Project Name: OR-K-33 Slab & Soils-D&D-R

Project Name (Expanded): Oak Ridge-K-33 Slab & Soils ER [Removal of slab and soil remaining after demolition of a former GDP building to achieve site cleanup standards.]

Project Type: Building / Facility D&D Project Type

FIMS Hazardous Category (replaces Building Type): 12 Not applicable (previous Building Type 1)

Project Type Detail: Other Cat 12 Facility

Addendum to the Phased Construction Completion Report for Exposure Units Z2-04 and Z2-05 in Zone 2, East Tennessee Technology Park, Oak Ridge, Tennessee, DOE/OR/01-2590&D1/A1, E.0521.059.0293

Site Context:
This project falls under the Defense Remedial Action WBS (identified as OR-0040.C, Nuclear Facility D&D-ETTP in PARS); this work was associated with, but not included in, WBS elements from the American Recovery and Reinvestment Act of 2009 WBS (identified as OR-0040.R in PARS). The projects include and preparation for decontamination and decommissioning (D&D); D&D of buildings and associated structures to grade or slab; removal or stabilization of below grade structures; remediation of burial grounds, contaminated soils and below grade structures; as well as monitoring and treatment of groundwater. Supporting projects include surveillance and maintenance and waste operations including construction, reconfiguration and demolition of select waste management facilities.

ETTP (then K-25) began operations during World War II as part of the Manhattan Project. Its original mission was to produce enriched uranium for use in atomic weapons, but at the end of the war, the plant’s mission evolved. From 1945 to 1985, it produced enriched uranium for the commercial nuclear power industry and in 1987, it was permanently shut down. Restoration of the environment, decontamination and decommissioning of the facilities, and management of the legacy wastes have since been major activities. Major contaminants include uranium (various isotopes), mercury, beryllium, and organic constituents. The industrial, or “impacted” areas of the site is about 800 acres, with several large (>1M SF) GDP buildings, and several hundred associated laboratory, centrifuge, and support facilities. There were numerous environmental releases and on-site radioactive material burial grounds, some including classified materials. Certain areas require high levels of security (Protected Areas) based on centrifuge and GDP technology. The prime contractor, currently URS/CH2M Oak Ridge, manages or provides technical oversight for environmental projects, although some were contracted through a DOE IDIQ contract.

ECAS Level 4/Parent Project Context:
The actual parent project grouping would be to include all of the WBS components associated with the UCOR cleanup contract. For ECAS purposes the Parent Project group has been identified as those UCOR/ETTP projects that were identified as potential projects for this (2017) ECAS database
addition. Note that the ECAS projects identified below are contained under several different higher-level WBS elements.

- OR-Chromium Water Treatment System Install & Startup-WM
- OR-CNFA Closure-D&D
- OR-ETTP 26 Building Characterization (ORISE)-D&D
- OR-K-1065 RCRA Closure A, D & E-D&D
- OR-K-1070B BG-ER
- OR-K-27 Decommissioning-D&D
- OR-K-31 Demolition-D&D
- OR-K-31/K-33 Removal Action-D&D
- **OR-K-33 Slab & Soils-D&D-R (renamed in 2017)**
- OR-K-731 Building-D&D
- OR-K-732 Switchyard-D&D
- OR-K-892 Cooling Water Pumphouse and Sludge Softener -D&D
- OR-TSCA Incinerator RCRA Closure-D&D
- OR-Zone 2 Exposure Unit 28-ER

Two ETTP ECAS Projects were previously developed and included in the ECAS database under the ECAS ARRA data collection program in 2011. These projects were conducted by both UCOR and the previous contractor (BJC) and should properly be included under this Parent Project.

- OR-K-27 Pre-Demolition-D&D-R
- OR-K-33 Structure-D&D-R

**D&D Facility Data:**

**Facilities:**
The K-33 slab and soils removal contract was awarded in September 2011 as part of the American Recovery and Reinvestment Act (ARRA) initiative. The building was constructed in 1954 to house uranium enrichment processes. K-33 was a two-level structure measuring 1450 feet long by 970 feet wide by 82 feet high. The lower level was constructed of concrete encased steel columns, steel girders, and steel beams supporting the second level. The building slab was reinforced concrete. The overall project included both the building Demolition and Disposition (D&D) and slab and soils removal. The slab and soils sub-project included removing concrete slab to grade. The overall project was segregated, managed, and tracked as two separate projects, one was the D&D and one was the slab and soils sub-project. This “ECAS Project” addresses only the slab and soils sub-project. Additional information and pictures of the buildings are available in the PCCRs identified in the reference documents and available on the referenced web site.

