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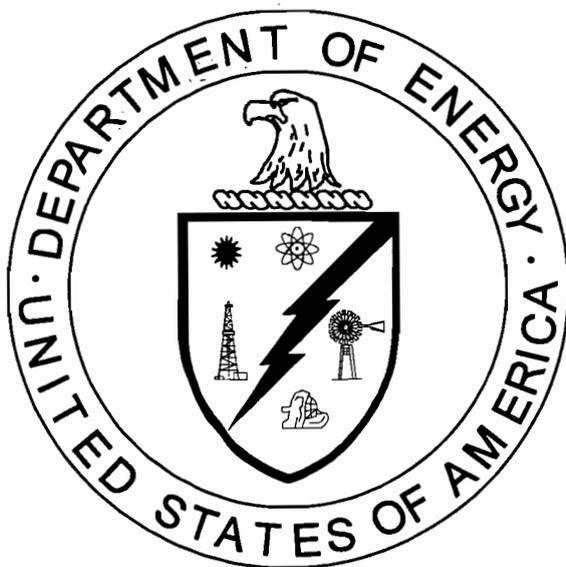
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Oak Ridge Reservation Federal Facility Agreement Quarterly Report for the Environmental Restoration Program

Volume 3. April-June 1995



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**Oak Ridge Reservation Federal Facility Agreement
Quarterly Report
for the Environmental Restoration Program**

Volume 3. April-June 1995

Environmental Restoration Program
P.O. Box 2003
Oak Ridge, Tennessee 37831-7298

Date Issued—July 1995

Prepared for the
U.S. Department of Energy
Office of Environmental Management
under budget and reporting code EW 20

LOCKHEED MARTIN ENERGY SYSTEMS, INC.
managing the
Environmental Management Activities at
Oak Ridge National Laboratory
Oak Ridge K-25 Site Oak Ridge Y-12 Plant
Paducah Gaseous Diffusion Plant Portsmouth Gaseous Diffusion Plant
under contract DE-AC05-84OR21400
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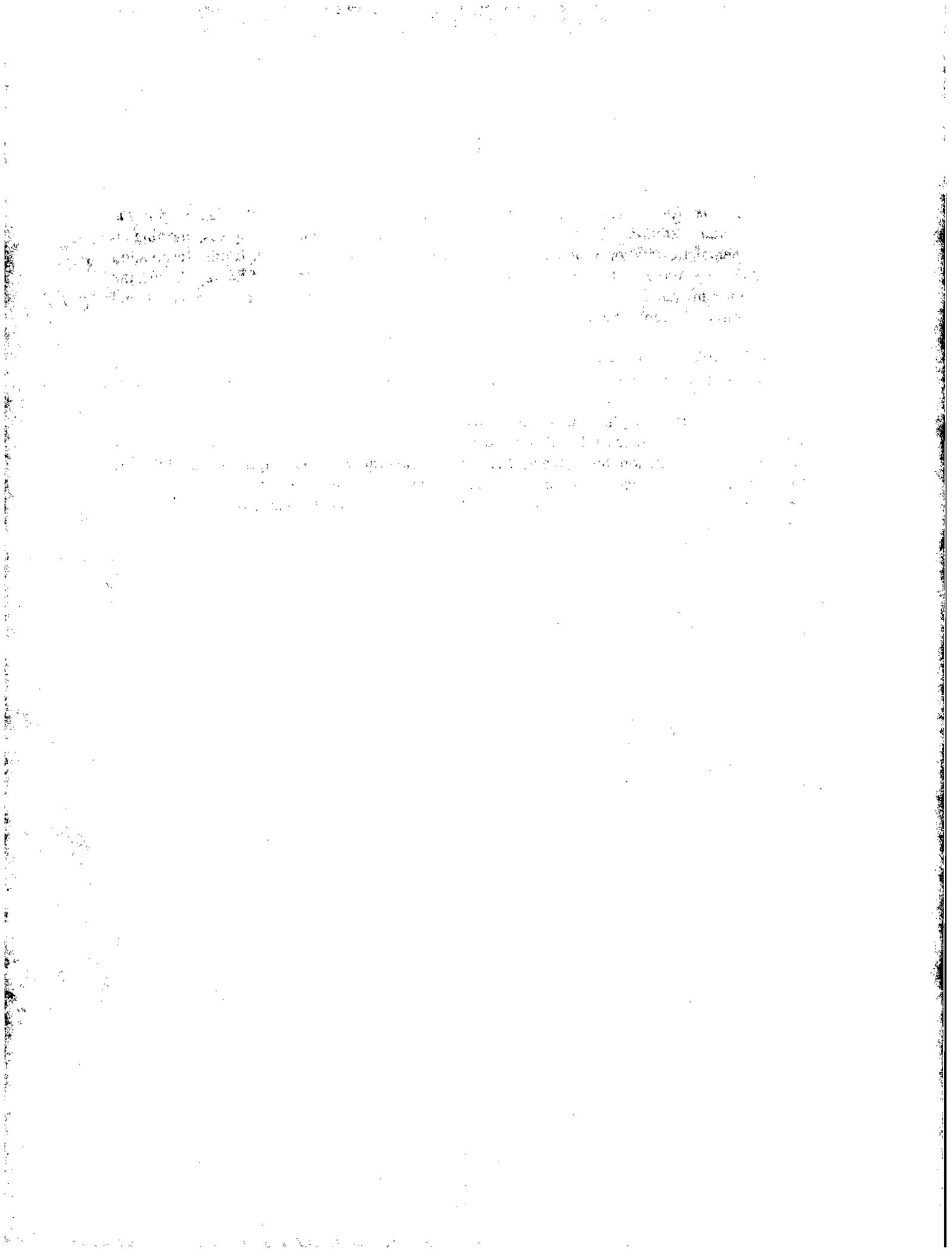


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PREFACE

This *Oak Ridge Reservation Federal Facility Agreement Quarterly Report for the Environmental Restoration Program* was prepared to satisfy requirements for progress reporting on Environmental Restoration Program (ER) activities as specified in the Oak Ridge Reservation Federal Facility Agreement (FFA) established between the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency, and the Tennessee Department of Environment and Conservation. The reporting period covered in this document is April–June 1995.

This work was performed under Work Breakdown Structure 1.4.12.2.3.04 (Activity Data Sheet 8304). Publication of this document meets an FFA milestone defined as 30 days following the end of the applicable reporting period. This document provides information about ER Program activities conducted on the Oak Ridge Reservation under the FFA. Specifically, it includes information on milestones scheduled for completion during the reporting period, as well as scheduled for completion during the next reporting period (quarter); accomplishments of the ER Program; concerns related to program work; and scheduled activities for the next quarter. It also provides a listing of the identity and assigned tasks of each of the DOE contractors performing ER Program work under the FFA.



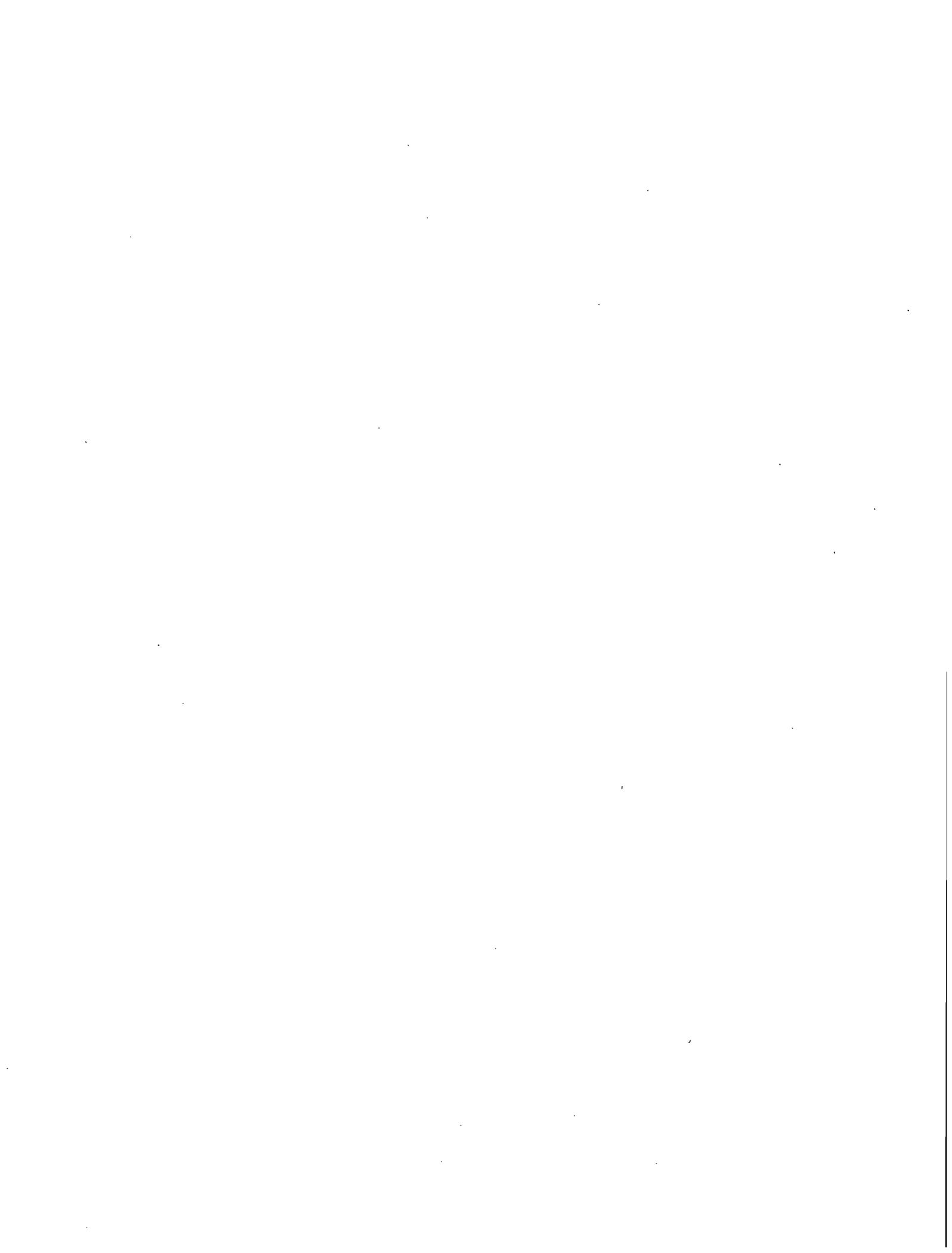
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ABBREVIATIONS

| | |
|---------|---|
| CA | Characterization Area |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| DNAPL | dense nonaqueous-phase liquid |
| DOE | Department of Energy |
| DOE-ORO | DOE Oak Ridge Operations Office |
| EFPC | East Fork Poplar Creek |
| EPA | Environmental Protection Agency |
| EPIC | Engineering Projects Information Center |
| ER | Environmental Restoration |
| FFA | Federal Facility Agreement |
| FS | Feasibility Study |
| ISV | in situ vitrification |
| LEFPC | Lower East Fork Poplar Creek |
| LLLW | liquid low-level radioactive waste |
| LMES | Lockheed Martin Energy Systems |
| LWBR | Lower Watts Bar Reservoir |
| MSRE | Molten Salt Reactor Experiment |
| NPDES | National Pollutant Discharge Elimination System |
| ORAU | Oak Ridge Associated Universities |
| OREIS | Oak Ridge Environmental Information System |
| ORNL | Oak Ridge National Laboratory |
| ORR | Oak Ridge Reservation |
| OU | operable unit |
| PCB | polychlorinated biphenyl |
| RCRA | Resource Conservation and Recovery Act |
| RI | remedial investigation |
| RI/FS | Remedial Investigation/Feasibility Study |
| RIWP | Remedial Investigation Work Plan |
| RMPE | reduction of mercury in plant effluents |
| ROD | Record of Decision |
| SCF | South Campus Facility |
| SWSA | solid waste storage area |
| TDEC | Tennessee Department of Environment and Conservation |
| UEFPC | Upper East Fork Poplar Creek |
| WAG | waste area grouping |
| WBR | Watts Bar Reservoir |
| WOC | White Oak Creek |
| WOL | White Oak Lake |



1. EXECUTIVE SUMMARY

This quarterly progress report satisfies requirements for the Environmental Restoration (ER) Program that are specified in the Oak Ridge Reservation (ORR) Federal Facility Agreement (FFA) established between the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the Tennessee Department of Environment and Conservation (TDEC). The reporting period covered herein is April through June 1995 (third quarter of FY 1995).

Sections 1.1 and 1.2 provide respectively the milestones scheduled for completion during the reporting period and a list of documents that have been proposed for transmittal during the following quarter but have not been approved as FY 1995 commitments.

1.1 DOCUMENTS TRANSMITTED TO THE REGULATORS

The following documents were transmitted to the regulators during the third quarter of FY 1995 and can be requested from the Information Resource Center in Oak Ridge.

- Bear Creek OU 2 Proposed Plan (DOE/OR/02-1338&D1)
- Surface Impoundments RI/FS Report (DOE/OR/02-1346&D1)
- GAAT Treatability Study Baseline Report (DOE/OR/02-1325&D1)
- WAG 6 Annual Environmental Monitoring Plan Report (DOE/OR/01-1377&D1)
- Implementation Plan for Liquid Low-Level Radioactive Waste Tank Systems for FY 1995 at ORNL Under the FFA (DOE/OR/01-1363&D1)
- K-25 Groundwater Data Report (Ltr.)
- K-1070 RI/FS Report (DOE/OR/01-1297&D1)
- Lower Watts Bar Reservoir ROD (DOE/OR/02-1373&D1)
- WBR Monitoring and Assessment Program Monitoring Plan (DOE/OR/02-1376&D1)
- South Campus Treatability Study Report (DOE/OR/02-1388&D1)
- Lower East Fork Poplar Creek ROD (DOE/OR/02-1370&D1)
- Technetium-95m Update Studies
- Technetium-95m Contaminated Soil and Plants
- Calcium-45-Tagged Forest

Regulatory Commitment Status

| Document title | Appendix E commitment date | Transmittal date |
|---|-------------------------------|------------------|
| Bear Creek OU 2 Proposed Plan | 06/02/95 | 06/01/95 |
| Surface Impoundments RI/FS Report | 05/12/95 | 05/04/95 |
| GAAT Treatability Study Baseline Report | 06/30/95 | 06/28/95 |
| WAG 6 Annual Environmental Monitoring Plan Report | 06/30/95 | 06/25/95 |
| K-25 Groundwater Data Report* | 05/31/95 | 05/31/95 |
| K-1070 RI/FS Report | 06/30/95 | 06/28/95 |
| Lower Watts Bar Reservoir ROD | 06/02/95 | 06/01/95 |
| Watts Bar Reservoir Map | 06/09/95 | 06/07/95 |
| Lower East Fork Poplar Creek ROD | 06/01/95 | 06/01/95 |
| South Campus Treatability Study Report | 06/30/95 | 06/29/95 |

*An agreement was made in the April 19, 1995, groundwater monitoring and strategy meeting that a notification letter of the data inclusion into OREIS would replace this document.

