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UCOR-4982/R1

**Construction Project Safety and Health Plan,
Outfall 200 Mercury Treatment Facility,
Y-12 Nuclear Security Complex,
Oak Ridge, Tennessee**

This document is approved for public
release per review by:

Peter Kortman (*signature on file*)

UCOR Classification &
Information Control Office

11/29/2017

Date

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Date Issued—December 2017

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

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for the East Tennessee Technology Park Mission
under contract DE-SC-0004645

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APPROVALS

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	December 2017

USQD Review Determination	<input type="checkbox"/> USQD <input type="checkbox"/> UCD <input type="checkbox"/> CAT X <input checked="" 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/R7
USQD Preparer:	_____ 11/30/17 Name Date
Exhibit L Mandatory Contractor Document	<input type="checkbox"/> No (No PCCB Reviewer Signature Required.) <input type="checkbox"/> Yes (Requires review by the Proforma Change Control Board.)
PCCB Reviewer:	_____ Name Date

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REVISION LOG

Revision Number	Description of Changes	Pages Affected
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ACRONYMS

AHA	activity hazard analysis
CERCLA	Comprehensive Environmental, Response, Compensation, and Liability Act of 1980
<i>CFR</i>	<i>Code of Federal Regulations</i>
CM	construction management
CPS&HP	Construction Project Safety and Health Plan
DOE	U.S. Department of Energy
ES&H	environment, safety, and health
FRE	Field Radiological Engineer
MTF	Mercury Treatment Facility
OF200	Outfall 200
ORR	Oak Ridge Reservation
OREM	Oak Ridge Office of Environmental Management
S&H	safety and health
UEFPC	Upper East Fork Poplar Creek
Y-12	Y-12 Nuclear Security Complex

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1. PROJECT BACKGROUND AND SCOPE

The U.S. Department of Energy (DOE) Oak Ridge Reservation (ORR) is located within and adjacent to the city of Oak Ridge, Tennessee. The area proposed for construction of the Outfall 200 (OF200) Mercury Treatment Facility (MTF) is located in the south-central portion of the Y-12 National Security Complex (Y-12) (see Fig 1).

Historical missions at Y-12 have resulted in the release of mercury to the environment, and contamination has been identified in soil, sediment, surface water, groundwater, buildings, drains, and sumps. Discharges from the West End Mercury Area at Y-12 are the primary point source contributors to mercury flux into the Upper East Fork Poplar Creek (UEFPC), which flows from the south-central portion of Y-12 and eventually through the city of Oak Ridge. Mercury is released into UEFPC via OF200 through direct erosion of contaminated soil, migration of dissolved mercury through storm drains and several outfalls, and through shallow groundwater. Currently, mercury contamination is considered the greatest environmental risk on the ORR. DOE intends to construct and operate the OF200 MTF, a water treatment system that will collect and treat the mercury-impacted surface water near OF200. Operation of the OF200 MTF will supplement other Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) response actions to further reduce mercury concentrations in UEFPC surface water and releases to the offsite environment.

The design, construction, and operation of the OF200 MTF is being conducted under CERCLA. 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 remedy agreed on by DOE, the Tennessee Department of Environment and Conservation, and the U.S. Environmental Protection Agency.

The OF200 MTF will include a Headworks area (weir, intake structure, grit removal chambers, storage tank, and pumping station) located adjacent to OF200, an above-grade pipeline extending several hundred feet along the south side of UEFPC, and a Treatment Plant (equalization tank, chemical reaction tanks, inclined plate clarifiers, treatment building, chemical storage, and utilities) located near the east end of the Y-12 site.