**Construction Details:**
The project estimated that the slab had a thickness of 6 inches. A total area of 1,412,316 square feet of slab (value from FIMS database) was demolished, sized, and hauled away. Also, soils were removed, backfilled with clean soil, graded, and seeded. Additionally, the slab and soils project included transport and disposal of slab debris and associated soil to EMWMF.

**Facility Use:**
The building was constructed in 1954 to house uranium enrichment processes. Oak Ridge-K-31 Demolition-D&D [Demolition of a GDP building from which the uranium-contaminated equipment
(converters, etc.) had been previously removed. The large transite structure contained fixed radiological contamination, tie lines, and some associated facilities.]

**Processes causing contamination:**
K-33 Facility was a gaseous diffusion facility with substantial radiological contamination that has since been removed.

**Contaminants of concern (including extent of contamination by major contaminant):**

<table>
<thead>
<tr>
<th>Building</th>
<th>Chemical Hazard</th>
<th>Location/Extent</th>
<th>Radiological Hazard</th>
<th>Location/Extent</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-33 Slab</td>
<td>Primarily Sanitary Waste</td>
<td>K-31 Slab, K-33 Truck Alley, four concrete pedestals in the K-792 area</td>
<td>Minimal LLW</td>
<td>K-31 Slab</td>
</tr>
</tbody>
</table>

**D&D Project Execution**

Site WBS Organization within the ECAS Project Scope:
The slab had a thickness of 6 inches. Additionally, the slab and soils project included transport and disposal of slab debris and associated soil to EMWMF. Removal of structures below the slab was required. Finally, backfilling and restoration of the area with clean fill and seeding was also included in project scope.

**Methods of execution:**

*Management:* LATA Sharp Remediation Services (LSRS) was an awardee in a nationwide EM indefinite delivery/indefinite quantity (ID/IQ) contract which gave them the opportunity to bid on this work. The nationwide EM ID/IQ contract was originally competitively awarded under a competitive 8A set-aside action. LSRS competed against other task ordering contractors to receive award of the firm-fixed price D&D task. The slab and soils work was later added-on non-competitively, and was also firm-fixed price.

The scope was planned, managed, and executed as a single project. The work breakdown structure (From *K-33 Slab and Soils Removal cost estimating relationship*), for this project follows in table 1.

From a project report: “A review was performed during the week of August 22, 2011, at the Oak Ridge Office (ORO). Review of this project was undertaken to assess whether it can be accomplished by the established contract period of performance and at the proposed cost. The review team evaluated the final cost and schedule negotiated between Oak Ridge and the selected contractor. The K-33 slab and soils removal was performed under a firm fixed price task order.”

<table>
<thead>
<tr>
<th>1.21.4.16.2.1.2</th>
<th>Prepare Waste Profile for Soils</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.21.4.16.2.1.2 1-3</td>
<td>Establish Regulatory Requirements, SAP/Work Package Preparation, Field Sampling and Analysis</td>
</tr>
<tr>
<td>1.21.4.16.2.1.3</td>
<td>Mobilization and Readiness</td>
</tr>
<tr>
<td>1.21.4.16.2.1.3 1-2</td>
<td>Mobilization and Training, Readiness Evaluation</td>
</tr>
<tr>
<td>1.21.4.16.2.1.4</td>
<td>Building Slab Removal and Disposition</td>
</tr>
<tr>
<td>1.21.4.16.2.1.4 1-3</td>
<td>Slab Demolition and Sizing, Load and Transport Slab Waste, Backfill Grade and Seed -Slab</td>
</tr>
<tr>
<td>1.21.4.16.2.1.5</td>
<td>Stabilize Cooling Lines, Utilities and Manholes</td>
</tr>
<tr>
<td>1.21.4.16.2.1.5 1-2</td>
<td>Stabilize Cooling lines, Utilities and Manholes, Stabilize Electrical Conduit</td>
</tr>
<tr>
<td>1.21.4.16.2.1.6</td>
<td>RemEDIATE Contaminated Soils/Unit</td>
</tr>
</tbody>
</table>
Excavate Contaminated Soils/Units, Load and Transport Contaminated Soils, Backfill Soils/Unit, Soils Project Management/Unit, Perform Soil Removal Verification Surveys/Unit, Provide IVC Support/Unit, Submit Declaration of Physical Completion

Demobilization

Demobilize Temporary Facilities, Demobilize Equipment, Demobilize Personnel

Prepare and Submit Slab and Soil PCCR

Prepare and Submit Slab and Soil PCCR

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.21.4.16.2.1.6</td>
<td>Excavate Contaminated Soils/Units, Load and Transport Contaminated Soils, Backfill Soils/Unit, Soils Project Management/Unit, Perform Soil Removal Verification Surveys/Unit, Provide IVC Support/Unit, Submit Declaration of Physical Completion</td>
</tr>
<tr>
<td>1.21.4.16.2.1.7</td>
<td>Demobilization</td>
</tr>
<tr>
<td>1.21.4.16.2.1.7</td>
<td>Demobilize Temporary Facilities, Demobilize Equipment, Demobilize Personnel</td>
</tr>
<tr>
<td>1.21.4.16.2.1.8</td>
<td>Prepare and Submit Slab and Soil PCCR</td>
</tr>
<tr>
<td>1.21.4.16.2.1.8</td>
<td>Prepare and Submit Slab and Soil PCCR</td>
</tr>
</tbody>
</table>

