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UCOR-4972/R1

**Construction Execution/Management Plan,
Outfall 200 Mercury Treatment Facility at the
Y-12 Nuclear Security Complex,
Oak Ridge, Tennessee**

This document is approved for public
release per review by:

Teresa Fancher (*signature on file*)

UCOR Classification &
Information Control Office

11/29/2017

Date

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Outfall 200 Mercury Treatment Facility at the
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Date Issued—December 2017

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

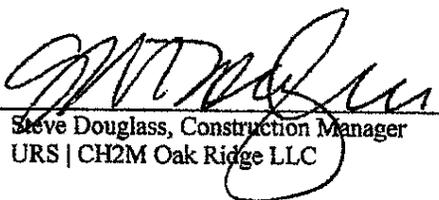
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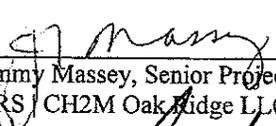
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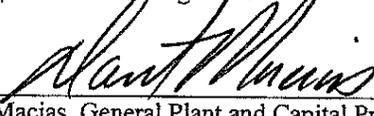
APPROVALS

Construction Execution/Management Plan, Outfall 200 Mercury Treatment Facility at the Y-12 Nuclear Security Complex, Oak Ridge, Tennessee	UCOR-4972/R1
	December 2017

USQD Review Determination	<input type="checkbox"/> USQD <input type="checkbox"/> UCD <input checked="" type="checkbox"/> CAT X <input type="checkbox"/> Exempt (Select Criteria 1-3 below.) USQD/UCD/CAT X No.: _____
Exemption Criteria	<input type="checkbox"/> (1) Non-Intent Change <input type="checkbox"/> (2) DOE-Approved Safety Basis Document <input type="checkbox"/> (3) Chief Accounting Officer, Internal Audit, Labor Relations, General Counsel, Outreach & Public Affairs, or Project Controls Services OR <input checked="" type="checkbox"/> (4) Document identified in USQD-MS-CX-REPORTS-1074/R6
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ACRONYMS

ABIH	American Board of Industrial Hygiene
ATP	Acceptance Test Procedure
BCR	Baseline Change Request
CAT	Construction Acceptance Test
CCB	Change Control Board
CCD	Construction Completion Document
CD	Critical Decision
CE/MP	Construction Execution/Management Plan
<i>CFR</i>	<i>Code of Federal Regulations</i>
CLA	Construction Labor Agreement
CM	Construction Management
CO	Contracting Officer
COR	Contracting Officer's Representative
CPS&HP	Construction Project Safety and Health Plan
CTR	Contractor Technical Representative
CY	Calendar Year
DCN	Design Change Notice
DCS	Document Control Specialist
DEAR	DOE Acquisition Regulation
DFPD	Deputy Federal Project Director
DOE	U.S. Department of Energy
DOE G	DOE Guide
DOE O	DOE Order
DOT	Department of Transportation
EB	Engineering Branch
EM	Environmental Management
ERP	Emergency Response Program
ES&H	environment, safety, and health
ESH&QA	environment, safety, health, and quality assurance
ESP	Early Site Preparation
FAT	Factory Acceptance Testing
FOB	Facilities Oversight Branch
FOBC	Facilities Oversight Branch Chief
FPD	Federal Project Director
IBC	International Building Code
IEWO	Inter Entity Work Order
IH	Industrial Hygiene
IPT	Integrated Project Team
IS	Industrial Safety
ISMS	Integrated Safety Management System
MOA	Memorandum of Agreement
MSL	Master Submittal Log
MTF	Mercury Treatment Facility
NCR	Nonconformance Report
NNSA	National Nuclear Security Administration
OF200	Outfall 200
OMD	Operations Management Division
OREM	Oak Ridge Office of Environmental Management

ORR	Oak Ridge Reservation
PAAA	Price-Anderson Amendment Act of 1988
PE	Project Engineer
PM	Project Manager
POD	plan of the day
POW	plan of the week
PSB	Program Support Branch
QA	quality assurance
QAB	Quality Assurance Branch
QAP	Quality Assurance Program
QC	quality control
QC/AP	Quality Control/Assurance Plan
QMSD	Quality and Mission Support Division
REA	Request for Equitable Adjustment
RFI	Request for Information
SME	subject matter expert
SOW	Statement of Work
SSWMB	Safety, Security, and Waste Management Branch
TP	Treatment Plant
TS	Transportation Specialist
UCOR	URS CH2M Oak Ridge LLC
UEFPC	Upper East Fork Poplar Creek
WEMA	West End Mercury Area
WPS	Waste Packaging Specialist
Y-12	Y-12 National Security Complex

1. PURPOSE

The purpose of this Construction Execution/Management Plan (CE/MP) is to establish uniform policies that will be used by construction management (CM) personnel to implement technical and administrative tasks for contracts making up the Outfall 200 (OF200) Mercury Treatment Facility (MTF) construction project. This CE/MP is a guidance document and is intended to be flexible in its application. It is intended that revisions and improvements be made to the plan as warranted. The Oak Ridge Office of Environmental Management (OREM) and the OREM CM support contractor will implement the plan and issue updates as appropriate. This CE/MP describes the approach to be used for planning, integrating, and managing the construction of the OF200 MTF, excluding Early Site Preparation (ESP).

This document is not intended to be a step-by-step procedure for each activity. Instead, it outlines general activities, processes, and requirements for the U.S. Department of Energy (DOE) and its contractors throughout the construction phase of the project. Procedures must always be understood and implemented in conjunction with the related contract conditions and specification section, which in the case of a conflict is more specific and supersedes this document.

OREM plans to award a prime contract for the OF200 MTF construction and to contract the current Environmental Management (EM) contractor for certain CM services along with Title III engineering. The OREM CM support contractor will have no contractual authority over the OREM construction contractor.

This CE/MP describes the project organization; identifies roles and responsibilities; and describes CM services to be provided during the construction phase of the project, including the procurement cycle, mobilization, construction, demobilization, and construction contract closeout.

OREM has developed a contracting strategy that will allow an accelerated start of some site preparation work in Calendar Year (CY) 2017 before the balance of construction work commences in CY 2018.

ESP activities are planned to include clearing, grubbing, demolition/removal of existing structures, installation of erosion controls and culverts, routing and stubbing utility services to the site, rerouting an existing steam condensate line, and installation of secant pile walls. CM and integration of the ESP activities will be addressed in the Construction Execution/Management Plan being developed to obtain Critical Decision (CD)-3A approval since that method of accomplishment is tailored to that scope. The ESP scope is, therefore, excluded from this plan.

This plan covers the balance of project construction and construction support including mobilization of the construction work force and equipment to the site, balance of site preparation, civil and structural erection, procurement and installation of process and support equipment, piping, electrical, instrumentation and controls, final site work, performance of systems Acceptance Test Procedures (ATPs), and demobilization. Construction support includes CM, site interfaces, and Title III engineering services.

Facility startup and operational testing includes developing test plans, commissioning, and compiling a transition package that includes clear and comprehensive documentation to support operations. Test plans will be implemented to verify installation and operability of equipment, piping, and instrumentation and can include testing with surrogates. Commissioning and transition packages will include all technical manuals and a complete set of as-built drawings from Title III. Operations startup includes acceptance of the facility by the operations organization, procedures and work control

document development and revision, and personnel training. Facility startup and operational testing is excluded from this plan.

2. PROJECT DESCRIPTION AND SITE PLAN

Historical missions at the Y-12 National Security Complex (Y-12) in Oak Ridge, Tennessee, used upwards of 24,000,000 lb of mercury, some of which was released to the environment. The Y-12 West End Mercury Area (WEMA) consists of the massive former mercury-use buildings Beta 4 (9204-4), Alpha-4 (9201-4), and Alpha-5 (9201-5), located in the west end of the Y-12 main plant area, including mercury-contaminated soils and storm sewers in the immediate vicinity (see Fig. 1). Residual mercury is in the 60-year-old, deteriorating storm drain infrastructure. Infiltrating groundwater and sediment-bound mercury are remobilized and transported through the storm drain network to OF200 and into the Upper East Fork Poplar Creek (UEFPC). Currently, this is the largest environmental risk on the Oak Ridge Reservation (ORR).

The design for the mercury treatment system was selected after a series of process steps. These steps included bench-scale treatability testing, water characterization, flow modeling, water chemistry modeling, treatment technology evaluation, project scalability, comparative evaluation, and siting and conceptual design. Using the results from these steps, the treatment system was selected for flow rates up to 3000 gallons per minute (gpm).

The design, construction, and operation of the OF200 MTF is being conducted under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980. The *Amendment to the Record of Decision for Phase I Interim Source Control Actions in the Upper East Fork Poplar Creek Characterization Area, Oak Ridge, Tennessee* (DOE/OR/01-2697&D2) documents the selected interim remedy as agreed on by DOE, the Tennessee Department of Environment and Conservation, and the U.S. Environmental Protection Agency.

The mercury treatment process flow is shown in Fig. 2. A current facility layout of the Headworks and Treatment Plant (TP) are shown in Fig. 3 and Fig. 4, respectively.

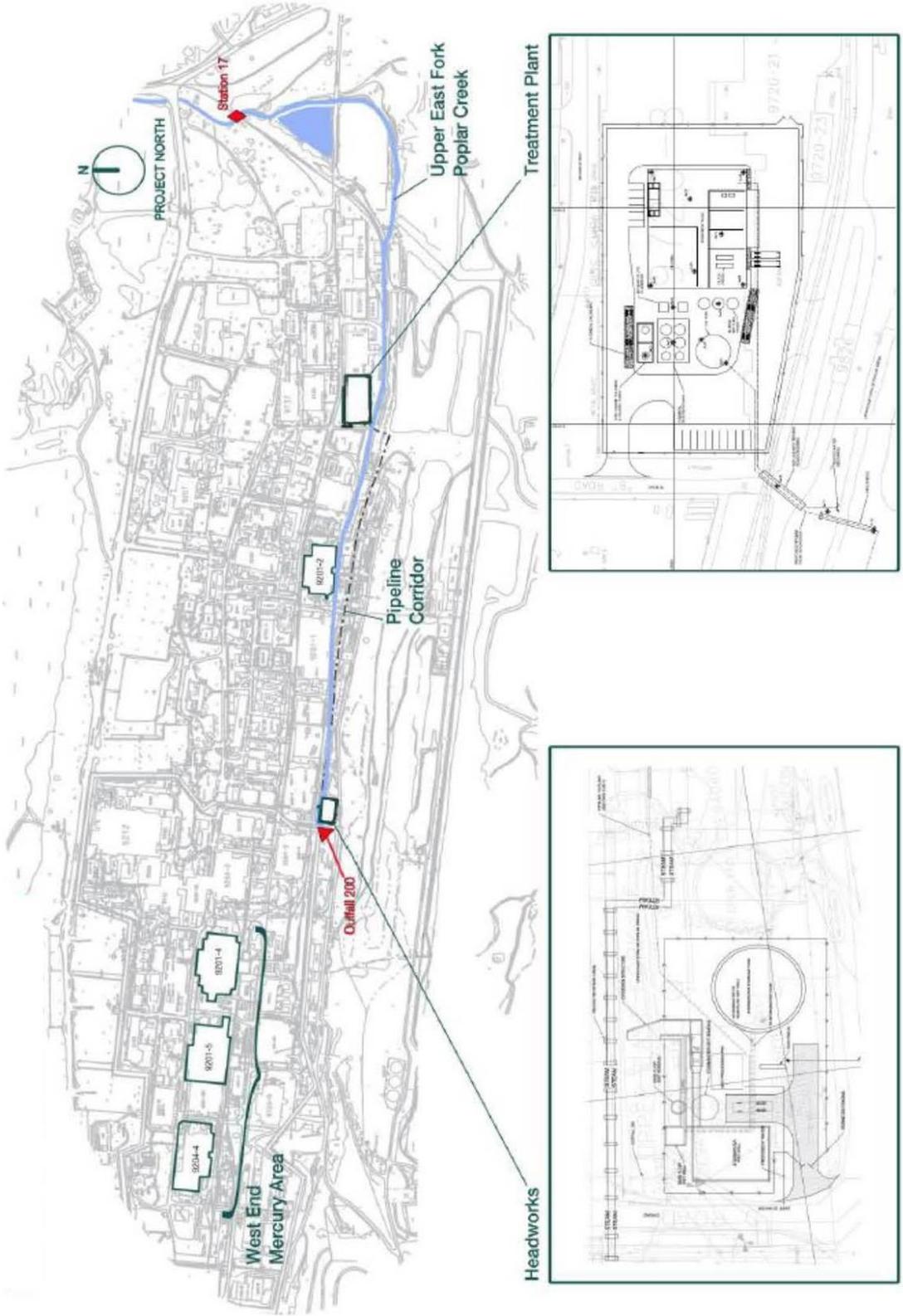


Fig. 1. Y-12 Site and OF200 MTF current site location.

