Outfall 200 Mercury Treatment Facility
Balance of Construction
Storm Water Pollution Prevention Plan,
Oak Ridge, Tennessee
Outfall 200 Mercury Treatment Facility
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Storm Water Pollution Prevention Plan,
Oak Ridge, Tennessee

Date Issued—January 2018

Prepared for the
U.S. Department of Energy
Office of Environmental Management

URS | CH2M Oak Ridge LLC
Safely Delivering the Department of Energy’s Vision
for the East Tennessee Technology Park Mission
under contract DE-SC-0004645
## APPROVALS

### Outfall 200 Mercury Treatment Facility
**Balance of Construction**
**Storm Water Pollution Prevention Plan,**
**Oak Ridge, Tennessee**

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<th>USQD Review Determination</th>
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### Exemption Criteria

- (1) Non-Intent Change
- (2) DOE-Approved Safety Basis Document
- (3) Chief Accounting Officer, Internal Audit, Labor Relations, General Counsel, Outreach & Public Affairs, or Project Controls Services

**OR**

- (4) Document identified in USQD-MS-CX-REPORTS-1074

### USQD Preparer:

- Jim Nicolosi
- 1-25-18

### Exhibit L Mandatory Contractor Document

- ☒ No (No PCCB Reviewer Signature Required.)
- ☐ Yes (Requires review by the Proforma Change Control Board.)

### PCCB Reviewer:

- Name
- Date

### Prepared by:

- Kevin R. Crow, P.E.
- Environmental Compliance and Protection Lead
- URS | CH2M Oak Ridge LLC
- 1-25-18
- Date

- Jeffery L. Murphy
- Environmental Scientist
- URS | CH2M Oak Ridge LLC
- 1-29-18
- Date

### Concurred by:

- Glen R. Galen
- Environmental Compliance and Protection Lead
- URS | CH2M Oak Ridge LLC
- 1/29/2018
- Date

- Teresa J. Pierce, P.E.
- Project Engineer
- URS | CH2M Oak Ridge LLC
- 1/29/18
- Date

### Approved by:

- Jimmy Massey
- Senior Project Manager
- URS | CH2M Oak Ridge LLC
- 1/30/18
- Date
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<tr>
<td>ARAP</td>
<td>Aquatic Resources Alteration Permit</td>
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<td>ARAR</td>
<td>applicable or relevant and appropriate requirement</td>
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<tr>
<td>BMP</td>
<td>best management practice</td>
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<td>CEE</td>
<td>construction exit/entrance</td>
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<td>CERCLA</td>
<td>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</td>
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<td>CGP</td>
<td>Construction General Permit</td>
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<td>COR</td>
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<td>CW</td>
<td>concrete washout</td>
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<td>Erosion Prevention and Sediment Control</td>
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<td>Federal Emergency Management Agency</td>
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<tr>
<td>FM</td>
<td>Facility Manager</td>
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<td>HDPE</td>
<td>high-density polyethylene</td>
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<td>MTF</td>
<td>Mercury Treatment Facility</td>
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<td>NPDES</td>
<td>National Pollutant Discharge Elimination System</td>
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<td>NWP</td>
<td>Nationwide Permit</td>
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<td>ODB</td>
<td>oil and debris boom</td>
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<td>OF200</td>
<td>Outfall 200</td>
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<td>Oak Ridge National Laboratory</td>
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<td>pre-construction notification</td>
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<tr>
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<td>Plant Shift Superintendent</td>
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<td>Storm Water Pollution Prevention Plan</td>
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<td>Tennessee Department of Environment and Conservation</td>
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<td>TS</td>
<td>temporary seeding</td>
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PROFESSIONAL ENGINEER CERTIFICATION

The undersigned licensed Professional Engineer (PE) attests:

(i) That I am familiar with the requirements of the Tennessee General National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Stormwater Associated with Construction Activities, Permit No. TNR100000.

(ii) That I have visited and examined the designated work area covered by this Storm Water Pollution Prevention Plan (SWPPP).

(iii) That this SWPPP has been prepared in accordance with good engineering practice, including consideration of applicable industry standards.

(iv) That procedures for required inspections and testing have been established.

(v) That this SWPPP is adequate for the work area described within this SWPPP.

This certification in no way relieves the owner or operator of the Facility of his/her duty to fully implement this SWPPP. This SWPPP is valid only for the construction activities described and to the extent that the Facility owner or contractor properly installs storm water controls, inspects storm water controls, maintains storm water controls, and meets all other requirements as prescribed in this SWPPP.

Kevin R. Crow
Signature

Kevin R. Crow
Name

URS | CH2M Oak Ridge LLC
Company

109491
Tennessee PE License Number

EC&P Lead
Title

1-25-18
Date

KEVIN RAY CROW
REGISTERED ENGINEER
STATE OF TENNESSEE

1-25-2018
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1. GENERAL INFORMATION

1.1 PROJECT DESCRIPTION

The Oak Ridge Reservation (ORR) is located within and adjacent to the corporate limits of the City of Oak Ridge (COR), Tennessee, in Roane and Anderson counties. The ORR is bounded to the east and north by the developed portion of the COR. The ORR hosts three major industrial research and production facilities originally constructed as part of the World War II-era Manhattan Project; these are the East Tennessee Technology Park (ETTP), the Oak Ridge National Laboratory (ORNL), and the Y-12 National Security Complex (Y-12).

Historic manufacturing processes, programs, and waste management practices associated with the Y-12 mission have resulted in the contamination of soil, surface water, sediment, building structures, biota, and groundwater. These processes included chemical separation techniques; weapons manufacturing; research and development; waste storage, management, and disposal; and physical plant maintenance activities that resulted in the release of large quantities of mercury to the environment. Because of the contaminant releases at Y-12 and other U.S. Department of Energy (DOE) facilities, the ORR was placed on the U.S. Environmental Protection Agency (EPA) National Priorities List (NPL) that was established under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (54 Federal Register 48184, November 21, 1989).

At Y-12, work on nuclear weapons in the 1950s and 1960s involved the utilization of more than 20 million pounds of mercury. Processes at Y-12 used mercury to separate lithium for nuclear weapons. The lithium separation operations started in 1955 and ended in 1963. During that time, about 700,000 lb of mercury were lost into buildings, soil, groundwater, and sediment.

As part of a CERCLA action, a water treatment facility is being constructed to address the legacy mercury contamination in the Outfall 200 (OF200) effluent. The Mercury Treatment Facility (MTF) is being designed and constructed to treat discharges from the storm drain system adjacent to the former mercury-use buildings in the West End Mercury Area.

The OF200 MTF will help capture mercury that migrates from the buildings and soil during major demolition activities at Y-12. The OF200 MTF is designed to reduce mercury concentrations in the water exiting Y-12 to meet a goal of 51 nanograms per liter (ng/L) total mercury in the treated effluent that discharges to Upper East Fork Poplar Creek (UEFPC). The MTF will be operational prior to large-scale demolition of mercury-contaminated buildings located in the western portion of Y-12.

The OF200 MTF is being designed to treat up to 3000 gal of water per minute. The Headworks will include a 2-million-gal field-erected storage tank for collection of excess storm water to be treated later. Mercury migrating from the mercury-contaminated areas in the western portion of Y-12 will enter the Headworks just below OF200 and will then be pumped through a Transfer Pipeline to the Treatment Facility. Treated water will be discharged from the OF200 MTF through a new CERCLA storm water outfall into UEFPC.

This Storm Water Pollution Prevention Plan (SWPPP) was prepared specifically for balance of construction. A separate SWPPP was implemented for early site preparation activities.
1.2 PREPARATION AND COMPLIANCE

This SWPPP has been prepared in accordance with sound engineering practices to meet the substantive requirements of the Tennessee General National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Stormwater Associated with Construction Activities, Permit No. TNR100000, also referred to as the Construction General Permit (CGP). Primary personnel involved with the development of this SWPPP have completed the Tennessee Erosion Prevention and Sediment Control (EPSC) Training and Certification Program, are Certified Professionals in Erosion and Sediment Control, and/or are professional engineers (PEs) licensed in the state of Tennessee.

This SWPPP identifies potential sources of pollution that may reasonably be expected to affect the quality of storm water from the construction sites. The SWPPP describes and ensures the implementation of practices that will be used to reduce the pollutants in storm water discharges associated with construction activity at the site and to ensure compliance with required CERCLA agreements. A copy of the SWPPP shall be retained onsite at the project location at all times.

This SWPPP shall be amended whenever there is a change in project scope that would be expected to have a significant effect on the discharge of pollutants, when inspections or investigations by site operators, local, state, or federal officials indicate the SWPPP is proving ineffective in eliminating or significantly reducing pollutants, or when site conditions warrant modification.

It is the intention and goal of this SWPPP that any discharge from the property described in this document creates no objectionable color contrast in the water body that receives it. The activities described in this document will be carried out in a way that will prevent any discharge that would cause visible solids, bottom deposits, or turbidity that might impair the usefulness of the waters on the property or downstream of the property for fish and aquatic life, livestock watering and wildlife, recreation, irrigation, navigation, or industrial or domestic water supply.

1.3 AUTHORIZED DISCHARGES

This SWPPP conforms to the substantive requirements of the CGP. The CGP authorizes point source discharges of storm water from construction activities including clearing, grading, filling, excavating, and other similar construction activities that result in the disturbance of 1 acre or more of total land area. Projects and developments that are less than 1 acre in land disturbance are exempt unless the construction is part of a larger common plan of development or unless special provisions apply, such as an expected exceedance of a state water quality standard due to the construction activities.

1.3.1 Storm Water from Construction Support Activities

The CGP authorizes discharges of storm water from construction support activities, including equipment staging yards, materials storage areas, borrow areas, etc. This is based on the provision that the support activity is primarily related to the construction site covered under the general permit, the operator of the support activity is the same as the operator of the construction site, the support activity is not a commercial operation serving multiple unrelated construction projects by different operators, the support activity does not operate beyond completion of the construction activity, and the appropriate controls and measures are identified in a SWPPP covering the discharges from the support activity areas.
1.3.2 Authorized Non-Storm Water Discharges

Certain non-storm water discharges from active construction sites are authorized by the CGP provided that they are identified in the SWPPP; that they are discharged through stable discharge structures; and that the SWPPP identifies and ensures the implementation of appropriate pollution prevention measures for the non-storm water discharge. All authorized non-storm water discharges must be free of sediment and other solids; must not cause erosion of soils; and must not result in sediment impacts to receiving streams.

The following non-storm water discharges from active construction sites are authorized by the CGP:


- Waters used to wash vehicles of dust and soil, not process materials, where detergents are not used and detention and/or filtration is provided before the water leaves the site. Wash removal of process materials such as oil, asphalt, or concrete is not authorized.

- Water used to control dust.

- Potable water sources, including water line flushing, from which chlorine has been removed to the maximum extent practicable.

- Routine external building wash-down, which does not include detergents or other chemicals.

- Groundwater or spring water that is known to be uncontaminated based on analytical results or process knowledge.

- Foundation and footing drains where flows are known to be uncontaminated based on analytical results or process knowledge.

1.4 UNAUTHORIZED NON-STORM WATER DISCHARGES

The following discharges are prohibited:

- Discharges from dewatering activities, unless managed by appropriate controls (refer to Appendix B).


- Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials.

- Fuels, oils or other potential pollutants used in vehicle and equipment operation and maintenance.

- Soaps or solvents used in vehicle and equipment washing.

- Discharges or discharge-related activities that are likely to jeopardize the continued existence of listed or proposed threatened or endangered aquatic species, or their critical habitat, under the Endangered Species Act, or will cause a prohibited “take” of federally or state listed aquatic species.
Storm water discharges shall contain no distinctly visible floating scum, oil, or other matter. Storm water discharges must not cause an objectionable color contrast in the receiving stream. The discharge of hazardous substances and/or oil is not authorized by the CGP.

1.5 SPILL PREVENTION, RESPONSE, AND REPORTING

When spills of chemicals used or stored on the project occur, immediate response is necessary. Immediately notify the Y-12 Plant Shift Superintendent (PSS) in the event of a release, spill, or leak of a hazardous substance; petroleum, oils, and lubricants (POL); sanitary water; or any other material. The Y-12 PSS will direct actions to secure the area where the spill has occurred and contain the spill until the Oak Ridge Office of Environmental Management (OREM) gathers the proper resources to take over the incident. Project personnel will then be responsible for cleanup of the spill.

In addition, the Y-12 PSS shall be contacted if visible contamination from legacy operations is noted during construction activities. This may include observation of visible mercury deposits, observation of oily stains [may contain polychlorinated biphenyls (PCB) or other contaminants], observation of metal shavings or cuttings, observation of materials in excavated soils that do not match the color or texture of the surrounding soils, etc. The Y-12 PSS will direct activities to identify, contain, and recover these materials.

1.5.1 Best Management Practices

1. All oil transfer activities, including the fueling of equipment and vehicles, onsite will:
   — Be conducted in designated areas that are at least 30 ft from a storm drain inlet or waterway and are not within the flood zone of UEFPC.
   — Be conducted using drip pans or other appropriate containment.
   — Be continuously monitored.
   — Have spill response material at the oil transfer/fueling activities location that can contain a spill during oil transfer/fueling activities.

2. All containers storing POLs, such as tanks and drums, will comply with the Spill Prevention, Control, and Countermeasure (SPCC) Plan applicable to Y-12 or related procedures. This will include, but not be limited to the following:
   — Notification of all stored inventories of POLs will be provided to the SPCC Plan Lead for the Y-12 site.
   — Adequate secondary containment for all POL containers of any volume must be provided. POL containers that are 55 gal or greater may be subject to additional SPCC requirements.
   — A properly sized and stocked spill kit shall be maintained near all POL storage areas and working areas. These spill kits must be adequate for responding to a spill on land and on water.
   — All oil-handling personnel and equipment operators must be trained on how to report a spill and how to properly and safely respond to a spill.
   — Any spills shall be reported immediately to the Y-12 PSS office at (865) 574-7172. Coordination of spill response and cleanup will be conducted as stated in Sect. 1.5 of this SWPPP.

3. Any hazardous waste generated as part of this project will be managed and disposed of in accordance with EPA and state/local regulations.
4. Portable sanitary units will be provided for use by all workers, as needed, throughout the life of the project. All sanitary waste will be regularly collected from the portable units by a licensed sanitary waste management contractor.

5. Materials and supplies will be stored in designated/posted areas within the disturbed area. Because UEFPC may exceed its banks during heavy precipitation events, material storage areas will not be placed in areas that may be prone to flooding by UEFPC. Materials and supplies may be stored in the open only if they will not cause contamination of any storm water that comes into contact with them. Materials that may contribute to the contamination of storm water (i.e., dry fertilizer, concrete mix) must be covered or stored inside to prevent contact with storm water. Material storage areas will be as small and as few in number as practicable. They will be established only in designated areas that minimize the disturbance of soil during use and minimize the possibility of storm water runoff being contaminated with sediment or other pollutants.