1.2 DOCUMENTS PROPOSED FOR TRANSMITTAL TO THE REGULATORS

The following documents have been proposed for transmittal to the regulators during the fourth quarter of FY 1995.

- Kerr Hollow Quarry ROD
- Upper East Fork Poplar Creek OU 1 RI Work Plan
- Waste Evaporator Facility Action Memorandum
- Core Hole 8 Plume RA Report (Ph. 1)
- Active Liquid Low-Level Radioactive Waste (LLLW) Tanks Structural Integrity Assessment Category C Tanks and Pipelines
- Active LLLW Tanks Bethel Valley Upgrade Design Assessment
- K-1407 B and C Ponds RA Report
- K-901-A Holding Pond Remedial Site Evaluation
- Preliminary Ecological Risk Assessment
- Clinch River/Poplar Creek RI/FS
- ORR Site Management Plan
- WC-14 Remedial Action Report

2. SIGNIFICANT ACCOMPLISHMENTS

The following significant accomplishments are noted for the ER Program during the third quarter of FY 1995.

A seven-member screening panel for the Site-Specific Advisory Board identified potential applicants to serve as Site-Specific Advisory Board members and to ensure screening and selection activities included a diverse and fair representation of the population of the area to meet the Federal Advisory Committee Act criteria. Twenty applicants were proposed for the board from the 54 applications received. The selected members' names have been submitted to DOE Headquarters and will be released to the public upon official notification by DOE Environmental Management Assistant Secretary Thomas Grumbly. When the advisory board convenes this summer, members of the community will be invited to attend the meetings, which always will be open to the public.

The Department of Energy's Quarterly Stakeholders Meeting was held April 18 at Pollard Auditorium in Oak Ridge. More than 100 stakeholders attended the presentation and poster session. Topics covered at the meeting included Lower Watts Bar Reservoir (LWBR), Union Valley Groundwater, Core Hole 8 Removal Action, the Common Ground Process, East Fork Poplar Creek (EFPC), Molten Salt Reactor Experiment Facility, Oak Ridge National Laboratory (ORNL) Surface Impoundments, Facility Transition and Management Program, Federal Facilities Compliance Act, Environmental Management Programmatic Environmental Impact Statement, Spent Nuclear Fuel Programmatic Environmental Impact Statement, and Transportation Information Network.

Approximately 60 people attended a public information meeting June 8 to explain the Record of Decision (ROD) for East Fork Poplar Creek, which calls for excavating two areas of the floodplain with mercury concentrations greater than 400 ppm. The cleanup level was modified after the Proposed Plan was announced in January, so this meeting was held to bring the public up to date on the changes. In addition, the public comment period was re-opened from June 14 – July 13. DOE will only accept comments on the new cleanup level. An addendum to the responsiveness summary with DOE's responses to comments on the new cleanup level will be available later this summer.

Two public meetings were held to discuss the Proposed Plan for LWBR. The first meeting was held April 4 in Kingston, and the second meeting was held April 11 at Spring City Elementary School.

Negotiations with the regulators were successfully completed concerning the application of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process to the Molten Salt Reactor Experiment (MSRE) remediation project. The MSRE project consists of three phases: (1) a time-critical removal action, which includes a series of stabilization activities designed to decrease the potential for release of hazardous and radioactive materials; (2) the uranium deposit removal phase, to be conducted as a non-time-critical removal action, which will facilitate more rapid execution with decreased documentation requirements and result in significant cost savings to the project; and (3) the salt removal phase, to be conducted as a focused remediation project, evaluating several alternatives for the final disposition of the molten salt. The Action Memorandum for the time-critical removal action was submitted to the regulators on June 12, 1995.

A tank characterization system has been designed, fabricated, tested, and successfully used to safely retrieve radioactive sludge samples from the Gunite and Associated Tanks at ORNL. This

system is capable of performing selective sampling, video inspection, sludge depth measurement, and tank wall sampling within any radial location in radioactive tanks. The tank characterization system was developed and implemented in approximately 6 months as part of the Treatability Study Baseline Report.

3. TECHNICAL STATUS

3.1 OAK RIDGE Y-12 PLANT

The original mission of the Y-12 Plant, built adjacent to the city of Oak Ridge in 1943 as part of the Manhattan Project, was to separate the fissionable isotope of uranium (U235) by the electromagnetic process. Since the discontinuation of this process and until 1993 the facility evolved to support highly sophisticated manufacturing and development engineering associated with the production and fabrication of nuclear weapons components. Currently, the work force is refocusing the unique technical capabilities and expertise at the facility to provide (1) weapons dismantlement and storage, (2) enriched uranium material storage and management, (3) weapons process technology and development support, (4) renovation or decontamination and decommissioning of stand-by or shut-down buildings, (5) transfer of DOE-developed technology to enhance the competitiveness of the nation's industry in world-wide markets, and (6) maintenance and support of the National Security Program Office for DOE.

An additional facility priority is the clean-up or mitigation of environmental pollution resulting from past waste management practices on portions of the 800-acre site. The remedial action strategy integrates the numerous applicable federal and state regulations for efficient compliance and approaches both investigation and remediation efforts on a watershed basis. Three watersheds or hydrogeologic regimes have been identified at the facility: (1) Bear Creek, (2) Upper East Fork Poplar Creek (UEFPC), and (3) Chestnut Ridge.

3.1.1 Upper East Fork Poplar Creek

Description

The UEFPC Characterization Area (CA) consists of both surface water and groundwater components of the UEFPC watershed and appropriate sources located within that watershed. This complex CA, which contains multiple contaminants, multiple contaminant sources, and commingled plumes, is a point of origin for both off-site surface water and groundwater contamination. The CA is bounded (in general) by the base of Pine Ridge to the north and Chestnut Ridge to the south. The boundary extends westward, where it abuts the boundary of the Bear Creek CA, and eastward to the DOE property line. The CA will also address a carbon-tetrachloride contaminated groundwater plume that extends past the DOE property line and surface water in UEFPC to where the scope of Lower East Fork Poplar Creek (LEFPC) begins.

Numerous primary sources exist within the CA. Infiltration from the S-3 Area dominates contamination in the western portion of the CA. The Salvage Yard, the S-2 Area, and the 81-10 Area are also known contaminant source areas in the CA. There are approximately 200 additional Resource Conservation and Recover Act (RCRA) Solid Waste Management Units within the boundaries of the CA. Many of these Solid Waste Management Units are of known low priority as contaminant sources to the environment; however, approximately 100 of these sites need additional evaluation.

Because of the wealth of historical data available for this CA, a streamlined RI/FS approach has been proposed and accepted by the FFA parties. This approach will use historical data to the fullest extent possible to complete the RI/FS, it will focus additional data collection efforts on

Feasibility Study (FS) needs, and it will use uncertainty management techniques to bound rather than fill data deficiencies. Because the CA is underlain by an extensive storm sewer system, a subbasin approach will be used to link information from potential source areas (i.e., soil data and inventories) to historical surface water and shallow groundwater data. This approach, together with groundwater contaminant plume maps, will allow large areas of the plant (each subbasin) to be prioritized according to the relative contaminant contributions to surface water and groundwater.

In March 1994, DOE announced that elevated levels of four industrial solvents had been found in wells installed by the U.S. Geological Survey, located about 0.5 mile east of the Oak Ridge Y-12 Plant in the Union Valley Industrial Park. Elevated levels of these same solvents, which are known as volatile organic compounds, have also been found in groundwater monitoring wells at the Y-12 Plant. As a result of this finding, DOE is taking steps to determine the extent of the contaminated groundwater plume and the direction it is moving.

Accomplishments

The RI/FS data quality objectives session for the UEFPC hydrogeological regime was conducted on March 28–30. Several important agreements were reached with the regulators at this meeting: (1) agreement was reached on the boundary of the CA that focuses on the watershed of the Y-12 Plant and the off-site Maynardville plume; (2) agreement was reached that DOE industrial land use will be considered for the FS remedial alternatives; (3) agreement was reached on the proposal for a streamlined Remedial Investigation Work Plan (RIWP) format (a task team was formed to complete this item); (4) agreement was reached on the RI/FS approach of using existing data and data assessment techniques; and (5) near-term project activities were identified for FY 95 actions. Another task team was identified to investigate the dense nonaqueous-phase liquid (DNAPL) issues in this CA. A meeting summary was issued to the regulators, who approved items 1–3 and a streamlined RIWP format for the FFA Appendix E milestone, due September 30, 1995.

Building 81-10 was demolished by personnel from the Waste Management and Maintenance divisions. All building debris was removed from the job site and disposed of in the landfill. The Building 81-10 Demolition Project was the first of its kind to be submitted by Y-12 ER to the State Historical Site Preservation Office and to meet all the new requirements for demolishing a building at the Y-12 Plant.

A pre-data quality objectives meeting was conducted on March 22.

Efforts to modify the baseline to reflect new watershed strategy were begun.

Comments were received from TDEC on Union Valley Report (Y/ER-206/R1).

Concerns

None.

Scheduled Activities for Next Quarter

The RIWP (D1) will be submitted to the regulators for their review.

3.1.2 Bear Creek Valley

Description

The Bear Creek Valley comprises the following: groundwater, surface water, floodplain soils, the S-3 Ponds, the Oil Landfarm Waste Management Area, and the Burial Grounds Waste Management Area. The Oil Landfarm Waste Management Area consists of the Oil Landfarm Hazardous Waste Disposal Unit, Sanitary Landfill I, the Boneyard/Burnyard, and the Chemical Storage Area. The Burial Grounds Waste Management Area consists of Burial Grounds A, B, C, D, E, and J and Oil Retention Ponds 1 and 2. These units were used until the 1980s as the primary area for the disposal of various types of hazardous and nonhazardous wastes generated at the Y-12 Plant.

Groundwater, surface water, floodplain soils, and source units are being evaluated as a single OU to ensure that (1) a consistent approach to remediation is implemented across the valley and (2) remedial actions at specific sites are prioritized to achieve the greatest risk reduction. Groundwater, surface water, and floodplain soils in Bear Creek Valley will be characterized over an area that extends west from a topographic high near the west end of the Y-12 Plant (the S-3 Waste Management Area) to the point where Bear Creek exits the valley near State Highway 95.

The primary groundwater contaminants in the Bear Creek hydrologic regime are nitrates, volatile organic compounds, radionuclides, and, to a lesser extent, trace metals. DNAPLs have been discovered at a depth of 270 ft below the Bear Creek Burial Grounds. These liquids consist primarily of perchloroethylene, trichloroethylene, 1,1,1-trichloroacetic acid, and high concentrations of PCBs.

Below is a description of each of the source units in the Bear Creek Valley:

S-3 Ponds. The S-3 Ponds are part of the S-3 Waste Management Area. They were constructed in 1951 and consisted of four unlined surface impoundments covering an area of roughly 400 ft on each side, with a total storage capacity of about 10 million gal. During its operation, up to 5500 gal/d of effluent were pumped to the pond. Primary contaminants were nitrates and uranium, with lesser concentrations of heavy metals and organic solvents. In 1988, the S-3 Ponds were closed as a RCRA landfill. An asphalt parking lot was constructed over the cap to complete site closure.

Oil Landfarm Hazardous Waste Disposal Unit. The Oil Landfarm Hazardous Waste Disposal Unit was used for the land application of waste oils and coolants that contained beryllium compounds, depleted uranium, PCBs, and chlorinated organic compounds. Disposal operations were discontinued in 1982. In 1990, the site was closed as a landfill with a multilayered engineered cap.

Sanitary Landfill I. Sanitary Landfill I received various types of nonhazardous waste from the Y-12 Plant. Waste disposal at Sanitary Landfill I was terminated in 1982, and the site was graded, capped, and closed in 1983 in accordance with TDEC regulations for sanitary landfills.

Boneyard/Burnyard. The Boneyard/Burnyard consists of ~8 acres used from 1943 to 1970 as a disposal site for waste from the Y-12 Plant. Burning and disposal of debris and sanitary, metallic, chemical, and radioactive wastes are known to have occurred. The site has been abandoned and is predominately covered with grassy vegetation.

Chemical Storage Area. The Chemical Storage Area overlays the southeastern portion of the Burnyard/Boneyard. The Chemical Storage Area is ~2 acres in size and was used to burn or

neutralize liquid and gaseous wastes from 1975 until 1981. The Chemical Storage Area is presently covered with a RCRA-type cap.

Burial Grounds. Burial Grounds A, B, C, D, E, and J, located on the southern slope of Pine Ridge ~2 miles west of the Y-12 Plant, cover an area of about 5000 by 3000 ft. Each disposal unit consists of a series of trenches excavated to depths of 14 to 25 ft below grade. The trenches received a variety of hazardous and nonhazardous solid and liquid wastes. All hazardous waste disposal operations were discontinued in 1981. All trenches known to have received RCRA hazardous material have been capped as part of a RCRA closure.

Oil Retention Ponds. Oil Retention Ponds 1 and 2 were constructed to intercept seepage from burial trenches. Both ponds were RCRA-closed in 1990. A wide range of contaminants may have been disposed of in the Bear Creek Burial Grounds. Volatile organic compounds in soil resulting from groundwater transport are of primary concern.

The nature and extent of soil contamination within each of the listed source units and the nature and extent of groundwater, surface water, and floodplain soils contamination in Bear Creek Valley will be determined during the CERCLA investigation.

Accomplishments

Field screening of Bear Creek floodplain soils was completed on April 21, 1995. Screening for PCBs, radiation and volatile organic compounds was conducted. Off-site shipment of samples for comprehensive analysis based on the results of the screening was completed on June 26, 1995.

Concerns

Concern: Historical groundwater radionuclide data does not meet the detection limit requirements necessary to support the Human Health Risk Assessment. Additional groundwater sampling and analysis is required. **Impact:** There will be a schedule delay for the Bear Creek RI and FS reports. **Action:** The schedule impact will be evaluated and communicated to the regulators in the FFA project managers' meeting.

Scheduled Activities for Next Quarter

Bear Creek floodplain soils analysis and data validation activities will be completed.