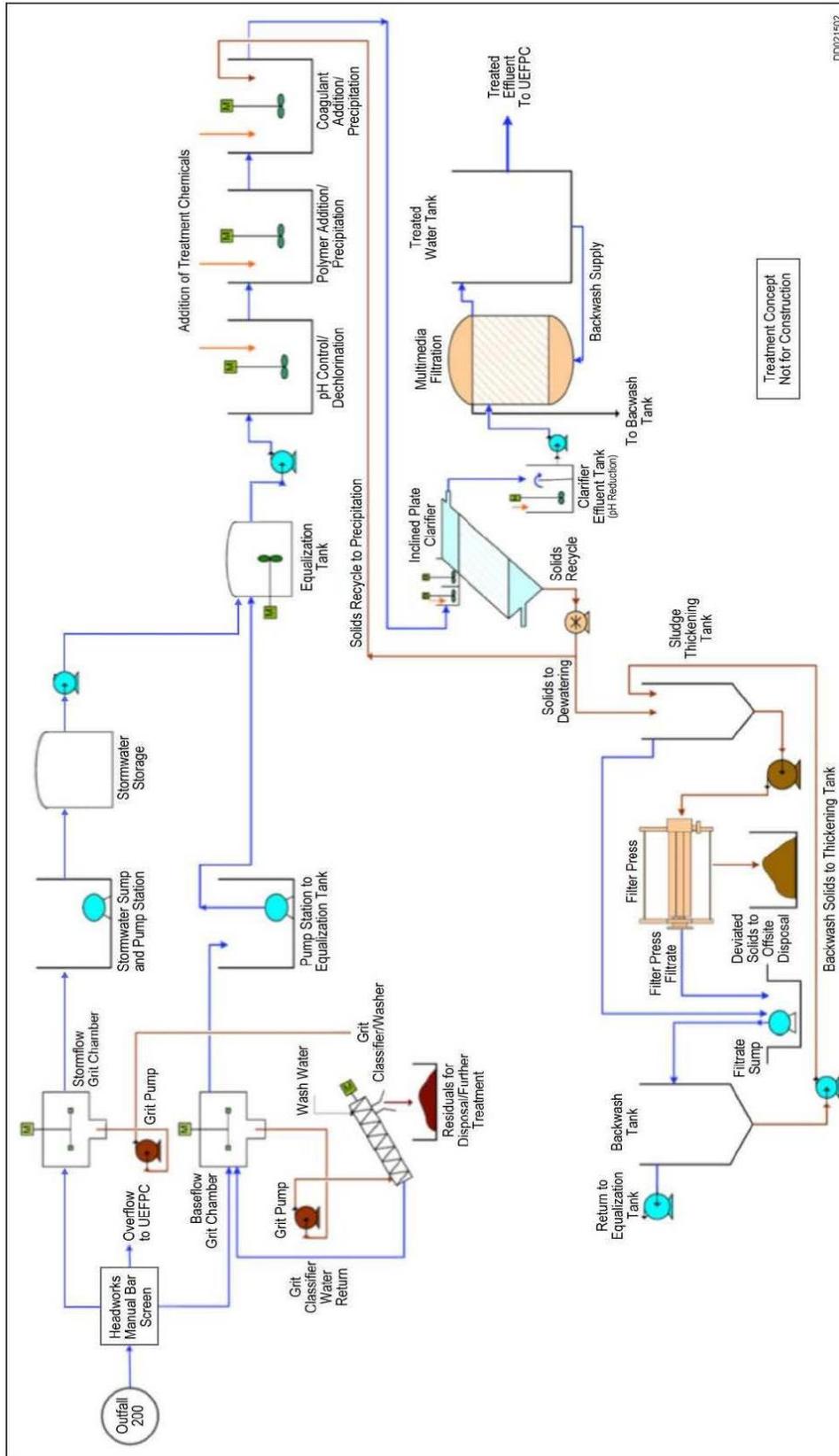


Fig. 2. OF200 MTF system process flow diagram.

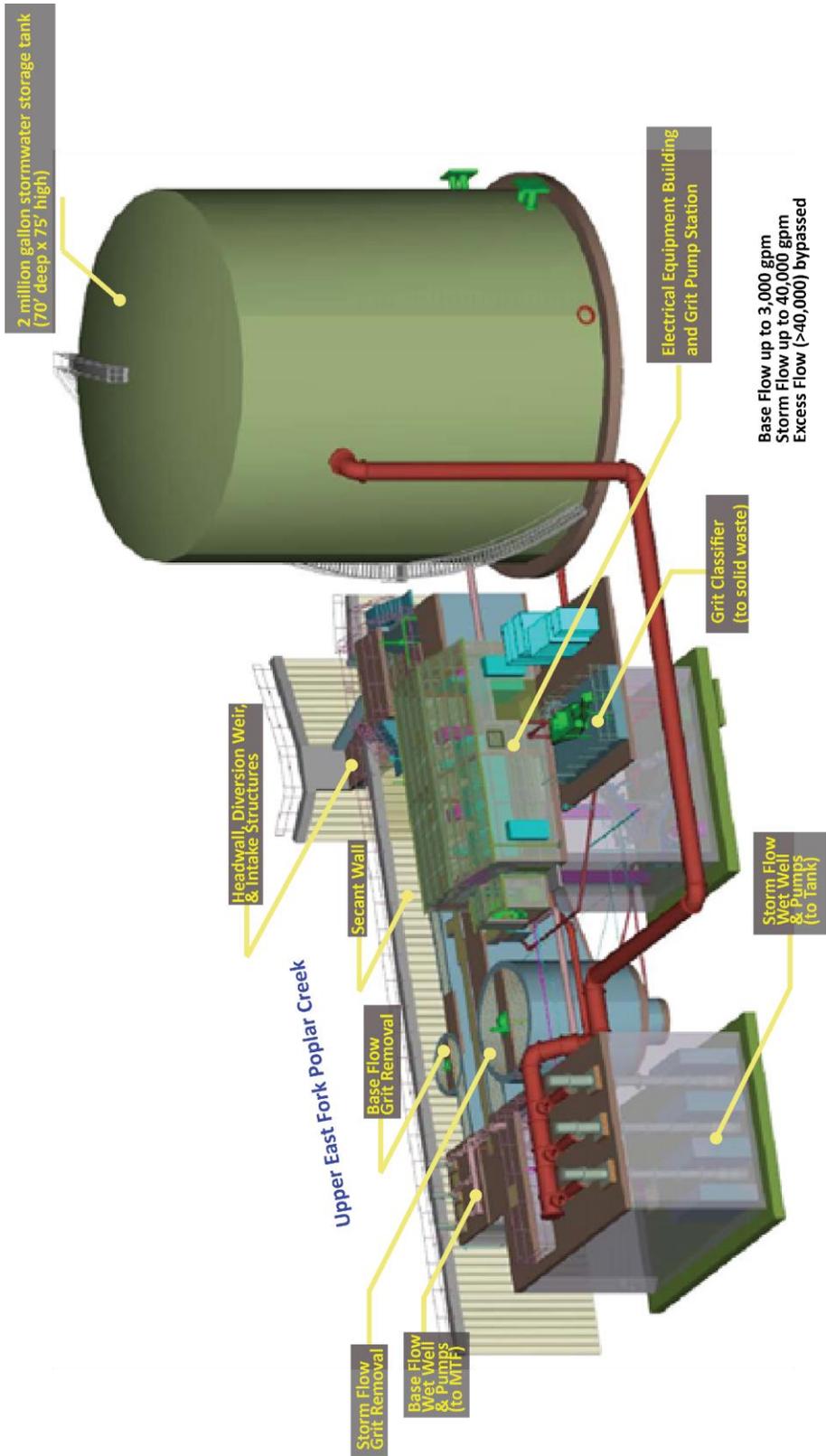


Fig. 3. Current OF200 MTF Headworks layout (storm water storage capacity shown at right).

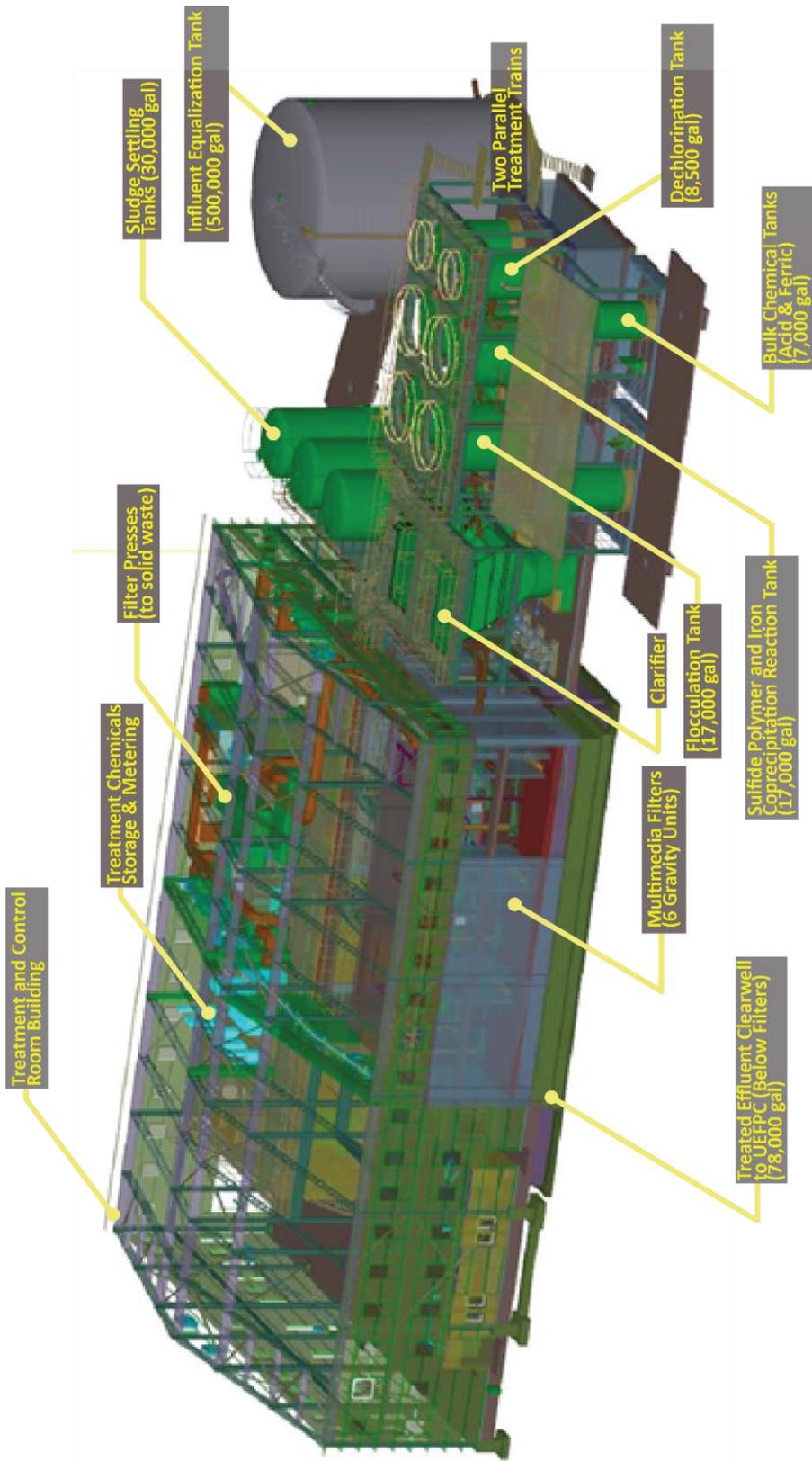


Fig. 4. Current OF200 Treatment Plant model (equalization tank shown at right).

The detailed design includes drawings and technical specifications including data sheets, issued as a certified-for-construction package to be used for construction bid, award, and performance of the work. The design drawings include the following:

- Civil—site layouts, site grading, erosion control, demolition, any required utility relocations, and yard piping plans
- Structural—building, tank, and equipment foundations, supports, and in-stream and below-grade structures
- Process—process flow diagrams, major process equipment, and process and instrumentation diagrams
- Mechanical—piping, pumps, tanks, and equipment layouts and details
- Electrical—utility tie-ins and electrical distribution, overall one-line diagrams, outdoor lighting, electrical equipment and cabling, and emergency notification and fire alarms
- Instrumentation—overall control system logic, instrumentation layout, and details
- Architectural—building plans and layouts
- Building mechanical—heating, ventilation, and air conditioning, plumbing and building services

2.1 OF200 MTF PROJECT SCOPE

The OF200 MTF Project scope is one of several alternatives evaluated in UCOR-4578, *Conceptual Design Report for the Outfall 200 Mercury Treatment Facility*. The preferred alternative in the Conceptual Design Report, which was further modified during dispute resolution and is now the OF200 MTF Project scope, includes the following main system components and functions: OF200 Diversion Structure and Headworks area, TP area, and Transfer Pipeline.

2.1.1 MTF Headworks

The OF200 diversion structure and Headworks will be located adjacent to the outfall on the south side of UEFPC. This location allows in-stream diversion along with collection and transfer components. Locating the diversion structure near the outfall optimizes the capture of flow from WEMA without treating the large volumes of additional, relatively clean water that flows into UEFPC downstream. The Headworks will divert the UEFPC flow downstream from OF200 and is sized to divert flows up to 40,000 gpm for collection and treatment, while allowing bypass of excess storm flow. The Headworks include capabilities for grit separation and pumping of the collected base flow to the TP site via a pipeline. The pumping transfer rate of nominally 3000 gpm will support the treatment system design flow capacity. For diverted storm water in excess of the treatment system capacity up to 40,000 gpm, grit separation is followed by pumping to a storm water tank sized to store up to 2 million gal of storm water. Storm water collected in the storage tank can later be fed into the transfer system to the TP when diverted flows from UEFPC drop below the treatment system capacity. The grit removal system includes a solids dewatering system and capability for loading solid waste containers with grit.

2.1.2 OF200 MTF Treatment Plant

The TP will be located at the site of the former Bldg. 9720-8 near the east end of Y-12. The TP consists of outdoor tanks and treatment equipment placed in near proximity to a treatment building that houses weather sensitive or labor-intensive equipment.

Outdoor equipment includes an equalization tank, clarifiers, backwash and sludge settling tanks, process reaction tanks, and bulk chemical storage tanks. Temporary staging of waste containers from process operations (e.g., grit and filter cake residuals) can be accommodated at the site.

Weather-sensitive equipment and equipment requiring higher frequency for manned operation are indoors in the treatment building. This equipment includes multi-media filtration, filter presses, treatment chemical make down systems, filter clear well and backwash basins, backwash pumps and associated equipment, and operations support and control areas.

2.1.3 Transfer Pipeline Corridor

A transfer pipeline approximately 3100 ft long will be located generally along the south side of UEFPC between the Headworks and TP areas. The pipeline will be located within an approximately 50-ft-wide corridor along the south bank of UEFPC to minimize interferences with Y-12 utilities/operations. The transfer pipeline will generally be an at-grade, single-contained pipe sized to handle the design flow for the treatment system. Road crossings will primarily be underground, while the crossing of UEFPC into the TP will be via a pipe bridge.