6. Hazardous wastes and materials must have secondary containment and must be covered or stored inside to prevent contact with storm water. Chemicals, drums, and bagged materials should not be stored directly on the ground.

7. All onsite vehicles and equipment will be monitored for leaks daily and will receive regular preventive maintenance to reduce the chance of leakage.

8. Potential pollutants, such as metal fines, metal cuttings or shavings, etc., shall be collected in the work areas and properly managed and disposed.

1.5.2 Spill Control and Response Practices

Spill cleanup and response materials should be onsite at all times. If the spilled material is known, personnel are properly trained, and it is deemed safe to do so, the following actions should be taken:

1. Stop the leak.

2. Use appropriate spill response materials to control the spilled material, including deployment of additional oil and debris booms (ODBs) across UEFPC, as needed.

3. Properly dispose of contaminated spill response materials.

Where the spill gets into the soil, the soil should be excavated, properly treated, and contained.

1.5.3 Spill Reporting and Record Keeping

If a release, spill, or leak should happen, the following actions shall be taken after reporting the incident to the Y-12 PSS office:

1. Place a written report of the spill event and associated response actions in the SWPPP within 14 days of the spill event. The written report will include a description of the release (i.e., quantity and type of material), date of the release, circumstances leading to the release, and steps taken to respond and/or address the release.

2. Evaluate the SWPPP to determine if modifications are warranted to identify measures to prevent the reoccurrence of such releases, spills, or leaks. Revisions to this SWPPP will be prepared if modifications are needed.
1.6 **SOLID WASTE AND LITTER CONTROL**

Each contractor is responsible to provide litter control for trash generated by their crew. A dumpster for solid waste will be located near the construction trailer and is limited to garbage and paper trash only. Paint cans, oil cans, used oil and filters, and other typical construction and household hazardous waste shall be contained and disposed of by the contractor by taking them to a Hazardous Waste Disposal Center. DOE policy for recycling (e.g., aluminum beverage cans and plastics) shall be followed.

1.7 **DUST SUPPRESSION/PREVENTING TRACKING OF SEDIMENT ONTO ROADWAYS**

Construction/demolition entry and exit areas should be stabilized with gravel or similar material to prevent the tracking of sediments onto roadways. Preventing the tracking of sediments onto roadways is a high priority. Any sediment that is tracked onto paved roads should be removed as soon as possible. Refer to B.5. *Business Management Practices for the Creation of a Construction Exit/Entrance* in Appendix B.

Wet suppression, or “watering,” can be used to control dust generated during work activities. Water must be applied often to be an effective dust suppression agent. However, care must be taken not to overwater, which may cause excessive runoff and the transport of particulate materials and other pollutants into the storm drain system.

When possible, the water used for dust suppression should be non-chlorinated. This will prevent the discharge of chlorinated water into the storm drain system in the event of a spill or over-application, thereby preventing potential damage to biota in receiving streams.

The beds of haul trucks that are transporting demolition materials, gravel, soil, or other materials that may contain particulates must be covered to prevent the generation of dust when the trucks are moving.

To prevent additional generation of dust, areas must be stabilized after earth-disturbing work has been completed. This may be done by establishing vegetative cover or by placing gravel, mulch, or other materials over areas of exposed soil.

Vehicle traffic in the area of disturbance shall be limited to very slow speeds. Also, the number of vehicles and the amount of vehicle activity at any one time should be controlled to prevent excessive dust.

To reduce the possibility of excessive dust, high traffic areas should be inspected on a daily basis, and lower traffic areas should be inspected on a weekly basis during dry conditions.

1.8 **SOIL STABILIZATION**

When possible, existing vegetation should be preserved. Disturbed portions of the site must be stabilized. Stabilization practices may include: temporary seeding (TS), permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, gravel, stone, and/or other appropriate measures. Use of impervious surfaces for final stabilization should be avoided unless it is necessary in places such as roadways, driveways, or areas planned for future construction activities.

Stabilization measures shall be initiated as soon as possible in portions of the site where construction activities have temporarily or permanently ceased. Temporary or permanent soil stabilization at the construction site (or a phase of the project) must be completed no later than 14 days after the construction.
activity in that portion of the site has temporarily or permanently ceased. In the following situations, temporary stabilization measures are not required:

1. Where the initiation of stabilization measures is precluded by adverse soggy ground conditions, stabilization measures shall be initiated as soon as practicable.

2. Where construction activity on a portion of the site is temporarily ceased, and soil disturbing activities will be resumed within 14 days.

Soil stabilization measures that are implemented shall be maintained until final stabilization is achieved.
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2. SITE DESCRIPTION

2.1 OVERALL PROJECT SITE

The OF200 MTF will lie in the UEFPC watershed. The UEFPC watershed includes approximately 1170 acres that encompasses the industrialized area of Y-12, and extends along the top of Pine Ridge to the north, the top of Chestnut Ridge to the south, the eastern boundary of the Bear Creek Valley watershed to the west, and the DOE property line to the east. The OF200 MTF construction is being conducted in two phases. The first phase is the early site preparation phase which had a separate SWPPP. The second phase, covered by this SWPPP, is the MTF balance of construction. The MTF balance of construction is expected to begin in late 2018. The OF200 MTF construction project site is divided into these areas:

1. Headworks
2. Transfer Pipeline
3. Treatment Facility

The Headworks is located on the south bank of UEFPC, bounded by E Road to the west and Third Street to the south. The site will include an intake structure in UEFPC, base flow grit chamber and pump station, storm flow grit chamber and pump station, a 2-million-gal storm water storage tank, grit pump building, grit handling system, grit rolloff, and chemical feed system.

The Transfer Pipeline is approximately 3100 ft long and connects the Headworks to the Treatment Facility. It parallels the south side of UEFPC and then crosses UEFPC to the north to enter the Treatment Facility. The 20-in.-diameter pipeline will be constructed primarily of ultraviolet resistant high-density polyethylene (HDPE). The Transfer Pipeline is generally located above ground and supported at grade; however, the pipeline is buried at road crossings and at the entrances into the Headworks and the Treatment Facility. The Transfer Pipeline is elevated on a pipe bridge where it crosses UEFPC to the Treatment Facility.

The Treatment Facility is bounded by Second Street to the north, Third Street to the south, B Road to the west, and A Road to the east. The Treatment Facility will include an equalization tank, chemical truck unloading and storage, chemical reaction tanks, inclined plate clarifiers, sludge settling tanks, and the treatment building. A new CERCLA plant effluent outfall will be constructed at UEFPC near the southwest corner of the Treatment Facility.

Figures are presented in Appendices C, D, and E showing site plans and sediment and erosion controls for the Headworks, Transfer Pipeline, and Treatment Facility, respectively. Figures 1 through 3 indicate the approximate boundaries for the balance of construction work areas.
Fig. 1. OF200 MTF overall balance of construction work area.

Fig. 2. OF200 MTF Headworks balance of construction work area.
2.2 ESTIMATION OF THE TOTAL DISTURBED AREA OF THE SITE

The total area that will be affected by construction activities will be approximately 4.6 acres. The area of disturbance can be broken down as follows:

1. Headworks—Approximately 1 acre
2. Transfer Pipeline—Approximately 1.3 acres
3. Treatment Facility—Approximately 2.3 acres

2.3 DESCRIPTION OF SITE TOPOGRAPHY INCLUDING PERCENT SLOPE

Topographically, the property generally slopes toward UEFPC at approximately 2–5%. Storm water discharges from the work areas will enter UEFPC. UEFPC eventually discharges to Poplar Creek.

2.4 DESCRIPTION OF STREAMS ADJACENT TO THE SITE & RECEIVING WATERS

The receiving water for all storm water runoff from the balance of construction work area is UEFPC. UEFPC is listed on the 2016 Draft 303(d) as being impacted by PCBs, mercury, nutrients, Escherichia coli (E. coli), loss of biological integrity due to siltation, and other anthropogenic habitat alterations. The soils and/or accumulated water within the work area could be contaminated with radionuclides, PCBs, mercury, or other contaminants. Therefore, caution must be taken during earthwork at Y-12 so as to not to further impact UEFPC.
2.5 SOILS

Y-12 is situated in the eastern portion of the Tennessee valley and ridge physiographic province, which is underlain by southeast-dipping sedimentary rocks of Cambrian through Mississippian age. Unconsolidated materials overlying bedrock in the UEFPC watershed include alluvium (stream-laid deposits), colluvium (material transported downslope), residuum (in situ residual material left after weathering of bedrock), weathered bedrock, and fill. Fill material consists of reworked natural materials mixed with construction debris. The unconsolidated materials are predominately clayey silts and silty clays. Very few areas within the watershed have a sequence of natural soil horizons because extensive cut-and-fill grading during construction of Y-12 reworked much of the preexisting unconsolidated material. In addition, the tributary system to UEFPC and a portion of the main channel in the central and western portions of the complex were captured in an extensive storm drain system. The thickness of fill material placed along former UEFPC tributaries is quite variable, ranging from a few feet to nearly 30 ft in the north-central portion of the complex. In most areas of the watershed, the water table lies within the unconsolidated zone or just beneath the bedrock-unconsolidated zone interface at depths ranging from less than 10 ft in the southern portion of the complex to more than 30 ft in the northern portion of the complex. Portions of the storm drain system flow continuously because they capture groundwater base flow, as well as storm runoff.

Based on information obtained from the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service Soil Survey (NRCS), it was determined that the soil at this site is classified as UrD, or Urban Land. These soils are found in areas where the surface is covered by roads, streets, parking lots, commercial buildings, etc., with predominantly impervious ground cover. These soils are generally well drained and have a slow to moderate permeability.

Because the soil encountered at this site has been disturbed in the past, erodible silts, clays, and sands may be located near the ground surface. For this reason, strict adherence to the utilization of best management practices (BMPs) outlined in this plan will be required in order to prevent erosion and control the discharge of sediment from the site. The use of prescribed BMPs, along with the minimization of amounts of area disturbance at any one time, will serve to reduce the likelihood of discharges of sediment occurring at the site. The proposed BMPs are believed to be adequate to prevent sediment-laden waters from reaching the receiving stream.

2.6 HYDROGEOLOGY

The UEFPC watershed utility and infrastructure system includes an extensive network of sumps, storm drains, pipes, and outfalls. These features strongly influence the movement and discharge of shallow groundwater. In several large buildings (e.g., 9201-4, 9201-5, 9204-4, and 9201-2), basement dewatering sumps collect shallow groundwater for discharge through outfalls to UEFPC, depressing the water table in some areas. The subsurface drainage system installed within the unconsolidated material influences groundwater flow and the water table. Within Y-12, infiltrating rainfall percolates through permeable zones in the unconsolidated materials to recharge groundwater where the ground surface is not covered by buildings or paving. Infiltrating groundwater can move downward and laterally quite rapidly within the unconsolidated zone through permeable zones to recharge the bedrock units beneath, or until intercepting a storm sewer or utility trace and discharging to UEFPC.

2.7 PROTECTED SPECIES AND CRITICAL HABITAT

The ecology of the UEFPC watershed has been, and continues to be, strongly influenced by anthropogenic structures and industrial activities. Most of the UEFPC watershed is covered with concrete, gravel, asphalt,
industrial structures, or grass. The UEFPC provides very little habitat for terrestrial vertebrate animals; woodchuck, opossum, raccoon, and striped skunk are among the largest and most abundant mammals. Although surveys of protected vertebrates inhabiting the ORR are not comprehensive, the likelihood of federally- or state-listed species is very low. Various birds nest and forage in the UEFPC watershed, including the belted kingfisher.

There are two dominant aquatic features in the watershed, UEFPC and Lake Reality. The UEFPC channel has been extensively modified over the years by the installation of structures such as road crossings and weirs, and through significant use of riprap and erosion controls. Much of the channel lacks riparian vegetation. Historically, mostly for security reasons, trees have not been allowed to grow along UEFPC. The UEFPC channel aquatic habitat differs substantially from creeks in more natural settings, lacking the “pool and riffle” morphology often associated with creeks in such settings. Lake Reality is a plastic-lined, flat-bottomed, steep-sided settling and spill control basin that is home to turtles and fish, but does not support much vegetation.

Y-12 contains no designated habitat that could support threatened or endangered species of plants; however, most of the area has not been directly surveyed. In 1997, a small wetland was identified just outside the complex in an area between New Hope Cemetery and Bear Creek Road. The area is dominated by jewelweed, cardinal flower, and microstegium as groundcover species and sycamore, red maple, ironwood, and green ash as woody species, none of which is threatened, endangered, or in need of special protection.

Several species of submerged macrophytes and emergent aquatic plants previously grew in and near the edge of the former New Hope Pond. None of these are considered to be rare or endangered.

2.8 WATER QUALITY RIPARIAN BUFFER ZONES

The CGP requires a minimum 30-ft natural water quality riparian buffer be preserved between the top of stream bank and the disturbed construction area. However, because of the selected MTF location, earth-disturbing work will be required within the riparian zone. BMPs will be used within this zone to prevent erosion and control sediment in order to minimize the impact of sediment to UEFPC.

2.9 WORK TO BE CONDUCTED IN STREAM OR WITHIN FLOODPLAINS

2.9.1 Vegetation Removal Along Stream Bank

Large trees and other vegetation will be removed along the banks of UEFPC in the Headworks area as part of the early site preparation activities for the OF200 MTF. If additional vegetation removal associated with the balance of construction becomes necessary (e.g., for installation of the Transfer Pipeline or plant effluent outfall), the following guidelines will be followed to the extent possible:

1. Vegetation will be removed only to ground level.
2. No grubbing or soil disturbance will be performed as part of the vegetation removal activities.
3. Clearing or other disturbance of areas immediately adjacent to UEFPC will be minimized during installation of the intake structure, transfer line, and the discharge outfall.
4. Where appropriate, disturbed areas will be stabilized and revegetated.
5. Vegetation removal will be limited to only that needed for project construction.
2.9.2 Floodplains Management

Protection of floodplains is mandated by Executive Order (EO) 11988 Floodplains Management. EO 11988 requires that federal agencies avoid “to the extent practicable” construction within floodplains. The official floodplain maps are now maintained by the Federal Emergency Management Agency (FEMA). Floodplain maps may be located at https://msc.fema.gov/portal. The location of the Treatment Facility appears to be just south of map no. 47001CO238F. This area is not available on the current FEMA catalogue.

UEFPC floodplain boundaries (100-year and 500-year) are shown on the OF200 MTF Balance of Construction civil drawings. Although the Treatment Facility is outside of the 500-year floodplain, the Headworks and portions of the Transfer Pipeline are within the boundaries of the 100-year and 500-year floodplains. An evaluation of alternative locations was conducted and documented as part of the Conceptual Design. Regulators involved have reviewed and approved the Conceptual Design as part of the CERCLA process.