Groundwater sampling for collection of radionuclide data will continue.

Work will continue on preparation of the RI and FS reports for Bear Creek Valley.

3.1.3 Bear Creek OU 2

Description

Bear Creek OU 2 consists of the Rust Spoil Area, Spoil Area 1, and the SY-200 Yard.

Rust Spoil Area. The Rust Spoil Area is located in Bear Creek Valley less than 0.5 mile west of the Y-12 Plant on Old Bear Creek Road. The Rust Spoil Area was used from 1975 to 1983 for the

disposal of spoil material generated during various renovation, maintenance, and construction operations at the Y-12 Plant. Disposed material was periodically graded, resulting in changes in topography and in filling of part of the Bear Creek channel. Approximately 100,000 yd³ of nonuranium-contaminated construction spoils were disposed of at the site. Small quantities of solvent-contaminated material and material containing asbestos, mercury, and uranium may have been disposed of in this area. Soil contamination is of primary concern.

Spoil Area 1. Spoil Area 1 is located near the southwest end of the Y-12 Plant, bounded by Old Bear Creek Road and West Patrol Road. Spoil Area 1 was used for the disposal of ~100,000 yd³ of nonhazardous, nonradiologically contaminated construction debris. Although plant controls eliminated the disposal of hazardous and radioactive wastes, past plant practices indicate that some of the construction material may have been contaminated with trace amounts of asbestos, mercury, beryllium, thorium, and uranium.

SY-200 Yard. The SY-200 Yard is a 200- by 300-ft aboveground storage area located adjacent to Old Bear Creek Road. Materials from several Y-12 and ORNL divisions included PCB transformers, lead shielding plates, and radioactively contaminated materials. Soil contamination is of primary concern.

Accomplishments

The FS Report (D2) was issued for regulator approval on April 28, 1995.

The Proposed Plan (D1) was issued for regulatory review on June 1, 1995. The preferred alternative includes maintenance of existing caps at Spoil Area 1 and the SY-200 Yard and evaluation of groundwater contamination from the Rust Spoil Area in the Bear Creek OU RI/FS.

Concerns

None.

Scheduled Activities for Next Quarter

After the Proposed Plan is approved, it will be available to the public for a 30-day review.

Work will begin on preparation of the Record of Decision (ROD) (D1).

3.1.4 Chestnut Ridge OU 2

Description

Chestnut Ridge OU 2 consists of the Filled Coal Ash Pond and Upper McCoy Branch. The Filled Coal Ash Pond is situated within the McCoy Branch watershed about 0.5 mile south of the Y-12 Plant. The pond was constructed in 1955 to serve as a settling basin for coal ash from the Y-12 steam plant. By 1967, the pond had filled, spilling sediments directly into McCoy Branch. From 1967 to 1989, ash was carried within McCoy Branch to Rogers Quarry, about 0.5 mile downstream of the Coal Ash Pond.

Impacts to surface water, stream sediments, and groundwater from metals, including uranium and major ions, are of concern. Biomonitoring of aquatic organisms in McCoy Branch and Rogers Quarry has shown a biological impact potentially from the ash pond operations.

Accomplishments

The Proposed Plan (D2) was issued for regulatory approval on May 25, 1995. The proposed alternative includes dam stabilization, surface water controls, and environmental enhancements. The surface water diversion component originally included in the preferred alternative was deleted due to uncertainties regarding its effectiveness.

Concerns

None.

Scheduled Activities for Next Quarter

Preparation of the ROD will continue.

3.1.5 Reduction of Mercury in Plant Effluents (RMPE)

Description

The RMPE subproject has undergone a major rescoping activity to define projects required to support the Clean Water Act, National Pollutant Discharge Elimination System (NPDES) requirements. The formal Baseline Change Proposal has been submitted. The new project scope consists of the Mercury Use Building Source Elimination and the Mercury Treatment Facility.

Mercury Use Areas. From 1955 through 1963, a column-exchange process involving large quantities of mercury was employed to separate lithium isotopes. The Mercury Use Areas include buildings and other facilities that have been designated as possible sources of mercury contamination because of known, suspected, or presumed releases. The area of investigation includes soils surrounding and drainages associated with the following buildings and adjoining areas: 9201-2, 9201-5, 9202, 9204-4, 9733-1, 9733-2, and mercury flask storage areas and deflasking facilities.

Mercury Use Building Source Elimination. Mercury-contaminated storm drains and sumps in the Mercury Use Building—which consists of buildings 9201-2, 9201-4, 9201-5, and 9204-4—will be bypassed by the installation of new piping that will provide for a clean transport of water from the building. This activity will be conducted in a phased manner.

Interim Mercury Treatment Unit. A new on-line effluent treatment process will be installed in Building 9201-2 to remove mercury from Y-12 Plant storm water. The design is for a demonstration treatment process with associated pumps and piping to collect the contaminated sump water for treatment. Following startup and demonstration of the interim facility capabilities, technical work will focus on optimization of the system components up to and including total system replacement, if cost justified, to meet NPDES requirements.

Central Mercury Treatment Facility. The mercury-contaminated waters from the Mercury Use Building sumps (9201-4, 9201-5, and 9204-4) will be collected, and long-term treatment will

be performed at the Central Mercury Treatment Facility. The facility will be housed at the existing Central Pollution Control Facility.

Accomplishments

Design for the 9204-4 source elimination work was kicked off April 11.

The Central Mercury Treatment System project has been designated an Engineering Projects Information Center (EPIC) (Task Order Project), and the task order proposal is being prepared. The demolition and removal design is complete.

A Conduct of Operations Matrix Assessment has been approved for the RMPE sampling and ESD/development field activities.

A study has been started to evaluate upgrading the Interim Mercury Treatment Unit to a permanent system by replacing the disposable carbon columns with permanent elements.

Concerns

Concern: The latest NPDES permit requires UEFPC to be at state water quality standard for mercury on the last day of the permit. **Impact:** This is unattainable and will require that the permit be appealed. **Action:** The ongoing CERCLA activities for UEFPC, which will result in a Proposed Plan and ROD, will be considered as a vehicle to obtain relief from the NPDES permit requirements. Under the current RI/FS schedule, the ROD will not be complete by the last day of the permit, and other interim alternatives under the CERCLA process are being considered.

Scheduled Activities for Next Quarter

None.

3.1.6 Kerr Hollow Quarry

Description

Kerr Hollow Quarry was a former rock and gravel that was abandoned in the late 1940s when it filled with water. Since at least 1951, the Y-12 Plant and ORNL have used Kerr Hollow Quarry for the treatment of water-reactive materials and potentially explosive chemicals and for the disposal of empty compressed gas cylinders. Kerr Hollow Quarry was not intended for use as a hazardous waste storage or disposal facility—it was used strictly for the emergency handling of reactive, corrosive, and ignitable wastes when personnel safety was of primary concern.

Kerr Hollow Quarry was a permitted facility under NPDES Permit No. TN 0002968-Outfall 301 for the treatment of certain potentially explosive chemicals or water-reactive metals. The permit required monitoring the Kerr Hollow Quarry outfall following a treatment operation, with results reported quarterly to TDEC.

The empty compressed gas cylinders, positioned on the northwest bank of the quarry, were removed from the area and returned to the Y-12 Plant for disposal. Prior to the early 1970s,

however, such gas cylinders were discarded in the quarry. A RCRA closure was completed on this project, which removed the remaining cylinders from the quarry.

Accomplishments

The Proposed Plan (D2) was approved by the regulators, and it was released for public comment on June 12, 1995.

Concerns

None.

Scheduled Activities for Next Quarter

The ROD (D1) will be submitted to the regulators for their review. An extension was received on this milestone.

3.1.7 RCRA Closures

Description

This subproject consists of three areas: (1) the Building 9409-5 Diked Tank Storage Facility, (2) the Garage Underground Storage Tanks, and (3) the Interim Drum Yard.

YS-017 Building 9409-5 Diked Tank Storage Facility. The Building 9409-5 Diked Tank Storage Facility is a RCRA, outdoor, concrete, diked area with a capacity of approximately 238,000 gal. This facility was constructed in 1942 as a four-cell cooling tower basin, but it was modified in 1980 for use as a secondary containment facility for tanks and drums of liquid waste. These tanks and drums have contained, at various times, liquid waste coolant, solvents, and waste oils, all of which may have contained PCBs. Some of the waste liquids stored in this facility were known to have contained uranium and beryllium. Chromium may be present as a result of the water treatments used during cooling tower operations. All tanks have been removed from the facility, and the closure plan has been submitted. Closure plan approval is pending.

YS-019 Garage Underground Storage Tanks. The Garage Underground Storage Tanks were part of an on-site facility for servicing motor vehicles. This facility included a gas station with associated underground fuel tanks, underground piping, dispensing pumps, a building, and ancillary fixtures. Two tanks were previously used to store unleaded gasoline (a 20,000-gal tank) and leaded gasoline (a 10,000-gal tank). The tanks were subsequently diverted from their initial use to the storage of waste oils containing the spent solvents perchloroethylene and Freon-113 and measurable quantities of PCB and uranium. A third empty tank in the same dirt emplacement with the two RCRA tanks contained waste oil that was not hazardous as defined by current regulations.

Surface soil shows evidence of spills/leaks that occurred during sampling and transfer operations. These tanks were originally gasoline storage tanks and were later converted to store the following:

Largest tank: unleaded gasoline, 1975 to 1979; waste oil, 1980 to present

Smaller tanks: gasoline, 1962 to 1979; waste oil, 1980 to present

Clean closure of the tanks began in 1988 with the excavation, decontamination, and removal of the tanks; the sampling of surrounding soil; and the removal of contaminated soil. As a subproject, the three contaminated tanks were cleaned and removed in early 1994. The RCRA closure package—which includes closure certification by the independent Registered Professional Engineer, the closure summary report, and supporting closure documentation—has been transmitted to the state regulators for review.

YS-030 Interim Drum Yard. The Interim Drum Yard west of Building 9720-32 is a RCRA, outdoor, tented storage facility for containerized hazardous waste. Drums are stored on wooden pallets placed on gravel lined with a plastic tarp covering native soil.

Wastes stored at the facility consist of mercury, metals, acrylonitrile, methylene chloride, organics, Freon-113, cyanide, PCBs, uranyl nitrate, penetrant solution and emulsifiers, asbestos, and sodium hypochlorite.

Soil sampling indicated that the underlying surface soil and gravel were contaminated. All waste stored at this site was shipped off site for final disposal or transferred to a RCRA-permitted storage facility on the ORR. The tent structures and diking were also removed to prepare the site for sampling and characterization activities. Analytical results indicated that the soil in two areas had some contamination above RCRA clean closure criteria for cadmium and mercury. Spot soil removal is proposed for these two areas, and after three attempts at overexcavation, the site would be closed with contamination in place. Any further investigatory or remedial action would be conducted according to the requirements of CERCLA. Closure Plan approval is pending.

Accomplishments

Approval of the RCRA Closure Plan for the Garage Underground Storage Tanks (GUST) has been received and final clean closure has been completed.

The Closure Plan for the Interim Drum Yard and Diked Tank Storage Facility was submitted to the regulators for approval.

Concerns

None.

Scheduled Activities for Next Quarter

None.

3.2 OAK RIDGE NATIONAL LABORATORY

ORNL occupies ~3560 acres in Melton Valley and Bethel Valley, 10 miles southwest of downtown Oak Ridge, Tennessee. ORNL's missions are to conduct applied research and engineering

development in support of DOE programs in nuclear fusion and fission, energy conservation, fossil fuels, and other energy technologies and to perform basic scientific research in selected areas of the physical, life, and environmental sciences. The laboratory was built in 1943 as part of the World War II Manhattan Project. Its original mission was to produce and chemically separate the first gram quantities of plutonium as part of the national effort to produce the atomic bomb. ORNL's remediation sites are organized into WAGs based on drainage area and similar waste characteristics.

3.2.1 ORNL WAG 1 Gunite and Associated Tanks

Description

This area consists of the underground steel and Gunite tanks associated with two tank farms located in the center of the ORNL main plant area. The Gunite and Associated Tanks area includes the tanks located in the North and South Tank Farms as well as tanks TH-4 and W-11. The Solid Waste Management Units within this area are primarily the large Gunite tanks installed to store liquid wastes in 1943 and subsequently used as the main holding tanks for the LLLW system at ORNL. A number of steel tanks associated with the North Tank Farm are also included in this area. The strategy of this grouping is to allow those tanks that are geographically similar to be remediated as a group.

The Gunite and Associated Tanks area is commonly referenced as three separate tank groups:

- South Tank Farm Waste Tanks W-5, W-6, W-7, W-8, W-9, and W-10;
- North Tank Farm Waste Tanks W-1, W-2, W-3, W-4, W-13, W-14, W-15, and W-1A; and
- Building 3550 Laboratory Waste Tanks TH-4 and W-11.

Accomplishments

The Baseline Treatability Study Work Plan (D1) was submitted to the regulators on June 30, 1995.

The Phase 2 Sampling and Analysis Plan was completed for a floating boom that deploys a clamshell sampling device to obtain sludge and debris samples near the tank walls. The boom will also be used to deploy a new underwater camera system that will videotape the conditions on the tank floor, walls, and dome.

Phase 2 sampling activities were initiated, and sludge and debris samples were successfully collected with the floating boom.

Planning is under way for performing necessary maintenance of the tank Cold Test Facility at WAG 5 for use on cold tests of sluicing and/or sampling equipment.

Design packages were issued for the site preparation and facility modifications required for tanks W-3 and W-4.

Technical specifications were issued for the modified light duty utility arm.

Concerns

None.

Scheduled Activities for Next Quarter

Continue design of systems for treatability studies that include the high-efficiency particulate air filter system, the equipment package, the modified light-duty utility arm, and confined sluicing.

Continue study of alternative options for waste disposal, including Melton Valley storage tanks operations analysis, sludge transport and alternatives, and verification/grouting treatment options.

Continue Phase 2 sampling activities in support of the Treatability Study.

3.2.2 ORNL WAG 1 Core Hole 8***Description***

The Core Hole 8 plume of contaminated groundwater was discovered during groundwater investigations in WAG 1. The project received its name after rock and groundwater samples taken from Core Hole 8 (a sampling site in the main plant area of ORNL) were found to be contaminated with ^{90}Sr —a radioactive substance. This discovery provided a key that enabled investigators to understand how groundwater contaminated with ^{90}Sr was getting into ORNL storm drain systems. The plume originally flowed into the ORNL storm sewer system and from there into First Creek. First Creek empties into White Oak Creek (WOC), which in turn feeds the Clinch River near ORNL. The source of contamination in the plume is unknown, but projects have been identified to investigate potential sources. A system was designed to collect, transfer, and treat contaminated groundwater from an underground stream before it enters storm sewers at ORNL. From three catch drains, the groundwater is pumped to ORNL's Process Waste Treatment Plant where contaminants are removed and the treated water is released.