2.2 MANAGEMENT OF CONSTRUCTION WORK

The OREM CM support contractor team will provide CM support to OREM and ensure adherence to the OF200 MTF OREM construction contract. This support will be accomplished as shown in Table 1.

Table 1. General roles matrix

Activity	Organization		
	OREM	CMC	Other
CM SUPPORT FOR PRE-AWARD PROJECT PLANNING			
Provide CM support services for Construction Contract Procurement			
• Perform Technical Evaluations of Contractor RFI	1	2	
• Develop Request for Qualifications	1	2	
• Develop SOW	1	2	
• Develop RFP Clauses, T&C, other SOW Sections, etc.	1	2	
• Review and provide comments on requirements flow down to Contractors	1	2	
• Bid Solicitation	1	2	
• Conduct Pre-Bid Conference/Walk down	1	2	
• Develop responses to Contractor RFIs	1	2	
• Perform Technical Evaluations of Contractor proposals for OREM	1	2	
Develop Construction-Related CD-3 Documents			
• Develop Construction Execution/Management Plan		1	
• Develop Construction Project S&H Plan		1	1-contr
• Develop Quality Assurance Plan for Construction	1		1-contr
• Develop Quality Control/Assurance Plan		1	
• Develop Startup Test Plan		1	

Table 1. General roles matrix (cont.)

Activity	Organization		
	OREM	CMC	Other
CM SUPPORT FOR PRE-AWARD PROJECT PLANNING			
Other Pre-Construction Contract Award Support Services			
• Perform project management services during pre-award project planning		1	
• Develop NNSA/OREM transfer of the footprint for construction	1	2	
• Update MOAs to define site interfaces following transfer of operational responsibility to OREM	1-DOE to DOE	1-all others	
• Develop Y-12 work packages for existing utility isolations	2		1-CNS
• Develop Y-12 work packages for new utility tie-ins	2		1-CNS
• Develop contractor work packages for construction activities			1-contr
CM SUPPORT FOR CONSTRUCTION			
Provide CM Support Services for Mobilization			
• Conduct pre-construction conference with contractor to outline contractor requirements for performing work and publish meeting minutes	1	2	
• Conduct pre-job labor conference with contractor to obtain contractor approval of Site Labor Agreement	2		1-contr
• Review contractor pre-mobilization submittals	1	2	
• Coordinate required training for contractor workers		2	1-contr
• Perform construction readiness management assessment	1	2	
• Provide CM support during Contractor mobilization to site		1	
• Provide occurrence reporting during mobilization	2		1-contr
Provide CM Support Services during Construction			
• Provide CM support during construction		1	
• Monitor Contractor adherence to policies and procedures	2	1	
• Monitor Contractor compliance with contract requirements	2	1	
• Provide construction progress		1	
• Develop/maintain Master Construction Submittal Log		1	
• Review Contractor submittals during construction	1	2	
• Prepare construction daily field reports		1	
• Conduct weekly construction progress meetings and publish meeting minutes	2	1	
• Provide interface with contractor Facility Manager		1	
• Provide interface with Y-12 Representatives		2	1-contr
• Coordinate Y-12 field support to isolate existing utilities from project sites		2	1-contr
• Coordinate Y-12 field support to tie-in new project utilities at project sites		2	1-contr
• Provide construction contract correspondence management		1	
• Monitor and verify delays and prepare/submit delay notices	1	2	
• Develop responses to contractor RFIs	1	2	
• Develop/maintain RFI Log		1	
• Coordinate/track Non-Conformance Reports		1	
• Assess and process contractor claims	1	2	

Table 1. General roles matrix (cont.)

Activity	Organization		
	OREM	CMC	Other
CM SUPPORT FOR CONSTRUCTION			
Provide CM Support Services during Construction (cont.)			
• Maintain Contract Action Log	1	2	
• Review and process contractor invoices	1	2	
• Attend plan-of-the-day meetings		2	1-contr
• Provide project management and regulatory support services during construction		1	
• Provide Waste Management support services during construction	1		
• Provide S&H support services during construction	1		
• Provide radiological protection support services during construction	1		
• Provide environmental compliance support services during construction		1	
• Provide QA and QC support services during construction	1	2	
• Perform special inspections		1	
• Provide SCADA programming		1	
• Provide Title III engineering services during construction		1	
• Provide Engineering related to Design Authority during construction		1	
• Review/coordinate/track design changes		1	
• Provide engineering drawing as-builts		1	
• Provide nuclear facility safety support for design changes during Construction		1	
• Provide occurrence reporting during construction	2		1-contr
Provide CM Support Services for Systems Acceptance Testing			
• Prepare ATPs		1	
• Provide CM review of ATPs		1	
• Provide Test Director for performance of ATPs		1	
• Provide CM support during performance of ATPs		1	
• Provide PM and regulatory support services during performance of ATPs		1	
• Provide Waste Management support services during performance of ATPs	1		
• Provide S&H support services during performance of ATPs	1		
• Provide Radiological Protection support services during performance of ATPs	1		
• Provide Environmental Compliance support services during performance of ATPs		1	
• Provide QA and QC support services during performance of ATPs	1	2	
• Provide Title III Engineering services during performance of ATPs		1	
• Prepare Construction Acceptance Test Report		1	
• Provide occurrence reporting during performance of ATPs	2		1-contr
Provide CM Support Services for Demobilization and Construction Contract Closeout			
• Develop construction project closeout documentation		1	
• Project acceptance checklists		1	

Table 1. General roles matrix (cont.)

Activity	Organization		
	OREM	CMC	Other
CM SUPPORT FOR CONSTRUCTION			
Provide CM Support Services for Demobilization and Construction Contract Closeout (cont.)			
• Facility checkout/walk-through with contractor		1	
• Construction Statement of Acceptance (punchlist items)		1	
• Inspection and Acceptance Report		1	
• Provide CM support during construction punchlist work		1	
• Provide CM support during contractor demobilization		1	
• Provide waste management support services during demobilization	1		
• Provide S&H support services during demobilization	1		
• Provide radiological protection support services during demobilization	1		
• Provide environmental compliance support services during demobilization		1	
• Provide QA/QC support services during demobilization	1	2	
• Verify acceptance of end product	1	2	
• Review Contractor’s Turnover Package	1	2	
• Provide occurrence reporting during demobilization	2		1-contr

^a1 = Primary role and 2 = Secondary role.

ATP = Acceptance Test Procedure

CD = Critical Decision

CM = Construction Management

CMC = OREM CM support contractor

CNS = Consolidated Nuclear Security, LLC

contr = contractor

DOE = U.S. Department of Energy

MOA = Memorandum of Agreement

NNSA = National Nuclear Security Administration

OREM = Oak Ridge Office of Environmental Management

PM = Project Manager

QA = quality assurance

QC = quality control

RFI = Request for Information

RFP = request for proposal

S&H = safety and health

SCADA = Supervisory Control and Data Acquisition

SOW = Statement of Work

T&C = terms and conditions

Y-12 = Y-12 National Security Complex

3. PROJECT ORGANIZATION AND RESPONSIBILITIES

3.1 ORGANIZATIONAL RELATIONSHIPS

This section describes the project organization, identifying the various participants, their roles and responsibilities, and the reporting relationships.

Having a well-defined organizational structure is key to ensuring work is performed safely, on time, and within budget. Incidents, safety issues, duplication of effort, delay in completing work, and poor stewardship of resources are greatly minimized by having clearly defined roles, responsibilities, authorities, and working relationships with interfaces. Successful completion of the project requires the efforts and cooperation of many organizations.

As a DOE EM project, the Assistant Secretary for Environmental Management is the OF200 Project Management Executive under DOE Order (O) 413.3B. The project is implemented under the leadership of the OREM Federal Project Director (FPD), who is vested with authority and accountability for the project. Within OREM, the FPD is supported by the Deputy FPD and matrixed functional support representatives. National Nuclear Security Administration (NNSA) staff are a part of the Integrated Project Team (IPT) to provide specialized knowledge and coordination between the project and Y-12.

The OREM organization is a dynamic modeled organization designed to afford the FPD the necessary resources using a pool of qualified individuals. The FPD serves as the leader and overall manager for the project and maintains full accountability for ensuring the work is performed safely.

The Deputy FPD is a Federal Project Manager (PM) responsible for execution of the work on behalf of the FPD and directly supports the FPD on a daily basis as their representative in the field. The Deputy FPD interacts regularly with contractor(s) and keeps the FPD apprised of all performance-related issues.

The FPD and Deputy FPD are supported by other OREM and technical support contractor staff that, together with specific personnel from the performing contractor(s), form the core membership of the IPT. This IPT staff is supported intermittently and as needed by subject matter experts (SMEs). The FPD has access to the necessary technical expertise and infrastructure for integration of project controls and administration, environment, safety, and health (ES&H), quality, and safety basis requirements into their projects through functional OREM divisions.

OREM has established an IPT to assure successful completion of the project. An IPT Charter (DOE/ORO/2488, *Integrated Project Team Charter*, Revision 2) has been developed and is updated at least annually. This Charter provides the framework for team interaction, communications, coordination for all project activities, and is a standalone document.

The FPD has overall responsibility for the success of the project and, at any time with the approval of the OREM Manager, can reorganize the IPT to meet changing needs. The reorganizations will be kept to a minimum to maintain stability and progress of the project. The IPT Charter establishes specific lines of authority, with the FPD having been delegated the necessary authority for overall project execution.

The FPD invites contractor personnel to attend IPT meetings to provide a forum for project planning and information exchange, including updates on project execution and implementation of contractor roles and responsibilities. URS | CH2M Oak Ridge LLC (UCOR), as the current OREM Environmental Management contractor, is responsible for issuing the OF200 MTF design, serves as the Design

Authority for the OF200 MTF Project, and is responsible for preparation of the CD-2/3 documents. UCOR personnel actively participate in the IPT as requested by the FPD. The OREM CM support contractor (currently UCOR) will attend and participate in the IPT.

Since OF200 MTF is being constructed at Y-12, agreements between OREM and NNSA are being developed and documented to define the conditions, expectations, requirements, regulations, authorities, protocols, procedures, and processes to be followed by OREM and NNSA Federal staffs and prime contractors, the OREM construction contractor, associated sub-tier contractors, and OREM support contractors in executing the project safely, efficiently, and effectively.

OREM will award a contract for the OF200 construction and will contract with the EM contractor for certain CM services along with Title III engineering. The OREM construction contractor will need to access the Y-12 site contractor, as the NNSA site operations contractor for Y-12, to provide site-specific knowledge and support. The OREM construction contractor also will need to coordinate mechanical and electrical utility tie ins that will be performed by the Y-12 site contractor. OREM plans to implement an Inter Entity Work Order (IEWO) with NNSA for Y-12 site contractor support, which includes the performance of the utility tie-ins. The OREM CM support contractor will have no contractual authority over the OREM construction contractor or the Y-12 site contractor.

The OREM CM support contractor will utilize the expertise of CH2M to serve as the Design Agent to provide Title III engineering services.

3.2 DOE ROLES AND RESPONSIBILITIES

OREM will award and administer a construction contract for OF200 MTF construction. OREM will implement an IEWO with NNSA for Y-12 site contractor support. The OREM CM support contractor will provide certain CM and Title III engineering services to the OREM Contracting Officer (CO).

3.2.1 Federal Project Director

FPDs are accountable to the OREM Manager for the following responsibilities:

- Maintain line management responsibility for work within portfolio
- Manage all projects within assigned portfolio throughout the project cycle
- Provide strategic planning for future goals and commitments of project portfolios, including sequencing of projects
- Lead Portfolio IPT
- Work with Functional Division Directors to ensure adequate resources and establish priorities to support portfolio needs
- Oversee and manage the development of the project portfolio definition, technical scope, and budget to support mission need
- Understand the project portfolio and how it relates to the OREM Integrated Baseline, Integrated Master Plan, and overall OREM goals/objectives
- Approve IPT charters (non-major system acquisitions) and review/concur on project execution plans (PEPs) and other key project documentation
- Participate in the OREM budget formulation/prioritization process

- Evaluate contractor performance on project activities and submit contract administration deliverables based on established timelines for project portfolio (i.e., award fee, performance feedback reports, Contractor Performance Assessment Reporting System, etc.)
- Serve as the Contracting Officer's Representative (COR) or the Alternate COR for assigned contracts, including review of scope statements, cost estimates, schedules; providing technical direction; and recommending approval to the CO
- Serve as the primary interface with COs on ensuring contract management deliverables are identified and dispositioned appropriately within established timeframes (i.e., Contract Change Proposals/Requests for Equitable Adjustments [REAs], Authorized Unpriced Work, etc.)
- Approve changes to project baselines within authorized thresholds as member of the OREM Change Control Board (CCB)
- General project-level reporting at Monthly and Quarterly Project Reviews
- Approve reporting for projects using the Integrated Planning, Accounting and Budget System and Project Assessment and Reporting System Version Two
- Ensure compliance with DOE O 413.3B and recommend approval of CDs (CD-1, -2, -3, and -4)
- Communicate project status to OREM senior management with support from functional divisions as needed
- Maintain knowledge of key issues on individual projects within the portfolio
- Maintain regular communication with contractor counterparts
- Maintain operational awareness of field activities/management walkthroughs
- Obtain and maintain FPD certification
- Ensure milestones in regulatory agreements pertaining to portfolio activities are met
- Serve as a member of the Supervisory Management Team, which interfaces with regulatory agency counterparts
- Ensure preparation and approval of regulatory decision documents
- Serve as an OREM point-of-contact for media inquiries about ongoing OREM activities for assigned project portfolio in coordination with the Public Affairs Division

3.2.2 Deputy Federal Project Director

The Deputy Federal Project Director (DFPD) is the Federal PM responsible for execution of the work on behalf of the FPD and is assigned specifically to the OF200 MTF project where the FPD is responsible for a portfolio of projects. The DFPD directly supports the FPD on a daily basis as their representative in the field and is an integral component of the IPT. In the absence of the FPD, the DFPD is appointed to act on his/her behalf for IPT related matters. The DFPD interacts regularly with contractor(s) and keeps the FPD apprised of all performance related issues.