2.9.3 Protection of Aquatic Resources

Protection of aquatic resources at the proposed location is regulated by both the U.S. Army Corps of Engineers (USACE) under the authority of the Clean Water Act (CWA), and the Tennessee Department of Environment and Conservation (TDEC) under the authority of the Tennessee Water Quality Control Act of 1977. Both agencies require a permit for construction that could adversely affect the aquatic resources of waters of the state. Such permits may take the form of Individual Permits (which are granted on a project-specific basis) or Nationwide Permits (NWPs) (in the case of USACE) or General Permits (in the case of TDEC). Individual Permits require submission of an application, followed by agency and public review and approval before construction may begin. Projects of high complexity, or with other sensitive aspects, often require Individual Permits. Nationwide and General Permits, on the other hand, are granted to certain specified activities, and, provided the activity meets the requirements specified in each permit, may proceed without the lengthy review process. The OF200 MTF balance of construction activities in EFPC should qualify for Nationwide and General Permits. Please note that both USACE and TDEC must approve the proposed activities.

Construction of the OF200 MTF intake and outfall structures should qualify for USACE NWP No. 7, for Outfall Structures and Associated Intake Structures. The requirements for this permit are listed in Sect. 2.9.3.1. Please note that this permit requires pre-construction notification (PCN) of USACE, and (excepting the provisions of General Conditions 32(a)(2) are met) approval from USACE, before construction may begin. The contents of the PCN are listed in General Conditions 32(b).

Similarly, construction of the OF200 MTF intake and outfall structures should qualify for TDEC’s General Aquatic Resources Alteration Permit for Construction of Intake and Outfall Structures. The requirements for this permit are listed in Sect. 2.9.3.2. Please note that this permit requires a pre-construction application be submitted to, and approved by, TDEC before construction may begin. The contents of the pre-construction application are very similar to those of the USACE PCN.

Because the OF200 MTF balance of construction activities are being undertaken entirely on a CERCLA site by authority of CERCLA as approved or required by EPA, permits do not have to be obtained under Sect. 404 of the CWA or Sect. 10 of the Rivers and Harbors Act; however, CERCLA activities must meet the applicable or relevant and appropriate requirements (ARARs). General and specific conditions for both the USACE and TDEC permits are listed below, and should be considered to be ARARs. Note that some of the listed requirements may become irrelevant, depending upon the final configuration of the plans, or upon agreement with the appropriate regulatory agency. In those cases, the requirements may be removed from the list of ARARs. It should also be noted that notification to the appropriate regulatory agency is a
requirement of both USACE and TDEC permits; therefore, it is recommended that both the USACE and TDEC be officially notified of the proposed activities well before any soil or sediment disturbing activities are begun within the stream. Notification is oftentimes accomplished through completion and submittal of the appropriate application form; however, notification may be accomplished through other means. If the decision is made to fulfill the notification requirement through other means, the appropriate regulatory agency should be contacted for guidance.

2.9.3.1 USACE NWP General Conditions

NWP General Conditions apply to all of the USACE NWPs. Many of these conditions are irrelevant to the construction of the intake and outfall structures for the OF200 MTF. The following list has been edited to include only those conditions relevant to this project. USACE has assigned a number to each General Condition, and that number has been retained in bold in the following list. The USACE 2017 NWP General Conditions that are applicable to the OF200 MTF balance of construction activities are listed below:

10. Activity Falling Within 100-Year Floodplains. The activity must comply with applicable FEMA approved state or local floodplain management requirements. (Note that regulatory agencies have already reviewed and approved the Conceptual Design for the OF200 MTF activities that fall within the floodplains. If the design within the floodplains is modified, the modifications must be re-evaluated with regard to the impacts to the floodplains.)

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., onsite).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(d) For losses of streams or other open waters that require a PCN, the district engineer may require compensatory mitigation to ensure that the activity results in no more than minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult-to-replace resources [see 33 Code of Federal Regulations (CFR) 332.3(e)(3)].

(e) Compensatory mitigation plans for Nationwide Permit (NWP) activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. Restored riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25–50 ft wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or
habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR Part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWPs, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f)).

(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.

(6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly
indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

32. Pre-Construction Notification (PCN).
   (a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a PCN as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

   (1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

   (2) 45 calendar days have passed from the district engineer’s receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer.

However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 20 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is “no effect” on listed species or “no potential to cause effects” on historic properties, or that any consultation required under Sect. 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Sect. 106 of the National Historic Preservation (see 33 CFR 330.4(g)) has been completed.

If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee’s right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of PCN: The PCN must be in writing and include the following information:

   (1) Name, address and telephone numbers of the prospective permittee;

   (2) Location of the proposed project;
(3) A description of the proposed project; the project’s purpose; direct and indirect adverse environmental effects the project would cause, including the anticipated amount of loss of water of the United States expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(4) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(5) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse effects are minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and

(7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Sect. 106 of the National Historic Preservation Act.

(c) Form of PCN: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) Agency Coordination:

(1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity’s compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project’s adverse environmental effects to a minimal level.
(2) For all NWP activities that require PCN and result in the loss of greater than 1/2-acre of waters of the United States, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the PCN. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity’s compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects to the aquatic environment of the proposed activity are minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each PCN that the resource agencies’ concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Sect. 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(4) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of PCNs to expedite agency coordination.

2.9.3.2 USACE NWP 7—Outfall Structures and Associated Intake Structures

Activities related to the construction or modification of outfall structures and associated intake structures, where the effluent from the outfall is authorized, conditionally authorized, or specifically exempted by, or otherwise in compliance with regulations issued under the NPDES program (Sect. 402 of the CWA). The construction of intake structures is not authorized by this NWP, unless they are directly associated with an authorized outfall structure.

Notification: The permittee must submit a PCN notification to the district engineer prior to commencing the activity. (See General Condition 32.)

2.9.3.3 TDEC General ARAP for Construction of Intake and Outfall Structures

The TDEC General Aquatic Resources Alteration Permit (ARAP) for Construction of Intake and Outfall Structures appears to be applicable to construction of the OF200 MTF Headworks intake structure and the Treatment Facility effluent outfall structure. Special Conditions and General Conditions associated with this general ARAP are listed below in Fig. 4. These conditions were considered and incorporated into the applicable BMP plans in Appendix B.
Tennessee Department of Environment and Conservation
General Aquatic Resource Alteration Permit for
Construction of Intake and Outfall Structures

Effective Date: April 7, 2015
Expiration Date: April 6, 2020

Activities Covered by this Permit
This general permit authorizes the construction, maintenance, repair, rehabilitation or replacement of intake and outfall structures in waters of the state. Outfall structures include those structures and conveyances used for the discharge of wastewater, stormwater, cooling water, etc. Intake structures include those structures used for the removal of water for the purpose of domestic water supply, irrigation, cooling water, etc.

Authorization under this general permit is only for the construction of the structures and does not authorize the withdrawal or release of water. The effluent from the outfall must be separately authorized, conditionally authorized, specifically exempted, or otherwise in compliance with regulations issued under the National Pollutant Discharge Elimination System program (§402 of The Clean Water Act). The withdrawal of water by the intake must be separately authorized, specifically exempted, or otherwise in compliance with regulations issued under §69-3-108 of The Tennessee Water Quality Control Act of 1977.

Certain activities due to size, location or potential water quality impacts are not covered under this general permit, as described in both the Special and General Conditions sections. Activities not qualifying for authorization under this general permit may be authorized by a standard (individual) permit provided that all requirements of the Tennessee Water Quality Control Act of 1977 (the Act) are met.

Special Conditions
1. New intake or outfall structures shall be located and oriented such as to avoid permanent alteration or damage to the integrity of the stream channel including the opposite stream bank. The alignment of the outfall structure (except for diffusers) should be as parallel to the stream flow as is practicable, with the discharge pointed downstream. Diffusers may be placed perpendicular to stream flow for more complex mixing.

2. Intake and outfall structures shall be designed to minimize harm and to prevent the impoundment of normal or base flows. Base flow is the usual or normal flow of the stream that is supplied primarily by groundwater from springs and seeps, but not affected by rapid runoff during and after rainfall.

3. Velocity dissipation devices shall be placed as needed at discharge locations to provide a non-erosive velocity from the structure.

4. Headwalls, bank stabilization materials, and any other hard armoring associated with the installation of each structure shall be limited to a total of 25 feet along the receiving stream’s bank.

Fig. 4. TDEC General ARAP for Construction of Intake and Outfall Structures.
General Conditions

1. All activities must be accomplished in conformance with the approved plans, specifications, data and other information submitted in support of the ARAF application (form CN-1091) and the limitations, requirements and conditions set forth herein. Failure to comply with the terms and conditions of this permit is a violation of the Tennessee Water Quality Control Act of 1977 (the Act), and is subject to penalty in accordance with T.C.A. §69-3-115.

2. Activities, either individually or cumulatively, that may result in greater than de minimis degradation to waters of the state are not covered. This general permit shall not be used incrementally to combine with other activities resulting in a net loss of water resource values.

3. Clearing, grubbing, and other disturbance to riparian vegetation shall be kept at the minimum necessary for slope construction and equipment operations. Unnecessary riparian vegetation removal, including trees, is prohibited. Native riparian vegetation must be reestablished after work is completed. Non-native, non-invasive annuals may be used as cover crops until native species are established. Coverage under this permit does not serve to waive any local riparian buffer protection requirement, and permittees are responsible for obtaining any necessary local approval.

4. Widening of the stream channel as a result of this activity is prohibited.

5. This activity may not result in a disruption or barrier to the movement of fish or other aquatic life.

6. Activities that directly impact wetlands, or impair surface water flow into or out of any wetland areas are not covered.

7. Activities located in a component of the National Wild and Scenic River System or waters designated as Outstanding National Resource Waters are not covered.

8. Activities occurring in known or likely habitat of state or federally listed threatened, endangered, or species of special concern may not be authorized without prior coordination with the Tennessee Wildlife Resources Agency (TWRA) and TDEC Division of Natural Areas (DNA) to determine if any special conditions are required to avoid and/or minimize harm to the listed species or their habitat. Adverse effects to federally listed threatened and endangered species are not permitted without prior authorization from the United States Fish and Wildlife Service (USFWS) as required by Section 7 or Section 10 under the Endangered Species Act.

9. Work shall not commence until the permittee has obtained all necessary authorizations pursuant to applicable provisions of §10 of the Rivers and Harbors Act of 1899; §404 of The Clean Water Act and §26a of The Tennessee Valley Authority Act, as well as any other federal, state or local laws.

10. Backfill activities must be accomplished in a manner that stabilizes the streambed and banks to prevent erosion. All contours must be returned to pre-project conditions to the extent practicable and the completed activities may not disrupt or impound stream flow.

11. The use of monofilament-type erosion control netting or blanket is prohibited.

12. This permit does not authorize impacts to cultural, historic or archaeological features or sites.

13. This permit does not authorize access to private property. Arrangements concerning the use of private property shall be made with the landowner.

14. Where practicable, all activities shall be accomplished in the dry. All surface water flowing towards this work shall be diverted using cofferdams and/or berms constructed of sandbags, clean rock (containing no fines or soils), steel sheeting, or other non-erodible, non-toxic material. All such diversion materials shall be removed upon completion of the work.

Fig. 4. (cont.)
2.9.3.4 Stream Mitigation

While mitigation for certain stream impacts has been required for many years in the state of Tennessee, the Tennessee Water Quality Control Board adopted rules in July 2000 that more clearly specify the requirement that permits for the alteration of streams must not result in a net loss of water resource value. The USACE and TDEC Division of Water Pollution Control now require compensatory mitigation for permitted impacts to Tennessee streams. Compensatory mitigation may be accomplished through the replacement, restoration, and/or enhancement of degraded stream channels using natural channel designs and bioengineering techniques.

The following factors must be considered when determining if appropriate and practicable mitigation is necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., onsite).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

Activities that may be conducted as part of mitigative activities include:

- Placement of brush, logs, boulders, or other material in the stream channel to restore stream channel structural complexity
- Stabilization of stream banks
- Culvert replacement
- Supplemental erosion/sediment control measures
- Revegetation of riparian areas with native vegetation

The need for mitigation activities at UEFPC will be evaluated after construction of the OF200 MTF has been completed. Any mitigative activities undertaken in UEFPC will be performed in conjunction with personnel from the ORNL Environmental Sciences Division. Note that specific measures are not mandated. Rather, the need for mitigation activities is evaluated on a case-by-case basis, and specific measures may be subject to negotiation and agreement between the constructor and the appropriate regulatory agency. This may take the form of a reviewed and approved mitigation plan developed by the constructor, the use of mitigation banks, or an in-lieu fee.

2.9.3.5 Fish Barrier Installation

As a result of the construction of the OF200 MTF, a portion of UEFPC several hundred feet in length (from an area downstream of the intake structure in the Headworks area to an area near the Third Street bridge) will potentially be dewatered. It is currently believed that the small, constant discharges from a few storm water outfalls and discharges of treated effluent from the Big Springs Treatment Facility will not provide sufficient quantities of discharged water to maintain a constant, ongoing flow through this portion of UEFPC.

If this occurs, occasional flow in the dewatered section of UEFPC may result when storm events cause a discharge of storm water large enough to temporarily restore flow or when a bypass of the MTF occurs as
a result of the storage capacity of the storm water storage tank being exceeded. Temporary restoration of flow may result in a condition where fish could migrate back into the dewatered section of UEFPC. These fish could potentially be stranded in the dewatered section of UEFPC as the flow recedes, which may result in a fish kill.

The installation of a fish barrier is a possible means to prevent the migration of fish into the dewatered portion of UEFPC. Two basic types of fish barriers are available:

1. Physical barriers
   - Nets (Because the fish in UEFPC are generally small, a net with a small mesh size would be required; this could result in excessive maintenance constraints.)
   - Racks
   - Screens

2. Behavioral barriers
   - Electric fish barriers—Prevent fish from migrating upstream by producing a graduated, pulsed field of direct current in the water that affects muscular control in fish.
   - Acoustic fish deterrents—Use sound/pressure waves (noise) to influence the behavior of aquatic organisms.
   - Strobe lights—An unnatural stimuli for fish and serves to repel them from areas where they are not desired.
   - Air bubble curtain—Generates a field of small air bubbles that act as a barrier to fish migration.

The need for a fish barrier will be assessed separately from the construction of the MTF. Determination of the need for a fish barrier and the type of fish barrier that might be utilized in UEFPC will be performed in conjunction with personnel from the ORNL Environmental Sciences Division.