Table 1-WBS for K-33 Slab and Soils Task
(From K-33 Slab and Soils Removal cost estimating relationship)

**Regulatory:**
The regulatory driver is the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) process in accordance with the approved Action Memorandum for the Remaining Facilities Demolition Project at East Tennessee Technology Park, Oak Ridge, Tennessee (DOE/OR/01-2049&D2) as implemented through the ORR Federal Facility Agreement (FFA). Subcontractor developed integrated project review documents for an Independent Project Review (IPR) and Environmental Management Acquisition Advisory Board (EMAAB) approval. Preparation of appropriate CERCLA documentation required for disposal of waste at the EMWMF, including DQO sessions, Sampling and Analysis Plan (SAP), Quality Assurance Project Plan (QAPP), the Waste Handling Plan (WHP), and Characterization and waste profile(s).

**Physical Approach:**
The D&D of K-33 facility was accomplished prior to this work. ORISE performed the characterization to support the development of waste profiles. Subcontractors performed the K-33 Pad Demolition, and waste dispositioned and transported to the EMWMF for disposal.

**Technologies:** The contractor used standard demolition technologies (e.g., excavators).

**Activities self-performed:**
- All management and key technical positions along with a portion of the technical staff
- Waste management
- Used significant professional services contracted (i.e., seconded) labor inter-mixed with prime contractor staff

**Activities subcontracted:**
- Subcontract awarded to ORISE by LSRS. ORISE performed early characterization efforts.
- K-31 Pad Demolition,
- Waste dispositioned and transported to the EMWMF

**Issues that impacted the project:**
- None
**Scope Growth:**
No identified scope growth

**Notes Regarding Use of Data**

1. The review team evaluated the final cost and schedule negotiated between Oak Ridge and the selected contractor. The K-33 slab and soils removal was performed under a firm fixed price task order.” Overall, there was some competition present, but this task was not awarded in a highly competitive environment.
2. ORISE performed the characterization and upfront project planning. ORISE, due to the nature in which it was formed and operated, is generally more expensive as other DOE contractors.

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**Remove this before final**

**Table 8. Waste disposal**

<table>
<thead>
<tr>
<th>Waste Type</th>
<th>Material Description</th>
<th>Total amount</th>
<th>Unit</th>
<th>Disposal Outlet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demolition Debris</td>
<td>Operation floor (slab)</td>
<td>30,292</td>
<td>CY</td>
<td>EMWMF, Waste Lot 401.1</td>
</tr>
<tr>
<td>RCRA Waste</td>
<td>Nine floor drains and material from the north truck alley loading dock</td>
<td>1.74</td>
<td>CY</td>
<td>Energy Solutions, Clive, Utah</td>
</tr>
<tr>
<td>PCB-contaminated</td>
<td>Contaminated pipe and soil</td>
<td>191,000</td>
<td>Lbs</td>
<td>Energy Solutions, Clive, Utah</td>
</tr>
<tr>
<td>Clean Waste</td>
<td>Copper grounding grid</td>
<td>34,980</td>
<td>Lbs</td>
<td>Y-12 Sanitary Landfill</td>
</tr>
</tbody>
</table>

EMWMF = Environmental Management Waste Management Facility  
PCB = polychlorinated biphenyl  
RCRA = Resource Conservation and Recovery Act of 1976

**Waste K-33 Slab PCCR Addendum**

The K-903 slab (Fig. 1) consisted of reinforced concrete that previously housed the Bldg. K-33 Compactor Facility. Originally left in place, the K-903 slab was radiologically contaminated, potentially by the Bldg. K-33 tie-line size-reduction activities that were performed using the K-903 slab. Due to the radiological contamination, the K-903 slab was removed (Fig. 2) on August 10-September 10, 2015, following evaluation of EU Z2-05 in the PCCR. Following removal of the K-903 slab, the area was restored to match the existing contour and surroundings (Fig. 3). Gravel was used be consistent with the surrounding area.

The K-903 slab was disposed at the Environmental Management Waste Management Facility (EMWMF) under EMWMF Waste Lot 401.1, K-33 Building Debris and Miscellaneous Material, which was modified to include the K-903 slab per concurrence form FCN-ETTP-Zone 2-166 (Appendix B). The “as-disposed” volume of waste was 974 cy.