The DFPD has the following responsibilities:

- Manage OREM capital and operating projects through the planning, execution, and closeout phases to ensure projects are completed safely, and within scope, schedule, and cost thresholds

- Support the negotiations of regulatory agreements for OREM activities on the ORR sites with regulatory agencies in support of project activities
- Ensure government and contractor-executed functions are carried out in compliance with DOE directives in a manner that protects government and contractor personnel and the general public against all ES&H hazards arising from performance of contract work
- Lead preparation of CD documents and coordinate scheduling of CDs for the design, construction, and closeout phases of the project, including the approval of significant milestones
- Develop Acquisition Plans, PEPs, Risk Management Plans, and IPT Charters for assigned projects
- Manage project risks actively
- Coordinate with regulatory agencies to obtain permits and/or applicable approvals
- Provide input on contractor(s) performance on project activities to support project portfolios and/or COs
- Promote federal workforce partnering with OREM contractors to achieve contract objectives
- Lead project team interactions with regulatory authorities
- Communicate issues involving ES&H to the FPD and other appropriate OREM elements
- Provide day-to-day technical guidance and oversight of contractor activities
- Serve as the COR or the Alternate COR for assigned contracts, which includes review of scope statements, cost estimates, and schedules, and recommend approval to the CO
- Assure projects are aligned with OREM Program objectives
- Manage the Change Control Process to ensure proposed changes to the OREM integrated baseline are properly identified, developed, reviewed, alternatives evaluated, approved, implemented, validated, and documented
- Establish and lead sub-IPT
- Prepare technical/costs evaluations of baseline change proposals/REAs as needed
- Maintain operational awareness of field activities/management walkthroughs
- Support FPD project reporting

3.2.3 Facility Representative

A Facility Representative is an individual assigned responsibility by the Field Element Manager (or designee) for monitoring the safety performance of the facility and its operations. This individual is the primary point of contact with the OREM construction contractor for operational and safety oversight and reports to OREM line management.

The Facility Representative has the following responsibilities:

- Represents OREM in day-to-day operational oversight of OREM construction contractor activities
- Maintains awareness of major work in progress and in planning, as well as which personnel are controlling the work, what procedures are used, and whether training and qualification requirements have been established and are being met
- Documents Operational Awareness Activity in the OREM Issues Management System

- Receives notification of occurrences at assigned facilities/projects from the responsible contractor
- Completes the review, comment, and approval of Operational Emergencies and Significance Category Recurring, 1, and 2 Final Reports within 10 calendar days after receipt of the report
- Determines appropriate SMEs to assist in the performance of walkthroughs and surveillances
- Performs surveillances in accordance with OREM-OM-IP-06, *Formal and Informal Assessments*.
- Uses stop work as necessary to protect the health and safety of workers and the public, to protect the environment, or to protect the facility and equipment.
- Adheres to established OREM/contractor codes of conduct and protocols, and all safety requirements, while performing assigned duties.
- Maintains familiarity with site and facility characteristics, procedures and work controls, organizational structure, and key personnel.
- Responds to facility events and serves as the OREM presence for unique operations.
- Observes, evaluates, and reports on the effectiveness of the contractor in multiple areas important to safe, efficient, and productive operation.
- Supports and participates in accident investigations, audits, appraisals, Price-Anderson Amendments Act of 1988 (PAAA) enforcement activities, and visits to the assigned facility, as requested.
- Maintains frequent communication with supervision and other Facility Representatives, informs line management of current facility conditions, and communicate hazards to line management.
- Facilitates the notification and reporting of occurrences and safety or operational concerns to the Facilities Oversight Branch Chief (FOBC).
- Reviews contractor documentation and assessment reports to determine if a systemic or recurring problem exists with contractor activities.
- Requests needed technical resources from the FOBC.
- Maintains proper training, and qualifications to ensure immediate unannounced access to facilities.
- Provides input to the quarterly reports as requested by the FOBC or designee.
- Submits weekly reports to the FOBC or designee.
- Conducts Implementation Verification Reviews at assigned facilities in accordance with OREM-OM-IP-06, *Formal and Informal Assessments*

3.2.4 Contracting Officer's Representative

The FPD is the COR for the construction contract and is accountable to the OREM Manager for the following:

- Monitor contractor performance of and compliance with contract requirements
- Evaluate contractor performance per the contract
- Inform the CO if it appears contract requirements will not be completed on schedule and within budget and per the Statement of Work (SOW)

- Monitor the administrative and funds aspects of the contract by reviewing incurred costs to determine if they will be allowed
- Interpret the technical requirements of the contract's SOW and reporting to the CO all technical issues, which would result in increased costs or alterations to the SOW
- Compile and enter Contractor Performance Assessment Reporting Systems data
- Assist the CO in closing out the contract

3.2.5 Contracting Officer

The CO serves as a standing member of the IPT, with sole authority to modify OREM contracts.

3.2.6 Industrial Safety Representative

The primary project functions of the Industrial Safety (IS) Representative include the following:

- Provide SME support of Integrated Safety Management Systems (ISMS)
- Review OREM construction contractor's compliance/implementation of 48 *Code of Federal Regulations (CFR) 970.5223-1, Integration of Environment, Safety and Health into Work Planning and Execution*
- Review OREM construction contractor's implementation of DOE Policy 450.4A, *Integrated Safety Management Policy*, as appropriate
- Provide on-site presence
- Perform surveillances of OREM construction contractor's ISMS
- Monitor field activities and review contractor work control documentation
- Serve as a point-of-contact for the project for safety and health issues and interfaces with the Project Industrial Hygienist (IH) as needed
- Provide an oversight function responsible for monitoring the OREM construction contractor's industrial safety program compliance

3.2.7 Industrial Hygienist

The primary project function of the IH includes the following:

- Provide support to anticipate, recognize, evaluate, and develop controls for occupational health hazards
- Provide an oversight function responsible for monitoring the OREM construction contractor IH program compliance

3.2.8 Other Functional Authorities

Functional authorities and responsibilities (e.g., Nuclear Safety, Waste Management, Quality Assurance [QA], etc.) typically reside within OREM.

The Operations Management Division (OMD) consists of three branches: Facilities Oversight Branch (FOB); Safety, Security, and Waste Management Branch (SSWMB); and Engineering Branch (EB).

OMD provides technical support to the project in the areas of safety and health, nuclear safety, fire and electrical safety, radiation protection, transportation, security, operations oversight, conduct of operations, engineering, waste management, criticality safety, PAAA enforcement, safety system oversight, and emergency preparedness. OMD also serves as the Defense Nuclear Facilities Safety Board liaison. The Division Director is responsible for providing critical support to ensure OREM can accomplish its mission in a safe and technically compliant manner. The Division Director is supported by a highly qualified diverse staff of SMEs and Facility Representatives that provide real-time oversight of contractor programs, systems, and operations.

The FOB provides front-line oversight of facility operations. This organization provides accurate, objective information on the effectiveness of contractor work performance and practices, including the implementation of ISMS. It is an integral component of the OREM performance assurance and contractor oversight functions; surveillance and assessment activities are performed in accordance with OREM procedures for its assigned programs and responsibilities.

The SSWMB provides program direction and technical expertise to ensure that OREM can conduct its mission safely and compliantly. The Branch is responsible for programmatic direction to the projects, technical review of safety and waste management documents, and coordination of emergency management and security plans and procedures as applicable. SSWMB provides technical Subject Matter Experts in support of the OREM mission. It is responsible for oversight of contractors' Waste Management and Transportation, Worker Safety and Health, Occupational/Construction Safety, IH, Electrical Safety, Fire Protection, Chronic Beryllium Disease Prevention, Radiation Protection/Health Physics, Integrated Safety Management/Safety Conscious Work Environment, Voluntary Protection Program, Security, and Technical Training and Qualifications Programs.

The EB provides program area expertise related to engineering, safety basis, maintenance, and PAAA enforcement. The EB is responsible for reviewing safety basis documents and provides technical SMEs to support projects, programs, and enhancement of the OREM mission. EB is responsible for oversight of the contractor's Engineering, Safety Basis, Maintenance, Nuclear Startup and Readiness, Safety Systems, and Criticality Safety Programs.

The Quality and Mission Support Division (QMSD) is responsible for consolidating and executing programmatic support functions and providing independence to QA for assessments. QMSD, which is responsible for a wide range of administrative, technical, and program/project management services, is linked in function by providing services to all of OREM. QMSD consists of two branches: (1) Quality Assurance Branch (QAB), and (2) Program Support Branch (PSB). The Business Services extension provides administrative and facility management support.

The QAB staff is responsible for ensuring program-wide consistency for the execution and delivery of QA for OREM and OREM contractors pursuant to DOE Order 414.ID, *Quality Assurance*, and EM-QA-001, *EM Quality Assurance Program (QAP)*. Members of QAB are designated to fulfill the roles of Software QA, Training Manager, Operating Experience/Lessons Learned Coordinator, and Suspect/Counterfeit Items Coordinator. Additional staff functions include management of the OREM Issues Management System, Assessment Program Committee, contractor assurance systems, OREM procedure development and administration, and directives management. QAB also serves as the QA support organization for OREM, providing support for procedure development, QA plan development and review, technical support to line item projects on QA issues, and interfacing with external groups on quality issues.

The PSB staff provides a wide range of services to the OREM Program, including general support to program obligations in the areas of environmental compliance, public and regulatory interface activity,

groundwater program, historic preservation, facility information management, communications, and reindustrialization of the East Tennessee Technology Park.

The following functional authorities will provide support to the OF200 MTF balance of construction phase of the project:

- Planning and Baseline Management
- Project Controls
- QA
- Safety and Health
- Waste Management
- Environmental Compliance
- Nuclear Safety
- Radiological Protection
- Engineering
- Legal
- Regulatory and Stakeholder Interface
- Fire Protection
- Risk Management

3.3 OREM CONSTRUCTION CONTRACTOR ROLES AND RESPONSIBILITIES

OREM will award a construction contract for the balance of OF200 MTF construction with the OREM construction contractor accountable to the OREM CO for execution. This CE/MP addresses some of the non-traditional roles and responsibilities and interfaces unique to OF200 execution.

The OREM construction contractor will assume the role of and be responsible for duties associated with the Facility Manager for the construction site footprint. NNSA will transfer operational responsibility of the construction site footprint to OREM. The OREM construction contractor will be an OREM prime contractor. The OREM CM support contractor's programs and procedures will not be flowed down to the OREM construction contractor, and the OREM CM support contractor will not provide the Facility Manager during construction.

The OREM construction contractor will be responsible for occurrence reporting. OREM will provide technical assistance to the OREM construction contractor to ensure occurrence reporting is conducted in accordance with requirements.

The OREM construction contractor will be responsible for the following:

- Develop work package(s) for all field activities to be performed by OREM construction contractor workers and sub-tier contractors
- Develop/obtain construction permits (e.g., excavation, penetration, hot work, etc.)
- Oversee and coordinate construction work

- Obtain support services
- Function as primary construction contact with Y-12 personnel supporting the project
- Coordinate contractor activities with Y-12 personnel as requested
- Provide field construction status

3.3.1 Facility Manager

The primary project functions of the Facility Manager include the following:

- Responsible for implementation of lockout/tagout program
- Responsible for initial control of construction work site in the event of an abnormal occurrence
- Responsible for work release
- Attend Plan-of-the-Day (POD) meetings as required
- Report abnormal conditions
- Coordinate work with other affected organizations and contractors
- Allow access to construction site
- Approve energized work and excavation permits
- Approve work boundaries and tie-in permits
- Ensure safety basis requirements are consistent with and addressed to the extent applicable in work control documents
- Perform occurrence categorization and report writing, and performs notifications.

3.3.2 Transportation Specialist/Waste Packaging Specialist

The Transportation Specialist (TS) must be qualified to perform the duties of the TS and the Waste Packaging Specialist (WPS). The TS is responsible for providing all transportation documents to make a safe and compliant shipment, performing U.S. Department of Transportation (DOT) inspections on all outbound shipments, scheduling transportation equipment, entering shipments into the appropriate databases and scheduling shipments with receiving facilities. The TS will also perform the functions of the WPS, which is responsible for reviewing OREM construction contractor activities related to waste containers from obtaining, tracking, loading, closure, and staging/storage until the container is offered for transport. The WPS also verifies that the waste does not include anomalous or prohibited items. Other responsibilities of the TS/WPS include, but are not limited to, the following:

- Verify package integrity prior to filling
- Verify appropriate package for waste to be containerized
- Verify package contents meet description in the approved profile
- Verify packaged waste meets the applicable waste acceptance criteria
- Verify no anomalous items included in package
- Perform DOT inspections on all outbound shipments prior to departure.
- Provide all shipping documentation for each shipment

- Schedule shipments with the receiving facility.
- Verify the waste container is properly closed in accordance with the manufacturers closing instructions.
- Verify package is not breached and/or damaged and is in a condition to withstand the stresses of loading, handling, stacking, and shipping
- Perform inspection, surveillance, and oversight of activities critical to the ORR Waste Certification Programs
- Identify and document nonconforming conditions and activities
- Tracks container movements and start the regulatory clock
- Verify container is properly configured (e.g., liners, absorbents, gasket, etc.)
- Maintain positive control of waste containers to prevent introduction of anomalous or prohibited items
- Ensure package integrity is sufficient to meet corresponding DOT packaging specification
- Verify selection of the appropriate onsite accumulation, staging, and/or storage facility when waste cannot be shipped directly
- Coordinate with disposal facility to ensure waste can be accepted without exceeding the receiving unit's capacity or violating its acceptance criteria

3.3.3 Waste Coordinator

The primary project functions of the Waste Coordinator include the following:

- Coordinate resources for the management of waste generated by the OREM construction contractor(s)
- Act as single point of contact for waste identification/characterization of planned waste
- Identify discrete waste streams for segregation by waste profile
- Assist in waste generation forecasting
- Verify the selection of the appropriate onsite accumulation, staging and/or storage facility when waste cannot be shipped directly offsite
- Manage all waste management activities within the OF200 MTF construction footprint
- Notify Facility Manager of planned changes in waste-related operations
- Ensure OREM construction contractor waste management work within the OF200 MTF construction footprint is performed safely, per approved procedures, and in accordance with work control processes specified by contract requirements
- Notify Facility Manager in the event of an incident or emergency
- Ensure waste certification requirements are implemented
- Perform self-assessments and routine inspections of waste management activities
- Work with TS to ensure OREM construction contractor waste management activities are included in the ORR Landfill facility plan of the week (POW)/POD and ensure waste management representation at the ORR Landfill Facility POW/POD meetings as applicable

- Review work packages for waste generation and waste management activities
- Approve hazardous waste determinations
- Notify the Hazardous Material Inventory System Coordinator when an inventoried chemical is shipped for disposal
- Oversee the timely development of generator waste characterization documentation.

