water for planting and maintenance shall be provided by the Contractor and shall be free from contaminants or any ingredients harmful to plant life. The Contractor shall furnish his/her own equipment, hoses, connections, or other watering equipment. Water from the surrounding wetlands or open water areas may not be used for irrigation.

3.8 WETLAND MAINTENANCE PERIOD

3.8.1 The Contractor shall perform maintenance of the restored wetland areas, including deer fencing, goose fencing and other herbivory control devices (if installed) beginning immediately after areas are planted and seeded, and continuing for a period of five calendar years following the last wetland planting date. Maintenance within one calendar year of the last wetland planting date (the initial maintenance period) shall be at no additional cost to the Government. If areas of the wetland restoration require replanting due to failure during the

initial maintenance period, the initial maintenance period shall be extended for those areas to one calendar year following replanting. Replanting of failed areas shall be performed as specified herein.

3.8.2 The Contractor shall provide at least 75 percent cover of all disturbed wetland areas (evenly distributed cover throughout the disturbed areas) with indigenous wetland plant species within the initial one year maintenance period. Bare spots may not be larger than 10 square feet. Areas not achieving the above requirement within the initial maintenance period shall be renovated at no additional cost to the Government.

3.8.3 The Contractor shall ensure that the restored wetland areas shall continue to develop such that they will achieve at least 85 percent cover (when all strata are combined) by the end of the 5-year monitoring period or as required by NJDEP, with bare spots no larger than 10 square feet. The contractor shall ensure a survival rate of 90 percent for trees and 80 percent for shrubs at the end of the 5-year monitoring period.

3.8.4 The growing season for wetlands restoration areas shall be between April 30 and October 15. The initial wetland maintenance period shall encompass at least one complete growing season.

3.8.5 Maintenance shall be monitored and measured by the inspections specified below. If required, corrective measures shall include reseeding, additional plantings, removal of any dead plants and replacement with new plants, additional watering, additional controls for herbivory, or other measures as deemed necessary by the EPA’s Representative.

3.8.6 Deer exclusion fencing, goose fencing and other herbivory management structures (if installed) shall be maintained for 5 years or as long as the NJDEP monitoring requirement. Maintenance within the initial maintenance period shall be at no additional cost to the Government.

3.8.7 Plants damaged by wildlife, insects, disease, or natural events shall be replaced as needed during the five-year monitoring period. Any replacement during the initial maintenance period shall be at no additional cost to the Government.

3.8.8 The Contractor shall provide a long-term maintenance plan for maintenance beyond the initial maintenance period, at no additional cost to the Government.

3.9 INSPECTIONS

3.9.1 Wetland Monitoring Plan

3.9.1.1 The Contractor’s WS shall develop a Wetland Monitoring Plan that will be part of the Contractor’s Wetland Restoration Plan submittal. The Wetland Monitoring Plan shall be implemented by the Contractor for both the initial maintenance period and the 5-year monitoring period and shall be utilized during the site inspections specified below. The plan shall include all requirements of the NJDEP Mitigation Project Monitoring Reports Checklist for

Completeness (dated January 2, 2013), or more recent NJDEP checklists as appropriate and as approved by NJDEP for use on this project. The plan shall include specific success criteria for each of the five monitoring years in order to meet requirements specified herein.

3.9.1.2 The Wetland Monitoring Plan shall focus on obtaining both qualitative and quantitative data on the plant community and documenting the establishment of wetland hydrology during the growing season, development of hydric soil characteristics, and a wetland plant community. Reporting requirements shall be included to keep project personnel and regulatory agencies informed of progress and/or problems. The plan shall also include provisions for implementing remedial actions, if necessary, and any long-term site management recommendations.

3.9.1.3 As part of the Wetland Monitoring Plan, monitoring stations will be established within the wetland restoration area as shown on the Contract Drawings. Additional monitoring stations shall be added if so directed by the EPA’s Representative.

3.9.1.4 The monitoring stations shall be permanently marked and photographed facing the cardinal compass directions from the fixed point shall be taken prior to commencement of site preparation. Following completion of grading and planting, and for each of the three inspection events specified below during the monitoring period, photographs shall be taken facing the cardinal compass points from the fixed monitoring point and for each photo the inspector shall note the date, time, weather, and relevant observations.

3.9.1.5 During each of the inspections specified below, the Contractor’s WS and EPA’s Representative shall inspect the permanent wetland monitoring stations in detail, as well as perform a more general inspection of the entire wetland restoration area. Within the monitoring stations, the concentric plant sampling protocol established by USACE and described in TR-Y-87-1 shall be followed to document: the species present and their occurrence within the wetland restoration area; field indicators of hydric soil development or lack thereof; and hydrology. Qualitative assessments shall include visual inspections of the condition of the planting efforts and natural re-colonization, hydrologic conditions, document any colonization by non-native invasive species including but not limited to *Phragmites australis*, and observations of wildlife use for each monitoring station.

3.9.1.6 During each of the inspections specified below, the condition of the deer fencing shall be examined and recommendations for maintenance or adjustments made as needed.

3.9.2 Initial Inspection

3.9.2.1 After areas are planted and seeded, the Contractor and Contractor’s WS shall request an “Initial Inspection” of the wetland restoration areas by the EPA’s Representative. The Contractor shall notify all parties of the inspection date with written request at least 10 days prior to the anticipated inspection date. The EPA’s Representative and Contractor’s WS will inspect the wetland restoration areas, including the permanent monitoring stations, for compliance with the plans and specifications, with regard to the number and quality of plants, plant sizes, species, and location.

3.9.2.2 At the Initial Inspection, areas will be defined by the EPA’s Representative as “approved,” or “not approved.” Areas noted as “approved” shall have sufficient planting coverage and quality of live, native plants. Areas noted as “not approved” are subject to immediate correction by the Contractor. Any and all corrective work identified during the inspection shall be performed until acceptance by the EPA’s Representative, at no additional cost to the Government.

3.9.3 Interim Inspection

3.9.3.1 Approximately 3 months following the Initial Inspection, the EPA’s Representative and the Contractor’s WS will perform an “Interim Inspection” of the overall wetland restoration area and the permanent monitoring stations. The Contractor shall notify all parties of the inspection date with written request at least 10 days prior to the anticipated inspection date. The EPA’s Representative and Contractor’s WS will inspect said Work for vitality and compliance with the 75 percent coverage requirement and the requirements of Paragraph 3.9.1.5. If it is evident in the opinion of the EPA’s Representative that it is unlikely that the 75 percent re-establishment requirements will be achieved, the Contractor shall immediately supplement the plantings as necessary to achieve the required coverage. If appropriate, a delay in planting may occur with the approval of the EPA’s Representative in order to plant during favorable planting times as indicated in Paragraph 3.3. Any and all corrective Work identified during the inspection shall be performed until acceptance by the EPA’s Representative, at no additional cost to the Government.