2.10 CONSTRUCTION ACTIVITIES

The OF200 MTF construction activities related to soil disturbance and EPSC measures are briefly described below for the Headworks, Transfer Pipeline, and Treatment Facility in anticipated order of construction. Some EPSC measures such as sediment control barriers (SCBs) and ODBs may have been installed by others during early site preparation; the working condition of these EPSC measures must be verified for continued use. Additional EPSC measures shall be installed in accordance with the civil drawings and the figures in Appendices C, D, and E of this SWPPP. At no time during construction are any areas of the project to remain exposed to erosion for more than 7 calendar days. Site stabilization shall be per the requirements of the stabilization plan. Water management during excavation must be per an approved Water Control Plan. Additionally, no construction shall take place on the project until the appropriate EPSC measures and other BMPs are in place and properly functioning. EPSC measures must be maintained throughout the construction phase until final grades are established and disturbed areas are revegetated, or receive their asphalt or concrete surface. At that time any remaining temporary EPSC measures shall be removed.
2.10.1 Balance of Construction—Headworks

- Implementation of appropriate EPSC measures for Headworks excavation to include SCBs (silt fencing, wattles, Erosion EelsTM), inlet protection, ODB, and construction exit/entrance (CEE); see Fig. C-1 in Appendix C.
- Excavation of soil and rock for below-grade concrete structures and temporary shoring.
- Placement and compaction of granular subbase material for grit chambers, pump stations, and grit pump building.
- Implementation of additional EPSC measures for Headworks grading and concrete work to include CW and TS (as needed); see Fig. C-2 in Appendix C.
- Installation of micropiles and foundations for base flow grit chamber, base flow pump station and grit pump building.
- Installation of micropiles and foundations for storm flow grit chamber and storm flow pump station.
- Diversion of EFPC stream flow to allow work in dry conditions on intake structure and in-stream diversion weir (recommend sandbag berms in UEFPC upstream and downstream of work area and bypass pumping through fabric-lined diversion channel on north side of UEFPC next to roadway); see Fig. C-3 in Appendix C and B.14. Best Management Practices for Stream Diversions and B.4. Best Management Practices for the Creation and Operation of a Dewatering Station in Appendix B.
- Placement of structural concrete for base flow channel, intake structure and in-stream diversion weir
- Placement of structural concrete for storm flow channel.
- Removal of temporary EPSC measures for diversion of UEFPC stream flow to include removal of sandbag berms, bypass pumps, dewatering devices and fabric-lined diversion channel.
- Establishment of underground electrical service to Headworks.
- Seeding and mulching for disturbed areas that will not be surfaced with gravel, concrete or asphalt.
- Installation of buildings, mechanical equipment and materials.
- Installation of storm water storage tank foundation and storage tank.
- Installation of all site work asphalt and concrete.
- Removal of temporary EPSC measures to include SCBs (silt fencing, wattles, Erosion Eels), inlet protection, CW, CEE, and ODB; do not remove inlet protection or ODB if still required for Transfer Pipeline activities.

2.10.2 Balance of Construction—Transfer Pipeline

- Procurement of all materials and equipment including HDPE pipeline, pipe supports and anchors, pipeline bridge, and crossover stairs.

™ Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.
• Implementation of appropriate EPSC measures for Transfer Pipeline installation to include SCBs (silt fencing, wattles, Erosion Eels), inlet protection, and an ODB; see Figs. D-1, D-2, D-3, D-4, D-5, D-6, D-7, D-8, and D-9 in Appendix D.

• Clearing and grubbing of the transfer pipeline route, as required prior to pipeline installation.

• Placement of gravel pads along pipeline route.

• Placement of concrete for pipeline bridge piers, pipe supports and anchors.

• Installation of pipeline bridge structure over EFPC on pipeline bridge piers.

• Installation of all transfer pipeline and heat trace components.

• Installation of bollards along pipeline route.

• Installation of pipeline crossover stairs in eight locations along transfer pipeline route.

• Removal of temporary EPSC measures to include SCBs (silt fencing, wattles, Erosion Eels), inlet protection, and ODB; do not remove inlet protection or ODB if still required for activities at Headworks or Treatment Facility.

2.10.3 Balance of Construction—Treatment Facility

• Implementation of appropriate EPSC measures for Treatment Facility site demolition and excavation to include SCBs (silt fencing, wattles, Erosion Eels), inlet protection, and CEE; see Fig. E-1 in Appendix E.

• Demolition of existing features and structures including removal of concrete slabs, walls, stairs, docks and appurtenances, and removal of asphalt.

• Implementation of appropriate EPSC measures for Treatment Facility effluent outfall structure to include SCBs (silt fencing, wattles, Erosion Eels), ODB, and installation of sandbag berm in EFPC to isolate work area for installing plant effluent outfall; see Fig. E-2 in Appendix E.

• Vegetation removal from new plant effluent outfall area along EFPC as required, installation of plant effluent outfall, and subsequent removal of sandbag berm.

• Placement and compaction of granular subbase material in preparation for concrete work, backfill and rough site grading.

• Implementation of additional EPSC measures for Treatment Facility grading and concrete work to include CW and TS (as needed); see Fig. E-3 in Appendix E.

• Installation of concrete foundations for Treatment Facility.

• Establishment of underground electrical service to Treatment Facility.

• Seeding and mulching for disturbed areas that will not be surfaced with gravel, concrete, or asphalt.

• Installation of buildings, mechanical equipment and materials.

• Installation of process equipment, piping, electrical, instrumentation, and control systems.

• Installation of all site work asphalt and concrete.

Removal of temporary EPSC measures to include SCBs (silt fencing, wattles, Erosion Eels), inlet protection, CW, CEE, and ODB; do not remove inlet protection or ODB if still required for Transfer Pipeline activities.
3. STORM WATER RUNOFF CONTROLS

3.1 EROSION PREVENTION AND SEDIMENT CONTROLS

The primary purpose of balance of construction EPSC measures is to prevent offsite sediment transport by retaining sediment onsite while land disturbing activities are ongoing. Selected controls shall be installed and maintained in accordance with the manufacturer’s specifications and good engineering practices (GEPs). An EPSC Plan that incorporates a combination of structural, non-structural, and stabilization practices has been prepared for the construction activities associated with this project and is included in Appendices C, D, and E. EPSC measures must be in place before earth moving operations begin, and must be maintained throughout the construction period. All EPSC measures proposed for this project have been designed or selected to control storm runoff generated by a two-year, 24-h storm event.

3.2 NON-STRUCTURAL PRACTICES

Existing vegetation at the site should be preserved to the maximum extent possible. Litter, debris, and construction chemicals exposed to storm water shall be picked up prior to anticipated storm events or otherwise be prevented from becoming a pollutant source. Generation of dust shall be minimized by spraying or misting with water or by other similar methods. CW, material storage, stockpiling of soil, dewatering, and equipment and vehicle washing activities shall be limited to designated areas that will be field located by the contractor.

3.3 STRUCTURAL PRACTICES

Structural practices proposed for use on this project to reduce the transport of sediment and to control erosion include SCBs (i.e., silt fences, wattles, Erosion Eels), a CEE, storm drain inlet protection, storm water outlet protection, storm water and stream diversion structures, and deployed ODBs. The locations of these measures are shown on the EPSC figures in Appendices C, D, and E. Details for proposed structural EPSC measures, in accordance with the Tennessee Erosion and Sediment Control Handbook, or as specified by the design engineer, are included in Appendix B.

Muddy accumulated water pumped from excavation and work areas must be held in settling basins or filtered prior to discharge to surface waters. The discharge of accumulated water shall be through the selected dewatering structure that will be field located by the contractor. Refer to B.15. Best Management Practices Plan for the Discharge of Accumulated Water and B.4. Best Management Practices for the Creation and Operation of a Dewatering Station in Appendix B.

3.4 STABILIZATION PRACTICES

Pre-construction vegetative ground cover shall not be removed or disturbed more than 14 days prior to earth moving, unless the area is seeded or mulched or other temporary cover is installed. Stabilization of disturbed areas shall be initiated immediately whenever earth-disturbing activities have temporarily or permanently ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Slopes exceeding 35% shall be stabilized no later than 7 days after construction activity on the slopes has temporarily or permanently ceased.
Temporary stabilization measures are not required where construction activity on a portion of the site has temporarily ceased but will resume within 14 days or in areas where initiation of stabilization measures is precluded by snow cover, frozen ground conditions, or soggy ground conditions. Stabilization measures shall be initiated as soon as practicable when such conditions exist.

Permanent stabilization shall be established on all unpaved disturbed areas and areas not covered by permanent structures at the conclusion of construction activities. Final stabilization will be attained when all soil-disturbing activities at the site have been completed and final cover (e.g., gravel, asphalt, concrete) has been installed or permanent vegetative stabilization has achieved a uniform density of at least 70% throughout the site.

3.5 GUIDELINES FOR THE IMPLEMENTATION OF EPSC MEASURES

3.5.1 General guidelines for the implementation of EPSC measures

- EPSC measures have been designed to keep sediment onsite to the maximum practicable extent. EPSC measures must be properly selected, installed, and maintained in accordance with the manufacturer’s specifications. EPSC measures must be able to slow runoff to prevent the formation of rills and gullies. If periodic inspections or other information shows that an EPSC measure has proven to be ineffective, it must be replaced or modified to meet relevant site circumstances.

- Specific EPSC measures (e.g., silt fences and other appropriate controls) for this project are described in detail in Appendix B and are shown on the figures in Appendices C, D, and E.

- If sediment escapes the permitted area, offsite accumulations of sediment that have not reached a stream or other surface waterway must be removed at a frequency sufficient to minimize offsite impacts. For example, sediment that has escaped the construction site and has collected in a roadway must be removed so that it is not subsequently washed into storm sewers and/or streams by the next rain and to prevent it from becoming a safety hazard to users. Contact the MTF Facility Manager (FM) or MTF Project Manager if sediment reaches a receiving stream.

- Concrete trucks will wash out at the designated areas. CW areas will be field located to meet the needs of the construction activities and shall be designed in accordance with B.9. Best Management Practices for the Construction of a Concrete Washout Structure in Appendix B.

- Sediment and/or CW debris will be removed from EPSC measures when design capacity has been reduced by 50%.

- After use, materials used for EPSC (e.g., silt fence) will be removed or otherwise prevented from becoming a pollutant source for stormwater discharges.

- Vegetation clearing will be held to the minimum necessary for balance of construction activities. Existing vegetation at the site will be preserved to the maximum extent practicable.

- Construction will be sequenced to minimize the exposure time of the disturbed area.

- EPSC measures must be in place and functional before any earth disturbance activity begins, and must be maintained throughout the construction period. Temporary measures may be removed at the beginning of the workday but must be replaced before the end of the workday.

- Records of dates and descriptions of key activities—including major grading, the temporary or permanent cessation of construction activities on any portion of the site, or the initiation of stabilization measures—along with inspection and rainfall records will be maintained onsite.
3.5.2 Rainfall Monitoring Plan

EPSC measures and devices are utilized to minimize the dislodging and suspension of soil in runoff and to retain mobilized sediment onsite. Storm water runoff is directly proportional to the intensity and duration of a given rainfall event. Rainfall monitoring is necessary in order to estimate the effectiveness of EPSC measures and devices at the construction site. The intent of the rainfall-monitoring plan is to provide a means to record the volume of rainfall and the time period in which it fell in order to estimate the intensity of the rainfall event.

- A rain gauge or records of a locally applicable rain gauge (meteorological tower) shall be checked after every rainfall event occurring on the project site.

- If an onsite gauge is used, a fence post type rain gauge shall be used to measure rainfall. The standard fence post rain gauge shall be a wedge-shaped gauge that measures up to 6 in. (150 mm) of rainfall (e.g., Tru-Chek® Direct-Reading Rain Gauge). An English scale should be provided on one face, with a metric scale on the other face. Graduation shall be permanently molded in durable weather-resistant plastic. The minimum graduations shall be 0.01 in. (or 0.1 mm). An aluminum bracket with screws may be used for mounting the gauge on a wooden support.

- The rain gauge will be located at or along the project site in an open area such that the measurement will not be influenced by outside factors (i.e., overhangs, gutters, trees, etc.). At least one rain gauge will be located within each linear mile (as measured along the center line of the primary alignment) of the project where clearing, grubbing, excavation, grading, cutting or filling is being actively performed, or exposed soil has not yet been permanently stabilized.

- The rain gauge shall be checked after every rainfall event occurring on the project site. Detailed records of the rainfall event(s), including dates, amounts of rainfall, and the approximate duration or starting and ending times, shall be maintained. Records of rainfall gauge readings will be maintained in the Rainfall Data Log in Appendix A. Copies of rainfall logs and inspection records will be maintained with this SWPPP.
4. INSPECTIONS

4.1 INSPECTION SCHEDULE

Inspections of EPSC measures should be performed as follows:

1. Before anticipated storm events or a series of events, such as intermittent showers over one or more days (when a 50% or greater chance of rainfall is predicted from a recognized weather source):
   — The weather forecasting source should be consistently checked at the same time each day.
   — The weather forecasting source should be checked a minimum of 24 h and maximum of 48 h in advance of the workday in question.
   — Inspections and associated necessary repairs done 60 h before a rain event constitute compliance with “before anticipated storm events.”

2. During or within 24 h after the completion of any storm event of 0.5 in. or greater

3. At least twice per calendar week, at least 72 h apart, during any construction and thereafter until the site is fully constructed and all disturbed areas are permanently stabilized. For unpaved areas, permanent stabilization requires a uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of at least 70%.
   — During prolonged rainfall, daily inspections are suggested, and repairs will be made as needed. However, these do not replace the required inspections. The construction inspector or designee will ensure that inspections are made on non-work days (weekends and holidays) as necessary. If a reduction in the frequency of inspections is warranted, the requirements outlined in the CGP will be followed. Written documentation of the intent to change the inspection frequency and the justification for the change must be amended to this SWPPP.

4.2 INSPECTION PROCEDURE

Disturbed areas and storage locations shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. EPSC measures in these areas shall be inspected for proper operation. Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking. Storm water runoff discharge points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impact to receiving waters. UEFPC shall be inspected for stream conditions that may indicate impact from sediment from storm water runoff (e.g., dead or dying vegetation, stressed or dying fish, discoloration of stream bottom potentially related to sediment deposition).

- Inspector(s) responsible for the inspection of EPSC measures must have an active “Fundamentals of Erosion Prevention and Sediment Control—Level I” certification. Copies of the inspectors’ certifications will be kept onsite.

- Inspections will include, but are not limited to the following:
  — The condition of disturbed areas that have not been permanently stabilized
  — The condition and proper functioning of EPSC measures
  — The condition of material storage areas exposed to precipitation
  — The condition and proper functioning of CEEs
— The condition and noted impacts to stormwater outfalls that receive runoff from the disturbed area
— UEFPC stream conditions

• The results of these inspections and necessary repairs will be logged utilizing the inspection report in Appendix A or an approved equivalent.
• Inspection sheets will be maintained in a logbook. The site inspector(s) will be responsible for keeping the logbook up-to-date.
• Inspection and construction records shall be maintained for 3 years after the finalization of the balance of construction work activities.

4.3 INSPECTION RESULTS

Inadequate control measures or control measures in disrepair shall be replaced, repaired, or modified before the next rain event if possible, but in no case more than 7 days after the need is identified. If the EPSC measure appears to be inadequate, the FM or MTF Project Manager should be notified. Site or project changes shall be included in the SWPPP within 7 days following the inspection. Implementation of changes to the SWPPP shall be implemented within 14 days.