The OF200 MTF scope is organized to include the following major activities:

- Design and acquisition
- Site preparation not accomplished during Early Site Preparation
- Facility construction and construction support
- Construction acceptance testing
- Construction closeout

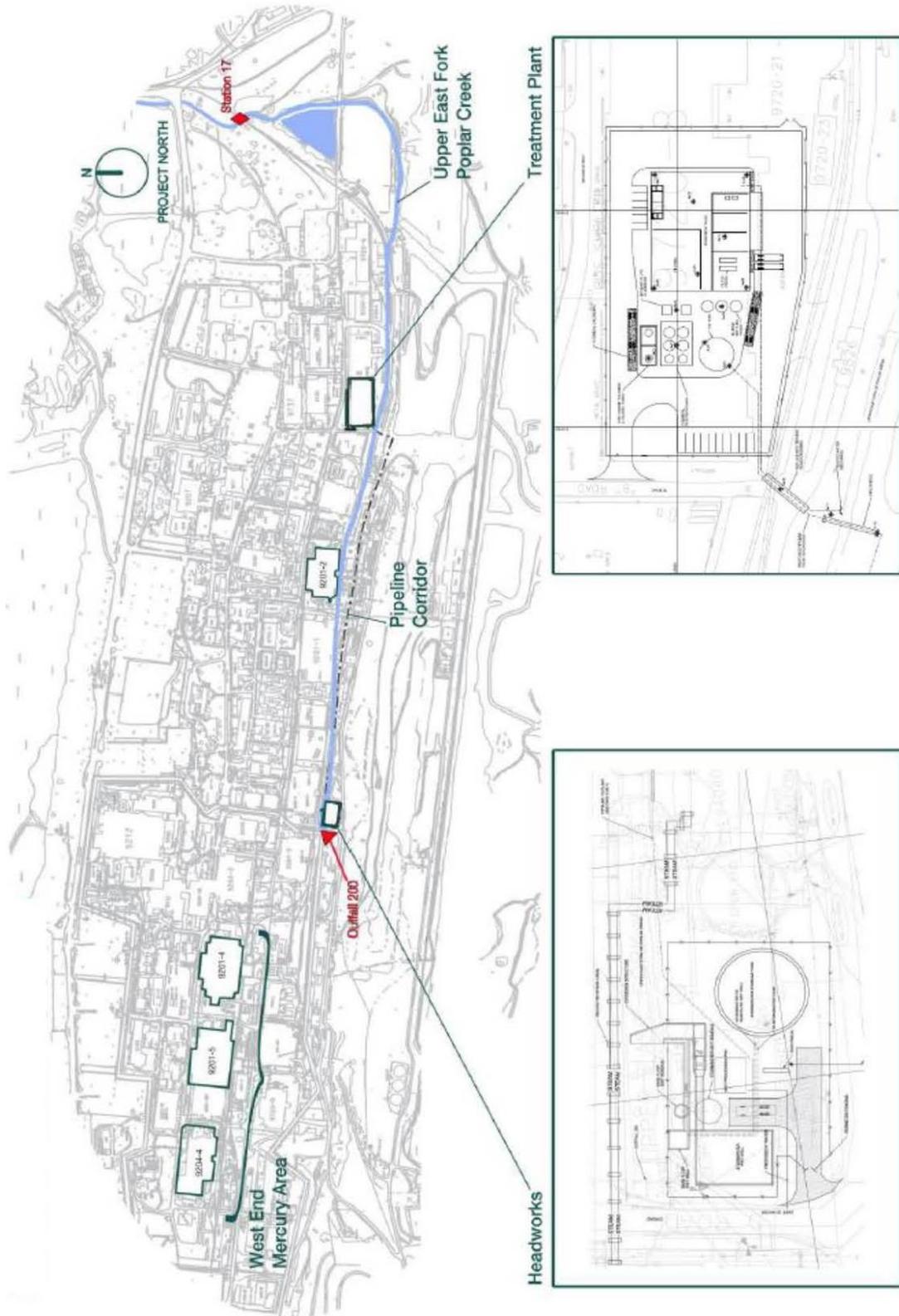


Fig. 1. Y-12 Site and OF200 MTF location.

2. PROJECT METHOD OF ACCOMPLISHMENT

The DOE Oak Ridge Office of Environmental Management (OREM) plans to award and manage a contract for construction of the OF200 MTF. OREM also will utilize the existing Environmental Management contractor to provide construction management (CM) support in the role of OREM CM support contractor. The OREM CM support contractor will provide CM and SME support and conduct field observations for OREM. The OREM CM support contractor will routinely interface with the OREM project team to report results to OREM. OREM has approval authority of all project environment, safety, and health (ES&H)-related programs and procedures.