3.9.4 Final Inspection

3.9.4.1 At the conclusion of the Contractor’s initial maintenance period, the EPA’s Representative and the Contractor’s WS will perform a “Final Inspection” of the wetland restoration areas and the permanent monitoring stations. The Contractor shall notify all parties of the inspection date with written request at least 10 days prior to the anticipated inspection date. The EPA’s Representative and Contractor’s WS will inspect said Work for vitality and compliance with the 75 percent coverage requirement and the requirements of Paragraph 3.9.1.5. If one year after planting, 75 percent re-establishment has not been achieved, the Contractor shall provide and plant additional trees, shrubs, and ground cover as directed by the EPA’s Representative, at no additional cost to the Government. Planting of such materials shall take place during the times as indicated in Paragraph 3.3. The maintenance and inspection period for these replanted areas shall continue for one additional year following replanting.

3.9.5 Wetland Restoration Inspection Reports

3.9.5.1 Complete and submit three inspection reports no later than 30 days following the Initial, Interim, and Final wetland inspections, summarizing the findings of the inspections, any deficiencies noted by the EPA’s Representative, and the corrective actions taken to address the issue. The monitoring reports shall follow the requirements of the NJDEP Mitigation Project Monitoring Reports Checklist for Completeness (dated January 2, 2013), or more recent NJDEP checklists as appropriate and as approved by NJDEP for use on this project. Items to be

included in the monitoring report include, but are not limited to, documentation forms, photographs of the monitoring stations facing the cardinal compass points, additional photographs as necessary to document site conditions, a narrative summary of the inspection findings, and records for each maintenance visit performed.

3.9.6 Five-Year Monitoring and Reporting

3.9.6.1 After the initial maintenance period of 1 year, monitoring shall continue for the entire 5-year monitoring period as required by NJDEP. Monitoring shall be performed in accordance with the approved Wetland Monitoring Plan as described in Paragraph 3.9.1. Monitoring shall occur twice yearly, in the early spring and fall. Monitoring reports shall be prepared in accordance with the Wetland Monitoring Plan and the NJDEP Mitigation Project Monitoring Reports Checklist for Completeness (dated January 2, 2013), or more recent NJDEP checklists as appropriate and as approved by NJDEP for use on this project. Monitoring reports shall include a description of areas that require maintenance including but not limited to failed plant material, herbivory, erosion, establishment of invasive species, and damaged deer fencing as well as recommendations for remedying such areas. The monitoring report shall also include a discussion of the likelihood that the restored wetlands will meet the 5-year coverage requirements as outlined in Paragraph 3.8.3.

3.10 WARRANTY

All plantings used on the Site, including trees, shrubs, and ground cover, shall come furnished with a minimum one-year material warranty from the date of purchase, such that the plantings are free of disease, sickness, defects or deficiencies that would prevent establishment. Plant and seed installation shall be warranted by the Contractor as specified in Paragraphs 3.4 and 3.5, and the plant establishment and survival shall be warranted by the Contractor as specified in Paragraph 3.8.

END OF SECTION

SECTION 02957

BRACKISH MARSH RESTORATION

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 Brackish Marsh Restoration refers to the brackish marsh restoration areas depicted on the Contract Drawings. These areas shall be referred to herein as “brackish marsh” or “marsh.” Brackish marsh restoration is required for alterations of existing herbaceous marsh as indicated in the Contract Drawings and if the Contractor infringes upon such marsh areas beyond the identified limit of work. Plants and seed specified are intended to provide a native brackish marsh habitat ranging from 1.0 to 8.0 parts per thousand salinity under normal circumstances, and to be resilient to temporary higher salinities during extreme high tides and storms.

1.1.2 Furnish all labor, materials, equipment and incidentals required to install erosion control measures, place organic rich loam, finish grade, apply soil amendments, install plant stock, apply seed, construct goose deterrent, and maintain the restoration areas as specified herein and depicted on the Contract Drawings.

1.1.3 Restore all brackish marsh areas that are indicated to be restored or are temporarily altered by construction activities including herbicide application, clearing, excavation, and trenching of marshes during the course of construction to equal or better than that condition which existed previous to construction. At a minimum, brackish marsh restoration areas shall achieve 75% cover by native wetland plant species one year after construction. All restoration work shall be as indicated.

1.1.4 The work includes:

1.1.4.1 Supply organic-rich loam as specified in Paragraph 2.1 for all brackish marsh restoration areas.

1.1.4.2 Grade all brackish marsh areas to match pre-construction grades.

1.1.4.3 Furnish and install plant plugs.

1.1.4.4 Furnish and sow brackish marsh seed mix.

1.1.4.5 Install and maintain goose deterrent around and within the brackish marsh restoration area to ensure the survival of plants and seedlings. Install additional herbivore deterrents as needed during Maintenance and Monitoring periods to prevent damage by other wildlife (such as muskrats, moles, and other animals). Goose deterrent shall be maintained until the end of the 5-year Monitoring Period, at which time it shall be removed.

1.1.4.6 Final cleanup and all other work required to complete the requirements of this section.

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. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z60.1 American Standard for Nursery Stock

UNITED STATES COMPOSTING COUNCIL (USCC)

TMECC Test Method for the Examination of Composting and Compost

UNITED STATES DEPARTMENT OF AGRICULTURE (USDA) PLANTS DATABASE

USDA DATABASE The PLANTS Database (<http://plants.usda.gov>). National Plant Data Team, Greensboro, NC 27401-4901 USA.

UNITED STATES ARMY CORPS OF ENGINEERS TECHNICAL REPORTS (TR)

TR-Y-87-1 Corps of Engineers Wetlands Delineation Manual

U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER ENVIRONMENTAL LABORATORY (ERDC/EL) TECHNICAL REPORTS (TR)

ERDC/EL TR-10-20 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Plain Region (Version 2.0)

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION (NJDEP)

NJDEP CHECKLIST NJDEP Mitigation Project Monitoring Reports Checklist for Completeness (dated January 2, 2013), or more recent NJDEP checklists as appropriate and as approved by NJDEP for use on this project.

1.3 SUBMITTALS

Refer to SECTION 02955 – FRESHWATER WETLAND RESTORATION.

1.4 CERTIFIED WETLANDS SCIENTIST

Refer to SECTION 02955 – FRESHWATER WETLAND RESTORATION.

1.5 PERMITS

Refer to SECTION 02955 – FRESHWATER WETLAND RESTORATION.

PART 2 PRODUCTS

Restoration of the brackish marsh shall include the following material product specifications for the brackish marsh topsoil, plantings, seeding, mulch, and goose deterrent.

2.1 BRACKISH MARSH TOPSOIL – ORGANIC RICH LOAM

2.1.1 Organic rich loam shall be used as topsoil to achieve final contours in the brackish marsh restoration zones. The final grades shall be achieved using 1 foot of organic rich loam as specified in Paragraph 2.1 of SECTION 02955 - FRESHWATER WETLAND RESTORATION. The loam composition for brackish marsh restoration shall be the sandy loam (with no more than 70% sand), loam, or sandy clay loam specified therein for forested wetland restoration zones.