Accomplishments

Post-construction monitoring to determine the success of the removal action was completed, and it was determined that Phase II is not necessary. The amount of ^{90}Sr released into First Creek was reduced by an average of 86%.

The system continues to function as designed. All construction activities were completed except asphalt repairs and removal of the temporary site access road.

Concerns

None.

Scheduled Activities for Next Quarter

Submit the Remedial Action Report to the regulators for their review.

3.2.3 Process Waste Treatment Plant Surge Capacity Upgrade

Description

The purpose of this project is to provide improved surge capacity for Process Waste Treatment Plant. Effluent from certain containment dikes, above and below grade collection sumps at ORNL, is pumped to the Process Waste Treatment Plant for treatment prior to release. During peak seasonal rainfall periods, the capacity of the Process Waste Treatment Plant is exceeded, so additional holding or surge capacity is needed to ensure proper treatment. Currently, surge capacity is provided by existing 350,000-gal tanks, the 3524 Equalization Basin, and the 190 Process Waste Ponds. The Equalization Basin and Process Waste Ponds will be taken out of service by the Surface Impoundment OU of WAG 1, so construction of additional surge capacity is needed. This additional capacity will be ensured through the addition of a 1,000,000-gal tank with transfer pumps and a jet mixer installed in a concrete dike.

Accomplishments

Significant construction progress continues, including essential completion of the 650,000-gal concrete containment basin. Structural steel, piping, and the electrical portion of project are progressing. Piping tie-ins to existing process waste and utility lines were completed.

Concerns

None.

Scheduled Activities for Next Quarter

Construction will continue and tank erection will be initiated.

3.2.4 ORNL WAG 1 Surface Impoundments OU

Description

This OU consists of four surface impoundments located in the south central portion of the Bethel Valley ORNL facilities complex. A brief description of each of the four impoundments follows.

Basin 3513. This unlined impoundment was constructed in 1944 to serve as a settling basin for untreated waste waters prior to their discharge into adjacent WOC. This impoundment is no longer used, but water is kept in the pond to provide shielding for radioactive sediments.

Basin 3524. Basin 3524, frequently referred to as the Equalization Basin, was an intermediate storage, collection, and mixing basin for the process waste treatment system located in Building 3544. Now it is only used for surge capacity for storm events.

Basins 3539 and 3540. ORNL Basin 3539 and Basin 3540, constructed in 1964 and frequently referred to as the 190 Ponds, were formerly used as surge ponds to receive process waste streams, primarily from the Building 4500 complex. The waste streams are split into identical, parallel basins and monitored primarily for radionuclides before discharge either to the process waste treatment

system via Basin 3524 or to WOC. Currently the ponds are only used as surge capacity for the collection of storm water during peak storm events.

Accomplishments

The RI/FS (D1) was submitted to the regulators on May 12, 1995, for review and comments.

As part of the streamlined approach for environmental restoration pilot initiative, preparation began for an independent commercial/industrial cost estimate for remediation of the surface impoundments utilizing the alternatives identified in the FS.

Concerns

None.

Scheduled Activities for Next Quarter

Begin drafting the Proposed Plan.

3.2.5 ORNL WAG 1 Groundwater

Description

The WAG 1 groundwater activities focus on shallow groundwater that discharges to surface streams within WAG 1. The potential exists for contaminant migration from various sources within WAG 1 through both shallow and deeper groundwater to off-WAG receptors. This project is entering into a period of monitoring and characterization to identify contaminant sources and their migration pathways, with the objective of identifying potential locations for early actions.

Accomplishments

Analytical results from the first round of sampling have been received and analyzed. The results suggest that contaminants concentrations are increasing, particularly in the western portion of the WAG.

Concerns

None.

Scheduled Activities for Next Quarter

A second round of samples will be obtained, and preparations will begin to initiate source investigations early in FY 1996.

3.2.6 Inactive Liquid Low-Level Radioactive Waste Tanks

Description

LLLWs have been collected at ORNL since 1943 in tank systems used for the storage, transfer, and treatment of the collected LLLW. Some of the tanks are no longer in use and have been classified as removed from service. Liquids and sludges remain in many of the tanks, with several tanks receiving inleakage from groundwater and rainwater. The tanks are located in WAGs 1, 5, 8 and 9.

Accomplishments

Site investigation of the Batch I, Series 1 tanks (inactive LLLW tanks 3013, 3001-B, 3004-B, and T-30), was completed.

Verbal approval was received from the regulators to proceed with removal or in-place stabilization of the Batch I, Series 1 tanks as a maintenance activity rather than a CERCLA activity. Because the CERCLA streamlined Risk Assessment showed that the risk from these tanks is already within acceptable limits, there is no CERCLA driver. The letter documenting the decision to proceed with remediation as a maintenance action has been sent to the regulators.

W-12: The W-12 Valve Pit Decontamination Project was on hold awaiting the installation of the containment enclosure. The installation activities began on June 27 with the relocation of the gantry assembly to its position over the W-12 pit. The tent frame installation was scheduled to begin June 30. After the frame assembly is complete, the GM bridge and trolley will be installed prior to installing the tent fabric. Completion of the tent installation is tentatively scheduled on or before July 7.

Nonprogrammatic Inflow: Two more drains were located west of Building 3030 and have been tentatively identified as hot drains. The loose-fitting caps were sealed with urethane caulk and the mesh and rock cover replaced over the locally contaminated soil. This action may stop further addition of contamination to the soil and/or limit groundwater seepage into the LLLW system.

WC-19 Alternative Study: A study is being conducted of alternative methods for maintaining a reduction in radioactive levels and clarity of the water in the Building 3001 Storage Canal and its dependency to Tank WC-19. Methods for eliminating the use of Tank WC-19 include various options for bypassing the tank by changing systems or rerouting discharges to process waste. Considerations also include eliminating the need to remove radioactivity and clarify the canal water by grouting the canal solid.

Concerns

None.

Scheduled Activities for Next Quarter

In July 1995, partial rerouting of ground water and rainwater will be attempted. Plans are to caulk nine topside filter plugs, which may reduce unsteady inflows.

The WC-14 Remedial Action Report will be submitted to the regulators for review.

Complete the site investigation for the Batch I, Series 2 inactive LLLW tanks (tanks WC-1, W-19, W-20, and H-209) and Batch I, Series 3 inactive LLLW tanks (tanks W-19 and W-20).

Complete Maintenance Action Work Plan and initiate maintenance activity field work for removal or in-place grouting of Batch I, Series 1 tanks.

3.2.7 Active Liquid Low-Level Radioactive Waste Tanks

Description

LLLWs have been collected at ORNL since 1943 in tank systems used for storage, transfer, and neutralization. The stated objective of the FFA as it relates to the tank systems (Appendix F) is to ensure structural integrity, containment, detection of releases, and source control pending final remedial action at the site. The FFA requires that leaking LLLW tank systems be immediately removed from service. It also requires that LLLW tank systems that do not meet the design and performance requirements established for secondary containment and leak detection be either upgraded or replaced.

Accomplishments

Valve Replacement: Valve replacement or upgrade activities required to support leak testing of active LLLW piping segments have been completed.

Cathodic Protection: The systems test results for the cathodic protection equipment for the Phase I systems (6A, 14, and 16) have been received. The test results indicate that the equipment is functioning properly and will provide effective cathodic protection of the LLLW piping.

Installation of cathodic protection equipment on System 20 piping between valve box 1A and valve box 1 has been completed. Installation of equipment on the other Phase II systems (9 and 21) is on hold pending receipt of materials.

Treatment of PCBs in WC-14 Tank Sludge: A time-critical removal action was performed on Tank WC-14. The waste inventory of Tank WC-14 was reduced on May 24, 1995, by removing 376 gal of liquid in accordance with the actions described in the *Action Memorandum for the Waste Area Group 1 Tank WC-14 Removal Action at ORNL* and its subsequent revision. The liquid removed from the tank was solidified by using an absorbent solid material (brand-named RADSORB). The inventory of the tank was reduced to approximately 15% of the tank's rated capacity of 1000 gal. The objectives of the removal action, as described in the Action Memorandum and subsequent revision letter, were met.

3025 Source Treatment Study: Alternative planning has continued for the Irradiated Materials Examination and Testing Facility located in Building 3025. A source treatment method for removal of cobalt-60 from Irradiated Materials Examination and Testing Facility electropolishing waste solutions has undergone further testing and is ready for demonstrating with actual waste. Flow-through column tests and bench scale batch testing have been conducted with nonradioactive surrogate wastes of differing composition, some spiked with actual waste samples. Test results were successful, demonstrating the flexible nature of the treatment process. The alternative plan for

Building 3025, including all other waste generating activities, is being reevaluated to ensure the incorporation of the Irradiated Materials Examination and Testing Facility source treatment activities along with bottling and transportation plans.

LLLW Transfer Cask Study: Design activities were initiated this quarter for the transfer cask needed for transport of liquid waste from several ORNL facilities to the central LLLW evaporator system. The study was initially focused on Building 3047 activities, but the scope was expanded to identify cask design needs for buildings 3525, 3517, and 7920. A preliminary cask concept was developed for Building 3047 based on waste volume and composition data for the facility. In addition, documentation is being reviewed for a licensed cask that might be used as an overpack for an inner container for holding LLLW.

Technical Support and Documentation: A meeting of the Technical Advisory Group for the ORNL LLLW FFA program was held May 18-19 in Oak Ridge. The meeting focused on special issues raised by the Technical Advisory Group at their previous meeting, including the application of risk-based prioritization to waste management project planning and the preparation of structural integrity assessments for active, singly contained LLLW tank systems. The agenda also included presentations to update Technical Advisory Group members on ongoing activities affecting active and inactive tank systems.

Concerns

None.

Scheduled Activities for Next Quarter

The FFA Technical Advisory Group will meet on September 20-21, 1995.

The following D1 documents will be submitted to the regulators for review:

- Structural Integrity Assessments for Category C Tanks and Pipelines,
- Bethel Valley FFA Upgrade Line Item Design Assessment,
- Annual Status Report on FFA Compliance for LLLW Tank Systems for FY 1995, and
- Implementation Plan for LLLW Tanks for FY 1995 at ORNL Under the FFA (D1).

3.2.8 ORNL WAG 2

Description

ORNL WAG 2 includes two sites. The first site consists of the area encompassed by the stream channels of WOC and Melton Branch; the second site includes White Oak Lake (WOL), White Oak Dam, and the White Oak Creek Embayment prior to confluence with the Clinch River. WOC, WOL, and its tributaries represent the major drainage system for ORNL and the surrounding facilities.

WOC and its tributaries are located in Melton and Bethel valleys. WOC flows into the Clinch River at River Mile 20.8, about 1.5 miles north of the junction of Interstate 40 and State Highway 95. WOL is located upstream of WOL Dam and just south of the ORNL main complex. White Oak Creek Embayment encompasses the area downstream of WOL Dam to the confluence

of WOC with the Clinch River (0.6 miles). WOL is a surface impoundment that serves as a final settling basin for particle-reactive contaminants from ORNL operations and waste storage areas. Contaminants of concern identified to date are ^{90}Sr ; ^{137}Cs ; ^{60}Co ; thorium; uranium; transuranics; metals (mercury, zinc, and chromium); and some organic compounds (including PCBs) located primarily in bottom sediments.

Site-wide surface water assessment activities will continue under this Activity Data Sheet as the ORNL Area Surface Water Program. Groundwater assessment activities will continue as the ORNL Area Groundwater Program under a separate Activity Data Sheet (3315). By drawing together data collection and assessment activities, the Surface Water and Groundwater programs will provide ER the management tools needed for timely decision making to conduct remedial actions with maximum efficiency and cost effectiveness.

Accomplishments

A round of baseflow samples from Melton Branch, just upstream and downstream from Seep Area C and Seep Area D in WAG 5, was completed. Samples were analyzed principally for ^{90}Sr to determine the overall effectiveness of the removal actions in reducing the ^{90}Sr flux from these two seep areas. The regulatory permitting and approval process was initiated for restoration of the main weirs on WOC and Melton Branch prior to their confluence (i.e., removal of accumulated sediments) by conventional dredging and clean-out operations.

Bathymetry data was evaluated to determine subsequent lake bottom sediment coring locations and the sediment fill-up rate of the lake so that the function of WOL as a retention area for sediment transport prior to going off site can be evaluated.

Evaluation continued of floodplain soil characterization, WOL bathymetry, erosion rates, and Intermediate Holding Pond radiological inventory data to determine the potential for off-site transport of contaminated sediments and for uptake of contamination by biota.

Surface water samples were collected and analyzed on Bearden and Raccoon creeks to evaluate whether WAGs draining into these unmonitored streams may potentially contribute to off-site contaminant fluxes.

Concerns

None.

Scheduled Activities for Next Quarter

Complete development of preliminary data packages for assessment of radionuclide distributions and inventory in WAG 2.

Complete clean out of the main weirs on WOC and Melton Branch.

The WAG 2 Surface Water Environmental Restoration Monitoring and Assessment Report (not an FFA milestone) will be submitted to the regulators for their information.

3.2.9 ORNL WAG 4 Seeps Collection and Treatment

Description

WAG 4 is located in Melton Valley immediately south of the main plant area through a gap in Haw Ridge. This WAG is comprised of three areas: (1) a shallow land burial ground containing radioactive and hazardous wastes, (2) two pilot-scale LLLW waste seepage trenches, and (3) an underground pipeline used for transferring liquid radioactive wastes from the main plant area to waste pits and trenches (WAG 7).

Accomplishments

The Phase 2 Site Investigation field activities were completed in June 1995.

Concerns

None.

Scheduled Activities for Next Quarter

Initiate the focused Proposed Plan for Interim Action.

3.2.10 ORNL WAG 5

Description

ORNL WAG 5 comprises 16 remediation sites, including LLLW transfer lines and leak sites, hydrofracture surface facilities, waste storage tanks, a sludge basin and a holding pond, and a shallow land burial ground containing radioactive and hazardous wastes [Solid Waste Storage Area (SWSA) 5]. The major contaminants detected in shallow groundwater are ^{90}Sr and ^3H .