The OREM construction contractor will work in accordance with their contract and their ES&H programs and procedures. The OREM CM support contractor will have no contractual authority over the OREM construction contractor.

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3. INTRODUCTION

This Construction Project Safety and Health Plan (CPS&HP) outlines the requirements and approach OREM will implement for the OF200 MTF construction. Effective implementation of an appropriate Worker Safety and Health (S&H) Program ensures the requirements of 10 (*Code of Federal Regulations*) *CFR* 851, *Worker Safety and Health Program*, are met by the project. Each contractor will have an OREM-approved CPS&HP and will perform work under their own S&H programs, processes, and procedures.

3.1 APPLICABILITY

This CPS&HP provides guidance that applies to OREM contractors performing work during construction, including the OREM construction contractor and their subcontractors. This is not an implementing document, but rather outlines the OREM approach for effective ES&H for the project. Each OREM contractor will develop, submit, implement, and perform work in accordance with their own ES&H programs and documents. Each contractor shall make a determination based on their scope of work whether their work activities fall under the requirements of 29 *CFR* 1910.120 or 29 *CFR* 1926.65.

3.1.1 CPS&HP Applicability Determination

This CPS&HP has been developed to outline the requirements for implementing ES&H programs for the project in accordance with DOE-STD-1149-2016, *Safety and Health Program for DOE Construction Projects*. This standard requires the development of a CPS&HP for work activities meeting the definition of construction in 10 *CFR* Part 851.3 defined as follows:

“Construction means combination of erection, installation, assembly, demolition, or fabrication activities involved to create a new facility or to alter, add to, rehabilitate, dismantle, or remove an existing facility. It also includes the alteration and repair (including dredging, excavating, and painting) of buildings, structures, or other real property, as well as any construction, demolition and excavation activities conducted as part of environmental restoration or remediation efforts.”

Based on the scope of the project as described in Sect. 1, the work to be performed on the project meets the definition of “construction” as defined above. This CPS&HP is intended to outline how OREM will implement the project and how each performing contractor will address applicable construction-related hazards and controls.

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4. DEFINITIONS

The ES&H-related terms used in this document as defined as follows:

Activity Hazard Analysis (AHA) – A documented process whereby a work activity is analyzed for hazards, using a “What If” approach, and a set of safety controls is identified to eliminate or mitigate those hazards prior to the work being performed.

Engineering Controls – A method of controlling worker exposure by redesigning equipment, tools, and workstations.

Injury or illness – Injuries include cases such as, but not limited to, a cut, fracture, sprain, or amputation. Illnesses include both acute and chronic illnesses, such as, but not limited to, skin disease or respiratory disorder.

Record – Material originated or received by a specific office in carrying out its objectives that needs to be kept for administrative, legal, research, scientific, or historical value, and that has had all required information entered and has been signed, stamped, or otherwise validated or authenticated and dated, as required.

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5. CONSTRUCTION SAFETY AND HEALTH PROGRAM

5.1 GENERAL

The OREM construction contractor and any subcontractors will establish and maintain a program to protect the S&H of all persons on the construction worksite, including employees, employees of other contractors or subcontractors, visitors, and the public. This program also shall protect against damage to property, materials, supplies, and equipment, and prevent unnecessary work interruptions. The objective of the program is to ensure compliance by the OREM construction contractor and all worksite subcontractors with the S&H standards prescribed in the construction project acquisition documents. The word “program” is used to describe the S&H requirements and the word “plan” describes the contractor’s project-specific document to implement these requirements.