2.2 PLANT MATERIALS

2.2.1 Herbaceous plants shall be as indicated on the plant schedule presented on the Contract Drawings. Purple Loosestrife, reed canary grass, *Phragmites*, or any other species listed in the NJDEP Checklist shall not be planted in any of the brackish marsh areas. Any proposed substitutions, if needed due to lack of availability, must be native to the region of the Site. If practicable, plant material shall be sourced from within a 150-mile radius of the planting site and grown within the 6A to 7B (inclusive) USDA Hardiness Zones. If practicable, plant material shall also be sourced from US EPA Ecoregion 84C (Barrier Islands – Coastal Marshes) or Ecoregion 84D (Inner Coastal Plain) as mapped at <https://www.epa.gov/eco-research/ecoregion-download-files-state-region-2#pane-28>. If material cannot be sourced from these areas, then it shall be sourced from as close to the Site as practicable. Plants shall be nursery grown under climatic conditions similar to those in the locality of the Site and shall conform to the variety and sizes indicated. Plants shall conform also to the indicated botanical names and standards of size, culture and quality for the highest grades and standards as adopted in ANSI Z60.1.

2.2.2 All plants shall be container grown. No heeled in plants or plants from cold storage shall be used. Plants shall be healthy, vigorous, and densely foliated; shall be free of disease, insect pests, eggs or larvae and shall have healthy, well developed root systems. All parts of the plant shall be moist and shall show active green cambium when cut to demonstrate plants are healthy and vigorous.

2.2.3 Container-Grown Stock shall have been grown in a container long enough for the root system to have developed sufficiently to hold its soil together, firm, and whole. No plants shall be loose in the container.

2.2.4 All plant stock shall be labeled by common name and botanical name and certified as the correct species by the plant supplier, and conform with the stock indicated in the Contract Documents and the Contractor’s approved Wetland Restoration Plan.

2.2.5 Inspection of plant materials

2.2.5.1 Plants shall be inspected by the WS before shipment.

2.2.5.2 Plants may also be inspected and approved by the EPA’s Representative upon delivery for conformance to specified requirements as to quality, size and variety. Such approval shall not impair the right of inspection and rejection during the progress of the Work.

2.2.5.3 Plants shall be accompanied by State Nursery inspection certificates.

2.3 BRACKISH MARSH SEED

2.3.1 Brackish marsh seed shall be received in the manufacturer’s original unopened container bearing the date of the last germination test, which date shall be within a period of six months prior to commencement of seeding operations. Seed shall be from same or previous year’s crop; each variety of seed shall have a purity of not less than 85 percent, a percentage of germination not less than 90 percent, shall have a weed content of not more than 1 percent and contain no noxious weeds. The seed mixture for brackish marsh restoration areas shall be as shown on the Contract Drawings.

2.3.2 Any proposed substitutions, if needed due to lack of availability, must be native to the region of the Site. If practicable, seed shall be sourced from within a 150-mile radius of the planting site and grown within the 6A to 7B (inclusive) USDA Hardiness Zones. If practicable, seed shall also be sourced from US EPA Ecoregion 84C (Barrier Islands – Coastal Marshes) or Ecoregion 84D (Inner Coastal Plain) as mapped at <https://www.epa.gov/eco-research/ecoregion-download-files-state-region-2#pane-28>. If seed cannot be sourced from these areas, then it shall be sourced from as close to the Site as practicable.

2.3.3 The seed mix shall contain none of the following:

- Reed Canary grass (*Phalaris arundinacea*)
- Common Reed (*Phragmites australis*)
- Purple Loosestrife (*Lythrum salicaria*)
- Any invasive species listed in the NJDEP Checklist

2.3.4 The seed shall be furnished and delivered premixed. A manufacturer’s certificate of compliance to the specified mixes shall be submitted by the manufacturer for each seed type. These certificates shall include the guaranteed percentages of purity, weed content and

germination of the seed and also the net weight and date of shipment. No seed may be sown until the certificates have been submitted and approved.

2.4 GOOSE DETERRENT

2.4.1 Goose deterrent shall consist of a combination fence and grid system.

2.4.2 Goose fence shall consist of 48-inch tall polypropylene mesh with an aperture size that will allow the free flow of air and water. Goose fence shall be installed with stakes designed for at least 5 years of water contact and secured with ties that will last a minimum of 5 years. Stakes shall be spaced at a maximum of 50 feet.

2.4.3 The goose grid system shall consist of twine stretched between stakes to achieve a protective grid to prevent geese from landing. Stakes shall be no more than 50 feet apart. The twine shall be marked with Mylar tape spaced at a maximum distance of 25 feet, tied such that each side of squares created within the grid contain two strands of Mylar. Twine, stakes, and Mylar tape shall be of materials that will last for a minimum of 5 years in this application.

PART 3 EXECUTION

3.1 GENERAL

3.1.1 The Contractor shall restore all brackish marsh areas. Brackish marsh restoration shall include restoring disturbed brackish marsh areas to pre-construction contours, placement of organic rich loam topsoil to restore final grades to pre-construction condition; application of soil amendments as necessary to meet brackish marsh topsoil organic matter content specifications, the planting of herbaceous plants as shown on the Contract Drawings, the application of brackish marsh seed mix throughout the disturbed brackish marsh area, and maintenance of the brackish marsh for one year.

3.1.2 Grades in areas that are to be left as open water (as indicated on the Contract Drawings) shall be established such that they will support the restoration of stable pre-construction grades in all brackish marsh restoration areas. If open water excavation depths extend beyond 1 foot below ground surface, these areas shall be backfilled to original, pre-construction grade.

3.1.3 After contaminated soil removal is completed, the subgrade will be restored with clean fill to 1 foot below final grades in accordance with SECTION 02201 – BACKFILL, COMPACTION, AND GRADING. The subgrade shall be restored such that a minimum of 12 inches of organic rich loam may be placed without exceeding existing grades. The clean backfill subgrade shall be covered by temporary erosion cover netting if it will remain exposed for 7 or more consecutive days to prevent subgrade erosion prior to topsoil placement and the finished grade establishment, in accordance with SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT.

3.1.4 All restored brackish marsh areas altered during construction shall be temporarily stabilized as specified in SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT.

3.1.5 The Contractor shall not utilize equipment in the brackish marsh area that will damage any final restored surfaces.

3.2 MARSH TOPSOIL PLACEMENT

Refer to SECTION 02955 – FRESHWATER WETLAND RESTORATION

3.3 BRACKISH MARSH PLANTING AND SEEDING SCHEDULE

3.3.1 Planting or seeding shall be done within ten days following brackish marsh wetland topsoil placement, unless otherwise approved by the EPA’s Representative.

3.3.2 Submit schedules to the EPA’s Representative for approval 30 days prior to brackish marsh planting and seeding. The brackish marsh restoration areas will be planted and seeded between April 30 and June 15 unless otherwise approved by the EPA’s Representative. Planting or seeding of any brackish marsh area during the dry season between June 15 and September 15 will require EPA’s Representative approval and additional watering and irrigation as necessary. In all cases, herbaceous material must be planted at least 30 days before the average first frost date of October 15. Hydroseed and straw mulch shall not be applied when weather conditions prevent installation at specified coverages.