Two separate projects are under way in this WAG at this time. The WAG 5 RI is collecting, analyzing, and reporting data for use in remediation planning. A second project was initiated to collect and treat water from two contaminated seeps into Melton Branch that were contributing significant amounts of ^{90}Sr to WOC.

Accomplishments

WAG 5 RI:

The electronic deliverable for transfer of WAG 5 data to OREIS was completed.

WAG 5 Seeps Collection and Treatment:

The Seep C treatment system captured 81 mCi of ^{90}Sr during the months of April and May, which resulted in an average 21% reduction at White Oak Dam.

The Seep D treatment system captured 55.6 mCi of ^{90}Sr during the months of April and May, which resulted in a 14% reduction at White Oak Dam.

The WAG 5 Seeps C and D Post-Construction Report (D2) was issued to the regulators for approval.

Concerns

None.

Scheduled Activities for Next Quarter

Continue Seep C and Seep D operations and monitoring.

Submit the D2 version of the WAG 5 RI Report to the regulators.

3.2.11 ORNL WAG 6

Description

ORNL WAG 6 consists of SWSA 6, the Emergency Waste Basin, and the Explosives Detonation Trench. SWSA 6 is located northwest of WOC near White Oak Dam and State Highway 95. This 68-acre site is still in operation as a waste burial ground for solid low-level radioactive waste. Contaminants of concern include radionuclides and hazardous chemicals.

The Emergency Waste Basin is located north of SWSA 6. It is a 2-acre basin constructed as an LLLW or process-waste holding basin for use when ORNL might be unable to release wastes to WOC. The basin has never been used, and no releases have been detected in the stream leaving the basin; however, surface contamination has been found in the basin.

The Explosives Detonation Trench is located in the eastern central part of SWSA 6. It was used to detonate explosives and shock-sensitive chemicals requiring disposal. Explosive wastes were laid in the bottom of the trench and detonated with a small plastic explosive charge. No releases are believed to have occurred.

Accomplishments

The Annual Report of Monitoring Activities was submitted to the regulators for their information.

Concerns

None.

Scheduled Activities for Next Quarter

Complete baseline sampling of groundwater monitoring wells and surface water devices by September 30, 1995.

Submit the Environmental Monitoring Plan to regulators for approval by September 20, 1995.

3.2.12 ORNL WAG 7 In Situ Vitrification

Description

In situ vitrification (ISV) has been selected as the baseline closure technology for several pits and trenches at WAG 7. The ISV activity will continue in FY 1995 with a field-scale demonstration of two adjacent melts in Pit 1 whereby contaminated soil particles will be melted into a glass matrix. A Treatability Study will provide necessary information regarding the design, implementation, and performance of ISV for Pit 1 and other sites with known similar soil contamination. Pit 1 was selected for the demonstration because of its limited size (30,000 ft³) and radionuclide inventory (87 Ci of mixed fission products). The major objectives of ISV-related work in FY 1995 include completing design and fabrication of the ISV off-gas filter system and collection hood; completing the Pit 1 site characterization; completing all environmental, safety, and health documents; and obtaining approval for performing the technical specifications. The technical objectives to be accomplished for ISV-related work are the following:

- attaining the required depth for incorporating source contamination,
- demonstrating field procedures for overlapping at least two melts,
- demonstrating off-gas handling techniques for any volatilized ¹³⁷Cs,
- demonstrating adequate site characterization techniques, and
- promoting stakeholder acceptance.

Recent findings have indicated that some radionuclides can be readily volatilized from soil during thermal treatments. In some cases, volatilization of the radionuclide is preferable to retention in an ISV melt. The thermal soil decomposition studies initiated in FY 1994 for ¹³⁷Cs, ⁹⁰Sr, ⁹⁹Tc, and radioactive U contaminants will be summarized in a technical report in FY 1995. These data will constitute a valuable adjunct in the evaluation of ISV as a closure technology.

Accomplishments

ISV Off-Gas Hood Design and Fabrication: The design review was conducted for the off-gas hood. Orders were placed for the ISV off-gas prefilter system consisting of (1) the piping and control valves and (2) the high-efficiency particulate air filter prefilter housings. Construction piping was completed and shipped to ORNL. The high-efficiency particulate air filter housing and filters are nearing completion.

Pit 1 Site Characterization: Elemental analyses of lithium borate fusions of core samples of dense weathered rock underlying Pit 1 were completed. Two slug tests were completed to determine the hydraulic conductivity of Pit 1 soil fill above the maximally contaminated depth to evaluate the potential for dewatering the pit. Plutonium and uranium analyses of maximally contaminated soil from Pit 1 was completed, which confirmed that initial concentration assumptions were valid. Calculated conductivities proved too low for significant dewatering of Pit 1 prior to the melt.

Pit 1 ISV Run Preparation: Site preparation and transportation plans for large-scale ISV system trailers were completed. Preparation of the site-specific test plan and safe operating procedure for the large-scale ISV equipment and off-gas hood for Pit 1 ISV operations are nearly

complete. Site preparations were completed, including grading with gravel, covering site gravel, setup of large scale ISV equipment, and installing thermo couples and vents.

Supporting Documents: The readiness review, site health and safety, waste management, and quality assurance project plans were completed.

Concerns

None.

Scheduled Activities for Next Quarter

Complete test plans and safe operating procedures for large-scale equipment and off-gas hood.

Set up the ISV hood and equipment.

Complete off-gas hood design and fabrication.

Initiate ISV melt operations and complete the first of the three melts.

3.2.13 ORNL WAG 10 Hydrofracture Wells Plugging and Abandonment

Description

The objective of this work is to plug and abandon WAG 10 injection wells, deep observation and monitoring wells, and deep boreholes that are not suitable for recompletion and use as groundwater monitoring wells.

Accomplishments

Review comments regarding the March 1995 Site Characterization Summary Report for WAG 10 wells at the Old Hydrofracture Facility were received from TDEC and EPA.

The Plugging and Abandonment Options Analysis Report for Old Hydrofracture Wells in WAG 10 was completed. The report can be used as the basis of a general plugging and abandonment approach for most WAG 10 wells and as a more focused strategy for the Old Hydrofracture Facility wells characterized in FY 1994.

Wellhead tapping and sampling was initiated for 21 wells associated with the New Hydrofracture Facility at ORNL.

Concerns

None.

Scheduled Activities for Next Quarter

Prepare responses to regulatory review comments regarding the Site Characterization Summary Report for WAG 10 wells at the Old Hydrofracture Facility.

Continue tapping and sampling and initiate geophysical logging of 21 New Hydrofracture wells.

3.2.14 ORNL Area-Wide Groundwater Program

Description

Groundwater flowpaths and restoration activities are not constrained by WAG boundaries. Therefore, groundwater activities associated with individual contaminant/WAG source OUs have been integrated over a larger geographic area. The area-wide groundwater OU underlying of Melton Valley and Bethel Valley has been established and will be the focus of multi-year, long-term characterization and monitoring activities. Focused remedial actions will be implemented as required.

Accomplishments

A summary plan was prepared for development and installation of a hydrofracture grout sheet and west Melton Valley groundwater monitoring system. The plan describes the design and installation of a groundwater monitoring system for the western portion of Melton Valley at ORNL, which will identify and quantify contaminants from waste disposal facilities that may migrate to the Clinch River or beyond.

Concerns

None.

Scheduled Activities for Next Quarter

Continue sampling and measurements at Hydrostatic Head Monitoring Station wells and other existing well locations.

Continue development of the plan for the west Melton Valley and hydrofracture grout sheet monitoring system.

Continue compilation and assessment of groundwater data.

3.2.15 Molten Salt Reactor Experiment Uranium Remediation Project

Description

The MSRE is located in Building 7503 at WAG 8 in Melton Valley. Part of the AEC's Molten Salt Reactor Program, MSRE was built to investigate the concept for central power station applications. The reactor first went critical on June 1, 1965, and was shut down on December 12, 1969. A surveillance and maintenance program was initiated on the shut down facility. In 1990, elevated radiation readings indicated migration of radioactive contamination outside the fuel drain tank cells. Subsequent analyses and tests showed evidence of UF₆ present in the Auxiliary Charcoal Bed, located in the Charcoal Bed Cell.

A Remediation Program Plan was formulated in 1993 and immediate actions to place the facility in a safer condition were initiated in 1994. Water was removed from the Charcoal Bed Cell,

a criticality alarm was installed, and personnel were relocated from office spaces in buildings 6503 and 7509.

A senior review board of independent, recognized nuclear industry experts performed an assessment of the MSRE remediation project in February 1995. The board noted that actions already taken at the facility, currently in progress, or planned for the near future, have been and will be effective in reducing the risks at MSRE. The board also noted that the facility is in a safer condition than it was a few months ago.

Accomplishments

All water was drained from the Charcoal Bed Cell, and steps were taken to prevent encroachment of water sources to the cell to eliminate the risk of criticality. The Charcoal Bed Cell has been inserted by filling it with CO₂ to lower the impact of a highly unlikely carbon-fluorine exothermic chemical reaction within the cell. An updated Criticality Accident Alarm System was installed after failure of the temporary alarm system from the Y-12 Plant.

Concerns

Concern: The very small potential for criticality in the Auxiliary Charcoal Bed cannot be completely ruled out until all possible sources of water are removed from nearby systems. **Impact:** The much diminished risk of a carbon-fluorine chemical reaction could spread uranium deposits and daughter products as long as they remain in the Auxiliary Charcoal Bed. **Action:** Actions are listed below in "Scheduled Activities for Next Quarter."

Scheduled Activities for Next Quarter

Complete gamma survey mapping of buildings 7503 and 7509 to ensure complete confidence in knowledge of extent of uranium migration.

Complete Charcoal Bed Cell confinement enhancement to hold any likely results of carbon-fluorine reaction within cell.

Continue preparations for partitioning the off-gas system to completely stop migration of uranium to off-gas piping and Auxiliary Charcoal Bed.

Complete design of purge-and-trap system to remove reactive gases, and continue preparations for installations of the system.

Continue review of alternative for long-term fuel disposition.

3.2.16 Waste Evaporator Facility

Description

Building 3506 (Waste Evaporator Facility) is located adjacent to the South Tank Farm in the main plant area. Building 3506 operated as an evaporator from 1949 to 1954, and after decontamination it was used as an experimental facility to demonstrate contaminated waste incineration. The primary project objective is the demolition of the above-grade portions of the

facility. This action would remove an obstacle inhibiting access in the South Tank Farm and would facilitate the continued remedial activities at the Gunita and Associated Tanks OU. This decontamination and decommissioning activity is being conducted as a non-time-critical removal action under CERCLA.

Accomplishments

The D2 version of the Engineering Evaluation/Cost Analysis was submitted for public review.

Preparation of the Action Memorandum was initiated.

The design package (performance specification and Division I requirements) was completed.

Concerns

None.

Scheduled Activities for Next Quarter

Initiate procurement of a demolition subcontractor.

Perform additional waste characterization sampling and analysis.

The Action Memorandum will be submitted to the regulators for their review.

3.3 OAK RIDGE K-25 SITE

The K-25 Site was built as part of the Manhattan Project during World War II to supply enriched uranium for nuclear weapons production. Construction of the K-25 Site started in 1943, and Building K-25, the first diffusion facility for large-scale separation of ^{235}U , was fully operable by August 1945. Additional buildings involved in the enrichment process were operable by 1956. In response to the national postwar nuclear emphasis, plant operations were modified to include the production of uranium compatible with reactors used to generate electric power. Because of the declining demand for enriched uranium, the enrichment process was placed on standby in 1985 and shut down in 1987. The K-25 Site now has a multipurpose mission that includes serving as the location of many contractor central staff functions, operating waste treatment facilities, serving as a center for applied technology, and supporting the development of the Advanced Vapor Laser Isotope Separation uranium enrichment technology.

3.3.1 K-901 Area

Description

The K-901 area consists of a contaminated burial ground, landfarm, holding pond, and two construction waste disposal areas. The area is located northwest of the main plant.

K-1070-A Old Contaminated Burial Ground, northwest of Building K-33, was used for the disposal of several types of material from the 1940s to 1976. The burial ground contains $\sim 35,575 \text{ ft}^3$

of uranium-contaminated material and 2430 ft³ of thorium-contaminated material. Other material includes UF₆ cylinders, beryllium chips, boron, radioactive NaF, oil, rags, etc. The K-1070-A Landfarm received ~5000 ft³ of fuller's earth between 1979 and 1985. The fuller's earth was laden with concentrated acids, sludges, and other degradation products from uranium enrichment cascade oil.

The K-901-A Holding Pond received chromated, cooling-tower water blowdown and a variety of other wastes from barrels drained into the pond in the late 1950s. The K-901 Waste Disposal Area and K-901-A Sanitary Disposal areas each received construction wastes beginning in the 1940s. Small pockets of radioactive contamination have been found at the K-901-A Sanitary Disposal Area.

Accomplishments

The K-901 dye tracer plan was submitted to the regulators, EPA and TDEC, for their review and comment. EPA and TDEC approved the dye tracer plan pending resolution of comments from TDEC. The decision was made in the comment resolution meeting to begin the dye tracer study in the wet season, November 1995, instead of the dry season, June 1995, as originally planned. This change in schedule will result in RI field activities being completed in February 1996 instead of November 1995.

Concerns

Concern: During the monthly program review with DOE and the regulators on March 27, 1995, EPA expressed concern that additional requirements from the conduct of operations audit will add costs to the already financially constrained ER budget. **Impact:** There will be additional cost to the K-901 project. **Action:** As requested by EPA, DOE provided the written explanation of DOE Order 5480.19, "Conduct of Operations Requirements for DOE Facilities."

Scheduled Activities for Next Quarter

Field activities—drilling, sampling, and a dye-tracer test—will continue.

The K-901-A Holding Pond Remedial Site Evaluation will be issued to the regulators for their review.

3.3.2 K-1070

Description

The K-1070 area consists of the K-1070-C/D Classified Burial Ground, located on a hill at the eastern edge of the K-25 Site. The burial ground is composed of several disposal areas: large trenches, small pits, three earthen dike areas, a landfarm, and a concrete pad. Both low-level radioactive and nonradioactive, nonhazardous waste materials and equipment were buried in the large trenches. The small pits were used to empty drums of hazardous waste. The dikes, which received RCRA closure approval from the State of Tennessee, were used for surface storage of drummed wastes. The landfarm is a road onto which potentially contaminated oils were sprayed for dust suppression. The concrete pad was used for compaction of metal drums before burial. Contaminants of concern at the burial ground are volatile and semivolatile organics, uranium-contaminated scrap metal, uranium compounds, lead, and other metals. An interim remedial

action was initiated in January 1994 for the SW 31 Leachate Seep, which is located immediately west of the site and has been likely contaminated by the burial ground.