4.4 REPORTING

Inspection reports will be maintained onsite and made available to TDEC upon request. The following records shall be maintained on or near the site:

• Dates when major grading activities occur
• Dates when construction activities temporarily or permanently cease on a portion of the site
• Dates when stabilization measures are initiated
• Inspection records
• Rainfall records

The permittee shall also retain the following items/information in an appropriate location onsite:

1. Detailed records of the rainfall event(s) including dates, amounts of rainfall, and the approximate duration or starting and ending times shall be maintained
2. A copy of the site inspector’s certification or training record for inspector certification
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APPENDIX A CONTENTS

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MAJOR ACTIVITIES LOG .................................................................................................................. A-7

CONSTRUCTION STORM WATER INSPECTION FORM ................................................................. A-9
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**RAINFALL DATA LOG**

At a minimum, the Construction Manager or designee shall record the date, rain gauge location and reading, approximate duration of rain event, and the name of the individual logging the data. Rainfall data should be recorded each day. Maintain a copy of this Rainfall Data Log with this Storm Water Pollution Prevention Plan (SWPPP).

<table>
<thead>
<tr>
<th>Date</th>
<th>Rain gauge location</th>
<th>Rain gauge reading (inches)</th>
<th>Approximate duration of rain event (hours)</th>
<th>Person logging information</th>
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MAJOR ACTIVITIES LOG

For major activities associated with site construction and erosion prevention and sediment control (EPSC) measures, at a minimum the Construction Manager or designee shall record the date, a description of the major activity, and the name of the individual logging the data. Major activities shall include, but not be limited to, the beginning of major grading, the temporary or permanent cessation of construction activities, the initiation or resumption of construction activities, the implementation of temporary or permanent stabilization practices, and the installation of EPSC measures. Activity descriptions should be recorded each day. A copy of this Major Activities Log shall be maintained with this SWPPP.

<table>
<thead>
<tr>
<th>Date</th>
<th>Description of major activity associated with site construction and erosion prevention and sediment control measures</th>
<th>Person logging information</th>
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A-7
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CONSTRUCTION STORM WATER INSPECTION FORM

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC)
Division of Water Resources
William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue, 11th Floor, Nashville, Tennessee 37243
1-866-891-6332 (TDEC)
General NPDES Permit for Stormwater Discharges from Construction Activities (CGP)
Construction Stormwater Inspection Certification (Twice-Weekly Inspections)

<table>
<thead>
<tr>
<th>Site or Project Name:</th>
<th>NPDES Tracking Number: TNR</th>
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<tbody>
<tr>
<td>Primary Permittee Name:</td>
<td>Date of Inspection:</td>
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</tbody>
</table>

Current approximate disturbed acreage:  

<table>
<thead>
<tr>
<th>Has rainfall been checked/documented daily?</th>
<th></th>
<th>No</th>
<th>Name of Inspector:</th>
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<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
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</tbody>
</table>

Current weather conditions:  

<table>
<thead>
<tr>
<th>Inspector’s Training Certification Number:</th>
</tr>
</thead>
</table>

Please check the box if the following items are on-site:

- [ ] Notice of Coverage (NOC)
- [ ] Stormwater Pollution Prevention Plan (SWPPP)
- [ ] Twice-weekly inspection documentation
- [ ] Site contact information
- [ ] Rain Gage
- [ ] Off-site Reference Rain Gage Location:

Best Management Practices (BMPs):

Are the Erosion Prevention and Sediment Controls (EPSCs) functioning correctly? If "No," describe below in Comment Section

1. Are all applicable EPSCs installed and maintained per the SWPPP?  
   - [ ] Yes  
   - [ ] No

2. Are EPSCs functioning correctly at all disturbed areas/material storage areas per section 4.1.5?  
   - [ ] Yes  
   - [ ] No

3. Are EPSCs functioning correctly at outfall/discharge points such that there is no objectionable color contrast in the receiving stream, and no other water quality impacts per section 5.3.2?  
   - [ ] Yes  
   - [ ] No

4. Are EPSCs functioning correctly at ingress/egress points such that there is no evidence of track out?  
   - [ ] Yes  
   - [ ] No

5. If applicable, have discharges from dewatering activities been managed by appropriate controls per section 4.1.4? If "No," describe below the measures to be implemented to address deficiencies.  
   - [ ] Yes  
   - [ ] No

6. If construction activity at any location has temporarily/permanently ceased, was the area stabilized within 14 days per section 3.5.3.2? If "No," describe below each location and measures taken to stabilize the area(s).  
   - [ ] Yes  
   - [ ] No

7. Have pollution prevention measures been installed, implemented, and maintained to minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters per section 4.1.5? If "No," describe below the measures to be implemented to address deficiencies.  
   - [ ] Yes  
   - [ ] No

8. If a concrete washout facility is located on site, is it clearly identified on the project and maintained?  
   - [ ] N/A  
   - [ ] Yes  
   - [ ] No

9. Have all previous deficiencies been addressed? If "No," describe remaining deficiencies in Comment section.  
   - [ ] Yes  
   - [ ] No

Comment Section. If the answer is "No" for any of the above, please describe the problem and corrective actions to be taken. Otherwise, describe any pertinent observations:

Certification and Signature (must be signed by the certified inspector and the permittee per Sections 3.5.8.2 (g) and 7.7.2 of the CGP)

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(c)(4), this declaration is made under penalty of perjury.

<table>
<thead>
<tr>
<th>Inspector Name and Title:</th>
<th>Signature:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Permittee Name and Title:</td>
<td>Signature:</td>
<td>Date:</td>
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CN-1173 (Rev. 6-16)  
(Page 1 of 2)  
RDA 2356
Construction Stormwater Inspection Certification Form (Twice-Weekly Inspections)

Purpose of this form/ Instructions

An inspection, as described in section 3.5.8.2. of the General Permit for Stormwater Discharges from Construction Activities ("Permit"), shall be performed at least twice every calendar week and documented on this form. Inspections shall be performed at least 72 hours apart. Where sites or portion(s) of construction sites have been temporarily stabilized, or runoff is unlikely due to winter conditions (e.g., site covered with snow or ice), such inspection only has to be conducted once per month until thawing results in runoff or construction activity resumes.

As described in section 3.5.8.1 of the Permit, inspectors performing the required twice weekly inspections must have an active certification by completing the "Fundamentals of Erosion Prevention and Sediment Control Level I" course (http://www.inepsc.org). Twice weekly inspections can also be performed by: a licensed professional engineer or landscape architect, a Certified Professional in Erosion and Sediment Control (CPESC) or a person who has successfully completed the "Level II Design Principles for Erosion Prevention and Sediment Control for Construction Sites" course. A copy of the certification or training record for inspector certification should be kept on site.

Qualified personnel, (provided by the permittee or cooperatively by multiple permittees) shall inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, structural control measures, locations where vehicles enter or exit the site, and each outfall.

Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the site's drainage system: Erosion prevention and sediment control measures shall be observed to ensure that they are operating correctly.

Outfall points (where discharges leave the site and/or enter waters of the state) shall be inspected to determine whether erosion prevention and sediment control measures are effective in preventing significant impacts to receiving waters. Where discharge locations are inaccessible, nearby downstream locations shall be inspected. Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking.

Based on the results of the inspection, any inadequate control measures or control measures in disrepair shall be replaced or modified, or repaired as necessary, before the next rain event if possible, but in no case more than 7 days after the need is identified.

Based on the results of the inspection, the site description identified in the SWPPP in accordance with section 3.5.1 of the Permit and pollution prevention measures identified in the SWPPP in accordance with section 3.5.2 of the Permit, shall be revised as appropriate, but in no case later than 7 days following the inspection. Such modifications shall provide for timely implementation of any changes to the SWPPP, but in no case later than 14 days following the inspection.

All inspections shall be documented on this Construction Stormwater Inspection Certification form. Alternative inspection forms may be used as long as the form contents and the inspection certification language are, at a minimum, equivalent to the division’s form and the permittee has obtained a written approval from the division to use the alternative form. Inspection documentation will be maintained on site and made available to the division upon request. Inspection reports must be submitted to the division within 10 days of the request.

Trained certified inspectors shall complete inspection documentation to the best of their ability. Falsifying inspection records or other documentation or failure to complete inspection documentation shall result in a violation of this permit and any other applicable acts or rules.
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BEST MANAGEMENT PRACTICES DETAILS
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B.1. BEST MANAGEMENT PRACTICES FOR SEDIMENT CONTROL BARRIER

Sediment control barriers (SCB) are shown on the Erosion Prevention and Sediment Control (EPSC) Plan in Appendices C, D, and E and described as silt fencing, wattles, and Erosion Eels™.

The silt fencing shall be installed where SCB is indicated and:

1. There is adequate space to allow the silt fence to be installed.
2. Surface conditions allow the proper trenching and staking of the silt fence.

Where silt fencing cannot be installed, wattles will be utilized where ground conditions allow the proper trenching and staking of the wattles.

1. Silt fencing will be installed in accordance with the Silt Fencing Best Management Practice (BMP).
2. Wattles will be installed in accordance with the Wattles BMP.

Where neither silt fencing nor wattles can be installed due to either workspace allowances or ground conditions, then Erosion Eels shall be utilized.

1. Erosion Eels will be installed in accordance with the BMP for the Erosion Eels for Sediment Control under Sheet Flow Conditions.
2. Localized control of activities such as drilling may utilize Erosion Eels in accordance with the BMP for the Erosion Eels for Sediment Control under Sheet Flow Conditions.

™ Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.
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B.2. BEST MANAGEMENT PRACTICES FOR THE INSTALLATION OF SILT FENCING

Silt fencing is a temporary sediment control measure composed of woven geotextile fabric supported by posts. Silt fence is used to intercept sediment transported from disturbed areas. The silt fence is designed to temporarily dam the flow of storm water runoff and allow slow flow through the porous geotextile fabric. Suspended sediment in the ponded water will settle out upstream of the barrier.

The following general notes and installation instructions shall apply to all silt fencing utilized. The contractor should follow all manufacturer installation instructions. The following list is intended to emphasize select aspects of silt fence installation and maintenance.

1. All silt fencing must be installed along the ground contour. No silt fencing shall be installed running up and down slope. The bottom of the fence at the ground line shall be on grade, +/- 0.5%.
2. All silt fencing must be properly trenched and staked as shown in Figs. B-1 and B-2.
3. Silt fencing has a life span of approximately 6–12 months. All silt fencing installed longer than 12 months shall be replaced with new silt fencing.
4. Ensure the height of the silt fence does not exceed 24 in. above the ground.
5. Ensure ponding water depth does not exceed 1.5 ft.
6. The silt fence should be created from a continuous roll of filter fabric cut to length to avoid joints. If joints are necessary, they shall be constructed to ensure the fabric can be rolled together and fastened to a support post.
7. Attach fabric on the upstream side of the posts.
8. Install posts no more than 6 ft apart and no less than 2 ft deep.
9. When silt fence is installed adjacent to streams, wetlands, and other natural resources, silt fencing with wire or mesh backing shall be used.
10. Silt fencing with backing shall use 1.25 lb/ft T-type steel posts with 14 gauge wire backing that has a maximum mesh size of 6 in.
11. Silt fencing without backing support posts shall be hardwood posts that are 2.25 in. × 2.25 in. × 58 in. nominal size. T-type steel posts may also be used. If T-type steel posts are used, then they shall be 1.25 lb/ft.
12. Silt fencing fabric shall meet the specifications listed in Fig. B-3.
Fig. B-1. Silt fence (elevation view).
Drawing obtained from Tennessee Erosion & Sediment Control Handbook, Fourth Edition

Fig. B-2. Silt fence (sectional view).
Drawing obtained from Tennessee Erosion & Sediment Control Handbook, Fourth Edition
<table>
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<tr>
<th>Test Material</th>
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<th>With backing</th>
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<td>#70 to #100 standard sieve</td>
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<td>UV Stability (after 500 hrs)</td>
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**Fig. B-3. Silt fence fabric requirements.**

Information obtained from *Tennessee Erosion & Sediment Control Handbook, Fourth Edition*
B.3. BEST MANAGEMENT PRACTICES FOR THE INSTALLATION OF SEDIMENT CONTROL WATTLES

Wattles are a temporary sediment control measure constructed to intercept sheet flow. Wattles used to intercept sheet flow should function to decrease runoff velocity, allow for the ponding of water, and let suspended sediment settle out of the ponded water upstream of the barrier.

The following general notes and installation instructions shall apply to all wattles installed as part of EPSC measures for the Mercury Treatment Facility (MTF). The contractor should follow all manufacturer installation instructions. The following list is intended to emphasize select aspects of wattle installation and maintenance.

1. Install wattles along the ground contour.
2. Wattles must be properly staked as shown in Figs. B-4 through B-7. Wattles shall not be installed if surface conditions do not allow proper staking.
3. Wattles shall be 18 in. diameter in size.
4. Where long rows of wattles are required, the ends of the wattle segments should be overlapped as shown in Fig. B-4.
5. Remove all rocks, clods, vegetation, or other obstructions so that installed wattles have direct contact with the underlying ground surface.
6. Install wattles by laying them flat on the ground in an excavated small trench 2–3 in. in depth. Wattles shall be installed on the contour and perpendicular to water flow. Soil from the excavation should be saved to backfill the upslope length of the wattle. Compact the backfilled soil. Allow no gaps between the wattle and the ground surface.
7. Wooden stakes at least 40 in. in length shall be used to secure the wattles in place. Install stakes at 4 ft intervals or as specified by manufacturer. Less than 1–2 in. of stake shall be left exposed above the wattle. Stakes may be placed on each side of the wattle and tied across with a natural fiber twine, or stakes may be placed in a crossing manner.
8. Terminal ends of wattle rows shall hook up slope to ensure containment of runoff.
Fig. B-4. Wattle installation guide.
Drawing obtained from Tennessee Erosion & Sediment Control Handbook, Fourth Edition
Dewatering stations are temporary sediment control structures that use proprietary structures or a combination of geotextile fabric and stone to filter sediment from accumulated water discharges. A dewatering structure must be sized and operated to allow pumped water to flow through the filtering device without overtopping or bypassing the structure.

Approved options for this Storm Water Pollution Prevention Plan (SWPPP) include:

1. Straw bale/silt fence pit
   - The capacity of the dewatering pit will depend on the pump selected for dewatering activities. The storage volume of the pit shall be calculated using the following formula:
     $$\text{Pump discharge (gpm)} \times 16 = \text{cubic feet of storage required}$$
   - Pumping of water into the dewatering pit must be continuously monitored. Discharge from the dewatering pit cannot cause an objectionable color contrast in the receiving stream. When the water level nears the top of the dewatering pit wall, the pump must be shut off while the structure drains down.
   - When the pit is 50% full of accumulated sediment, it shall be cleaned out.
   - The pit shall be constructed as shown in Figs. B-7 and B-8.
   - The dewatering pit shall not be located so that the effluent flows directly to a storm drain catch basin, utility structure, or surface water.