3.3.3 Planting and seeding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the planting and seeding operations, proposed alternate times shall be submitted for approval.

3.4 BRACKISH MARSH PLANTING

3.4.1 After final grades are established, the Contractor shall plant herbaceous plants throughout the brackish marsh areas as indicated on the Contract Drawings.

3.4.2 Plants which cannot be planted immediately upon delivery shall be set on the ground and be protected with soil, bark mulch, or other acceptable material. Roots or balls of plants shall be protected at all times from sun and from drying winds.

3.4.3 While wetland plugs are being distributed in planting beds or are awaiting planting after distribution, the Contractor shall protect the roots from drying out; the means employed shall be satisfactory to the EPA’s Representative. Planting of plugs shall be performed using a hand trowel; dibble bars shall not be used. The Contractor shall excavate planting holes to a depth which will allow the top of the plug soil to be planted even with the surrounding ground surface. Care shall be taken to firm the soil around the plugs’ roots so as to anchor the plants

well, while not compressing the root systems. Care shall be exercised in setting the plants plumb.

3.4.4 After the installation of plant plugs is completed in the brackish marsh restoration area, install goose deterrent around and within the area per the Wetland Restoration Plan.

3.5 BRACKISH MARSH SEEDING

3.5.1 After planting is completed in the brackish marsh restoration areas, the areas shall be stabilized Brackish Marsh Seed Mix as indicated on the Contract Drawings. The seed shall meet all standards of purity and packaging requirements as specified above. Seed shall be spread at the rate indicated on the Contract Drawings.

3.5.2 Prior to seeding, the brackish marsh seeded areas shall be prepared by scarifying or harrowing the topsoil surface by hand raking.

3.5.3 Seed application may be accomplished by broadcast seeding. Seeding procedure shall ensure even coverage. Gravity feed applicators, which drop seed directly from a hopper onto the prepared soil, shall not be used because of the difficulty in achieving even coverage, unless otherwise approved. Tar tack shall not be used.

3.5.4 Seed shall be uniformly spread by broadcasting half the total rate of seed application in one (1) direction, and then broadcasting the remainder of the seed at 90 degrees from the first direction.

3.5.5 Any washouts which occur shall be regraded and reseeded until a stabilized slope is established.

3.6 WATERING

3.6.1 The Contractor shall water the brackish marsh plantings and seed as necessary for establishment during the maintenance period, in accordance with their approved Wetland Restoration Plan.

3.6.2 Watering shall be started immediately after completing the seeding of an area. Water shall be applied to supplement rainfall at a rate sufficient to ensure moist soil conditions to a minimum depth of 1 inch. Run-off shall be prevented. Watering trucks shall not be driven in the marsh, unless otherwise directed by the EPA’s Representative.

3.6.3 Irrigation water for planting and maintenance shall be provided by the Contractor and shall be free from contaminants or any ingredients harmful to plant life. The Contractor shall furnish his/her own equipment, hoses, connections, or other watering equipment. Water from the surrounding wetlands or open water areas may not be used for irrigation.

3.7 BRACKISH MARSH MAINTENANCE PERIOD

Refer to SECTION 02955 – FRESHWATER WETLAND RESTORATION.

3.7.1 The Contractor shall perform maintenance of the restored brackish marsh areas, including goose deterrent and other herbivory control devices (if installed) beginning immediately after areas are planted and seeded, and continuing for a period of five calendar years following the last brackish marsh planting date. Maintenance within one calendar year of the last wetland planting date (the initial maintenance period) shall be at no additional cost to the Government. If areas of the brackish marsh restoration require replanting due to failure during the initial maintenance period, the initial maintenance period shall be extended for those areas to one calendar year following replanting. Replanting of failed areas shall be performed as specified herein.

3.7.2 The Contractor shall provide at least 75 percent cover of all disturbed brackish marsh areas with indigenous wetland plant species within the initial maintenance period. Bare spots may not be larger than 10 square feet. Areas not achieving the above requirement within the initial maintenance period shall be renovated at no additional cost to the Government.

3.7.3 The Contractor shall ensure that the brackish marsh areas shall continue to develop such that they will achieve at least 85 percent cover (when all strata are combined) by the end of the 5-year monitoring period or as required by NJDEP, with bare spots no larger than 10 square feet.

3.7.4 The growing season for brackish marsh restoration areas shall be between April 30 and October 15. The initial brackish marsh maintenance period shall encompass at least one complete growing season.

3.7.5 Maintenance shall be monitored and measured by the inspections specified below. If required, corrective measures shall include reseeding, additional plantings, removal of any dead plants and replacement with new plants, additional watering, additional controls for herbivory, or other measures as deemed necessary by the EPA’s Representative.

3.7.6 Goose deterrent and other herbivory management structures (if installed) shall be maintained for 5 years or as long as the NJDEP monitoring requirement. Maintenance within the initial maintenance period shall be at no additional cost to the Government.

3.7.7 Plants damaged by wildlife, insects, disease, or natural events shall be replaced as needed during the five-year monitoring period. Any replacement during the initial maintenance period shall be at no additional cost to the Government.

3.7.8 The Contractor shall provide a long-term maintenance plan for maintenance beyond the initial maintenance period, at no additional cost to the Government.

3.8 INSPECTIONS

Refer to SECTION 02955 – FRESHWATER WETLAND RESTORATION.

3.9 WARRANTY

Refer to SECTION 02955 – FRESHWATER WETLAND RESTORATION

END OF SECTION

SECTION 13300

WATER TREATMENT SYSTEM

PART 1 GENERAL

1.1 SCOPE OF WORK

1.1.1 The Contractor shall furnish all labor, supervision, engineering, design, construction, erection, equipment, tools, necessary fabrication, materials, installation, startup testing, and other services as specified for the completion and proper operation of a temporary water treatment system. The Contractor, in executing this work, shall ensure that the system effluent meets the treatment objectives specified herein. The Middlesex County Utility Authority (MCUA) publicly owned treatment works (POTW) sanitary sewer line is identified as the primary discharge location. Alternatively, the Contractor shall discharge the treated water to surface water in accordance with the New Jersey Pollutant Discharge Elimination System (NJPDES) permit if MCUA POTW discharge is not approved by MCUA.

1.1.2 This section is written as a “performance-based” specification. Basic and potential treatment equipment/systems, such as pumps, tanks, filtration systems, housing, and piping are specified. Minimal requirements such as treatment capacity and criteria for treated water are included. It shall be the Contractor’s responsibility to provide a system to consistently treat the influent water and produce the required effluent water quality based on either MCUA or NJPDES permit. All required equipment and incidentals, including electrical and instrumentation, shall be furnished, whether specified herein or not, to produce a fully operational system.

1.1.3 The Contractor shall be responsible for the design, installation, operation and maintenance (O&M) of a water treatment system that consistently achieves the required treatment criteria and is in compliance with all Federal, State and local laws. The Contractor shall also monitor system performance and maintain operating records of system performance that adequately document the required treatment.

1.1.4 System operation is expected to be intermittent. Any maintenance shall be conducted during downtime. The system should be fully operable during dewatering or other activities that will generate water and will require treatment.