Accomplishments

The RI/FS Report (D1) was issued to the regulators for their review on June 30, 1995.

Concerns

None.

Scheduled Activities for Next Quarter

Comments on the RI/FS Report will be addressed.

3.3.3 K-1070 SW-31 Spring Project OU

Description

This project work involves implementing an interim remedial action for the K-1070 Leachate seep (SW-31) to reduce risk to human health and the environment and to achieve compliance with a proposed permit modification. The seep appeared after an attempted reclamation of the area bordering the west end of the K-1070-C/D Burial Ground, which was swampy and had an unpleasant smell. The K-1070-C/D Classified Burial Ground was used to dispose of a variety of equipment and waste, including solvents and hazardous chemicals. The remedial action chosen involves air stripping the discharged water to remove volatile contaminants after pretreatment to remove iron, followed by carbon filtration (polishing) to remove PCBs. The Central Neutralization Facility will be upgraded by adding unit processes during a second phase of construction.

Accomplishments

The fixed-price subcontract for Phase 2 was awarded on May 5. A meeting was held on May 25 to discuss the preparation of a transition plan. This plan will be used to ensure all requirements are met before the Phase 2 upgrade operation is initiated and becomes a part of K-25 Waste Management operations.

Construction activities conducted as part of the first phase of the Central Neutralization Facility upgrade included removing water contained in the buried tank adjacent to the J basin; capping the pipe leading to the tank from Building K-1420 is nearing completion. The buried tank was filled on May 19 and left in place. The existing undersized carbon columns have been disconnected, and arrangements for removing these columns are being finalized. Notification will be made prior to the lifting and hoisting of the columns.

Concerns

None.

Scheduled Activities for the Next Quarter

Continue Phase 2 construction.

3.3.4 K-1407 Area

Description

The K-1407 area contains seven solid waste management units: the K-1407-A Neutralization Pit, the K-1407-B Holding Pond, the K-1407-C Retention Basin, K-1407-C and K-1417 Soil, the K-1070-B Old Classified Burial Ground, the K-1700 Stream (Mitchell Branch), and the K-1202 Hazardous Waste Storage Tanks. The K-1407 area is located east of the K-25 building at the northern edge of the K-25 Site.

The K-1407-A Neutralization Pit is a 33,000-gal reaction pit where sulfuric acid and calcium hydroxide are added to neutralize corrosive waste streams. The neutralization pit has processed various cleaning solutions and has received heavy metals.

The K-1407-B Holding Pond received neutralized cleaning solutions from the cleaning of nickel-plated steel pipes. The pond also received a variety of organic and radioactive wastes from other sources. The K-1407-C Retention Basin was used for storing sludges from the B Pond. Since sludge removal during 1987 and 1988, radionuclides are the only remaining contaminants. Both ponds are RCRA Interim Status Units and are scheduled for closure during the first quarter of FY 1995.

K-1407-C and K-1417 Soil is located north of the K-1407-C Pond. Uranium is the only suspected contaminant in this soil.

Buried at the K-1070-B Old Classified Burial Ground is a collection of materials, equipment, and scrap taken from the S-50 thermal diffusion plant; K-1131 feed plant; and K-25, K-27, and K-29 diffusion buildings. Contaminants include lead, uranium, and other metals.

The K-1700 Stream (Mitchell Branch) has received wastes from a variety of sources, including the K-1407-B Holding Pond and several area underground storm drain systems.

Another site, K-1407 contaminated debris, was discovered during closure operations and will be added to Appendix C in the FFA. This site consists of buried radioactively contaminated solid wastes and is located on the south side of the K-1407-C Retention Basin. A preliminary assessment was prepared for this site. Apparent risks posed by this buried debris do not warrant any remedial actions at this time.

The radionuclide contamination not addressed in the RCRA closure of the K-1407-B and -C units will be addressed in the future by CERCLA actions. Current plans are to combine the future remediation of the K-1407-B and K-1407-C units as CERCLA source OUs and as RCRA Interim Status Units. Because the CERCLA actions at both the K-1407-B and K-1407-C units will be the same, one set of CERCLA documents will be produced that will address both units.

Accomplishments

Removal of fluids from contaminated equipment has been completed. Area operation has been transferred to the Post-Remediation Surveillance and Maintenance Program, which will post the former ponds as underground radioactive contamination areas.

Paving began near the former K-1407-B/C ponds to repair portions of the road damaged by heavy truck traffic during remedial construction.

Concerns

None.

Scheduled Activities for Next Quarter

Issue Remedial Action Report to EPA and TDEC for review on July 30, 1995.

3.3.5 K-25 Groundwater***Description***

The K-25 Groundwater Program provides for the assessment and remediation of groundwater at the 1500-acre K-25 Site.

The K-25 Groundwater Program includes several data-gathering activities that have been designed to characterize the subsurface characteristics and flow regime of the site, provide information on whether or not any contamination may be migrating off-site, and establish the relationship of groundwater to surface water. The contaminants in the groundwater at the K-25 Site are radionuclides, principally ^{238}U ; organic compounds; and heavy metals, including principally Pb (lead) and Hg (mercury).

Accomplishments

The site-wide high base groundwater sampling project was completed. A total of 216 monitoring wells were sampled in a six-week period using micropurge/low-flow procedures. The results obtained from this sampling event and the results obtained from the low-base sampling event completed in November of last year will be evaluated to determine contaminant distributions and long-term groundwater monitoring needs for the site.

The K-25 Groundwater Program received the final report, "K-25 Groundwater Modeling Strategy," which was prepared by a team of experts comprised of university professors and private consultants. The conclusions presented in the report are that site-wide numerical modeling should not be considered at this time due to the lack of knowledge with respect to the conceptual model of groundwater flow and transport at the site. Although the report does not provide specific recommendations on a modeling approach, it does provide a list of recommended action items to reduce site uncertainties. Work on most of the action items is already underway or is in the planning stages.

Concerns

None.

Scheduled Activities for Next Quarter

Continue field activities.

3.3.6 Surveillance and Maintenance**Description**

This activity includes those tasks necessary to manage the Surveillance and Maintenance Program and to ensure adequate containment and site control at inactive wastes sites and other contaminated areas prior to final remediation and following the completion of the remediation. The major tasks consist of program and project management, routine surveillance and maintenance, and special activities. The sites include areas such as classified and/or contaminated burial grounds, scrap yards, switchyards, cooling tower basins, landfills, soil piles, and the grounds around inactive facilities.

The area that Surveillance and Maintenance encompasses consists of designated inactive wastes sites around the K-25 Site. Contaminants found within the surveillance and maintenance sites include radionuclides, including principally ^{238}U ; organic compounds; heavy metals, including principally Pb (lead) and Hg (mercury); PCBs; and asbestos.

Accomplishments

Fencing was completed around the high contamination area located on the peninsula at the K-901 Pond and the K-895 Cylinder Destruct Facility. The fencing falls under the guidelines of DOE Order 5400.5 and Lockheed Martin Energy Systems (LMES) position paper "Posting and Control of Environmental Soil Contamination Areas."

Corrective actions were coordinated for 41 noted surveillance and maintenance deficiencies during May. The corrective actions accomplished represent 33% of the total surveillance and maintenance deficiencies on backlog.

Concerns

None.

Scheduled Activities for Next Quarter

Routine maintenance activities will continue.

3.4 OAK RIDGE RESERVATION BOUNDARY AREAS

The ORR Boundary Areas consist of the Clinch River/Poplar Creek area, LWBR, LEFPC, Oak Ridge Associated Universities (ORAU) South Campus Facility (SCF), and Freels Bend Area.

Clinch River/Poplar Creek focuses on portions of the portions of Poplar Creek and the Clinch and Tennessee rivers that may have been adversely affected by contaminants released from ORR from the mid-1940s to the present. Melton Hill Reservoir and Clinch River, downstream from Melton Hill Dam, form the southern and eastern boundaries of the reservation.

Watts Bar Reservoir (WBR) is located on the Tennessee River just below its confluence with the Clinch River and is the first impoundment downstream of ORR. Contaminants released from the reservation into these water systems include a variety of radionuclides, metals, and organic compounds, with PCBs and cesium being of particular concern. The PCBs are identified as a concern through fish ingestion, and the cesium is a risk only if deep-channel sediments are dredged and the spoils placed on land.

LEFPC extends from the outfall of Lake Reality at the Y-12 Plant boundary downstream to the stream's confluence with Poplar Creek. Originating within the Y-12 Plant, it consists of a 23-km stream and associated 550-acre floodplain. LEFPC became contaminated with mercury and trace levels of other metals, organics, and radionuclides.

ORAU SCF is located within the city limits of Oak Ridge and is bounded by Bethel Road, State Highway 62, Hall Ridge, and Clinch River. SCF was originally established in 1945 to study the accidental irradiation of cattle that occurred during the test of the first atomic bomb over Alamogordo, New Mexico. Soon its scope included studies on the introduction and migration of radioisotopes in the food chain. After investigation, the primary contaminant of concern was a small trichloroethane plume located on the site.

The Freels Bend Area was used to support research conducted on SCF. Controlled herds of some animals were maintained on pasture land there with ancillary barns and out buildings. In addition, a Low-Dose Rate Facility and a Variable-Dose Rate Facility were located on the site, along with three reported animal burial sites.

3.4.1 Clinch River/Poplar Creek

The Clinch River RI focuses on the portions of Poplar Creek and the Clinch and Tennessee rivers that may have been adversely affected by contaminants released from the mid-1940s to the present from the DOE ORR. Melton Hill Reservoir and Clinch River, downstream from Melton Hill Dam, form the eastern and southern boundaries of ORR. Poplar Creek drains the K-25 Site and receives inflow from EFPC. Clinch River enters the Tennessee river system of multipurpose impoundments near Kingston, Tennessee, 34 km downstream from the Oak Ridge complex. This WAG/OU/study area includes Poplar Creek, Melton Hill Reservoir, and Clinch River from Melton Hill Dam to Kingston.

The contaminants released from ORR originate from research, industrial, and waste disposal activities conducted at ORNL, the Y-12 Plant, and the K-25 Site. The contaminants released from these facilities include a variety of radionuclides, metals, and organic compounds. Some liquid wastes are discharged to streams on the ORR, which drain into Clinch River; however, much of the water-borne contamination is derived from seepage into the shallow groundwater from old waste-storage pits and trenches. The contaminants of concern in the river/reservoir system were determined by preliminary human-health risk screening, using a variety of exposure pathways, and nonconservative screening. PCBs were identified as contaminants of concern through fish ingestion. TDEC has a fish consumption advisory in effect for Melton Hill Reservoir and the Clinch River arm

of WBR and other area reservoirs. Poplar Creek is posted by TDEC, advising against fish consumption and water contact because of mercury, metals, and organic chemical contamination. Arsenic, chromium, mercury, selenium, zinc, ^{137}Cs , and ^{60}Co are a risk only if deep-channel sediments are dredged and dredge spoil is used for agriculture.

Accomplishments

None.

Concerns

None.

Scheduled Activities for Next Quarter

The RI/FS (D1) will be submitted to the regulators on Sept. 18, 1995 for their review.

3.4.2 Lower Watts Bar Reservoir OU

Description

WBR is the first Tennessee river impoundment located downstream of ORR. The Tennessee Valley Authority's Watts Bar Dam, completed in 1942, is situated at Tennessee River Kilometer 853.6 (River Mile 530.5). The reservoir receives inflow from both the Tennessee and the Clinch rivers. This WAG/OU/study area consists of that portion of the reservoir that extends from Tennessee River Kilometer 913.1 (River Mile 567.5; mouth of the Clinch River at Kingston) to Watts Bar Dam.

The source of ORR contaminants in this OU is the Clinch River. Because the dam was completed prior to the start of operations at ORR, and also because the reservoir acts as an efficient trap for sediments and any associated particle-reactive contaminants, much of these contaminants have accumulated in the bottom of WBR over the years. The contaminants of concern and exposure pathways are the same as for the Clinch River OU, with PCBs in fish posing the greatest risk. TDEC has issued a fish consumption advisory for WBR. A fish consumption advisory is also in effect for Fort Loudon and Tellico reservoirs, located upstream of WBR and ORR. Sediment contaminant concentrations, because of dilution by the Tennessee River and the greater spatial extent of the reservoir as compared to the Clinch River, are generally lower in WBR than in the Clinch River. Screening-level human health risk analyses indicate that contaminants in sediment pose a risk only if deep channel sediments are dredged and the dredged spoil is used for agriculture.

Accomplishments

A meeting was held between EPA, TDEC, the U.S. Army Corps of Engineers, TVA, and DOE to discuss details of an interagency agreement regarding evaluation of permit applications for bottom sediment disturbing activities in LWBR. TDEC, EPA, and the U.S. Army Corps of Engineers agreed that the existing five-party interagency agreement for permit review does not need to be revised for LWBR. DOE and TVA will enter into a two-party interagency agreement.

Public meetings were held in Kingston, Tennessee, on April 4, 1995, and in Spring City, Tennessee, on April 11, 1995. The public comment period on the Proposed Plan ended April 28, 1995.

The ROD for LWBR (D1) was submitted to the regulators June 2, 1995.

The WBR Monitoring and Assessment Plan (D1) was submitted to EPA, TDEC, and other agencies, as appropriate, on June 7, 1995.

Concerns

None.

Scheduled Activities for Next Quarter

Respond to any comments on the D1 ROD and prepare the final D2 version.

Respond to any comments on the D1 Monitoring and Assessment Plan and prepare the final D2 version.

3.4.3 South Campus Facility OU

Description

The SCF OU is located within the city limits of Oak Ridge, Tennessee. It is bounded by Bethel Valley Road to the north, State Highway 62 to the east, Haw Ridge and the Clinch River to the south, and the western section of Bethel Valley to the west.

A research facility operated by ORAU, SCF was originally established in 1945 to study the accidental irradiation of cattle that occurred during the testing of the first atomic bomb near Alamogordo, New Mexico. The scope of research soon included studies on the introduction and migration of radioisotopes in the food chain as well as various other agricultural problems.

The boundaries of SCF encompass ~25 buildings and 130 acres of pasture land, but there is no enclosing fence. Access to the SCF property is generally unrestricted. Although several signs are posted to limit access, no fences or barriers exist to preclude access.

No documented evidence is available as to waste composition or quantity that may have been released to the environment at this location. Limited data exist, however, that identify potential hazardous waste sources and pathways. In addition, previous analytical data and the results of an inspection at this site indicate the presence of target compound list organics in the groundwater.