2. Sediment filter bag
   - The capacity of a sediment filter bag should be adequate to handle the dewatering pump discharge and should be based on manufacturer’s recommendation on pump sizing. The filter bag must be equipped with a sleeve to receive the pump hose; slitting the filter bag to provide a hose connection is not acceptable.
   - Pumping into the bag must be continuously monitored. Discharge from the filter bag cannot cause an objectionable color contrast in the receiving stream.
   - When the filter bag has 6 in. of accumulated sediment, it shall be replaced and properly disposed.
   - A stone pad shall be constructed as shown in Figs. B-5 and B-6.
   - The sediment bag shall not be located so that the effluent flows directly to a storm drain catch basin, utility structure, or surface water.

The measures described above are intended only to remove sediment from accumulated water. If there is reason to believe that chemical contaminants may be present in the accumulated water, the Best Management Practices Plan for Discharge of Accumulated Water shall be followed. This BMP plan is included in Appendix B.
Fig. B-5. Filter bag installation (plan view).
Drawing obtained from *Tennessee Erosion & Sediment Control Handbook, Fourth Edition*
Fig. B-6. Filter bag installation (section view).
Drawing obtained from *Tennessee Erosion & Sediment Control Handbook, Fourth Edition*

Fig. B-7. Straw bale/silt fence pit (plan view).
Drawing obtained from *Tennessee Erosion & Sediment Control Handbook, Fourth Edition*
Fig. B-8. Straw bale/silt fence pit (plan view).
Drawing obtained from *Tennessee Erosion & Sediment Control Handbook, Fourth Edition*
B.5. BEST MANAGEMENT PRACTICES FOR THE CREATION OF A CONSTRUCTION EXIT/ENTRANCE

Construction exits/entrances (CEEs) are temporary controls used to minimize the tracking of soil from the construction area to adjacent roadways. This control will prevent tracked soil from becoming re-suspended during precipitation events and creating sediment runoff to surface waters.

A CEE is required where vehicles will exit the work area and enter the paved roadway. The CEE shall be constructed as shown in Fig. B-9.

Fig. B-9. Construction entrance.
Drawing obtained from *Tennessee Erosion & Sediment Control Handbook, Fourth Edition*
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B.6. BEST MANAGEMENT PRACTICES FOR THE CREATION OF A SOIL STOCKPILE

Soil stockpiles are excavated materials consisting of topsoil or subsoils that have been removed and temporarily stored during the construction activity.

1. Locate soil stockpiles at least 50 ft away from all drainage system components including storm drain inlets.
2. Where practicable, choose soil stockpile locations that will remain undisturbed for the longest period of time as construction progresses.
3. All stockpiled soil shall be placed on an impermeable barrier and properly bermed; note that asphalt and concrete are not considered impermeable barriers. The material used to create the berm structure (e.g., straw bales) must also be covered by the same impermeable barrier. All stockpiled soil will be covered with plastic sheeting prior to any precipitation events to prevent surface runoff and accumulated water buildup. See Fig. B-10 for guidance on proper establishment of perimeter controls around a soil stockpile.
4. In order to prevent both wind and water erosion, stockpiles of soil should not exceed 3 ft in height above the natural ground surface, except as otherwise approved. Stockpile side slopes should be no steeper than 2:1 (h:v).
5. Where runoff from the soil stockpile may occur, place silt fencing at the base of the stockpile (between the stockpile and the ditch bank) to help retain soil until vegetation is established. This is especially important on subsoils where vegetation may not readily grow.
6. Soil stockpiles may be located around the perimeter of the project away from the construction activity, or located in the immediate vicinity of the construction. Do not locate soil stockpiles in or immediately adjacent to wetlands and watercourses, or such that any runoff from the stockpile will end up in wetlands and watercourses. Include the location of the soil stockpile(s) in the soil erosion control plan.
7. Where it is not possible to move the soil stockpile upland, place the stockpile behind a bench or berm to prevent erosion. This is especially important on steep slopes.
8. Excess stockpiled soil which is not used as fill should be disposed of in a manner which will not result in the soil running off and impacting surface waters or wetlands. The manner in which this excess soil is disposed of should be included in the soil erosion control plan.
9. Periodic inspections should be done to ensure excessive erosion has not occurred. If runoff or wind erosion has occurred, reduce the side slopes of the soil stockpile, or stabilize the stockpile with pieces of sod laid perpendicular to the slope, and staked.
10. When silt fencing is used around the soil stockpile, periodic checks should be made to ensure that piping has not occurred under the fencing, and to ensure that the fence has not collapsed due to soil slippage or access by construction equipment. Repair any damaged fencing immediately.
11. Berms at the base of the soil stockpile which become damaged should be replaced.
12. For soil stockpiles in active use, provide a stabilized designated access point on the upgradient side of the stockpile.
13. Cover all soil stockpiles with tarp, plastic, or other waterproof material overnight and when precipitation is forecasted. Tie down or weight covers to prevent movement. See Fig. B-11 for additional information on covering soil stockpiles.
Fig. B-10. Soil stockpile protection.

Drawing obtained from Tahoe Regional Planning Agency BMP Handbook, May 2014
Fig. B-11. Covering of soil stockpiles.
Drawing obtained from Tahoe Regional Planning Agency BMP Handbook, May 2014
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B.7. BEST MANAGEMENT PRACTICES FOR THE INSTALLATION OF AN OIL AND DEBRIS BOOM

An oil and debris boom (ODB) will be deployed on Upper East Fork Poplar Creek (UEFPC). This boom shall be capable of containing debris that might fall into UEFPC from brush and tree clearing activities (e.g., sawdust), as well as contain any oil that might spill into UEFPC. The boom shall meet the following requirements:

1. The boom shall be deployed across UEFPC immediately downstream of any work being conducted within the stream banks of UEFPC.
2. The boom shall be deployed before the beginning of any construction work, and it shall remain in place until all construction work covered by this SWPPP has been completed.
3. The boom shall be deployed in accordance with manufacturer instructions. This shall include ensuring there are no gaps between the surface water and the boom at any time while work is being conducted.
4. Remove any debris buildup from behind the boom that is noted during periodic inspections or during work activity. If an oil sheen is observed, the Y-12 National Security Complex (Y-12) Plant Shift Superintendent’s (PSS) office shall be notified.
5. The boom shall be designed for strong current and shall be at least 14 in. tall with a minimum of 8 in. of draft.
6. The boom length shall be sufficient to maintain proper deployment during high flow conditions.

Installation of the boom shall be coordinated with CNS Y-12 Environmental Compliance (EC) personnel.
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B.8. BEST MANAGEMENT PRACTICES
FOR THE INSTALLATION OF A SANDBAG BERM

A sandbag berm is a temporary sediment barrier constructed of stacked sandbags. This type of berm is utilized to intercept sediment-laden storm water runoff from disturbed areas as well as to redirect or prevent water flow. A temporary sandbag berm shall be installed along the north bank of UEFPC just prior to construction of the plant effluent outfall so construction can take place in the dry. The sandbag berm must be properly maintained throughout the effluent outfall construction period, and then be removed after the outfall is in place. It is anticipated that sandbag berms will also be used in UEFPC at the Headworks to isolate the work area for installing the intake structure. Sandbag berms would be installed just upstream and just downstream of the construction site for the intake structure.

Due to the extremely volatile flow dynamic of Outfall 200 (OF200), the sandbag berms should be sized to minimize the flow impact from UEFPC. It is understood that during high flow conditions from OF200, the sandbag berms will likely be overtopped. Therefore, the sandbag berms should only be kept in place in UEFPC during the applicable construction activity.

The sandbag berm shall be installed as follows.

1. Large stones and/or debris should be moved to allow good contact between the sandbags and the stream bottom.
2. The sandbag berms should generally be built to a height of 18–24 in.
3. Each sandbag should be about 18 in. long, 12 in. wide, and 3 in. thick.
4. Each sandbag shall not exceed 75 lb.
5. Sandbag material shall be
   — polypropylene or polyethylene woven fabric
   — have a minimum unit weight of 4 oz per yd²
   — have a minimum grab strength of 100 psi in any principal direction
   — have a puncture strength exceeding 300 psi
   — have an ultraviolet stability exceeding 70% after 500 h of exposure
6. The ends of the sandbags shall be tightly butted together to ensure the structure is as water resistant as possible.
7. The butt joints of each row of sandbags should be overlapped with those of each successive row of sandbags.
8. Sandbags should be stacked using a pyramid approach. The sandbag berm shall have a top width of at least 24 in. with a side slope of 2:1 or flatter if three or more layers of sandbags will be utilized in the construction of the berm.
9. All sandbag fill material shall be non-cohesive, Class 3 or similar permeable material free from clay and other potentially deleterious material such as recycled concrete or asphalt.
10. Sandbags shall be removed from UEFPC as soon as possible after completion of the construction activity.
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B.9. BEST MANAGEMENT PRACTICES FOR THE CONSTRUCTION OF A CONCRETE WASHOUT STRUCTURE

Concrete washout (CW) stations are temporary structures that serve as a designated area where concrete washout materials can harden, be broken up, and disposed of or backfilled. All CW activities that occur at the project site must use a properly installed and well-maintained CW. Discharge of CW runoff is not allowed from the washout structure. Washout activities shall be monitored and operated so as to not overtop or bypass the washout structure.

Approved options for this SWPPP include

1. Prefabricated CWs
   — Ensure containers are water tight and durable
   — Locate at least 50 ft away from storm drain catch basins or surface waters

2. Site-built CWs
   — Can be a temporary pit or bermed area as shown in Figs. B-12 and B-13. The construction detail below shows an earthen bermed pit. However, straw bales, wattles, or other sufficiently sized material may be utilized for the berm structure. Excavated pits are also allowed.
   — The liner fabric shall be inspected and ensured to be in good condition prior to use.

All CW structures shall be properly labeled in accordance with Fig. B-14.

---

**Fig. B-12. Concrete washout (sectional view).**
Drawing obtained from *Tennessee Erosion & Sediment Control Handbook, Fourth Edition*
Fig. B-13. Concrete washout (plan view).
Drawing obtained from *Tennessee Erosion & Sediment Control Handbook, Fourth Edition*

Fig. B-14. Concrete washout sign posting.
Drawing obtained from *Tennessee Erosion & Sediment Control Handbook, Fourth Edition*
B.10. BEST MANAGEMENT PRACTICES FOR THE USE OF EROSION EELS FOR SEDIMENT CONTROL UNDER SHEET FLOW CONDITIONS

In areas where sediment controls are needed and silt fencing or wattles cannot be installed because of limited space or inability to trench or stake in the ground surface, Erosion Eels will be used.

Erosion Eels is a proprietary product of Friendly Environment located in Shelbyville, Tennessee. Figures B-15 through B-18 were provided by the manufacturer. In addition, the general notes as well as installation instructions below were provided by the manufacturer. It is important for the contractor to be aware of and follow all manufacturer notes and instructions when installing and maintaining Erosion Eels.

1. Erosion Eels used for sheet flow conditions shall have specification mixture 1.0 (a filter mixture comprised of 100% shredded rubber that has been washed and processed to remove most, if not all, metal components. The material shall be derived from recycled tires and shall be shredded to produce a maximum particle size of +/- ¾ in.)

2. Erosion Eel size shall be a nominal diameter of 20 in. and a standard nominal length of 10 ft.

3. Erosion Eels shall be manufactured from a woven geotextile covering with interior filter materials as specified above.

4. Erosion Eels shall be installed along the ground contour.

5. Erosion Eels shall be installed on a bed prepared by removing any large debris including rocks, soil clods, and woody vegetation. All surfaces shall be uniformly compacted for maximum seating of eel in place. No trenching is required for installation of Erosion Eels.

6. If more than one Erosion Eel is placed in a row, the Erosion Eels shall be overlapped a minimum of 12 in. to prevent flow and sediment from passing through the joint. The overlapped ends of the Erosion Eels shall be compressed tightly together either by hand or by manufacturer-approved mechanized means.

7. Erosion Eels shall be installed where the handles will be positioned at the top of the device to ease deployment.
**Fig. B-15.** Construction entrance.
Drawing obtained from *Friendly Environment*

**Fig. B-16.** Construction entrance.
Drawing obtained from *Friendly Environment*
Fig. B-17. Construction entrance.  
Drawing obtained from Friendly Environment

**Spacing Recommendations for the Erosion Eel™ for Perimeter Controls and Intercepting Sheet Flow on Slopes**

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<th>Slope (%)</th>
<th>Single eel spacing (ft)</th>
<th>Dual eel spacing (ft)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>6</td>
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</table>

* DUAL STACK REFERS TO TWO EELS STACKED ATOP ONE ANOTHER AND STABILIZED WITH T-POSTS. SEE DETAIL E2-E ON SHEET E-2.

Fig. B-18. Construction entrance.  
Drawing obtained from Friendly Environment
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B.11. BEST MANAGEMENT PRACTICES
FOR THE USE OF STORM DRAIN INLET PROTECTION

As described in the *Tennessee Erosion and Sediment Control Handbook*, inlet protection is a temporary protective device that is placed around a storm drain catch basin to prevent sediment from entering the storm drain system. Many different types of inlet protections are available.

Storm drain inlet protection to be utilized as part of this SWPPP requires the placement of Erosion Eels as shown in Figs. B-19 through B-22.

1. Erosion Eels to be utilized for inlet protection shall have specification mixture 1.0 (a filter mixture comprised of 100% shredded rubber that has been washed and processed to remove most, if not all, metal components. The material shall be derived from recycled tires and shall be shredded to produce a maximum particle size of +/- .75 in.)

2. Erosion Eel size shall be a nominal diameter of 9.5 in.

Erosion Eels are to be installed in accordance with the following manufacturer’s requirements:

![Diagram of Erosion Eels installation](image)

**Fig. B-19. Construction entrance.**
Drawing obtained from *Friendly Environment*
Fig. B-20. Construction entrance.
Drawing obtained from *Friendly Environment*

Fig. B-21. Construction entrance.
Drawing obtained from *Friendly Environment*
Fig. B-22. Construction entrance.
Drawing obtained from *Friendly Environment*
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B.12. BEST MANAGEMENT PRACTICES FOR INSTALLATION OF STORM WATER OUTLET PROTECTION

As described in the *Tennessee Erosion and Sediment Control Handbook*, the outlets of channels, conduits, and other structures are points of high erosion potential because they frequently carry flow at velocities that exceed the allowable limit for the area downstream. To prevent scour and undermining, an outlet stabilization structure is needed to absorb the impact of the flow and reduce the velocity to non-erosive levels. A riprap-lined apron is the most commonly used practice for this purpose because of its relatively low cost and ease of installation. The riprap apron should be extended downstream until stable conditions are reached even though this may exceed the length calculated for design velocity control. Consider energy dissipaters such as concrete impact basins or paved outlet structures where conditions warrant.

The installation of a culvert in a stream is subject to the conditions of a U.S. Army Corps of Engineers 404 permit and Tennessee Aquatic Resources Alteration Permit (ARAP) conditions. These permit conditions may not allow the use of a riprap apron, and may require that the bottom of the culvert be buried below the natural stream bed elevation. A pre-formed scour pool or plunge pool should be considered in these situations.