1.2 SUBMITTALS

The Contractor shall submit complete packages with details for determination of compliance with this section in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.

1.2.1 Water Treatment Plan; Pre-Construction; EA

The Contractor shall submit a water treatment plan, which includes facility layout drawings and details, to install, maintain, and operate the temporary treatment system. At a minimum, the plan shall include the following components:

1.2.1.1 Water Treatment Equipment

The complete list of equipment and materials to be used in the water treatment system shall include, but not be limited to, primary process equipment, pumps, tanks, filtration system, control valves, flow monitoring instruments, level control instruments, chemicals, chemical feeding system and other similar equipment. Information for each piece of equipment shall include the following, as applicable:

- a. Manufacturer literature and model number
- b. Equipment size and dimensions
- c. Design capacity
- d. Utility requirements
- e. Materials of construction and weight
- f. Manufacturer’s certified rating curves showing characteristics of pumps and blowers, such as head, flow rate, brake horsepower, efficiency, etc.
- g. Installation and maintenance requirements

1.2.1.2 Process and Instrumentation Diagrams

A process and instrumentation diagram (P&ID) showing all major pieces of process equipment with controls. The P&ID shall contain complete piping, schematic diagrams and any other details required to demonstrate that the system has been coordinated and will properly function as a unit.

1.2.1.3 Calculations

Provide calculations supporting the sizing for all equipment and piping, including but not limited to those specified in PART 2 – PRODUCTS.

1.3 QUALITY ASSURANCE

The Contractor shall provide standard equipment modified as required and manufactured by companies whose products have commercially available replacement parts and have had similar units in service for not less than 5 years.

1.4 PERMITS

The Contractor shall be responsible for obtaining all necessary permits, including a Treatment Works Approval (TWA) permit, as required by NJAC 7:14A-22. The Contractor shall pay for all permits and comply with conditions and terms of the applicable permits unless directed by the EPA’s Representative otherwise. Based on where the treated water is discharged, the Contractor shall be required to obtain a temporary discharge permit from MCUA. The NJPDES/DSW permit equivalency will be obtained by the EPA and provided to the Contractor at the time of Notice to Proceed. The use of any equipment (e.g. air stripper) for treatment of volatile organic compounds (VOCs) is not anticipated. However, if the Contractor determines that is necessary to treat VOCs, it is the Contractor’s responsibility to obtain the necessary air emission permit in accordance with NJAC 7:27; Subchapter 8.

1.5 SYSTEM DESCRIPTION

1.5.1 This section describes the functions, configuration, and operating parameters of the system. It is intended to provide basic information necessary for the Contractor’s design, selection of equipment, installation and operation of the system. A representative treatment system diagram is shown on the Contract Drawings.

1.5.2 The Contractor shall design the water treatment system to operate on an intermittent basis as required by excavation dewatering. The treatment system shall be designed to operate with an average flow rate up to 70 gpm with a peak flow rate of 105 gpm (1.5 times average flow rate) not exceeding 100,000 gallons per day (gpd).

1.5.3 Estimated influent concentrations for treatment system design are listed under Table 13300-1, based on groundwater (MW-14S) and surface water (A9-93, A9-96, A9-97 and A9-93) quality data. Additional testing may be necessary to characterize the influent water quality for obtaining approval from MCUA for POTW discharge. It is the Contractor’s responsibility to contact MCUA to determine if additional sampling is required.

1.5.4 Effluent shall be discharged to the MCUA POTW or to surface water. The location of surface water discharge will be identified in NJPDES/DSW permit equivalent. Treated water shall meet the effluent criteria specified in the MCUA temporary discharge permit or NJPDES DSW permit. Treatment requirements for MCUA and NJPDES DSW permit are provided in Table 13300-1.

1.5.5 The Contractor shall provide means to clean out the sediment accumulated in the settling tanks and storage tanks as necessary.

1.5.6 The Contractor shall properly dispose of the waste generated by the water treatment system. The potential wastes include but are not limited to: sediment/sludge, used filter bags, and chemical containers.

1.5.7 Instrumentation and controls shall be furnished to provide both automatic and manual operation of the system. The Contractor shall provide process parameters necessary to monitor system performance including flow, pressure, and tank levels. At a minimum, the low and high water levels in the tanks, the differential pressure in the bag filters, the pressure in the optional treatment vessels, the instant flow rate and the total volume of discharged water need to be monitored.

1.5.8 Alarms shall be provided to alert or warn operators of abnormal conditions. Malfunction sensors shall be maintained at critical points in the treatment train to automatically provide a safe shutdown of the system in case of loss of power and during emergency conditions.

1.6 EQUIPMENT/PROCESS LAYOUT

1.6.1 All equipment shall be arranged to allow unobstructed access to components requiring operation and maintenance.

1.6.2 The Contractor shall provide removable couplings on piping between each component.

1.6.3 The equipment shall be located such that additional treatment units may be added if necessary to meet the required discharge criteria.

1.6.4 All piping shall be labeled with arrows indicating the direction of the flow.

1.7 DELIVERY, STORAGE, AND HANDLING

1.7.1 The Contractor shall arrange for the freight to the Site and for on- and off-loading of all system equipment shipped to the Site.

1.7.2 To the extent possible, all component equipment of the system shall be delivered to the Site on transportable structural steel skids, pre-piped and pre-wired, and ready for hookup.

1.7.3 Delivery date of each system and subsystem shall be relayed to the EPA’s Representative at least two working days prior to delivery. The equipment shall be shipped, delivered, handled, stored, and installed in ways that will prevent damage to the items. The equipment shall be shipped with suitable in-transit protection and shall be outfitted with lifting lugs, cleats, or other suitable means for unloading and erecting.

1.7.4 Any damage to the treatment equipment and components during delivery, storage, erection, operation, and maintenance due to mishandling by personnel of the Contractor and/or its subcontractor shall be paid for by the Contractor, at no additional cost to the Government.

1.8 TEMPORARY ELECTRICITY

The Contractor shall provide, maintain, and pay for temporary power service for operation of the water treatment system. Electricians shall have a minimum of 4 years demonstrated experience providing a similar type of work to that required.

1.9 REGULATIONS AND CODES

The Contractor shall comply with all the laws, ordinances, codes, rules, and regulations of the federal, state, and local authorities having jurisdiction over any of the work specified herein.

PART 2 PRODUCTS

2.1 GENERAL

2.1.1 The Contractor shall furnish and install a complete system ready for operation.

2.1.2 Parts shall be amply portioned for stress, which may occur during fabrication, transportation, unloading, erection, and operation. All units and/or parts of the same size shall be identical and interchangeable. The Contractor shall be responsible for all mechanical, instrumentation, process and electrical design, as well as assembly and related work.

2.1.3 The material of construction or surface coating and paint of all wetted parts of all equipment shall be suitable for the intended purpose and shall not cause loss of system integrity because of the constituents in the influent water.

2.1.4 All units shall be suitable for outdoor use and shall be constructed of corrosion-resistant materials.

2.1.5 Readings from pressure indicators shall be recorded at regular intervals throughout the system to aid in determining the limits of the system prior to failure of any system component due to system loading.