3.4 Y-12 SITE CONTRACTOR ROLES AND RESPONSIBILITIES

Since OF200 MTF is being constructed at the Y-12 site, agreements between OREM and NNSA have and will be developed and documented to define the conditions, expectations, requirements, authorities, protocols, and processes to be followed by OREM and NNSA Federal staffs and prime contractors, their subcontractors, and OREM support contractors in executing the project safely, efficiently, and effectively. It is expected that other agreements will be executed between the OREM CM support contractor and the Y-12 site contractor, and potentially between the OREM construction contractor and the Y-12 site contractor in support of construction. A summary of support needed from the Y-12 site contractor and the entity responsible for securing the support is included in Table 2.

Table 2. Summary of Y-12 site contractor support needed for OF200 MTF construction

Task	Notes/basis	Entity responsible for securing Y-12 service
Tie in ENS to Treatment Plant	Includes design review; preparation and approval of change package, outage plan, and LOTO; electrical AHJ inspection; labor to test, install, and tie-in; and PM/PE/PC/ES&H support	OREM construction contractor
Tie in Fire Alarm to Treatment Plant	Includes design review; preparation and approval of change package, outage plan, and LOTO; electrical AHJ inspection; labor to test, install, and tie-in; and PM/PE/PC/ES&H support	OREM construction contractor
Tie in communications to Treatment Plant	Includes design review; preparation and approval of change package, outage plan, and LOTO; electrical AHJ inspection; labor to test, install, and tie-in; and PM/PE/PC/ES&H support	OREM construction contractor
Perform hydrant Fire Department connection and miscellaneous testing for Treatment Plant (Fire Department/Fire Protect)	Includes design review performed by a Qualified Fire Protection Engineer (qualified is defined in DOE STD 1066-2012) as required by DOE O 420.1C, Change 1; preparation and approval of change package, outage plan, and LOTO; labor to test, install, and tie-in; and PM/PE/PC/ES&H support	OREM construction contractor
Tie in ENS to Headworks	Includes design review; preparation and approval of change package, outage plan, and LOTO; electrical AHJ inspection; labor to test, install, and tie-in; and PM/PE/PC/ES&H support	OREM construction contractor
Tie in Fire Alarms to Headworks	Includes design review; preparation and approval of change package, outage plan, and LOTO; electrical AHJ inspection; labor to test, install, and tie-in; and PM/PE/PC/ES&H support	OREM construction contractor

Table 2. Summary of Y-12 site contractor support needed for OF200 MTF construction (cont.)

Task	Notes/basis	Entity responsible for securing Y-12 service
Tie in Communications to Headworks	Includes design review; preparation and approval of change package, outage plan, and LOTO; electrical AHJ inspection; labor to test, install, and tie-in; and PM/PE/PC/ES&H support	OREM construction contractor
Excavation/Penetration Permit Support	Includes permit development, utility locates, and PM/PE/PC/ES&H support	OREM construction contractor
PM and general interface	PM, Design Area Rep (System Engineer), Environmental Compliance, and functional support, including technical support as requested for RFIs and attendance at weekly construction progress meetings	OREM construction contractor
Y-12 support for Acceptance Testing	Includes support during ATP development, testing, and test report development	OREM CM support contractor
Y-12 support for engineering during construction (Title III)	Includes support to review design changes	OREM CM support contractor
Final Tie in 13.8 kV power at Headworks	Includes design review; preparation and approval of change package, outage plan, power distribution permit, and LOTO; electrical AHJ inspection; labor to test, install, and tie-in; and PM/PE/PC/ES&H support	OREM construction contractor
Final tie-in 13.8 kV power at Treatment Plant	Includes design review; preparation and approval of change package, outage plan, power distribution permit, and LOTO; electrical AHJ inspection; labor to test, install, and tie-in; and PM/PE/PC/ES&H support	OREM construction contractor
Final tie-in sanitary water at Headworks	Includes design review; preparation and approval of change package, outage plan, and LOTO; labor to test, install, and tie-in; and PM/PE/PC/ES&H support	OREM construction contractor
Final tie-in sanitary/fire water at Treatment Plant	Includes design review; preparation and approval of change package, outage plan, and LOTO; labor to test, install, and tie-in; and PM/PE/PC/ES&H support	OREM construction contractor
Provide power to OREM construction contractor onsite job trailers	Includes design review; preparation and approval of change package, outage plan, power distribution permit, and LOTO; electrical AHJ inspection; labor to test, install, and tie-in; and PM/PE/PC/ES&H support	OREM construction contractor
Badging and Y-12 site training	OREM construction contractor badging and any required Y-12 training for OREM construction contractor workers	OREM construction contractor
Procurement support	Includes PM/PE/PC/ES&H/DAR support to field questions, providing information for development of RFP, and providing responses to RFIs during the procurement cycle	OREM

Table 2. Summary of Y-12 site contractor support needed for OF200 MTF construction (cont.)

Task	Notes/basis	Entity responsible for securing Y-12 service
NOTE: Y-12 site contractor support for tie-ins includes interfaces with Y-12 site infrastructure. Installation and testing of systems within the MTF, such as Communications, ENS and Fire Suppression, are the responsibility of OREM and the OREM Construction Contractor unless documented otherwise.		
AHJ = Authority Having Jurisdiction	OF200 = Outfall 200	
ATP = Acceptance Test Plan	OREM = Oak Ridge Office of Environmental Management	
CM = construction management	PC = Project Controls	
DAR = Design Area Representative	PM = Project Manager	
ENS = Emergency Notification System	PE = Professional Engineer	
ES&H = environment, safety, and health	RFI = request for information	
LOTO = lockout/tagout	RFP = request for proposal	
MTF = Mercury Treatment Facility	Y-12 = Y-12 National Security Complex site contractor	

3.5 OREM CM SUPPORT CONTRACTOR ROLES AND RESPONSIBILITIES

3.5.1 General

OREM will award a contract for construction and will contract with the current EM contractor (OREM CM support contractor) for certain CM support services along with Title III engineering for the balance of construction. The OREM CM support contractor will have no contractual authority over the OREM construction contractor. The OREM CM support contractor’s programs and procedures will not be flowed down to the OREM construction contractor.

The OREM CM support contractor will provide CM SME support to OREM and conduct assessments and field observations of the OREM construction contractor work in accordance with their OREM contract and environment, safety, health, and QA (ESH&QA) programs and procedures. The OREM CM support contractor will routinely interface with the OREM project team and report results to OREM. The OREM CM support contractor shall review OREM construction contractor documents as requested by the CO and provide comments to the CO. OREM shall have approval authority of all OREM construction contractor submittals.

3.5.2 Project Manager

The OREM CM support contractor PM leads the contractor project support activities from project inception, through award of the construction contract, during construction, and through construction contract closeout, including the following:

- Establish pre-construction support priorities, schedule requirements, and construction objectives
- Define project specific roles and responsibilities for the members of the project support team
- Ensure adequate resources, both deployed and matrixed, are allocated for pre-construction support activities
- Establish and maintain project communications with the project support team to effectively accomplish pre-construction activities
- Establish and maintain funding to accomplish pre-construction support activities
- Lead the project support team in execution of project work in safe, cost effective, and compliant manner while meeting project performance objectives
- Establish/maintain funding for CM support and infrastructure

- Maintain risk management actions
- Prepare and present monthly reports to OREM, including discussion of cost and schedule and technical performance
- Provide resolution of actions and issues that impact project baseline
- Authorize expenditure of project support funds within authority limits
- Approve variance analysis reports and estimates-at-completion
- Review construction completion documentation
- Timely and accurate communications regarding project activities

3.5.3 Construction Support Manager

The Construction Support Manager serves to allocate the necessary OREM CM support contractor resources for work execution activities. The primary project functions of the Construction Support Manager include the following:

- Support OREM in developing construction contract documentation
- Manage scope, quality, schedule, and cost of the OREM CM support contractor-provided CM services
- Mobilize CM support staff and the OREM CM support contractor infrastructure (e.g., project document control center, facilities, shops, equipment, etc.)
- Evaluate performance of projects to ensure appropriate lessons learned are evaluated for process/performance improvements as requested by OREM
- Provide construction contract administration support to OREM to ensure construction quality meets contract requirements
- Manage the OREM CM support contractor CM organization field staff
- Function as primary construction contact with OREM, representatives of the OREM contractors, and internal OREM CM support contractor CM team members
- Support OREM in negotiating contract changes with contractors as requested to ensure timely responses to change issues and change order development, and analyze change orders for schedule impacts as requested
- Review payment of contractor progress payment applications as requested
- Provide feedback to OREM on contractor's compliance with contract requirements
- Conduct final inspection walk down, establish final punch list, and provide summary of completion of punch list components to OREM
- Coordinate construction contract closeout activities as requested by OREM

3.5.4 Contractor Technical Representative

The primary project functions of the Contractor Technical Representative (CTR) include the following:

- Support preparation of SOWs

- Support preparation of notices of intent
- Support contract construction kick-off (pre-construction conference)
- Manage Master Submittal Log (MSL) to ensure timely response to support execution of the work
- Ensure OREM construction contractor's submittals, including work control documents, are processed and verify OREM approval
- Report status of achieving construction readiness (Notice to Proceed) and provide support as required to the Construction Support Manager
- Support evaluation of proposals
- Review Design Change Notices for construction impacts
- Provide construction progress status to OREM
- Monitor and verify delays
- Interface with Engineering on design and technical issues
- Attend plan of the day POD meetings
- Observe overall work execution activities including coordination and communication with Construction Team, functional organizations, facilities, and OREM construction contractor
- Manage Request for Information (RFI) log
- Monitor and report the work against baseline schedule and cost controls based on contract award and reporting requirements
- Monitor accruals, estimates-to-complete, and estimates-at-completion
- Evaluate design changes for schedule and cost impact
- Provide support to OREM for deviation notices/nonconformance reports (NCRs) related to construction
- Provide support to OREM for developing and maintaining Change Action Log
- Support contract changes as requested by OREM
- Support Project Manager for claims or impacts requiring Baseline Change Requests (BCRs)
- Review contractor pay requests as requested by OREM
- Support construction testing, if required
- Review construction completion documentation

The CTR responsibilities include the following:

- Accountable to the Project Manager for safe and compliant execution of the work within baseline requirements
- Accountable to the Construction Support Manager for implementation of CM policies and procedures applicable to construction execution and completion and closeout
- Accountable to the Construction Support Manager to support contract change control and risk management

- Accountable to the Construction Team for the daily leadership and communications for construction execution activities

3.5.5 Project Engineer

The primary project functions of the Project Engineer (PE) include the following:

- Serve as the OREM CM support contractor Design Authority representative
- Coordinate with the Design Agent to issue new design documents or changes
- Maintain and update design documents
- Serve as the primary technical interface with the Y-12 site contractor for design
- Oversee preparation of changes to design and as-built documentation
- Support the Construction Support Manager to resolve engineering-related questions/issues with the OREM CM support contractor team, OREM, and the OREM construction contractor
- Participate in assessments/surveillances of the construction process in accordance with the project's QA oversight strategy
- Support reviews of fabrication inspection and testing plans and completion document
- Support reviews of applicable construction testing
- Review and approve applicable exceptions required for construction completion
- Attend/support construction status and progress meeting as required
- Attend/support construction kick-off meeting
- Review and disposition RFI as required
- Prepare, track, and report design changes with potential to impact construction execution
- Review and approve applicable exceptions required for construction completion
- Review/concur with all construction contract changes/modification related to design requirements
- Ensure a formal design change process is utilized and maintained
- Approve and issue new design documents or changes within authority limits

The PE is responsible for the following:

- Accountable to the Project Manager for project engineering requirements for construction execution
- Accountable to the Construction Support Manager for performance and delivery of design media and technical support necessary to achieve the construction requirements

3.5.6 Environmental Compliance Representative

The primary project functions of the Environmental Compliance Representative include the following:

- Support development of environmental requirements as requested
- Support review of contractor environmental requirements required for award of contract

- Review OREM construction contractor environmental submittals
- Provide SME interpretive authority support to OREM for environmental issues and events for construction execution activities as requested
- Provide an oversight function for monitoring the OREM construction contractor environmental management program compliance

3.5.7 Quality Assurance Engineer

The primary project function of the QA Engineer is to provide support to OREM in the oversight of quality related activities such as:

- Define QA requirements for construction SOW as requested
- Review OREM construction contractor's QA program against DOE orders and standards as requested
- Support review of contractor QA qualifications required for award of contract
- Review OREM construction contractor QA submittals as requested
- Review fabrication, test, and inspection documents
- Review QA hold points as required
- Accept/release contracted fabrications if requested
- Provide SME interpretive authority for QA issues and events for construction execution activities
- Attend/support construction meetings as required
- Support construction completion/turnover as required
- Perform audits/surveillances of construction execution activities as required

3.5.8 International Building Code Special Inspections Inspector

The primary project functions of the International Building Code (IBC) Special Inspections Inspector include performing special inspections in accordance with the project specific plan detailed in the Statement of Special Inspections. Special Inspections will be provided by a certified or qualified inspector and associated testing will be performed by an accredited independent agency.