5.2 CONSTRUCTION PROJECT SAFETY AND HEALTH PLAN

Prior to commencing work on the project worksite, the OREM construction contractor and any subcontractors will prepare and have approved by OREM a site-specific project S&H plan that meets the requirements of 10 *CFR* 851. This plan is the OREM construction contractor’s proposal for implementing the S&H requirements prescribed by the construction project acquisition documents. Understanding that the project S&H plan is submitted prior to work starting, and that some project-specific information is not yet known (e.g., subcontractors to be used, type of fall protection to be used at a certain point in time, specific cranes etc.), known information will be provided and additional information added at each preparatory phase, along with the appropriate AHAs. The project S&H plan will be maintained for the duration of site work and will be updated as necessary to address activities not adequately documented in the plan. Each plan shall have within the determination of whether the scope of work activities described therein shall fall under the requirements of 29 *CFR* 1910.120 or 29 *CFR* 1926.65.

5.3 CONSTRUCTION MANAGER RESPONSIBILITIES

The OREM construction contractor’s manager is responsible for the overall management and success of the project and serves in a leadership role in S&H.

5.4 CONSTRUCTION SUPERINTENDENT RESPONSIBILITIES

The OREM construction contractor’s superintendent is responsible for planning and directing day-to-day field operations and ensuring resources are available to enable safe performance of the work. The construction superintendent ensures that work activities are planned and workers are properly trained and qualified prior to performing work in the field. The Construction Superintendent makes frequent and regular inspections of the worksites.

5.5 ACTIVITY HAZARD ANALYSIS

An AHA is required for all activities within a project, regardless of the size, scope, or complexity of work. The AHA is the heart of the project’s safety information and acts as the safety supplement to a work control process. Depending on the complexity of the activity, one or several AHAs may need to be completed. In some cases, AHAs may need to be staged in coordination with the initiation of the various phases of work.

Each AHA should be for a well-defined scope of work such that the hazards and the required control measures are clearly defined and easily understood.

5.6 WORKSITE SAFETY AND HEALTH ORIENTATION

All OREM construction contractor personnel working onsite will be required to attend an orientation before working at the jobsite. Newly employed, promoted, and/or transferred personnel will be fully instructed in safety practices required by their assignments. Visitors also must receive orientation prior to accessing work areas in the field or be escorted while on site.

The OREM construction contractor will develop a worksite S&H orientation for all of its personnel and subcontractors. The orientation will include general employee training required by the Y-12 site and site-specific training designed to familiarize personnel with the following details:

- Employee safety requirements and policies specific to the project
- Site-specific S&H requirements
- Permitting procedures (if applicable), including excavation permits, hot work permits, etc.
- Hazard communication on a multi-employer work site
- Emergency and medical procedures and other topics as circumstances require

5.7 ACTIVITY-SPECIFIC TRAINING

Training is based on a graded approach to ensure workers are trained and qualified commensurate with their responsibilities (i.e., Integrated Safety Management Guiding Principle #3 – Competence Commensurate with Responsibility). Workers on the project will possess the experience, knowledge, and skills necessary to safely and effectively fulfill their roles and responsibilities. Workers must successfully complete the appropriate S&H and other required training in accordance with regulatory, contractual, and internal requirements. The OREM construction contractor will maintain a training matrix to ensure project personnel are current on all training necessary for their assigned work. All training must conform to the training matrix and will be kept current and available on site for inspection.

All training documentation will be maintained per the OREM construction contractor's training records procedure. Acceptable forms of documentation of training include copies of current certificates of training for completed courses that are required for site access and operations. Printouts from a training record tracking system also are an acceptable form of documentation. Y-12 specific site access protocol will be followed.

5.8 RADIOLOGICAL PROTECTION

The OREM construction contractor will follow 10 *CFR* 835, Occupational Radiation Protection Program. Activities will be performed under approved Radiological Work Permits. The Project Field Radiological Engineer (FRE) will provide direction on radiological issues. The FRE will coordinate with other S&H disciplines in areas of mutual interest, such as respiratory protection, personal protection equipment, and heat stress if applicable.