2.2 SUMP PUMPS

2.2.1 The Contactor shall provide the required number of submersible sump pumps to convey the water from excavation sumps, sediment drying area and staging area to the settling tanks. The Contractor shall have a spare sump pump on site to eliminate any downtime caused by pump malfunction.

2.2.2 Each sump pump shall be capable of passing small solids without clogging and undue wear.

2.2.3 Each sump pump shall be connected with flexible hose for easy placement in different areas within the excavation area.

2.2.4 Each pump shall have properly designed mechanical seals for dry running and extra protection against leakage.

2.2.5 Each motor shall be non-overloading at all points on the pump design curve. The motor shaft shall be connected to the pump shaft by a flexible coupling.

2.3 SETTLING TANKS

2.3.1 One or more settling tank(s) shall be provided for flow equalization, reducing the amount of suspended solids in order to protect the other process equipment. The Contractor shall submit the dimensions and overflow rates of the settling tank(s) for approval.

2.3.2 The settling tank(s) shall be equipped with “V”-shaped floor and weirs to facilitate collection of the solids and to minimize solids in the tank effluent.

2.3.3 The settling tank(s) shall be properly coated to prevent rust from contacting contaminated water, and exposure to rain and sun.

2.3.4 The tank(s) shall have a manway for operator access.

2.3.5 The tank(s) shall be equipped with a safe work platform on the top and a staircase or ladder.

2.3.6 The side of the tank(s) shall be equipped with an appropriately-sized flange and/or valve to facilitate pipe connections. The tank(s) shall have a cover, vacuum breaker and vent.

2.4 TRANSFER PUMPS

2.4.1 Centrifugal pumps shall be provided as required for transferring fluid within the water treatment system as shown on the Contract Drawings and described herein. The centrifugal pumps shall be able to pump up to 105 gpm. For each transferring function, multiple pumps may be used in parallel. The Contractor shall have a spare pump on site to eliminate any downtime caused by pump malfunction.

2.4.2 Each centrifugal pump shall be a horizontal, American National Standards Institute (ANSI) type, single-stage, end-suction water pump coupled to an electric motor by means of a spacer-type coupling with coupling guard.

2.4.3 Each pump casing shall be one piece with a side cover and shall be designed to permit replacement of wearing parts. A minimum of 1/2-inch plugged drains and vents on the pump casing shall be provided.

2.4.4 Pumps shall be capable of pumping the required flow rate at the required head conditions, and shall be capable of providing sufficient outlet pressure at the effluent flanges.

2.4.5 The impeller shall be of the type designed for the specific application.

2.4.6 Replaceable mechanical seals shall be rated for the temperature, pressure, and water quality to be pumped in the system. Seals shall prevent leakage of air into the pump, or leakage of water out of the pump.

2.4.7 The motor shall be continuous-duty, electric, totally enclosed fan-cooled (TEFC), squirrel-cage induction type. The motor shall be sized so that when operating at rated speed, the motor cannot be overloaded despite variation in pumping head.

2.4.8 The bearing shall be the manufacturer’s standard ball or roller type suitable for the service intended. The bearing shall be oil- or grease-lubricated and provided with all necessary piping and fittings for lubrication and/or cooling.

2.4.9 All wetted parts of the pump shall be constructed with materials suitable for the intended use at the Site.

2.5 BAG FILTERS

2.5.1 The bag filters shall be of sufficient capacity to prevent frequent replacements and shall have capacity to handle 100 percent of the peak flow rate (105 gpm). The bag filters shall be installed such that one may be taken off-line for maintenance while the other or others are in operation. Three bag filters will be utilized in series with the anticipated filter size for bag filters as 100 microns, 25 microns and 5 microns. The actual filter size shall be determined during the startup period.

2.5.2 The units shall have a positive seal basket and compression assembly that allows for quick, efficient bag replacement and reduced operating and maintenance costs.

2.5.3 Each bag filter shall be equipped with a differential pressure gauge to monitor the pressure drop across the system. The frequency of bag filter change-out shall be in accordance with the manufacturer’s specifications.

2.6 CATION EXCHANGE RESIN

2.6.1 A filtration system shall utilize cation exchange resin to provide inorganics (metals) removal. The Contractor shall propose a cation exchange resin to reduce concentrations to meet discharge criteria.

2.6.2 The system shall be skid mounted for easy transport and installation.

2.6.3 The sand filters shall be equipped with a differential pressure gauge to monitor the pressure drop across the system.

2.7 OPTIONAL TREATMENT EQUIPMENT

2.7.1 Sand Filters

2.7.1.1 Sand filtration shall be used to treat the water for metals, chemical oxygen demand (COD), biological oxygen demand (BOD) and TSS to meet discharge permit effluent limits. Multiple sand filtration units may be required.

2.7.1.2 Sand filtration systems shall be equipped with an automatic controller to initiate backwashing. The Contractor shall use the water from the settling tank for backwashing. Backwashing frequency shall be conducted in accordance with the manufacturer's specifications.

2.7.1.3 The system shall be skid mounted for easy transport and installation.

2.7.1.4 The sand filters shall be equipped with a differential pressure gauge to monitor the pressure drop across the system.

2.7.2 Liquid Phase Granular Activated Carbon (LGAC)

2.7.2.1 The Contractor shall furnish at least two LGAC adsorption vessels in series to remove organic contaminants (VOCs and/or semi-volatile organic compounds) that may be detected at concentrations requiring treatment in the groundwater and surface water samples proposed during pre-excavation sampling. The LGAC adsorption system shall be capable of removing contaminants to meet the effluent water quality criteria specified in the permit. MCUA Influent requirements and NJPDES Effluent Standards for Site Remediation Projects are provided in Table 13301-1 for reference.

2.7.2.2 The activated carbon system shall consist of at least two pressure vessels in series. The connecting pipes shall be equipped with quick-connect hoses for change-out of the vessels. The LGAC shall be skid-mounted.

2.7.2.3 The Contractor shall provide the sizing calculations to the EPA’s Representative for approval.

2.7.2.4 Each carbon vessel shall be an American Society of Mechanical Engineers (ASME) - coded vessel. All vessels and internal materials of construction shall be corrosion-resistant.

2.7.2.5 The activated carbon system shall be furnished complete with vessels, internals, piping, valves, fittings and activated carbon media.

2.7.2.6 Water shall pass through the system influent valves and piping, enter the vessels at the top and flow downward through the LGAC bed. A screened collector system shall be provided to collect the treated water and retain the granular media in the bed. The treated water shall be discharged through the system effluent piping.

2.7.3 Filtration System for Inorganics (Metals) Treatment

Additional treatment equipment to treat inorganics (primarily metals) may be required based on the concentrations of metals detected in the influent.

2.8 SLUDGE PUMP

2.8.1 The sludge pump shall be constructed suitable for transferring sludge containing a high percentage of sand and silt and suitable for transferring iron sludge.