3.5.9 Document Control Specialist

The primary project functions of the Document Control Specialist (DCS) include the following:

- Establish and maintain construction Correspondence Control Log
- Establish and maintain log for RFI
- Receive/transmit RFIs and maintain RFI logs
- Establish MSL
- Receive/transmit construction submittals and maintain MSLs
- Establish Contract Action Log
- Establish construction project file hierarchy

- Process construction document transmittals
- Manage construction correspondence and project files and disposition records at closeout.
- Notify Construction Support Manager of functional change requirements and/or suspect deficiencies with document support facilities or compliance issues

4. OREM CM SUPPORT CONTRACTOR CONSTRUCTION MANAGEMENT SERVICES

4.1 PROCUREMENT CYCLE

4.1.1 General

The CM, PE, and CTR will support OREM to define the work to be performed by the OREM construction contractor, including a summary of work, design documents, Work Breakdown Structure, and Cost Summary Index. The SOW document is the most important of the procurement documents. It defines the work scope, processes, and requirements the OREM construction contractor is required to meet.

4.1.2 Pre-Bid Conference

The OREM CM support contractor CM team will provide support to OREM for the construction pre-bid conference.

4.1.3 Responses to Questions

The OREM CM support contractor CM team will provide support to the CO for responses to questions submitted by the proposers during the procurement phase.

4.1.4 Bid Evaluation

The OREM CM support contractor CM team will provide support to the CO to perform technical evaluations of proposals from bidding contractors as requested.

4.2 MOBILIZATION

4.2.1 Pre-Construction Conference

At contract award, the OREM COR, with support from the OREM CM support contractor Construction Support Manager, will schedule and conduct a pre-construction conference with project representatives from OREM, the OREM construction contractor and their sub-tier contractors, and project representatives from the OREM CM support contractor. Pre-construction conferences shall be used to clarify the SOW requirements for contractor mobilization and performance of work.

4.2.2 Pre-Job Labor Conference

The OREM construction contractor shall attend a pre-job labor conference with OREM Labor Relations to obtain approval of the Construction Labor Agreement (CLA). The OREM construction contractor shall agree to sign, comply with and be bound by the terms of the CLA.

The OREM construction contractor agrees to notify OREM Labor Relations prior to scheduling or conducting any pre-job conference(s) with the Knoxville Building and Construction Trades Council or any of its affiliated unions. Work shall not proceed until a pre-job conference has been conducted.

4.2.3 Pre-Construction Start Submittals

The MSL includes all required construction submittals listed in the SOW, construction specification(s), or other pertinent contract documents (e.g., engineering change notices). The submittals are sequentially numbered in the MSL, which is transmitted to the OREM construction contractor and document control who ensures the OREM construction contractor submittals are numbered in accordance with the MSL.

Submittals shall be prepared and submitted by the OREM construction contractor to the OREM CO with copies to the OREM CM support contractor for review and approval in accordance with the requirements of the MSL. The OREM CM support contractor DCS will have the responsibility to process submittals in accordance with the requirements of their procedures.

The OREM CM support contractor CTR will manage and direct the review of all submittals identified on the MSL. OREM and the OREM CM support contractor SMEs will perform submittal reviews for compliance with project requirements. The OREM CM support contractor will transmit submittals that have been reviewed to the OREM CO, indicating if the submittal meets or does not meet contract requirements. OREM will approve or reject the submittals, and the OREM CM support contractor DCS will distribute the dispositioned submittals to the OREM construction contractor.

4.2.4 Training

OREM, with support as requested from the OREM CM support contractor, will apply a graded approach to identify the training required for construction for inclusion in the OREM construction contract. This training will be identified on a project training matrix and will ensure a qualified workforce ready to perform work safely and efficiently. Programs are established that identify training requirements for personnel, ensure the training requirements are met and maintained, and address ongoing training as the project progresses from the planning phase through completion and closeout. The OREM construction contractor will be responsible to provide evidence of current training for their workers or to ensure their workers attend the required training identified in the project training matrix.

The CTR will notify the OREM COR when all pre-construction start submittals and training have been satisfactorily completed, indicating a readiness to proceed with the management assessment for construction field work.

4.2.5 Equipment/Material/Manpower Mobilization to Site

After all pre-mobilization submittals have been approved by OREM and all pre-mobilization training has been satisfactorily completed, the OREM construction contractor may initiate activities to deliver material and equipment to the project job site.

The OREM CM support contractor CM team will ensure all pre-mobilization submittals have been approved and ensure required worker training is in place prior to mobilization. The CM team will oversee the OREM construction contractor's inspection of equipment and materials as it arrives on site.

4.2.6 Construction Readiness – Management Assessment

After all pre-construction submittals have been approved by OREM and all pre-construction training has been satisfactorily completed, the OREM construction contractor will provide evidence of construction readiness to OREM. OREM may request the OREM CM support contractor to assist in the review of evidence of construction readiness. Upon satisfactory completion of construction

readiness, the OREM COR shall transmit a notice to the OREM construction contractor that construction field work may proceed.

4.3 GENERAL ONSITE ADMINISTRATION

4.3.1 Site Work Hours

Site work hours for the balance of construction field activities will be a 4-day per week/10-hour per day work schedule, Monday through Thursday, 6:30 a.m. to 5:00 p.m. Requests by the OREM construction contractor to work back shifts and/or weekends shall be submitted in writing to the OREM COR and the OREM CM support contractor Construction Support Manager a minimum of 72 hours in advance, or as soon as possible in the event of developing inclement weather or extenuating circumstances.

4.3.2 Badging/Site Access

The OREM construction contractor will be responsible to obtain badges, dosimeters, clearances, etc. for their workers. The OREM CM support contractor CTR will obtain from OREM and Y-12 the necessary forms and provide them to the OREM construction contractor to submit these requests.

The OREM construction contractor will be responsible for installing and maintaining appropriate access control (e.g., construction fencing, work zone boundaries, postings, etc.) for their work areas. The Facility Manager will establish and maintain appropriate OF200 Site access requirements (e.g., signage, etc.). The OREM construction contractor will provide coordination when OREM construction contractor work activities are collocated with other field activities being performed by the Y-12 site contractor.

4.3.3 Correspondence Procedures

The OREM CM support contractor DCS will be responsible for project record document correspondence related to submittals and non-business sensitive documentation between OREM, the OREM construction contractor, and the OREM CM support contractor. The OREM construction contractor shall utilize correspondence distribution cover sheets for all project correspondence. Project correspondence from the OREM CM support contractor shall be processed in accordance with the requirements of the OREM CM support contractor procedures.

4.3.4 Emergency Response

The OREM construction contractor shall develop and submit an Emergency Response Program (ERP) to OREM for review and approval. The OREM CM support contractor will provide a list of all required notifications to the OREM construction contractor for inclusion in this ERP. The OREM construction contractor shall be responsible to make the appropriate responses to an emergency and to make the required timely emergency response notifications in accordance with the requirements of the ERP.

4.3.5 Incident Reporting

The OREM construction contractor shall be responsible for all incident and occurrence reporting.

4.3.6 Notifications

The OREM construction contractor shall be responsible for all notifications for all incident and occurrence reporting in accordance with the requirements of their procedures.

4.3.7 Site Interface Requirements

The OREM CM support contractor Construction Support Manager serves to allocate the necessary CM support team resources and is the primary interface with SME personnel regarding work execution activities.

The OREM CM support contractor Project Manager provides the necessary interface for the owner regarding all design, procurement, and construction activities.

The Facility Manager acts as the interface between Y-12 facility operations and construction, and as the project work release authority for construction work within the OF200 MTF construction footprint. The Facility Manager also defines operational work control interface requirements for construction execution activities.

The OREM construction contractor provides the necessary interface between OREM contractors and other entities performing field activities during construction.

4.3.8 Facility Management of Construction Site

The OREM construction contractor will provide the Facility Manager during all balance of project construction field activities.

4.3.9 Work Control

The OREM construction contractor requirements for integrated safety management are implemented via the Department of Energy Acquisition Regulation (DEAR) clause at 48 *CFR* 970.5223-1, *Integration of Environment, Safety, and Health into Work Planning and Execution*, where prescribed by the DEAR.

The OREM construction contractor shall manage and perform work in accordance with a documented Safety Management System that fulfills all conditions of the DEAR clause at 48 *CFR* 970.5223-1 at a minimum. Documentation of this system shall describe how the OREM construction contractor will perform the following:

- Define the scope of work
- Identify and analyze the hazards associated with the work
- Develop and implement hazard controls
- Perform work within controls
- Provide feedback on adequacy of controls and continue to improve safety management

The OREM construction contractor is responsible for flowing down the ES&H requirements applicable to this work to contracts at any tier to the extent necessary to ensure the OREM construction contractor's compliance with the requirements.

The OREM construction contractor shall exercise a degree of care commensurate with the work and associated hazards. The OREM construction contractor shall ensure that management of ES&H functions and activities becomes an integral, but visible part of the OREM construction contractor work planning and execution processes.

The OREM construction contractor will have an ISMS that complies with applicable DOE Orders and meets the commitment to protect the workers, public, and environment. Consistent with ISMS and Environmental Management System principles, environmental compliance and protection considerations are addressed for the OF200 MTF construction by the OREM construction contractor and will be factored into the work practices. Before work is performed, the OREM construction contractor shall evaluate associated hazards, and identify and implement administrative and engineering controls to prevent and mitigate hazards to the work being performed and to the associated hazards.

The OREM construction contractor ISMS approach will help ensure the following:

- Workers, SMEs, managers, contractors, and service providers are fully aware of their roles, responsibilities, and authorities for ISMS and are held accountable through formal mechanisms; ISMS issues and initiatives are effectively identified, coordinated, and integrated.
- Workers are meaningfully involved in the ISMS processes, including the work control and feedback processes, to better ensure that hazards specific to the work activity, job site, facility, safety, public health, and environment are identified and mitigated and/or appropriate controls are implemented.
- Work is coordinated, as appropriate, with other contractors to preclude adverse impacts to workers, the public, and the environment.
- Lessons learned from previous activities are appropriately included in planning for future similar work; training and qualifications are maintained to ensure personnel are competent to perform assigned responsibilities.

4.3.10 Coordination of Other Contractor Personnel

The OREM CM support contractor PM provides overall project direction and coordination with the execution of the OREM CM support contractor work.

The Construction Support Manager ensures communication and coordination with the PM and other project SMEs regarding procurement and construction activities.

The CTR and PE ensure flow down of requirements is integrated into the SOW by coordination with applicable functions and SMEs.

The CTR manages the pre-construction activities and ensures coordination with deployed and matrixed resources. The CTR oversees overall work execution activities including coordination and communication with the Construction Team, functional organizations, facilities, and the OREM construction contractor. The CTR provides daily technical communication/coordination with the OREM construction contractor for execution per the contract.

4.3.11 Project Files

The OREM CM support contractor DCS shall manage all project files in accordance with their procedures.

4.4 CONTRACT DOCUMENT CONTROL

4.4.1 Changes to Contract Documents

The OREM construction contractor shall submit contractor claims to OREM and the OREM CM support contractor Document Control. The OREM CM support contractor DCS shall make contract document revision log entries, and distribute with guidance from the OREM CM support contractor CTR.

The OREM CM support contractor Construction Support Manager and CTR shall review contractor claims. If the claim is deemed not valid, the OREM CM support contractor Construction Support Manager will advise the OREM COR of the recommended claim disposition. The COR will make the final determination and advise the OREM construction contractor of the claim disposition.

If the claim is deemed valid and there is no need for a BCR, the OREM CM support contractor Construction Support Manager will advise the OREM COR of the recommended claim disposition and log the action. The COR shall process the contract release modification after making a final determination.

If the claim is deemed valid and requires a BCR, the OREM CM support contractor Construction Support Manager will advise the OREM COR of the recommended claim disposition and log the action. The COR shall process the BCR after making a final determination, and the COR will advise the OREM construction contractor of the claim disposition.

If the claim is deemed valid and requires a design change, the OREM CM support contractor PE will process and issue a Design Change Notice (DCN) in accordance with the OREM CM support contractor procedures. The OREM COR, with support from the OREM CM support contractor CM team, will request a proposal from the OREM construction contractor to implement the design change and process the claim as noted above.

4.4.2 Contract Document Revision Log

OREM shall maintain a contract document revision log. The OREM CM support contractor Document Control shall provide construction document processing in accordance with their procedures.

4.4.3 Record Drawings and Procedures

The OREM CM support contractor DCS shall provide project record drawings, procedures and documents processing in accordance with the requirements of their procedures.

4.5 SUBMITTALS

4.5.1 Submittal Schedule and Review

A submittal is any item that is required to be provided to OREM and copies to the OREM CM support contractor and must be reviewed by OREM and the OREM CM support contractor for technical, legal, or commercial adequacy to ensure it meets the full terms and conditions of the contract. Submittals required after construction start will be identified on the Project MSL. Submittals shall be prepared and submitted by the OREM construction contractor to OREM and copies to the OREM CM support contractor for review and approval in accordance with the requirements of the MSL. The OREM CM

support contractor DCS will have the responsibility to process submittals in accordance with their procedures.

4.5.2 Review Responsibilities

The OREM CM support contractor CTR will manage and direct the review of the project submittals. OREM and the OREM CM support contractor SMEs will perform submittal reviews for compliance with project requirements. The CTR will transmit submittals that have been reviewed to OREM with a recommendation that the submittal either meets or does not meet contract requirements. OREM will approve or reject the submittals and the OREM CM support contractor DCS will distribute the dispositioned submittals to the OREM construction contractor.

4.5.3 Transmittal Forms

The OREM CM support contractor transmittal form will be utilized for all project transmittals. Transmittals will be processed by the OREM CM support contractor DCS in accordance with the requirements of their procedures.

4.6 CLARIFICATIONS

4.6.1 Request for Information

The OREM construction contractor shall submit RFIs to OREM and copies to the OREM CM support contractor. The OREM CM support contractor DCS shall log and process RFIs in accordance with the requirements of their procedures. The OREM CM support contractor PE shall complete the review and disposition the RFI. The OREM CM support contractor CTR shall advise the OREM COR of the proposed response and, upon concurrence from COR, the RFI response shall be transmitted to the OREM construction contractor. The OREM CM support contractor CTR shall manage the RFI Log, which is maintained by the OREM CM support contractor DCS.