5.9 TOOLBOX SAFETY AND HEALTH TRAINING

The OREM construction contractor will conduct informal toolbox S&H training sessions at least weekly for all employees on the worksite. Depending on the crew size and stage of the project activities, this may be accomplished in single or multiple sessions and may address different topics for different work crews. Outlines of all toolbox training sessions will be prepared and annotated with the date, time, and names of employees in attendance.

5.10 INSPECTIONS AND HAZARD ABATEMENT

During periods of active construction, the OREM construction contractor will ensure that a designated representative, knowledgeable of the project's hazards and with full authority to act on behalf of the construction contractor, conducts frequent, regular, and thorough inspections of their respective areas of the worksite. These inspections will identify and correct hazards and instances of noncompliance with project S&H requirements and approved AHAs. The construction superintendent and other project supervisory staff also will include safety as a topical item as part of their routine review of project operations.

The OREM construction contractor shall take immediate corrective action to eliminate or control all identified hazards. Newly identified hazards will be appropriately addressed in revised AHAs. In cases where immediate corrective action is not possible or responsibility for abatement falls outside the scope of the project, the construction contractor will perform the following:

- Immediately ensure all affected employees are aware of the hazard, its location, and are removed from harm's way. This may require partial or complete suspension of construction operations.
- Immediately post warning signs at the location of the hazard describing the nature of the hazard.
- Verbally notify OREM and the OREM CM support contractor immediately of the location and description of the hazard. Follow up this notification in writing.
- Implement further interim control measures, as needed, to protect employees from the identified hazards and secure OREM approval for continued use of the employed measures.
- Where responsibility for abatement falls outside the project scope, the OREM construction contractor will also immediately notify the authority responsible for S&H management.

All identified hazards and their respective corrective actions will be documented in project inspection reports. The responsibility and timetable for abating hazards that were not immediately corrected also shall be similarly documented. Follow-up inspections should ensure subsequent abatement of such hazards.

5.11 REPORTING, RECORDKEEPING, AND ACCIDENT INVESTIGATION

The OREM construction contractor will establish and maintain complete and accurate records of all hazard inventory information, hazard assessments, exposure measurements, and exposure controls. All work-related injuries and illnesses of its workers and subcontractor workers shall be recorded and reported accurately and consistent with DOE Manual 231.1-1A, *Environment, Safety and Health Reporting Manual*. The contractor will comply with the applicable occupational injury and illness recordkeeping and reporting workplace S&H standards at their site, unless otherwise directed in DOE Manual 231.1-1A.

The OREM construction contractor will report and investigate all accidents, injuries, and illnesses, and will analyze related data for trends and lessons learned. Information gained from the investigation and lessons learned will be integrated into future work to be performed.

Reporting of all accidents and injuries will be performed in accordance with an approved accident/incident reporting procedure. All injuries and illnesses will be reported immediately to the worker's supervisor/superintendent and OREM by supervisors or designees. The OREM construction contractor management, in collaboration with the H&S Officer, will investigate and report each accident or incident involving worker injury or illness or damage to government vehicles and property. In the event of an accident, injury, or other reportable incident requiring immediate medical or emergency response, Y-12 emergency response via the Plant Shift Superintendent shall be notified immediately to request assistance. In the event of an accident, injury, or other reportable incident that does not require immediate medical or emergency response, OREM shall be notified as soon as practical or within not more than 2 hours.

6. REFERENCES

- 10 *CFR* 835, *Occupational Radiation Protection Program*, U.S. Department of Energy, Washington, D.C.
- 10 *CFR* 851, *Worker Safety and Health Program*, U.S. Department of Energy, Washington, D.C.
- 29 *CFR* 1910.120, *Occupational Safety and Health Standards*, Occupational Safety and Health Administration, Washington, D.C.
- 29 *CFR* 1926.65, *Safety and Health Regulations for Construction*, Occupational Safety and Health Administration, Washington, D.C.
- DOE Manual 231.1-1A. *Environment, Safety, and Health Reporting Manual*, March 19, 2004, U.S. Department of Energy, Washington, D.C.
- DOE STD 1149-2016. *Safety and Health Program for DOE Construction Projects*, U.S. Department of Energy, Washington, D.C.
- 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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