2.8.2 The Contractor shall submit the sizing of the sludge pump to the EPA’s Representative for approval.

2.9 TREATED WATER DISCHARGE

2.9.1 The Contractor shall provide an effluent discharge line capable of discharging treated effluent from the water treatment system to a sanitary sewer manhole identified by MCUA during permit approval or the surface water outfall as per NJPDES/DSW permit equivalent.

2.9.2 A flow meter and totalizer shall be installed in the effluent line. A sample port shall be provided on the effluent discharge line to obtain samples for compliance. Compliance sampling shall either be one sample per week during operation of the treatment system or as otherwise required by the provided MCUA POTW permit or NJPDES DSW permit.

2.10 SYSTEM PIPING, VALVES AND FITTINGS

2.10.1 The Contractor shall furnish all piping, valves, hoses and fittings for a complete operational water treatment system. All system piping shall be installed in place with proper supports and anchoring.

2.10.2 Influent and effluent connections shall be terminated as ANSI flanges approximately 12 inches above grade. Generally, valves on lines 3 inches and smaller shall be ball valves; valves on lines greater than 3 inches shall be butterfly valves; and valves on sludge transfer lines shall be plug valves.

PART 3 EXECUTION

3.1 INSTALLATION AND ERECTION

3.1.1 All component equipment shall be skid-mounted, pre-piped and pre-wired ready for hookup when possible. The installation of the system equipment shall be in strict accordance with the manufacturer’s technical data and printed instructions. Anchor bolts, guy wires, and supporting incidentals shall be furnished as required for proper installation of each component.

3.1.2 The tanks shall be installed in accordance with the manufacturer’s provided instructions. Tank mounting and tie-down devices shall be provided as recommended by the manufacturer.

3.1.3 The treatment system shall be installed within an impermeable containment area with secondary containment of 110% capacity of the largest tank/vessel as shown on the Contract Drawings.

3.2 START-UP TESTING

3.2.1 The Contractor shall conduct hydraulic tests on the system once all relevant systems have been documented and accepted by the EPA’s Representative as mechanically complete. The Contractor shall perform hydraulic testing at the maximum design flow rate for at least 2 continuous hours. Potable water shall be used for the test, unless otherwise approved by the EPA’s Representative. During the testing, the Contractor shall inspect all treatment system components, including tanks, pumps, piping, valves, meters, level controls, and connections, to confirm that no system components leak and that all system components perform correctly. Any leaks or other deficiencies observed during the testing shall be repaired and the water treatment system shall be retested after repairs. The hydraulic testing shall not be deemed complete until the entire water treatment system has operated under normal operating conditions without any leaks or other deficiencies for at least 2 consecutive hours.

3.2.2 Once the system has been determined to be operating to the satisfaction of the EPA’s Representative, testing shall be performed with water from the excavation dewatering to confirm that the system is capable of consistently meeting the effluent discharge criteria included under Table 13300-1 under normal operations and as specified in the MCUA POTW permit or NJPDES DSW permit. This will be determined through the collection and analysis of effluent samples from a sample port on the effluent discharge line which will be analyzed in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL. System effluent shall be collected and discharged back into the storage/holding tank(s) until the Contractor has demonstrated that the system meets the effluent discharge criteria. System effluent shall not be discharged until approved by the EPA’s Representative.

3.3 OPERATION AND MAINTENANCE

The Contractor shall provide and maintain all personnel, equipment and materials necessary for the operation and maintenance of the water treatment system. The system shall be operated in strict accordance with the equipment manufacturers’ specifications and in accordance with the Contractor’s approved plan.

3.4 SAMPLING AND ANALYSIS

Sampling during startup testing shall be performed daily and during full operation sampling shall be performed as specified in the MCUA POTW permit or NJPDES DSW permit. All samples shall be analyzed in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.

3.5 DISPOSAL OF RESIDUES

All process-derived wastes (e.g., settling tank sediments and bag filters) shall be mixed with the contaminated soil and disposed of at an approved off-site disposal facility in accordance with SECTION 02120 –TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL. Spent GAC from the water treatment system LGAC units that passes Toxicity Characteristic Leaching Procedure (TCLP) testing shall be considered non-hazardous and shall be recycled at an approved carbon generation facility. Spent GAC that fails TCLP testing shall be mixed with the contaminated soil and disposed of at an approved off-site disposal facility.

**Table 13300-1
 Influent Water Quality Estimates and Effluent Criteria**

Parameter	Unit	Influent Concentration ³		NJPDES Monthly Average Limit ⁴	NJPDES Daily Max Limit ⁴
		Surface Water ¹	Groundwater ²		
Volatile Organic Compounds					
Acrolein	µg/l	NA	NA	NC	100
Acrylonitrile	µg/l	NA	NA	NC	50
Benzene	µg/l	0.5 U	0.5 U	37	136
Bromoform	µg/l	0.5 U	0.5 U	29	58
Carbon Tetrachloride	µg/l	0.5 U	0.5 U	NC	8.8
Chlorobenzene	µg/l	0.5 U	0.5 U	15	28
Chlorodibromomethane	µg/l	0.5 U	0.5 U	NC	14
Chloroethane	µg/l	0.5 U	0.5 UJ	104	268
Chloroform	µg/l	0.5 U	0.5 U	21	46
Dichlorobromomethane	µg/l	0.5 U	0.5 U	NC	12
1,1-Dichloroethane	µg/l	0.5 U	0.5 U	22	59
1,2-Dichloroethane	µg/l	0.5 U	0.5 U	68	211
1,1-Dichloroethylene	µg/l	0.5 U	0.5 U	16	25
1,2-Dichloropropane	µg/l	0.5 U	0.5 U	153	230
1,3-Dichloropropylene	µg/l	NA	NA	29	44
Ethylbenzene	µg/l	0.5 U	0.5 U	32	108
Methyl Bromide	µg/l	0.5 U	NA	20	40
Methyl Chloride	µg/l	0.5 U	0.5 U	86	190
Methylene Chloride	µg/l	0.5 U	0.5 U	40	89
1,1,2,2-Tetrachloroethane	µg/l	0.5 U	0.5 U	NC	10
Tetrachloroethylene	µg/l	0.5 U	0.5 U	22	56
Toluene	µg/l	0.5 U	0.5 U	26	80
1,2-Trans-Dichloroethylene	µg/l	0.5 U	0.5 U	21	54
1,1,1-Trichloroethane	µg/l	0.5 U	0.5 U	21	54
1,1,2-Trichloroethane	µg/l	0.5 U	0.5 U	21	54
Trichloroethylene	µg/l	0.5 U	0.5 U	21	54
Vinyl Chloride	µg/l	0.5 U	0.5 U	104	268
Semi-Volatile Organic Compounds					
2-Chlorophenol	µg/l	5 U	5 UJ	31	98
2,4-Dichlorophenol	µg/l	5 U	5 UJ	39	112
2,4-Dimethylphenol	µg/l	5 U	5 UJ	18	36
4,6-Dinitro-O-Cresol	µg/l	10 U	10 UJ	78	277
2,4-Dinitrophenol	µg/l	10 U	10 UJ	71	123
2-Nitrophenol	µg/l	5 U	5 UJ	41	69
4-Nitrophenol	µg/l	10 U	10 UJ	72	124