4.7 CONTRACT CHANGES

4.7.1 Change Approval Process

The goal of change control is to effectively and efficiently manage and control changes within the performance baseline. OREM has established CCBs and implementing procedures to ensure all BCRs for scope, cost, or schedule are identified, evaluated, communicated, coordinated, controlled, reviewed, documented, implemented, and approved/disapproved by the appropriate authority in accordance with DOE O 413.3B requirements.

OREM procedure OREM-PC-IP-01, *Site Change Control Board*, establishes the process to follow to receive, review, and disposition BCRs. In addition, the roles and responsibilities of the CCB chairperson, board members, FPD, project/program managers, and CO are defined and baseline change control approval thresholds are established. The step-by-step process will be used during construction for developing, screening, determining type, approving authority, documenting, and implementing changes.

The OREM COR or the OREM construction contractor shall initiate contract changes. The OREM COR can request the OREM CM support contractor Construction Support Manager, with support from the CM team as applicable, to review construction contract changes/modifications.

The OREM construction contractor will have a DOE-compliant change control process and implementing procedure.

OREM will have contract change approval responsibility. OREM shall assemble, process, and issue all contract changes and modifications.

4.7.2 Construction Delays

The OREM CM support contractor form for lost time/work delay notification will be used by the OREM construction contractor to document lost time/work delays. The OREM construction contractor shall report delays or lost time prior to the end of the shift to the OREM CO, thereby providing an early warning so appropriate mitigation steps can be taken. The Lost Time/Work Delay Notification, when signed by both parties, becomes backup documentation for contractor claims or changes.

4.8 PAYMENT REQUESTS

4.8.1 Review Contractor Invoices

The OREM construction contractor will submit all payment requests to OREM. OREM may forward contractor payment requests to the OREM CM support contractor for review. The OREM CM support contractor Construction Support Manager and CTR will review contractor payment requests and make a recommendation for approval or rejection to OREM. OREM will approve and process all OREM construction contractor payment requests.

4.9 BACKCHARGES

A backcharge is a cost sustained by OREM and chargeable to a contractor for the OREM performance of work that is the responsibility of the OREM construction contractor. The OREM CM support contractor will support OREM in identifying and processing backcharges.

Without limitation, and by way of example only, backcharges may result from the following:

- Services performed by OREM, at the request of the OREM construction contractor, for work that is within a contractor's scope of work
- Costs sustained by OREM as a result of the OREM construction contractor noncompliance with the provisions of a contract or SOW, or the contractor's act of omission or negligence
- Costs incurred by OREM to fix defects, deficiencies, or errors that may appear in the work during the warranty period.
- Costs incurred by OREM, including support costs, when work is interrupted by a failure or equipment breakage of the OREM construction contractor's equipment
- Costs that arise when a NCR has been issued against work of the OREM construction contractor.

4.10 DEMOBILIZATION

After notification from the OREM construction contractor that the work is substantially complete, OREM, the OREM CM support contractor Construction Support Manager, CTR, SMEs, and representatives from the OREM construction contractor will conduct a field walk down, compile a Construction Project Exception List, and submit the signed Construction Completion Document (CCD).

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5. CONSTRUCTION-RELATED CD-2/3 DOCUMENTS

5.1 CONSTRUCTION EXECUTION/MANAGEMENT PLAN

In accordance with the requirements of DOE Guide (G) 413.3-9, *U.S. Department of Energy Project Review Guide for Capital Asset Projects*, the OREM CM support contractor has prepared this CE/MP to address specific construction activities and practices as well as identify the personnel and procedures that will be in place to accomplish the work.

5.2 CONSTRUCTION PROJECT SAFETY AND HEALTH PLAN

In accordance with the requirements of DOE O 413.3B, the OREM CM support contractor will prepare a Construction Project Safety and Health Plan (CPS&HP) that outlines the requirements for the OREM construction contractor to prepare a CPS&HP in accordance with the requirements of 10 *CFR* Part 851, Appendix A, Sect. 1(d). The OREM construction contractor's plan will be maintained current during construction.

OREM will provide routine safety and health oversight and will document inspections of their contractor's activities.

5.3 QUALITY ASSURANCE PROGRAM FOR CONSTRUCTION

In accordance with the requirements of DOE O 413.3B, OREM will prepare a QA Program for construction that outlines the activities and approach for the project to meet the requirements of 10 *CFR* 830, Subpart A and DOE O 414.1D, *Quality Assurance*, with consideration of DOE G 413.3-2, *Quality Assurance Guide for Project Management*.

The OREM CM support contractor will provide QA support, as requested, to review the OREM construction contractor QA Plan and provide feedback to OREM.

5.4 QUALITY CONTROL/ASSURANCE PLAN

In accordance with the requirements of DOE G 413.3-9, the OREM CM support contractor will prepare a Quality Control/Assurance Plan (QC/AP) that will establish the activities and approach for the project to establish QA Programs that describe the organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing, and assessing the contracted scope of work. This QC/AP will also ensure systems, structures, and components are constructed and tested in accordance with engineering technical specifications.

5.5 STARTUP TEST PLAN

The Start-up Test Plan details the testing approach for the OF200 MTF required as part of the overall startup, readiness, and turnover process outlined in the *Outfall 200 Mercury Treatment Facility, Startup Test Plan, Oak Ridge, Tennessee* (UCOR-4931), which is to be prepared by the OREM CM support contractor. In accordance with the requirements of DOE G 413.3-9, *U.S. Department of Energy Project Review Guide for Capital Asset Projects*, UCOR has prepared the Startup Test Plan that establishes

requirements for the OREM construction contractor to perform Construction Acceptance Tests (CATs) and ATPs.

The Test Plan is an implementing document that follows the requirements for acceptance testing in the Startup Plan. System acceptance testing provides objective evidence that structures, systems, and components procured and constructed according to the OF200 MTF design, as installed, will safely and adequately perform their design functions under design conditions and operating modes to support startup.

The scope of this Start-up Test Plan follows implementation of the OF200 MTF design from equipment manufacturing through construction, startup, and handoff to operations. The OF200 MTF will be divided into functional areas for testing purposes. Tests within the scope of this plan include Factory Acceptance Tests (FATs), CATs, ATPs, and Operational Test Procedures.

Successful completion of testing under the plan is accomplished when acceptance criteria are met; test deficiencies are resolved; and the final test results reports are approved. Test results reports should provide a clear statement that addresses the acceptability of the testing and of the system for operation. This is a critical input to the overall startup readiness and turnover process. Exceptions, limitations, or open items will be explained in sufficient detail within the test report to facilitate development of corrective or mitigative actions.

6. OTHER DOCUMENTS PRIOR TO CONSTRUCTION AWARD

6.1 NNSA/OREM TRANSFER OPERATIONAL RESPONSIBILITY OF OF200 MTF FOOTPRINT FOR CONSTRUCTION

The Memorandum of Agreement (MOA) between DOE OREM and NNSA outlines the terms and conditions of the transfer of operational responsibility for the Y-12 plant areas designated for the OF200 MTF.

The facility is anticipated to operate for a period of approximately 30 years. At that point, the parties may consider a return of the areas to NNSA.

6.2 DOCUMENTS TO DEFINE SITE INTERFACES

The success of the OF200 MTF construction requires open communications, agreements, and interfaces between OREM, the OREM CM support contractor, the Y-12 site contractor, and the OREM construction contractor. Since OF200 MTF is being constructed at Y-12, agreements between OREM and NNSA and between the OREM CM support contractor and the Y-12 site contractor are developed and documented to define the conditions, expectations, requirements, regulations, authorities, protocols, procedures, and processes during construction.

The MOA will address conditions for transfer of operational responsibility of the OF200 MTF construction footprint from NNSA to OREM.

Site Interface Agreements will be developed between the OREM CM support contractor and the Y-12 site contractor to define the services to be provided by Y-12 during construction. Site interface agreements also will be executed between the OREM CM support contractor and the OREM construction contractor to define the services to be provided by the OREM CM support contractor.

It is expected that other agreements may be executed between the OREM construction contractor and the Y-12 site contractor to define the services to be provided by Y-12 during construction.

6.3 REGULATORY DOCUMENTATION

The *Amendment to the Record of Decision for Phase I Interim Source Control Actions in the Upper East Fork Poplar Creek Characterization Area, Oak Ridge, Tennessee* (DOE/OR/01-2697&D2) documents the selected interim remedy. A Remedial Design Report/Remedial Action Work Plan has been prepared for regulatory approval to document the design, construction, and operations plans for the OF200 MTF.

The *Environmental Compliance and Protection Strategy Plan for Outfall 200 Mercury Treatment Facility, Y-12 National Security Complex* (UCOR-4329) has been prepared to identify the required regulatory documents and actions planned or anticipated for the OF200 MTF Project.

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7. TITLE III ENGINEERING

7.1 ENGINEERING DURING CONSTRUCTION

The Design Agent, CH2M, will provide Title III engineering support to the OREM CM support contractor Design Authority during the construction phase of the project, which will be coordinated through the OREM CM support contractor PE. Title III engineering support tasks include review of technical submittals, responses to RFIs, responses to Field Change Request, development of DCNs, field engineering support, support of test and checkout activities as applicable, and incorporation of redline construction data and DCNs into as-built drawings.

Engineering support during construction is a continuation of work performed to develop and issue the design package and is standard practice for professional engineering services. As construction progresses, involvement of the OREM CM support contractor, PE, and Design Agent ensures the design is implemented and configuration control is maintained.

7.2 ENGINEERING FIELD CHANGES

The primary procedure that governs changes to the approved design package is the OREM CM support contractor procedure for design changes.

7.3 ENGINEERING DRAWING AS-BUILTS

At the completion of construction, a final set of as-built drawings can be issued based on redlined data maintained during construction and the DCNs can be issued.

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8. PROJECT MEETINGS

8.1 GENERAL

Construction project meetings will be held in accordance with the requirements of the OREM CM support contractor procedures.

8.2 PRE-CONSTRUCTION CONFERENCE

At contract award, the OREM COR, with support from the OREM CM support contractor Construction Support Manager, will schedule and conduct a pre-construction conference. The conference shall be used to clarify the SOW requirements for contractor mobilization and performance of work on the project. The pre-construction conference shall be attended by the OREM CO, FPD, PM, Facility Representative, and appropriate SMEs, and the OREM CM support contractor PM, CM, CTR, PE, QA, and Environmental Compliance representative; Y-12 site contractor PM; and key OREM construction contractor representatives as a minimum.

The OREM CM support contractor Construction Support Manager will be responsible for chairing the pre-construction (kick-off) conference. The OREM CM support contractor CTR will be responsible for developing the agenda and for preparing and distributing the meeting minutes.

8.3 DAILY PROGRESS

8.3.1 Daily Field Reports

A Daily Activity and Manpower Report is used to document the daily performance of the construction activities. Performance areas include OREM construction contractor equipment, manpower, accomplishments, and issues that reflect on cost, schedule, safety and quality. The Daily Activity and Manpower Report is a tracking tool that aids the OREM CM support contractor CM team and the OREM construction contractor to communicate construction performance, communicate emergent issues, and provide a documented basis for the reconciliation of prime- and lower-tier contract invoicing.

Processing Daily Activity and Manpower Reports is applicable each day from contract award through the completion of the defined construction work scope. The OREM CM support contractor CTR is responsible for preparing the Daily Activity and Manpower Reports.

8.3.2 Plan of the Day Meeting

The POD meeting is led by the OREM construction contractor Facility Manager or designee and is attended by the OREM construction contractor superintendents, IS, OREM CM support contractor CTRs, and other project representatives as deemed appropriate for the ongoing project activities (e.g., Radiological Control, Waste Management, etc.). For each construction field activity listed, the appropriate contractor representative will provide the current status. The Facility Manager shall review the proposed work for the following day with the appropriate project representatives to ensure resources are available and facility conditions will support the work scheduled. Based on the reported status of the current day's work and the work scheduled for the next day, the Facility Manager will approve the release of work for the following day by signing the POD authorizing work.

8.4 WEEKLY PROGRESS MEETING

The dates and times for the Weekly Progress Meetings will be scheduled at the Pre-Construction Conference. The meetings are normally held weekly, but may be adjusted by the Construction Support Manager or CTR as needed. The Weekly Progress Meeting shall be attended by the following project personnel (or delegates): OREM FPD/Project Manager, Facility Representative, and appropriate SMEs; OREM CM support contractor PM, Construction Support Manager, CTR, PE, QA, and Environmental Compliance representative; key Y-12 site contractor representatives; and key OREM construction contractor representatives.

The OREM CM support contractor Construction Support Manager will be responsible for chairing the weekly progress meetings. The OREM CM support contractor CTR will be responsible for developing the agenda and for preparing and distributing the weekly progress meeting minutes.

8.5 MONTHLY SCHEDULE MEETING

Frequent management reviews and project status meetings form the foundation of visibility and control of the project's tasks.

The monthly scheduled meetings will address technical, schedule, and cost performance, including current Estimates at Completion, and are summarized at the Contract and Performance Work Statement levels, with details at the Control Account level as necessary. Significant control indicators, technical concerns that require resolution, schedule status/forecasts, contractor performance, risk management, and Variance Analysis Reports and their associated Corrective Action Plans also are reviewed at these times as applicable.

The OREM construction contractor will provide updated project technical, schedule, and cost performance status at each monthly schedule meeting.

8.6 IPT MEETING

Core IPT meetings are held bi-weekly to discuss project status, address issues, and track action items. The meetings are coordinated by the FPD and include topics that may impact the project, such as project plans and accomplishments, acquisition status, schedule, technical or other project issues, and action items. The OREM CM support contractor will publish agendas and distribute meeting minutes.

9. PROGRESS CONTROL AND REPORTING

9.1 MONTHLY STATUS REPORT

A monthly performance report will be prepared by the OREM construction contractor that contains an array of project and contract information, including earned value data, variance analysis reporting, and other project-related information as applicable to the contract.