An RI at SCF was conducted in FY 1993. SCF areas included in the RI are the wastewater treatment plant, ponds, various laboratories, and animal containment facilities. The RI determined that the primary contaminant of concern is trichloroethane, which is present in a small plume in the unconsolidated zone.

Accomplishments

Quarterly groundwater sampling has been conducted to monitor changes in water quality ever since completion of the RI in 1993. Analytical results of this most recent sampling event show that levels of volatile organic compounds (the contaminant of concern) are similar to those measured during previous quarterly sampling and during the RI. Those levels have been determined not to pose unacceptable risk to human health or the environment. This determination has resulted in a proposal of "no action" as the preferred alternative for the site.

The D3 version of the Proposed Plan, which incorporated language changes required by the regulators, was issued for public review on May 27, 1995. The public comment period will extend through June 26, 1995.

The D1 version of the SCF Wetlands Treatability Study Report was issued to the regulators on June 29, 1995. This document was issued as a secondary FFA report.

Concerns

None.

Scheduled Activities for Next Quarter

Public comments on the Proposed Plan will be incorporated into the responsiveness summary in the ROD.

The D1 version of the ROD will be submitted to the regulators by September 1995.

3.4.4 Freels Bend Study Area

Description

The Freels Bend Study Area was used to support research conducted at the ORAU SCF. This area is located southwest of the SCF and is bounded on three sides by the Clinch River. Control herds of some animals were maintained on pasture land here with ancillary barns and outbuildings. The research facilities included the Low Dose Rate Irradiation Facility and the Variable Dose Rate Irradiation Facility. Each of these facilities was used to expose and irradiate test animals that were subsequently observed over a period of time for exposure effects. The sources were removed from the Low Dose Rate Irradiation Facility; however, six sealed ^{60}Co sources still remain stored at the Variable Dose Rate Irradiation Facility.

There are three reported disposal areas for animal carcasses and miscellaneous wastes in the Freels Bend Area. These areas have been termed Animal Burial Sites I, II, and III. Access to the 70 acres of the Freels Bend Area is restricted and not open to the general public, although the area is not fenced. The entrance to the access road is blocked with a locked bar gate.

A Site Investigation was performed at Freels Bend Area in FY 1993. The regions investigated included those associated with the irradiation facilities, animal burial locations, and three small impoundments used in the care of control herds maintained at the Freels Bend Area. Contaminants of concern included radionuclides, organics, and metals. The findings of the Site Investigation were

presented to the regulators in November 1993, at which time the regulators agreed that DOE should submit a No Further Investigation petition for the Freels Bend Study Area.

Accomplishments

Regulatory concurrence was received on the No Further Investigation determination form for animal burial sites I, II, and III and the Variable Dose Rate Irradiation Facility.

The field work for the Low Dose Rate Irradiation Facility maintenance action was completed June 6, 1995.

Concerns

None.

Scheduled Activities for Next Quarter

A No Further Investigation determination form for the Low Dose Rate Irradiation Facility will be prepared and submitted along with the Maintenance Action Completion Report to the regulators by September 30, 1995.

3.4.5 Lower East Fork Poplar Creek OU

The LEFPC OU extends from the outfall at Lake Reality at the Y-12 Plant boundary downstream to the stream's confluence with Poplar Creek. The LEFPC site consists of the 23-km stream and an associated 550-acre floodplain.

Beginning in 1952, the Y-12 Plant began production-scale separation of lithium isotopes, which required the use of millions of kilograms of mercury. This process resulted in the release of 108,000 to 212,000 kg (239,000 to 470,000 lb) of mercury into EFPC between 1953 and 1983. More than 20 tributaries and treated effluent from the Oak Ridge Sewage Treatment Plant flow into the creek. Although the primary mercury discharges from the Y-12 Plant were eliminated in 1963, mercury continues to be released in EFPC from the Y-12 Plant and secondary sources (e.g., building drain systems, sewers, and connecting lines). The current release is approximately 20 g/day (0.7 oz/day) down from 100 g/day (3.5 oz/day) in 1985. Portions of the sewers were relined in 1986-87 to reduce mercury contamination. Efforts continue to further reduce mercury discharges (e.g., decontamination and decommissioning, RMPE, and remediation of mercury-use areas). The Y-12 ER Program has responsibility for the surface water in EFPC. Releases are regulated under the Clean Water Act NPDES permit for the Y-12 Plant.

Also, the Sewer Line Beltway was constructed near LEFPC by the city of Oak Ridge during 1982 and 1983 and contains over 10 miles of sanitary interceptor sewers and force mains. In certain instances, EFPC floodplain soils were used to provide topsoil. No records were kept to document the backfill procedures and locations.

The cleanup objective for the site is to prevent current and future user exposure to mercury-contaminated soils. Currently, risk levels are unacceptable in the EFPC-Sewer Line Beltway soils. DOE encourages public input to ensure that the remedy selected for the EFPC-Sewer Line Beltway meets the needs of the local community and is an effective solution to the problem.

Accomplishments

As a result of the public meeting held January 26, 1995, DOE Oak Ridge Operations Office (DOE-ORO) proposed increasing the EFPC cleanup level from 180 ppm mercury to 400 ppm mercury. EPA and TDEC have tentatively agreed to this proposed increase. A second public meeting was held June 8, 1995 to inform the public about the increase in cleanup levels. There were no adverse comments from the public at this meeting. A new public comment period began June 14, 1995, and will end July 13, 1995.

Concerns

Concern: The Disposal Unit Remedial Design is behind schedule. **Impact:** This delay will impact achieving the 15 month window for start of construction. **Action:** Initiate and accelerate remedial design.

Scheduled Activities for Next Quarter

Complete sampling actions to delineate the areal extent of mercury contamination greater than 400 ppm.

3.5 TECHNICAL PROGRAMS AND TECHNICAL OVERSIGHT

3.5.1 Oak Ridge Environmental Information System

Description

OREIS is a centralized, standardized, quality-assured, and configuration-controlled environmental data management system. It is composed of hardware, commercial software, customized integration software, a tabular data base, a geographic data base, and support documentation, including procedures. OREIS fulfills DOE-ORO's environmental information management obligations under an enforceable FFA [Docket No. 89-04-FF under Sect. 120 of CERCLA and Sections 3008(h) and 6001 of RCRA]. The OREIS project was initiated in September 1990, and the baseline production version of the system (OREIS V2.1) was released in June 1994.

The basic mission of OREIS is efficient retrievability and long-term (>3 years) retention of DOE-ORO environmental data. Its primary users include DOE and its contractors and subcontractors who perform environmental restoration, compliance, and surveillance activities. Other users include EPA, TDEC, other agencies, and the public.

The scope of OREIS includes the consolidation of data supporting environmental restoration, compliance, and surveillance activities. The types of environmental data incorporated in the OREIS computer system include known quality measurement and spatial data from the following environmental media: groundwater, surface water, sediment, soil, air, and biota. In addition to environmental measurement data, the OREIS data base contains descriptive and qualifier metadata to help document data quality and to enable end users to analyze the appropriateness of the data for secondary uses. The scope does not include performing project-specific activities (e.g., sample tracking, field results data entry, maintenance of equipment calibration records) or serving as project

control tools (e.g., cost accounting or milestone tracking) that are available through other computer systems (e.g., the National Sample Tracking System and Progress Tracking System).

Accomplishments

Support was provided for the generation of the first report using data from OREIS. The K-25 Site K-901 OU Investigation was the first Energy Systems environmental project to produce a project report from data in OREIS.

The total number of records in the OREIS Environmental Measurements Data Base was increased from 503,273 to 1,058,517. The one millionth record was loaded into OREIS on June 6.

An OREIS home page was created on the Internet (LMES internal server) as a means to access user documentation and other help information.

The first data from the Ambient Air Program was loaded in OREIS in April.

The document on well construction data in OREIS was presented to TDEC for review; data transfer is being prototyped.

Development of a technical specification for transmitting additional groundwater measurements to OREIS began in May.

A kick-off meeting was held to initiate a biota technical specification for transmitting biological monitoring data to OREIS in June.

Concerns

None.

Scheduled Activities for Next Quarter

Continue to load data, provide training, work with user groups, update OREIS components and user documentation, and support environmental information management activities.

Start the enhancement of a PC-based user interface to OREIS.

Provide enhancements to the OREIS data model to accommodate additional compliance and surveillance and biological data.

Initiate cooperative agreements with ER projects for time reduction in the data-to-OREIS cycle.

Start work with air emissions groups to develop a technical specification for transmitting air emissions data to OREIS by September 1995.

Develop a prototype for incorporating risk assessment models into the OREIS framework.

3.5.2 Remote Sensing and Special Surveys Program

Description

Remote sensing technologies provide efficient means for acquiring data for site identification and characterization, change detection, regional and local monitoring, and acquiring updated information to support geographic data bases (e.g., facility data, land cover, topography). The objectives of the Remote Sensing Program are to promote and manage routine examinations of the ORR and associated off-site areas and to process and analyze remotely sensed data that can be used in ER site characterization and cleanup activities. Surveys occur on a biannual basis with selected remote sensing surveys as needed during other times of the year for use in site-specific studies. The biannual approach provides an effective means for early detection of environmental problems that could develop as waste containment vessels degrade, and it also aids in monitoring improvements gained from restoration efforts and cleanup activities.

Accomplishments

“Selected Color Infrared Aerial Photography” was submitted to OREIS. The submitted color infrared imagery is derived from a number of sites across ORR, with emphasis on plant sites and known waste areas.

“Selected Nighttime Aerial Thermal Data” was submitted to OREIS. This digital raster imagery has been post-processed by the Remote Sensing Program to enhance data usability.

Aerial gamma radiological survey data were provided to the Office of Environmental Compliance and Documentation for their use in identifying places on the ORR where high levels of cesium contamination occur. Personnel of the Office of Environmental Compliance and Documentation are trying to locate areas where wildlife may become highly contaminated by radioactive cesium.

A magnetic threshold map was prepared for the ORR. This map shows the vertical magnetic gradient data with values exceeding +/- 0.15 nT/m superimposed on an aerial composite photograph of the ORR. At this cutoff all of the known burial grounds are obvious anomalies (SWSAs, Bear Creek Burial grounds, etc.). At lower cutoff values the affects of geologic variation begin to complicate the interpretation of the data.

Revisions to the Oak Ridge Sensitive Area geographic information system coverage were digitized and the results were submitted to the OREIS Program for inclusion in the OREIS system; the coverage will be updated as the resolution of boundaries is increased.

Concerns

None.

Scheduled Activities for Next Quarter

Submit selected airborne electromagnetic data to OREIS.

Submit selected airborne magnetic data to OREIS.

Submit selected daytime multispectral data to OREIS.

3.5.3 Risk Assessment Program

Description

A risk assessment, as defined in the DOE-ORO *Interim Policy Guidance on Environmental Restoration Risk Assessment Initiation, Implementation, and Interaction*, is the process of identifying, defining, and characterizing the adverse consequences of exposure to hazardous and radioactive materials. Under the ER Division, risk assessment includes the performance of a baseline risk assessment, refinement of preliminary remediation goals, and risk evaluation of remedial alternatives. Risk assessment may have both a human health risk assessment component and an environmental risk assessment component, whereby the human health risk assessment identifies, analyzes, and characterizes adverse health effects in human receptors and the environmental risk assessment identifies, analyzes, and characterizes adverse impacts on other environmental receptors (i.e., local flora and fauna, etc.).

The Risk Assessment Council was established to ensure consistent implementation of established methodology and technical defensibility of all risk assessments produced as part of the remedial activities on the ORR and for the other DOE-ORO facilities: Paducah and Portsmouth. The Risk Assessment Council is a multidisciplinary team of site risk assessment team leaders and other Energy Systems personnel with expertise in the following areas: human health risk, ecological risk, toxicology information and data bases, risk model validation, sensitivity/uncertainty analyses, and risk assessment project implementation. As outlined in the DOE-ORO interim policy guidance, the Risk Assessment Council is responsible for the following:

- providing advice and guidance on appropriate risk assessment methodology and procedures;
- developing appropriate methods, procedures, models, and/or data needed to fulfill risk assessment needs of the site programs;
- providing appropriate review of site programs' risk assessment implementation to ensure consistent application and interpretation of risk assessment guidance and methodology; and
- supporting ER Division risk assessment needs through the research and development of information to correct critical risk assessment data gaps.

Accomplishments

Comments were received on *Approach and Strategy for Performing Ecological Risk Assessments* (ES/ER/TM-33/R1) from the EPA on June 21, 1995.

Program representatives attended the LEFPC ROD workshop. This meeting was held between the FFA parties to resolve outstanding issues and to develop specific text to be included in the ROD.

Results were presented for the Y-12 Bear Creek Valley Radiological Groundwater, Surface Water, Soils, and Waste Inventory Data Evaluations and Proposed Radiological Sampling and Analysis (radionuclides, contaminants of potential concern, minimum detectable activities, sampling locations) at the June 1995 regulator meeting.

Concerns

None.

Scheduled Activities for Next Quarter

Deliver the Human Health Risk Assessment section of the UEFPC Characterization Area RIWP.

3.5.4 Federal Facility Agreement and Tennessee Oversight Agreement***Description***

Section 120 of CERCLA requires federal facilities listed on the National Priorities List to enter into an FFA with the EPA. The ORR was added to the National Priorities List in the fall of 1990. Subsequently DOE, EPA, and TDEC entered into this agreement. The primary purpose of the FFA is to establish a procedural framework and schedule for investigating and remediating contaminant releases at a site (the ORR) that pose a threat to human health and the environment.

The Tennessee Oversight Agreement obligates Tennessee to pursue a "program of independent monitoring and oversight," primarily related to DOE compliance with environmental laws, DOE radiation protection programs, and joint Tennessee-DOE emergency preparedness and response activities. The Tennessee Oversight Agreement obligates DOE to provide technical and financial support for Tennessee's oversight of and participation in the FFA, in addition to establishing and maintaining compliance programs.

Accomplishments

The revised FY 95 +1 and +2 prioritized work milestones were submitted to the regulators for their approval.

The FFA project managers' meetings were held. Several changes to the Appendix E milestones were approved, and sections of the FFA were modified and approved.

The TDEC Tennessee Oversight Agreement budget application for project funding for 1994-1995 was revised and approved by DOE.

Concerns

None.

Scheduled Activities for Next Quarter

Update Appendix C of the FFA and submit to the regulators for their review.

Update the ORR Site Management Plan and submit to the regulators for their review.