**Table 13300-1
 Influent Water Quality Estimates and Effluent Criteria (continued)**

Parameter	Unit	Influent Concentration ³		NJPDES Monthly Average Limit ⁴	NJPDES Daily Max Limit ⁴
		Surface Water ¹	Groundwater ²		
Semi-Volatile Organic Compounds (continued)					
Pentachlorophenol	µg/l	10 U	10 UJ	NC	30
Phenol	µg/l	5 U	5 UJ	15	26
2,4,6-Trichlorophenol	µg/l	5 U	5 UJ	NC	20
Anthracene	µg/l	5 U	5 UJ	22	59
Benzidine	µg/l	NA	NA	NC	50
Benzo (a) Anthracene	µg/l	5 U	5 UJ	NC	10
Benzo (a) Pyrene	µg/l	5 U	5 UJ	NC	20
Benzo(b)fluoranthene	µg/l	5 U	5 UJ	NC	10
Benzo (k) Fluoranthene	µg/l	5 U	5 UJ	NC	20
Bis (2-Chloroethyl) Ether	µg/l	5 U	5 UJ	NC	10
Bis (2-Chloroisopropyl) Ether	µg/l	5 U	5 UJ	301	757
Bis (2-Ethylhexyl) Phthalate	µg/l	5 U	5 UJ	59	118
Butyl Benzyl Phthalate	µg/l	5 U	5 UJ	NC	24
Chrysene	µg/l	5 U	5 UJ	NC	20
Dibenzo (a,h) Anthracene	µg/l	5 U	5 UJ	NC	20
1,2-Dichlorobenzene	µg/l	0.5 U	0.5 U	77	163
1,3-Dichlorobenzene	µg/l	0.5 U	0.5 U	31	44
1,4-Dichlorobenzene	µg/l	0.5 U	0.5 U	NC	28
3,3'-Dichlorobenzidine	µg/l	5 U	5 UJ	NC	60
Diethyl Phthalate	µg/l	5 U	5 UJ	81	203
Dimethyl Phthalate	µg/l	5 U	5 UJ	19	47
Di-N-Butyl Phthalate	µg/l	5 U	5 UJ	27	57
2,4-Dinitrotoluene	µg/l	5 U	5 UJ	NC	18.2
2,6-Dinitrotoluene	µg/l	5 U	5 UJ	255	641
Fluoranthene	µg/l	5 U	5 UJ	25	68
Fluorene	µg/l	5 U	5 UJ	22	59
Hexachlorobenzene	µg/l	5 U	5 UJ	NC	10
Hexachlorobutadiene	µg/l	5 U	5 UJ	20	49
Hexachlorocyclopentadiene	µg/l	5 U	5 UJ	NC	1800
Hexachloroethane	µg/l	5 U	5 UJ	21	54
Indeno (1,2,3-cd) Pyrene	µg/l	5 U	5 UJ	NC	20
Isophorone	µg/l	5 U	5 UJ	NC	20
Naphthalene	µg/l	5 U	5 UJ	22	59
Nitrobenzene	µg/l	5 U	5 UJ	27	68
N-Nitrosodimethylamine	µg/l	5 U	5 UJ	NC	20

**Table 13300-1
 Influent Water Quality Estimates and Effluent Criteria (continued)**

Parameter	Unit	Influent Concentration ³		NJPDES Monthly Average Limit ⁴	NJPDES Daily Max Limit ⁴
		Surface Water ¹	Groundwater ²		
Semi-Volatile Organic Compounds (continued)					
N-Nitrosodiphenylamine	µg/l	5 U	5 UJ	NC	20
Phenanthrene	µg/l	5 U	5 UJ	22	59
Pyrene	µg/l	5 U	5 UJ	25	67
1,2,4-Trichlorobenzene	µg/l	0.5 U	0.5 U	68	140
Inorganic Compounds (Metals)					
Aluminum	µg/l	470	2920 J	NC	NC
Antimony	µg/l	NA	2 U	NC	NC
Arsenic	µg/l	7.4	6.4 J	50	100
Barium	µg/l	31	143 J	NC	NC
Beryllium	µg/l	NA	1 U	NC	NC
Cadmium	µg/l	NA	0.25 U	50	100
Calcium	µg/l	251000	79200	NC	NC
Chromium	µg/l	NA	23.5	50	100
Cobalt	µg/l	1.5	1.5 J	NC	NC
Copper	µg/l	25	9.5	50	100
Iron	µg/l	21100 J	44300	1000	2000
Lead	µg/l	19	9	50	100
Magnesium	µg/l	709000	88300	NC	NC
Manganese	µg/l	200	369 J	NC	NC
Mercury	µg/l	0.04	0.2 U	NC	1
Nickel	µg/l	3.5	10.5	72	144
Potassium	µg/l	221000	58900	NC	NC
Selenium	µg/l	NA	1.1 J	50	100
Silver	µg/l	NA	0.037 J	25	50
Sodium	µg/l	5560000	806000	NC	NC
Thallium	µg/l	NA	0.5 U	100	200
Vanadium	µg/l	3.7	16.5	NC	NC
Zinc	µg/l	180	16.3	100	200
Groundwater Wet Chemistry					
Alkalinity as CaCO ₃	mg/l	NA	960	NC	NC
Total Organic Carbon	mg/l	NA	NA	30	45
Biochemical Oxygen Demand	mg/l	NA	NA	30	45
Chemical Oxygen Demand	mg/l	NA	NA	60	90
Total Dissolved Solids	mg/l	NA	NA	500 ⁵	500 ⁵
Total Suspended Solids	mg/l	NA	NA	30	45

**Table 13300-1
 Influent Water Quality Estimates and Effluent Criteria (continued)**

Parameter	Unit	Influent Concentration ³		NJPDES Monthly Average Limit ⁴	NJPDES Daily Max Limit ⁴
		Surface Water ¹	Groundwater ²		
Groundwater Wet Chemistry (continued)					
Sulfate	mg/l	NA	55	250 ⁵	250 ⁵
pH	SU	NA	6.2	6-9	6-9

Notes:

1 - Maximum analyte concentration used for surface water samples collected from locations: A9-93, A9-96, A9-97, A9-98

2 - Maximum analyte concentration used for groundwater samples collected from monitoring well: MW-14S

3 - Influent concentrations are based on prior sampling performed at the Site.

4 - NJPDES effluent standards for site remediation project for SC, SE Water per NJAC 7:14A:12: Appendix B

5 - Effluent standards for water quality parameters are listed from NJDEP standards for FW2 surface water per NJAC 7:9B because these parameters are not listed in NJAC 7:14A:12: Appendix B

µg/l – microgram per liter

mg/l – milligram per liter

NA - Analyte not analyzed or data not available due to rejected "R" flag for the analyte concentrations

NC - Analyte criteria not available

NJAC – New Jersey Administrative Code

NJDEP – New Jersey Department of Environmental Protection

NJPDES – New Jersey Pollutant Discharge Elimination System

J - Analyte concentration estimated

U - analyte not detected

SU – standard unit

END OF SECTION

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