The following criteria should be considered in the installation of outlet protection at the discharge point for the MTF into UEFPC as well as in the construction of the emergency storm water overflow structure from the storm water storage tank.

**Construction Specifications for the Installation of Outlet Stabilization Structures (Aprons)**

1. Apron structures should be designed to handle the peak storm flow in cubic feet per second (cfs) from the 25-year, 24-h frequency storm, or the design discharge of the water conveyance structure, whichever is greater.

2. The apron should be constructed on zero grade. The invert elevation of the downstream end of the apron should be equal to the elevation of the invert of the receiving channel. There should be no turbulence at the end of aprons.

3. The apron should be straight throughout its entire length, but if a curve is necessary to align the apron with the receiving stream, locate the curve in the upstream section of the riprap.

4. The apron may be lined with riprap, grouted riprap, or concrete. The gradation, quality, and placement of riprap should conform to riprap specifications.

5. Select stone for riprap from field stone or quarry stone. The stone should be hard, angular, and highly weather resistant. The specific gravity for the individual stones should be at least 2.5.

6. A separator must be provided between the riprap and natural ground. Suitable filters are flexible and consist of a well-graded gravel or sand-gravel layer or a synthetic filter fabric manufactured for this express purpose. The design of a gravel filter blanket is based on the ratio of particle size in the overlying filter material to that of the base material in accordance with the criteria below. The designed gravel filter blanket may consist of several layers of increasingly large particles from sand to erosion control stone.

7. More than one layer of filter material may be needed. Each layer of filter material should be at least 6 in. thick.
8. A synthetic filter fabric may be used with or in place of gravel filters. Filter blankets should always be provided where seepage is significant, or where flow velocity and duration of flow or turbulence may cause the underlying soil particles to move through the riprap.

9. Structural controls, generally made from precast concrete or from pour-in-place concrete, should be used whenever concrete aprons are installed.

10. Ensure that the subgrade for the geotextile and riprap follows the required lines and grades shown in the plan. Compact and fill required in the subgrade to the density of the surrounding undisturbed material. Low areas in the subgrade on undisturbed soil may also be filled by increasing the riprap thickness.

11. Install a geotextile liner to prevent soil movement through the openings in the riprap.

12. The geotextile must meet design requirements and be properly protected from punching or tearing during installation. Repair any damage by removing the riprap and placing another piece of geotextile over the damaged area. All connecting joints should overlap a minimum of 1 ft. If the damage is extensive replace the entire geotextile liner.

13. Riprap may be placed by equipment, but take care to avoid damaging the geotextile.

14. The minimum thickness of the riprap should be 1.5 times the maximum stone diameter, but not less than 6 in. (See Fig. B-23)

15. The outlet structure must conform to the specified grading limits shown on the plans.

16. Construct the apron on zero grade with no turbulence at the end. Make the top of the riprap at the downstream end level with the receiving area or slightly below it.

17. Ensure that the apron is properly aligned with the receiving stream and, preferably, straight throughout its length.

18. Immediately after construction, stabilize all disturbed areas with vegetation.

19. Select stone for riprap from fieldstone or quarry stone. The stone should be hard, angular, and highly weather-resistant. The specific gravity of the individual stones should be at least 2.5.
Fig. B-23. Geotextile installation.
Drawing obtained from *Pennsylvania Department of Environmental Protection Stormwater Best Management Practices Manual, June 2008*
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B.13. BEST MANAGEMENT PRACTICES FOR INSTALLATION OF OUTFALL STABILIZATION STRUCTURES

1. Inspect riprap outlet structures after heavy rains to see if any erosion around or below the riprap has taken place, if the stones have been dislodged, or if the separator has been damaged. Immediately make all needed repairs to prevent further damage.

2. New outfall structures shall be located such as to avoid permanent alteration or damage to the integrity of the stream channel, including the opposite stream bank. The alignment of the outfall structure should be as parallel to the stream flow as is practicable, with the discharge pointed downstream.

3. Velocity dissipation devices shall be placed as needed at discharge locations to provide a non-erosive velocity from the structure.

4. Headwalls, bank stabilization materials, and any other hard armoring associated with the installation of each structure shall be limited to a total of 25 ft along the receiving stream’s bank.

5. All activities must be carried out in such a manner as to prevent violations of Tennessee water quality criteria. This includes, but is not limited to the prevention of any discharge or use of materials that may be harmful to human, terrestrial, or aquatic life, or which causes visible solids, bottom deposits, or turbidity that may impair the designated uses of waters of the state.

6. Stream bank contours shall be returned to pre-project conditions to the extent practicable.

7. All outfall construction activities should be conducted in the dry whenever possible. Surface water flowing toward the work area can be diverted with berms constructed of sandbags, clean rock containing no fines or soil, or other non-toxic, non-erodible materials. All diversions shall be removed as soon as possible upon completion of outfall structure construction.
B.14. BEST MANAGEMENT PRACTICES FOR STREAM DIVERSIONS

A stream diversion is a temporary diversion constructed to convey stream flow around in-stream construction. Stream diversion channels are required by Aquatic Resource Alteration Permits in order to perform in-stream work separate from flowing water. Construction often includes stream crossings thus creating a potential for excessive sediment loss into the stream, by both the disturbance and approach areas, and by work within the streambed and banks. Stream diversions separate the flowing stream from the active construction area, reducing the potential for impacts from the instream construction activity.

A diversion of UEFPC will be required during the construction of the Headworks intake structure to be located in the UEFPC streambed. The actual location where the stream diversion will be located will be based on several factors including:

- Availability of suitable location for stream diversion channel or piping to be sited;
- Phasing of construction activities at the Headworks; and
- Requirements for continued use of roadways, utilities, or other facilities that may be impacted by the presence of stream diversion channels or piping.

Figure C-3 in Appendix C indicates the preference that UEFPC be diverted to the north side of UEPFC in either a constructed lined channel or pipeline that will be sited in the gravel area parallel to the existing roadway. The constructed lined channel or pipeline will be of sufficient length to bypass the construction area for the intake structure, and will route the water back into the existing creek bed just downstream of the intake structure. Water should only be diverted during construction of the intake structure, and the construction time should be minimized. The intake structure should be constructed during a projected dry period to minimize the handling of storm flow.

Project engineering personnel will choose the appropriate method of stream diversion to be utilized from some combination of the four types of stream diversions described in the Tennessee Erosion and Sediment Control Handbook. The four types of stream diversions from the handbook are described below.

1. **Bypass Pumping**—A bypass pump and an impervious dike divert the flow of the watercourse from the inlet of the pipe to the outlet of the pipe (Fig. B-24). This is a water-to-water operation and care should be taken that the discharge is at a low flow rate to minimize turbidity and/or potential erosion of the stream channel at the outlet of the bypass pipe or hose. Use this practice when another type of diversion is not physically possible or practical or when the construction activities will not require pumping for an extended period. Do not use this practice when the discharge location cannot be adequately stabilized; when ponding of the stream to adequately submerge the pump suction line is not allowed or not practical; or when the normal flow of the stream cannot be handled by the typical bypass pump.

   **Steps for Conducting Bypass Pumping**
   - Set up bypass pump and temporary piping. Place outlet of temporary pipe to minimize erosion at discharge site or provide temporary energy dissipation measures. Firmly anchor pump and piping.
   - Construct outlet protection if needed.
   - Construct impervious dike upstream of work area to impound water for bypass pump intake. Use a floating intake for pumps where possible.
   - Construct an impervious dike downstream, if necessary, to isolate work area.
   - Check operation of pump and piping system.
• Upon completion of construction, remove impervious dike, bypass pump, and temporary pipe; stabilize disturbed area.

**Fig. B-24. Bypass pumping.**

Drawing obtained from *North Carolina Department of Transportation BMPs for Construction and Maintenance Activities, August 2003*
2. **Suspended Bypass Pipe**—The suspended bypass pipe is used where an existing pipe or culvert is extended. This bypass pipe is constructed inside the existing pipe or culvert to divert the watercourse through the work area while allowing the work area to remain dry (Fig. B-25). Use this practice when a pipe or culvert is being extended and is large enough to accommodate the bypass pipe or when space limitations do not allow for a fabric lined diversion channel (for example, widening grade and drain projects). Do not use this practice when the upstream ponding required to enter the suspended pipe inlet is unacceptable.

**Steps for Use of Suspended Bypass Pipe**
- Install sediment controls.
- Install temporary pipe through the existing pipe or culvert to be extended. Place outlet of temporary pipe to minimize erosion at discharge site or provide temporary energy dissipation measures.
- Construct an impervious dike upstream of the work area to divert flow through the temporary pipe. Anchor and seal temporary pipe securely at inlet.
- Construct an impervious dike at the downstream side of the bypass pipe to isolate work area.
- Upon completion of the culvert or pipe extension, remove the impervious dike and temporary pipe and stabilize disturbed area.

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**Fig. B-25. Suspended bypass pipe.**
Drawing obtained from *North Carolina Department of Transportation BMPs for Construction and Maintenance Activities, August 2003*
3. **Piped Diversion**—Install a temporary pipe to divert the flow of the watercourse around the work area without the use of pumping operations (Fig. B-26). While the cost is higher for this operation than an open plastic lined channel, the probability of offsite sediment loss is much lower than with an open diversion channel. Use this practice where adequate slope and space exist between the upstream and downstream ends of the diversion. Do not use this practice where adequate space is unavailable, such as at pipe extensions, headwall installations and some pipe/culvert replacements.

**Steps for use of Piped Diversion**
- Install sediment controls.
- Install temporary pipe adjacent to work area. Excavation may be required to provide a positive drainage slope from the upstream to downstream side.
- Connect the downstream temporary pipe into the downstream existing channel. Place outlet of pipe to minimize erosion at the discharge site or provide temporary energy dissipation measures.
- Connect the upstream temporary pipe into the upstream existing channel.
- Construct an impervious dike at the upstream side of the existing channel to divert the existing channel into the temporary pipe.
- Construct an impervious dike at the downstream side of the bypass pipe to isolate work area.
- Upon completion of construction, remove the impervious dike and temporary pipe and stabilize the disturbed area.

Fig. B-26. Piped diversion.  
Drawing obtained from *North Carolina Department of Transportation BMPs for Construction and Maintenance Activities, August 2003*
4. **Fabric Lined Diversion Channel**—A fabric lined temporary diversion channel is used to divert normal stream flow and small storm events around the work area without the use of pumping operations (Fig. B-27). The temporary diversion channel is typically constructed adjacent to the work area and is lined with a poly-fabric to minimize the potential for erosion within the temporary diversion channel. Use this practice where adequate space and slopes exist adjacent to the work area. Do not use this practice where adequate space is unavailable such as at pipe extensions, headwall installations and some pipe/culvert replacements.

**Steps for use of Fabric Lined Diversion Channel**

- Install sediment controls.
- Excavate the diversion channel without disturbing the existing channel.
- Place poly-fabric liner in diversion channel with a minimum of 4 ft of material overlapping the channel banks. Secure the overlapped material using at least 1 ft of fill material.
- Connect the downstream diversion channel into the downstream existing channel and secure the poly-fabric liner at the connection.
- Connect the upstream diversion channel into the upstream existing channel and secure the poly fabric liner at the connection.
- Construct an impervious dike in the existing channel at the upstream side to divert the flow into the diversion channel.
- Construct an impervious dike in the existing channel at the downstream side to isolate the work area.
- Upon completion of the culvert construction, remove the impervious dikes and divert the channel back into the culvert.
- Remove the poly-fabric liner and fill in the diversion channel.
- Establish vegetation on fill section and all other bare areas.
Fig. B-27. Fabric-lined diversion channel.
Drawing obtained from North Carolina Department of Transportation BMPs for Construction and Maintenance Activities, August 2003
ADDITIONAL GUIDANCE FOR STREAM DIVERSIONS

The following guidance shall be followed when considering diversion of UEFPC using any of the methods provided above:

1. Disturbances within the confines of stream banks are required to be conducted “in the dry” or separate from flowing water. No excavation equipment should ever be operated in flowing waters.

2. In cases where in-stream work is unavoidable, a stream diversion should be considered to prevent excessive damage from sedimentation. To limit land-disturbance, overland pumping of the stream should be considered in low-flow conditions whenever possible. Temporary pipes can also convey smaller stream flows.

3. The duration of the instream work should be minimized to the shortest period possible.

4. Clearing of the streambed and banks should be kept to a minimum.

5. Work that requires a stream diversion channel requires authorization from the Tennessee Division of Water Pollution Control and United States Army Corps of Engineers. All conditions of the ARAP and COE permit must be followed.

6. The capacity of the diversion shall be designed to be equivalent to the bankfull capacity of the existing channel.

7. The stream diversion channel should be inspected at the end of each day to make sure that the stream flow control measures and construction material are positioned securely. This will ensure that the work area stays dry and that no construction materials float downstream.

8. Inspect impounded work area to ensure water is not contaminated with construction materials or chemicals and that dewatering/treatment is adequate. All repairs should be made immediately.
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B.15. BEST MANAGEMENT PRACTICES PLAN FOR THE DISCHARGE OF ACCUMULATED WATER

This BMPs plan establishes guidelines for sampling and discharge of accumulated water from Balance of Construction for the OF200 MTF, in accordance with federal regulations, state regulations, U.S. Department of Energy (DOE) Orders, and corporate policy. It provides guidelines for sampling, determining disposition, and discharging accumulated water using appropriate BMPs.

This BMP Plan applies to construction ditches, excavations, waterline breaks, and other areas where discharge of accumulated water to the environment may be required and where chemical contamination of the accumulated water may be suspected. Areas where discharge of accumulated water is governed by a regulatory permit (e.g., Resource Conservation and Recovery Act of 1976 [RCRA] Treatment, Storage, and Disposal [TSD] Facilities) are exempt from this BMP Plan. These areas shall follow guidance outlined in the appropriate permit.

This BMP is to be utilized in coordination with the Best Management Practices for the Creation and Operation of a Dewatering Station, which deals with the discharge of accumulated water containing sediment but not suspected to contain chemical contaminants. This BMP is also included in Appendix B of this document.

DISCHARGE OF ACCUMULATED WATER PROCESS

If discharge of accumulated water from an area is required, OREM and OREM Construction Management support contractor Environmental Compliance and Protection (EC&P) personnel will be contacted by the requester to identify minimum sampling requirements of accumulated water based on past history of the location where the water to be discharged is located, Y-12 National Pollutant Discharge Elimination System (NPDES) permit requirements, and professional judgment. Typical sampling parameters for accumulated water discharges are as follows:

— Sampling of water from soil excavations is based on the location of the excavation or the past use of the area being excavated.
— Sampling of storm water that has collected in uncovered outdoor containers (empty drums, open storage containers, portable secondary containment structures, etc.) is based on the use of the container, past contents of the container, etc.