The report will be approved and transmitted from the OREM construction contractor to the CO and COR. The FPD will make the report available to OREM IPT members. Specific content expectations for the monthly report are/will be defined in the contract and may include the following:

- Major accomplishments
- Safety performance
- Project performance data and variance analysis
- Contract deliverables
- Funds status
- Change control
- Risk management
- Major issues
- Schedules, including critical path
- Contract Performance Report formats

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10. CONSTRUCTION QUALITY ASSURANCE PROGRAM

10.1 INTRODUCTION

OREM has developed a QAP for construction to address requirements for construction. The plan describes how the QA criteria of 10 *CFR* Part 830 Subpart A and EM-QA-001, *EM Quality Assurance Program (QAP)*, are satisfied. The QAP also documents the implementation of requirements of DOE O 226.1B, *Implementation of Department of Energy Oversight Policy*, in the areas of management and independent assessment. The OREM construction contractor will be responsible for developing and implementing their own QA program in accordance with contract requirements.

10.2 OBJECTIVES

The plan identifies the use of training, procedures, assessments, and surveillance functions as management tools to ensure all functional and project activities, including contract work, are executed in a quality and safe manner, will protect workers, public health and the environment, and meet or exceed contract requirements.

10.3 CONTRACTOR'S RESPONSIBILITIES

QA is implemented through a program documented and maintained by the contractor(s) and approved by OREM. The OREM construction contractor QA program will address the implementation approach for DOE QA criteria, which include management (program, personnel training and qualifications, quality improvement, documents, and records), performance (work processes, design, procurement, inspection, and acceptance testing), and assessment (management assessment, independent assessment, and suspect/counterfeit items). Full compliance by the OREM construction contractor and its sub-tier contractors is required as specified in DOE O 413.3B.

10.4 QUALITY ASSURANCE

10.4.1 Surveillance Support

The OREM CM support contractor QA personnel will support OREM with performing surveillances and assessments of OREM construction contractor activities to determine compliance with project requirements to ensure an effective Quality Program, while providing continuous quality improvement.

The OREM CM support contractor QA personnel also will support OREM to review design changes, perform supplier evaluations, and perform procurement quality reviews as applicable.

10.4.2 Non-Conformance Reporting and Documentation

Nonconformance reporting documents the identification, disposition, and verification of corrective actions implemented to resolve a deficiency in characteristic, documentation, or procedure that renders the quality of an item or activity unacceptable or indeterminate.

The OREM construction contractor QA program/plan will include a nonconformance control program. The OREM construction contractor will be responsible for the flow down of requirements of a nonconformance control program to their sub-tier contractors.

11. CONSTRUCTION QUALITY CONTROL

11.1 PLAN REVIEW AND ACCEPTANCE

OREM CM support contractor QA has developed a QC/AP for the project to obtain CD-2/3 approval. The QC/AP will be submitted to OREM for review and approval.

11.2 OFF-SITE INSPECTIONS

The OREM CM support contractor will support OREM in performing offsite inspections during construction, utilizing either the OREM CM support contractor quality control (QC) or staff augmentation QC personnel as applicable and as defined in the OREM construction contract.

11.3 ON-SITE INSPECTIONS

The OREM CM support contractor will support OREM in performing onsite inspections during construction, utilizing either the OREM CM support contractor QC or staff augmentation QC personnel as applicable and as defined in the construction contract using the QA Surveillance Plan.

11.4 SPECIAL INSPECTIONS

Special inspections and tests shall be conducted in accordance with the applicable requirements of the IBC, Chap. 17.

The Statement of Special Inspections provides project compliance with the provisions of the IBC Chap. 17 for special inspection, structural observation, and testing for wind and seismic resistance. The Statement of Special Inspections for the OF200 MTF is provided in the project design drawings. Information included in the design includes the requirements for special inspections and observation statements as well as tables that identify the special inspections and observations that are required to be performed.

An approved agency shall be contracted by the owner (i.e., the OREM CM support contractor on behalf of OREM) to perform the inspections and observations and shall be objective, competent, and independent from the contractor responsible for the work being inspected.

The OREM CM support contractor will be responsible for the Special Inspectors to perform the special inspections required for OF200 MTF construction.

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12. CONSTRUCTION TESTING

12.1 GENERAL

The Startup Test Plan is the overarching document that provides a general description of the OF200 MTF startup process. Detailed procedures, tests, and plans will be developed to ensure the facility functions as designed. This plan will implement the testing approach and will be designed to ascertain if the equipment and/or systems is acceptable for use. The test types that will be conducted for the OF200 MTF construction may include FATs, CATs, and system ATPs.

12.2 FACTORY ACCEPTANCE TESTING

FATs are conducted by vendors at their facilities using their own procedures and controls. These may range from individual component qualification tests performed by the original equipment manufacturer to full sub-system functional tests performed by an integrator/fabricator. The goal of FATs is to verify prior to delivery that the component or subsystem is complete and functional in accordance with design and is ready for delivery to the project.

12.3 CONSTRUCTION ACCEPTANCE TESTING

CATs are conducted onsite by the OREM construction contractor with the system under their control. The objective is to verify the integrity of installation to design. Typical tests may include equipment anchoring, electrical continuity, piping leak tests, motor rotation, etc. IBC, National Electrical Code®, or other third party inspections required by code and may be conducted separately or in conjunction with CATs. In either case, results will be included as part of the CAT documentation package.

Execution of CATs confirms that equipment installed by the OREM construction contractor will operate as required by the design specifications. The testing may include hydraulic, pneumatic, electrical, and mechanical functioning and run-in tests of portions of systems and completed systems. The OREM construction contractor will provide the labor to perform CATs in accordance with design specifications and any additional testing requirements identified in the contract. CATs will be coordinated with, and accepted by the CTR with appropriate SME support.

The OREM construction contractor will provide the labor to perform the CAT.

12.4 ACCEPTANCE TEST PROCEDURES

System ATPs are functional tests of installed systems, sub-systems, components, or processes that may duplicate some aspects of the FATs previously performed at vendor facilities. Following the individual system ATPs, an integrated system ATP will be performed to support the Pre-Operational Readiness Evaluation as described in the Startup Plan. System ATPs are performed by the OREM construction contractor with the OREM CM support contractor and system vendor support as required. System ATPs are “cold” tests, meaning the process fluid is potable water or diverted water from another source. The functionality of process control software will be demonstrated during acceptance testing, however, preliminary software testing is the responsibility of the design agency and is not within the scope of the test plan.

The OREM CM support contractor will develop the system ATPs. The OREM CM support contractor will provide the Test Director and personnel, including designated system engineers necessary to support ATPs.

The OREM construction contractor will provide the labor to perform the system ATPs. The project Start-up Test Plan provides details on the systems to be tested.

12.5 TEST DIRECTOR RESPONSIBILITIES

The Test Director has overall responsibility for coordinating the performance of testing through the ATPs. Upon successful completion of testing associated with construction, the Test Director will prepare, certify, and present the test reports.

13. FIELD SUPPORT

13.1 INDUSTRIAL SAFETY SUPPORT

The OREM construction contractor will be responsible for providing an IS professional during construction activities to monitor field activities and to ensure work control documentation meets applicable safety and health procedures and controls. This individual will serve as a point-of-contact for the project for safety and health issues and will interface with the Project IH as needed. OREM will provide IS professional support to perform periodic field surveillances to ensure the OREM construction contractor is complying with requirements of the contract. The OREM IS professional will interface with the OREM construction contractor IS representative.

13.2 INDUSTRIAL HYGIENE SUPPORT

The OREM construction contractor will be responsible to provide an IH professional during construction activities to anticipate, recognize, evaluate, and develop controls for occupational health hazards. This individual shall be certified in the practice of IH by the American Board of Industrial Hygiene (ABIH) or meet the criteria for being eligible for ABIH examination in accordance with applicable contract requirements. OREM will provide IH professional support to perform periodic field surveillances to ensure the OREM construction contractor is complying with requirements of the contract. The OREM IH professional will interface with the OREM construction contractor IH representative.

13.3 ENVIRONMENTAL SUPPORT

The OREM construction contractor will be responsible to provide an environmental professional during construction activities to provide the interpretive authority for environmental issues and events for construction execution activities. The OREM CM support contractor will provide SME environmental compliance professional support to perform periodic field surveillances to ensure the OREM construction contractor is complying with requirements of the contract. The OREM CM support contractor Environmental Compliance professional will support the CTR and interface with the OREM construction contractor's environmental representative.

13.4 WASTE MANAGEMENT SUPPORT

The OREM construction contractor will provide a WPS during construction activities. The WPS is responsible for all activities related to waste containers from obtaining, tracking, loading, closing, and staging/storage until the container is offered for transport. The WPS also verifies that the waste does not include anomalous or prohibited items.

The OREM construction contractor will also provide a Waste Coordinator during construction activities. The Waste Coordinator interfaces with the generator for the management of waste and acts as the single point of contact with the ORR disposal facilities for waste generated during construction.

OREM will provide waste management oversight during construction activities to ensure the OREM construction contractor is complying with contract requirements and will interface with the OREM construction contractor's waste management representatives.

13.5 RADIOLOGICAL PROTECTION SUPPORT

The OREM construction contractor will be responsible to provide radiological protection support, including radiological protection field technicians. OREM will provide SME radiological protection support to perform periodic field surveillances to ensure the OREM construction contractor is complying with the requirements of the contract. The OREM radiological protection professional will interface with the OREM construction contractor radiological protection representative.

13.6 QUALITY ASSURANCE SUPPORT

The OREM construction contractor will be responsible to develop and submit a QA program/plan for review and approval to provide QA and QC support.

The OREM CM support contractor will support the OREM QA professional to perform periodic field surveillances to ensure the OREM construction contractor is complying with requirements of the contract. The OREM CM support contractor QA professional will support OREM and the CTR, as requested, to interface with the OREM construction contractor QA and QC representatives.

14. CONSTRUCTION CONTRACT CLOSEOUT

14.1 GENERAL

The final phase of construction is demobilization and contract closeout. To ensure work is completed in accordance with the contract, the project team will inspect the completed work and ensure required documentation from the contractor has been supplied.

14.2 SUBSTANTIAL COMPLETION INSPECTION

14.2.1 Substantial Completion Date

The OREM construction contractor will inspect the completed work and, when the list of remaining actions is considered manageable, submit the inspection report for approval along with any outstanding documentation. The CTR will review the OREM construction contractor inspection report and documentation to determine if a Substantial Completion Inspection is warranted.

14.2.2 Inspection Participants

The Substantial Completion Inspection, at a minimum, should include the following members of the project oversight team and OREM construction contractor staff: OREM CM support contractor Construction Support Manager, CTR, PE, QA, and Environmental Compliance representatives; OREM FPD, Facility Representative, Safety, Radiological Protection, and Waste Management SMEs as required; and OREM construction contractor PM, Superintendent, and Facility Manager.

14.2.3 Substantial Completion Inspection Guidelines

The inspection participants will perform the Substantial Completion Inspection using the OREM CM support contractor procedures.

14.2.4 Facility Checkout/Walkthrough

The project oversight and inspection team will perform an inspection and will document results in a CCD, noting all items that are not acceptable, including items that were self-identified by the OREM construction contractor. This walkthrough will include a review of contractor documentation as well as a site/facility checkout/walkthrough against the design documents.

14.2.5 Construction Statement of Acceptance

A CCD shall be completed by the OREM CM support contractor CTR based on the inspection team's input. The CCD will include the exception list that documents the results of inspections and will be provided to the OREM construction contractor for resolution of uncompleted items prior to Final Construction Completion Inspection.

14.3 FINAL COMPLETION INSPECTION

14.3.1 Final Completion

The OREM construction contractor will resolve/correct all items identified in the exception list and will submit the actions taken for each for approval. The CTR will review the OREM construction contractor's submittals and determine if a Final Construction Completion Inspection is warranted.

14.3.2 Inspection Participants

The final construction inspection, at a minimum, should include the following members of the project oversight team and OREM construction contractor staff: OREM CM support contractor Construction Support Manager, CTR, PE, QA, and Environmental Compliance representatives; OREM FPD, Facility Representative, Safety, Radiological Protection, and Waste Management SMEs as required; and OREM construction contractor PM, Superintendent, and Facility Manager.

14.3.3 Final Completion Guidelines

The Inspection participants will perform the Final Construction Completion Inspection using the OREM CM support contractor procedures.

14.3.4 Inspection and Acceptance Report

A CCD shall be completed by the OREM CM support contractor CTR based on the inspection teams input, including the exception list that documents results of the inspections and will be provided to the OREM construction contractor. If exceptions have not been resolved, the process will be repeated for Final Acceptance.

14.4 CONTRACTOR TURNOVER PACKAGE

The OREM construction contractor Turnover Package will be required to be submitted prior to Construction Completion Inspection. This package is reviewed and approved as part of this process.

The OREM CM support contractor CTR will coordinate review of the turnover package and will maintain its status with the DCS. The OREM CM support contractor Construction Support Manager will recommend acceptance to the OREM CO/COR following completion of the turnover package.

15. REFERENCES

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- 10 CFR 830. *Nuclear Safety Management*.
- 48 CFR 970. *DOE Management and Operating Contracts*, Sect. 5223-1, “Integration of environment, safety, and health into work planning and execution,” Washington, D.C.
- DOE Guide 413.3-2. *Quality Assurance Guide for Project Management*, June 27, 2008, U.S. Department of Energy, Washington, D.C.
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- DOE Order 226.1B. *Implementation of Department of Energy Oversight Policy*, April 25, 2011.
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- DOE/OR/01-2697&D2. *Amendment to the Record of Decision for Phase I Interim Source Control Actions in the Upper East Fork Poplar Creek Characterization Area, Oak Ridge, Tennessee*, 2016, U.S. Department of Energy, Office of Environmental Management, Oak Ridge, TN.
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- UCOR-4578. *Conceptual Design Report for the Outfall 200 Mercury Treatment Facility, Y-12 National Security Complex, Oak Ridge, Tennessee*, latest revision.
- UCOR-4931. *Outfall 200 Mercury Treatment Facility, Startup Test Plan, Oak Ridge, Tennessee*, latest revision.

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