Discharge of accumulated water should be performed in accordance with the following steps:

1. Requester will arrange for sampling and analysis of the accumulated water to be performed based on the guidance provided by EC&P personnel.
2. Requester will inspect accumulated water for a visible sheen, discoloration, floating solids, or other unusual conditions.
3. Requester will estimate quantity of water to be discharged.
4. Based upon analytical results, Y-12 NPDES permit requirements, and professional judgment where specific release limits are not documented, EC&P personnel will determine appropriate discharge instructions.
5. If the test criteria originally requested do not adequately address possibilities of contamination in a specific area, EC&P personnel will require additional sampling for appropriate contaminants.
6. If discharge of accumulated water to a grassy or graveled area is deemed impractical, EC&P personnel will advise requester on the appropriate discharge action. If the water is determined to be unsuitable for discharge, EC&P personnel will provide assistance in determining a suitable disposition for the water.

7. EC&P personnel will provide instructions to ensure that the water is released to a grassy or graveled area where it will cause no significant disturbance to the surrounding soil or grass due to high water pressure. EC&P personnel will also ensure that there is no direct discharge to the storm drain system or any surface water drainage feature.

8. If discharge to a grassy area is impractical, the requester will ensure that the discharge is conducted in accordance with guidance provided by EC&P personnel.

9. If discharge of water is disapproved, the requester will determine a suitable disposition for the water with the assistance of EC&P personnel.

10. Requester submits appropriate paperwork to allow for proper disposal of the accumulated water at an approved treatment facility, as necessary.

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<th>Discharge Criteria</th>
<th>Method</th>
<th>Release Limits</th>
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</thead>
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<td>Gross alpha, gross beta with minimum detectable activity of: Alpha, 8 pCi/L; Beta, 10 pCi/L.</td>
<td>EPA 900.0</td>
<td>15 pCi/L alpha* 50 pCi/L beta*</td>
</tr>
<tr>
<td>PCBs</td>
<td>EPA 608 or EPA 625</td>
<td>Not Detected**</td>
</tr>
<tr>
<td>Volatile Organics</td>
<td>EPA 624</td>
<td>Total of all VOCs shall not exceed 100 ug/L</td>
</tr>
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<td>Metals</td>
<td>EPA 200.7</td>
<td>Consideration will be given to appropriate regulatory requirements</td>
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<td>Field Measurement</td>
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<tr>
<td>Appearance</td>
<td>Field Visual Inspection</td>
<td>No visible sheen, discoloration, or unusual appearance</td>
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</table>

* If the analytical result for gross alpha and/or gross beta is over the stated guidelines, then an analysis for isotopic uranium may be requested to determine whether or not the discharge will be approved. If the isotopic analysis is required, appropriate Derived Concentration Standards for ingested water (DOE-STD-1196-2011) or Derived Concentration Guide values for ingested water (DOE Order 5400.5, Chap. III) will be utilized to determine if the water is suitable for discharge. Release limits for gross alpha and gross beta measurements correspond to the national primary drinking water standard (40 Code of Federal Regulations [CFR] Part 141, National Primary Drinking Water Regulations, Subparts B and G). Screening levels for gross alpha and gross beta are approximately 60% of the reference standard.

** Estimated values for PCBs are considered as being detectable PCBs. Therefore, water with analytical results that indicate detected or estimated values for PCBs MAY NOT be released.

Fig. B-28. Typical guidelines for discharge of accumulated water.
GUIDELINES FOR CONDUCTING DISCHARGES OF ACCUMULATED WATER

The following guidelines must be followed whenever a discharge of accumulated water is conducted:

- No discharge shall be conducted within 50 ft of a known storm drain inlet. If questions arise as to the location of storm drain inlets, personnel from EC&P should be contacted for guidance.

- Approved discharges must be released to a grassy or graveled area. Discharges should be conducted in such a manner as to not create a significant disturbance to the area (scouring) due to high water pressure.

- If discharge to a grassy or graveled area is not practical, additional guidance for conducting the discharge will be provided by EC&P personnel. This may include such measures as providing inlet protection in accordance with the Tennessee Erosion & Sediment Control Handbook, fourth edition; placing protective mats over storm drain inlets to prevent any entry of discharged water; discharging the water through a spray nozzle or through a soaker hose; etc.

- The project shall maintain a record of discharges of accumulated water that will include date, start time, end time, and estimated volume discharged. A review of this information may be requested by Y-12 environmental compliance personnel in the event of an upset condition in EFPC.

If any questions or problems arise during a discharge, EC&P personnel should be contacted as soon as possible. If problems arise with a discharge being conducted during off-hours or on weekends or holidays, the Facility Manager (FM) or Project Manager should be contacted.
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B.16. BEST MANAGEMENT PRACTICES FOR THE ESTABLISHMENT OF TEMPORARY GROUND COVER

Establishment of temporary vegetative cover with fast growing species is needed for seasonal protection on disturbed or denuded areas. Temporary vegetative cover is also required to temporarily stabilize denuded areas that will not be brought to final grade for a period of more than 14 days.

Benefits of Temporary Seeding (TS):

1. Control of runoff and erosion until permanent vegetation or other erosion control measures can be established
2. Temporary stabilization until permanent stabilization can be achieved
3. Provides residue for soil protection and seedbed preparation
4. Reduces problems of mud and dust production from bare soil surfaces during construction
5. Preserves the integrity of earthen sediment control structures such as dikes, diversions, and the banks of dams and sediment basins, and reduces the amount of maintenance associated with these devices

Establishment of Temporary Vegetation:

1. Annual plants that sprout and grow rapidly and survive for only one season are suitable for establishing initial or temporary vegetative cover.
2. Proper seedbed preparation, selection of appropriate species, and the use of quality seed are important.
3. Failure to follow established guidelines and recommendations carefully may result in an inadequate or short-lived stand of vegetation that will not control erosion.
4. TS provides protection for no more than 1 year, during which time permanent stabilization should be initiated.
5. Complete grading before preparing seedbeds, and install all necessary erosion control practices such as dikes, waterways, and basins.
6. Minimize steep slopes because they make seedbed preparation difficult and increase the erosion hazard.
7. If soils become compacted during grading, loosen them to a depth of 6–8 in. using a ripper, harrow, or chisel plow.
8. Apply lime according to soil test recommendations. If the pH (acidity) of the soil is not known, an application of ground agricultural limestone at the rate to 1–1.5 tons/acre on coarse textured soils and 2–3 tons/acre on fine textured soils is usually sufficient. Apply limestone uniformly and incorporate into the top 4–6 in. of soil. Soils with a pH of 6 or higher do not need to be limed.
9. Fertilizer application rates should be based on soil tests. When soil tests are not possible, apply a 10-10-10 grade fertilizer at 700–1000 lb/acre. Both fertilizer and lime should be incorporated into the top 4–6 in. of soil. If a hydraulic seeder is used, do not mix seed and fertilizer more than 30 min before the application.
10. Select a non-invasive grass or grass-legume mixture suitable to the area and season of the year. See information below for suggestions of TS species. Although native plants are preferred, there are currently no available native species that are not cost prohibitive. Non-invasive annual plants are preferred.

11. Seed shall be applied uniformly by hand, cyclone seeder, drill, cultipacker seeder, or hydraulic seeder. Drill or cultipacker seeders should normally place seed ¼ to ½ in. deep. Appropriate depth of planting is 10 times the seed diameter. Soil should be raked lightly to cover seed with soil if seeded by hand.

12. The use of mulch will help ensure establishment under normal conditions, and is essential to seeding success under harsh site conditions. Harsh site conditions include:
   a. Seeding in fall for winter cover
   b. Slopes steeper than 3:1
   c. Excessively hot or dry weather
   d. Adverse soils (shallow, rocky, or high in clay or sand)
   e. Areas receiving concentrated flow

13. Reseed and mulch areas where seedling emergence is poor or where erosion occurs, as soon as possible. Do not mow.

INFORMATION ON SEEDING RECOMMENDATIONS

Temporary Seedling Recommendation for Late Winter and Early Spring

<table>
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<th>Rate (lb/acre)</th>
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<td>Rye</td>
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**Seeding dates**

East ................. Above 2500 ft: Feb. 15—May 15
Below 2500 ft: Feb. 1—May 1
Middle ................................ Jan. 1—May 1
West ........................................... Dec. 1—Apr. 15

**Soil amendments**

Follow recommendations of soil tests or apply 2000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.

**Mulch**

Apply 4000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

**Maintenance**

Refertilize if growth is not fully adequate. Reseed, refertilize, and mulch immediately following erosion or other damage.
**Temporary Seeding Recommendation for Summer**

<table>
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<tr>
<td>Brown top millet</td>
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</table>

**Seeding dates**

- East .............................................May 15—Aug. 15
- Middle .........................................May 1—Aug. 15
- West ............................................Apr. 15—Aug. 15

**Soil amendments**

Follow recommendations of soil tests or apply 2000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.

**Mulch**

Apply 4000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

**Maintenance**

Refertilize if growth is not fully adequate. Reseed, refertilize, and mulch immediately following erosion or other damage.

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**Temporary Seeding Recommendations for Fall**

<table>
<thead>
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<th>Species</th>
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<tbody>
<tr>
<td>Oats</td>
<td>30</td>
</tr>
<tr>
<td>Winter wheat</td>
<td>30</td>
</tr>
</tbody>
</table>

**Seeding dates**

- East .............................................Aug 15—Dec 15
- Middle .........................................Aug. 15—Dec 30
- West ...........................................Aug. 15—Dec 30

**Soil amendments**

Follow recommendations of soil tests or apply 2000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.

**Mulch**

Apply 4000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

**Maintenance**

Refertilize if growth is not fully adequate. Reseed, refertilize, and mulch immediately following erosion or other damage. If necessary to extend temporary cover beyond June 15, overseed with 50 lb/ac re crimson clover in late February or early March.

*All information in this BMP obtained from Tennessee Erosion and Sediment Control Handbook (TNEPSC) Handbook*
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APPENDIX C.
OUTFALL 200 MERCURY TREATMENT FACILITY
HEADWORKS BALANCE OF CONSTRUCTION EPSC MEASURES
APPENDIX C CONTENTS

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HEADWORKS BALANCE OF CONSTRUCTION EPSC MEASURES

The following erosion prevention and sediment control (EPSC) measures are shown on the figures, as indicated. Additional best management practices (BMPs) that may apply are also listed below. Once installed most EPSC measures remain in place until construction is completed, and final stabilization is achieved.

Figure C-1. Headworks excavation EPSC measures

— Sediment Control Barrier (SCB)
— Oil and Debris Boom (ODB)
— Inlet Protection (IP)
— Construction Exit/Entrance (CEE)
— BMP for the Creation of a Soil Stockpile
— BMP Plan for Discharge of Accumulated Water

Figure C-2. Headworks grading and concrete work EPSC measures

— Sediment Control Barrier (SCB)
— Oil and Debris Boom (ODB)
— Inlet Protection (IP)
— Construction Exit/Entrance (CEE)
— Concrete Washout (CW)
— Temporary Seeding (TS)
— BMP Plan for Discharge of Accumulated Water

Figure C-3. Headworks stream diversion

— Sand Bag Berm (SBB)
— Sediment Control Barrier (SCB)
— Oil and Debris Boom (ODB)
— Inlet Protection (IP)
— Construction Exit/Entrance (CEE)
— Concrete Washout (CW)
— BMP for Stream Diversions
— BMP for the Creation and Operation of a Dewatering Station
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Fig. C-1. Headworks excavation EPSC measures.
Fig. C-2. Headworks grading and concrete work EPSC measures.
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Fig. C-3. Headworks stream diversion.
APPENDIX D.
OUTFALL 200 MERCURY TREATMENT FACILITY
TRANSFER PIPELINE BALANCE OF CONSTRUCTION
EPSC MEASURES
APPENDIX D CONTENTS

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Note: One single transfer pipeline is shown in sections covering nine figures.
They are shown in order from Headworks to Treatment Facility (west to east).
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The following erosion prevention and sediment control (EPSC) measures are shown on the figures, as indicated. These EPSC measures shall remain in place until construction is completed and final stabilization achieved.

**Figure D-1. Transfer Pipeline EPSC Measures**
- Sediment Control Barrier (SCB)
- Inlet Protection (IP)

**Figure D-2. Transfer Pipeline EPSC Measures**
- Sediment Control Barrier (SCB)

**Figure D-3. Transfer Pipeline EPSC Measures**
- Sediment Control Barrier (SCB)

**Figure D-4. Transfer Pipeline EPSC Measures**
- Sediment Control Barrier (SCB)
- Inlet Protection (IP)

**Figure D-5. Transfer Pipeline EPSC Measures**
- Sediment Control Barrier (SCB)

**Figure D-6. Transfer Pipeline EPSC Measures**
- Sediment Control Barrier (SCB)
- Inlet Protection (IP)

**Figure D-7. Transfer Pipeline EPSC Measures**
- Sediment Control Barrier (SCB)

**Figure D-8. Transfer Pipeline EPSC Measures**
- Sediment Control Barrier (SCB)

**Figure D-9. Transfer Pipeline EPSC Measures**
- Sediment Control Barrier (SCB)
- Oil and Debris Boom (ODB)
- Inlet Protection (IP)
Fig. D-1. Transfer Pipeline EPSC measures.
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Fig. D-2. Transfer Pipeline EPSC measures.
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Fig. D-3. Transfer Pipeline EPSC measures.
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Fig. D-4. Transfer Pipeline EPSC measures.
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Fig. D-5. Transfer Pipeline EPSC measures.
Fig. D-6. Transfer Pipeline EPSC measures.
Fig. D-7. Transfer Pipeline EPSC measures.
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Fig. D-9. Transfer Pipeline EPSC measures.
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APPENDIX E.
OUTFALL 200 MERCURY TREATMENT FACILITY
TREATMENT FACILITY BALANCE OF CONSTRUCTION
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TREATMENT FACILITY BALANCE OF CONSTRUCTION EPSC MEASURES

The following erosion prevention and sediment control (EPSC) measures are shown on the figures, as indicated. Additional best management practices (BMPs) that may apply are also listed below. Once installed most EPSC measures remain in place until construction is completed, and final stabilization is achieved.

**Figure E-1. Treatment Facility site demolition EPSC measures**

- Sediment Control Barrier (SCB)
- Inlet Protection (IP)
- Construction Exit/Entrance (CEE)
- BMP Plan for Discharge of Accumulated Water

**Figure E-2. Treatment Facility effluent outfall EPSC measures**

- Sand Bag Berm (SBB)
- Sediment Control Barrier (SCB)
- Oil and Debris Boom (ODB)

**Figure E-3. Treatment Facility grading and concrete work EPSC measures**

- Sediment Control Barrier (SCB)
- Oil and Debris Boom (ODB)
- Inlet Protection (IP)
- Concrete Washout (CW)
- Temporary Seeding (TS)
- Construction Exit/Entrance (CEE)
- BMP Plan for Discharge of Accumulated Water
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Fig. E-1. Treatment Facility site demolition EPSC measures.
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Fig. E-2. Treatment Facility effluent outfall EPSC measures.
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Fig. E-3. Treatment Facility grading and concrete work EPSC measures.
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