The FY 1996 funding profile and milestone impacts will be finalized and submitted to EPA and TDEC.

The TDEC Tennessee Oversight Agreement budget application for 1995 and 1996 will be reviewed, finalized, and approved by DOE.

4. REMEDIAL ACTION CONTRACTOR ASSIGNMENTS

Each FFA quarterly report includes a listing of the identity and assigned tasks of each of the DOE contractors performing work under the FFA. The primary contractors—Energy Systems, ENSERCH, Jacobs Engineering, and MK-Ferguson—will be performing work at all locations within the ORR. The following is included to satisfy this requirement.

4.1 OAK RIDGE Y-12 PLANT

Advanced Sciences, Inc. (ASI)—Provides laboratory and field support.

Analytical Projects Office (APO) at Lockheed Martin Energy Systems, Oak Ridge—All contracts for analysis of samples collected must be processed through this office. APO and LMES Procurement determine which labs will perform the analyses.

Army Corps of Engineers—Hydro-acoustic study of the Clinch River arm of Watts Bar Reservoir to determine water depth and the distribution, thickness, and type of bottom sediments.

ATI—Project Management Plans for Upper EFPC OU 1; Conduct of Operations compliance support for multiple programs.

Automated Sciences Group (ASG)—Provides support for various tasks in the management, collection, analysis, and interpretation of biota, water, and sediment samples. Also, provides program management assistance for the Clinch River ER Program.

Battelle/Pacific Northwest Laboratories (PNL)—Provides support for water, sediment, and contaminant modeling tasks.

Camber—Health and Safety Plans for Upper EFPC RMPE.

CDM Federal—Development of an RI Work Plan for UEFPC OU 1. Development of a Union Valley Interim Study Remedial Site Evaluation for Upper EFPC OU 1.

CH2M Hill—Provision of comments on previous RI plans for the Filled Coal Ash Pond. *[Closed]*

Colorado State University—Consulting concerning the DNAPLs in the Bear Creek Burial Ground. *[Closed]*

The Earth Technology Corporation—Development of the RI Plan and RI of the S-2, Coal Pile Trench, Salvage Yard, and Building 81-10 sites. Sub-subcontractors include *Singleton Labs and A. L. Clark* for drilling, *IT Corporation* for analytical support, *H&R Technical* for data management and health and safety support, and *International Waste Management Systems* for engineering support. *[Closed]*

ETE Consulting Engineering Inc.—Provision of professional services.

Foster Wheeler Environmental Corporation—Design prime contractor, LEFPC OU. Baseline planning support for ORAU.

Geraghty & Miller, Inc.—Support in preparation of all post closure permit applications and preparation of the Bear Creek Valley OU 4 RI Plan.

Highland Drilling Company—Characterization well drilling.

- Jacobs Engineering** (DOE prime contractor)—Prepares the decision documents (FS and ROD) in support of the new LWBR OU. Preparation of integrated RCRA/CERCLA/NEPA decision documents, including FSs, Proposed Plans, RODs, Environmental Assessments, Environmental Impact Statements, documents for interim actions, and cost estimates associated with these documents. Provision of technical support for RIs, assessments, and investigations for off-site locations; remedial action verification, DOE, and Energy Systems community relations activities, requirements associated with the Administrative Record; and risk assessments. PP/ROD prime contractor LEFPC OU.
- JAYCOR**—Provides support of data management activities and document maintenance in the production of risk assessment documents for the Clinch River ER Program.
- Lockeed-Martin Energy Systems**—Lead contractor, task orders, LEFPC OU.
- Michigan State University**—Breeding and raising mink in conjunction with the Clinch River ER Program's study of reproductive effects of ingesting fish from the Clinch River/WBR System.
- Midwest Technical, Inc.**—Provides support of data management activities and document maintenance in the production of risk assessment documents for the Clinch River ER Program.
- MK-Ferguson**—Baseline planning support for ORAU. Construction contractor, LEFPC OU.
- Oak Ridge Associated University (ORAU)**—Provides radioanalytical support for Phase 1 of the RI.
- ORACLE**—Provides support in the design and implementation of ORACLE-based databases and applications.
- Oak Ridge Institute of Science and Energy (ORISE)**—Provides risk assessment and contaminant transport modeling support.
- PAI**—Technical support for UEFPC RMPE project development.
- PEER Consultants**—Provides computer programming and bar coding support for the Clinch River ER Program.
- Queen's University**—The use of alcohol flooding to remediate sites contaminated by DNAPL; progress report submitted 5/31/94.
- SAIC**—Field sampling in Bear Creek Valley, development of an RI Report for Bear Creek Valley OU 2 and Bear Creek Valley OU, data management support, support for ER strategic plan development, and field mobilization. Provides support in the compilation of data packages, validation and verification of data packages, and analytical services coordination for Clinch River. Support Preparation of ROD for LEFPC OU.
- SENES, Oak Ridge**—Provides support for human health risk assessment.
- SONSUB**—Subcontract for the closure of Kerr Hollow Quarry. *[Closed]*
- Southern Illinois University**—Provides assistance in biological data collection and sample design.
- Tennessee Valley Authority** (via interagency agreement)—The interagency agreement provides support for the following tasks: (1) sedimentation range cross sections; (2) aerial photography and topographic mapping of WOC Embayment; (3) numerical modeling of water, sediment, and contaminant transport in Clinch River/WBR; (4) sampling and analysis of water and sediment from potential sources of contaminants; (5) review of TVA sediment-disturbing activities; (6) sampling and contaminant analysis of key fish species in the Tennessee River

System; (7) sediment and water toxicity studies; and (9) benthic macroinvertebrate community study at monitoring stations within the Clinch River and Poplar Creek. *[Tasks 1, 2 and 5 are closed]*

University of California-Davis—Provides quantitative histopathological analysis of target organs of fish.

University of Kansas—Support for geophysical studies concerning DNAPL migration. *[Closed]*

University of Tennessee—Hydrogeological support planned for RMPE as subcontractor to PAI. Provides assistance in data collection; data compilation; database development and management; development of procedures and maintenance/coordination of training; coordination of the Clinch River/WAG2 document management center with the other DMCs in LMES Oak Ridge; study of pollutant material transport, distribution, and characterization; and program management.

University of Waterloo—Consulting concerning the DNAPLs in the Bear Creek Burial Ground and PCB experiments. *[Closed]*

4.2 OAK RIDGE NATIONAL LABORATORY

Advanced Sciences, Inc. (ASI)—Administrative support, field coordination, and technical integration.

Advanced Systems Technology—Waste characterization processing and transportation assistance.

Analysas—Administrative support.

ATI—Structural integrity assessments for active LLLW tanks.

Automated Sciences Group—Biological data analysis, support for management, and analysis and interpretation of biological data from laboratory and field studies.

Battelle Pacific Northwest Laboratory—Design and fabrication services for an in situ vitrification off-gas hood and filtration system.

Bechtel National, Inc. (Team members also include CH2M Hill; PEER; ERC, Inc.; and IT Corporation)—RI activities for WAGs 1, 5, 6, and 10. Assessments will also be conducted of the inactive tanks as required by the FFA.

CDM Federal Programs—Preparation of a regulatory review and sampling and analysis plan for the WAG 6 performance monitoring activity.

CER—Assistance in preparing the WAG 6 well plugging and abandonment plan.

ChemRad Inc.—Walkover survey. *[Closed]*

Colorado Logging COLOG—Logging and ambient and stress testing of wells at WAG 5.

Dr. David Daniel—Assistance in evaluating the suitability of soil for caps.

Drevel University—Provision of technical personnel and knowledge. *[Closed]*

ECOTECH—Assistance in the analysis of surface water.

EDGE, Inc.—Groundwater monitoring of wells.

Environmental Consulting Engineers—Preparation of remediation and postremediation monitoring plans for WAG 6 and monitoring in WAG 2 and WAG 5 removal action investigation.

ERC, Edge—Geotechnical tests.

ETE Consulting Engineers—Survey services.

Foster Wheeler—Remedial design activities.

Geotek Drilling—Drilling services.

Gilbert Commonwealth—Assistance with preparing cost account plans and project documentation such as project management plans, health and safety plans, waste management plans, current year work plans, and configuration control support documents. Valve replacement for active LLLW tanks.

Harco—Cathodic protection for active LLLW tanks.

H. Kent Hepworth, PE, Ph D.—Technical assistance with remedial actions in support of the WAG 6 facility manager.

Highland Drilling Company—Construction and well plugging and abandonment services.

H&R Technical Associates, Inc.—Technical and administrative support in assembling reports, preparing minutes of meetings, and reviewing reports.

Hydrocomp—Expert review of field monitoring and modeling of contaminated sediment transport in WOC. *[Closed]*

IT Corp.—Final closure certification on the 3001 Storage Canal RCRA Interim Closure. *[Closed]*

Jacobs ER Team—Preparation of integrated RCRA/CERCLA/National Environmental Policy Act (NEPA) decision documents, including FSs, Proposed Plans, RODs, EAs, Environmental Impact Statements, documents for interim actions, and cost estimates associated with these documents. Provision of technical support for the performance of RIs, assessments and investigations of off-site locations, and remedial action verification; support for DOE and Energy Systems community relations activities; and support for the adherence to requirements associated with the Administrative Record and performance of risk assessments.

JAYCOR—Sampling and analysis support for benthic macroinvertebrate samples from WOC and its tributaries (*no longer supporting benthic macroinvertebrate samples*).

JBF Associates—Technical Advisory Group support and appraisal of the Underground Storage Tank Program.

Kansas Geological Survey—Collection of seismic reflection data for WAG 10.

Knoxville College—Data base support and technical support for sample collections.

Lockheed—Analytical services.

MAC Tech—Implementation of Data Quality Objectives for the Safer Program.

Midwest Technical, Inc.—Assistance in budgeting, planning, and cost tracking and provision of laboratory and field technical support.

MK-Ferguson—Construction management. Valve replacement/cathodic protection for active low-level radioactive waste tanks.

- North Carolina State University**—Assistance in biological monitoring and abatement tasks.
- Northern Arizona University**—Technical direction for surveillance and maintenance and WAG 5 cryogenic.
- Oak Ridge Associated Universities**—Field services coordination.
- OGDEN**—Geotechnical services as required to support the remedial design architect-engineer and the Performance Assessment Program.
- Peer Consultants**—Administrative support (team member of SAIC).
- Performance Development Corporation**—Technical and administrative support for active low-level radioactive waste tanks.
- Radian**—Preparation of environmental assessments and CERCLA decision documents. *[Closed]*
- SAIC**—Monitoring coordination, performance assessments, and hydrologic modeling for the WAG 6 Performance Assessment Program.
- Scientific Ecology Group SEG**—Field demonstration on waste stabilization in burial trenches.
- Solutions To Environmental Problems**—Provided trailer and parking installation support.
- Southwest Research**—Outside laboratory services.
- S. M. Stoller Corporation**—Administrative support.
- Temp Systems**—Assistance with administrative functions and surface water monitoring.
- Tennessee Valley Authority Interagency Agreement**—Technical supervision of FY 1992 drilling activities, including drilling three core holes and instrumenting them with multiport measuring systems (Westbay systems) and selecting monitoring intervals using core data, geophysical logs, and flowmeter data via the agreement.
- TMA Eberline**—Outside laboratory analytical services.
- University of California**—Assistance in biological monitoring and abatement tasks.
- University of California Davis**—Histopathological analyses of fish tissues.
- University of Mississippi**—Development of a special sensor for monitoring soil moisture and contaminant leaching.
- University of Tennessee**—Assistance in performing data collection; data compilation; development of performance criteria, maintenance programs, and quality assurance plans; and oversight of surface-water monitoring station upgrade activities.
- U.S. Geological Service**—Assistance in performing surface water monitoring.
- Vista Research, Inc.**—LLLW tank system leak testing methodology development.

4.3 OAK RIDGE K-25 SITE

- Adams Craft Hertz Walker**—Site surveying (for the Pond Waste Management Project).
- Advanced Sciences, Inc.**—Data validation.
- Analysas Corporation**—Records management (for the Pond Waste Management Project).

- Battelle, Columbus Laboratories**—Preparation of a simplified environmental assessment (for the Pond Waste Management Project).
- Brooks Rand Laboratory**—Mercury speciation analyses.
- CDM Federal Programs**—Preliminary Assessment/Site Inspection and RCRA Facility Investigation Work Plan preparation.
- Chemrad Tennessee Corporation**—Ultrasonic Ranging and Data System support.
- CompuChem Laboratories**—Chemical/radiological analyses.
- COR, Inc.**—Inventory Management Information System prototype development support (for the Pond Waste Management Project).
- Dennis Weiter Assoc.**—Study of available filter press operations (for the Pond Waste Management Project).
- Enterprise Advisory Services, Inc.**—Management systems support.
- ESE Biosciences Group**—Bioremediation of a former underground storage tank site. *[Closed]*
- ETE Consulting Engineers**—Surveying.
- Geraghty and Miller**—Technical support (for the K-25 Site Groundwater Protection Program). *[Closed]*
- GH Cofer**—Professional services.
- Gilbert Commonwealth**—Estimating support.
- Highland Drilling**—Characterization well drilling and drilling services for the K-25 Site Groundwater Protection Program. *[Closed]*
- HSW Environmental Consultants, Inc.**—Technical support (for the K-25 Site Groundwater Protection Program).
- Jacobs ER Team**—Preparation of integrated RCRA/CERCLA/NEPA decision documents, including FSs, Proposed Plans, RODs, EAs, Environmental Impact Statements, documents for interim actions, and cost estimates associated with these documents. Provision of technical support for the performance of RIs, assessments and investigations of off-site locations, and remedial action verification; support for DOE and Energy Systems community relations activities; and support for the adherence to requirements associated with the Administrative Record and performance of risk assessments.
- Labat-Anderson**—Assistance for Radian Corporation in the environmental assessment of the K-1407-B and -C Ponds. *[Closed]*
- Lockwood Greene**—On-site project engineering support and Title II design (for the Pond Waste Management Project).
- A. L. Lotts**—Operational Readiness Review Board support (is an independent member) (for the Pond Waste Management Project).
- PAI**—Technical consulting and generation of a project management plan and operational oversight management plan (for the Pond Waste Management Project).
- SAIC**—RI subcontract services for the K-770 and K-1070 OUs.

Tenera—Technical consulting and assistance in conduct of operations (for the Pond Waste Management Project).

University of Tennessee, Industrial Engineering Department—Assistance in planning for storage layout and warehousing (for the Pond Waste Management Project).

4.4 ORR BOUNDARY AREAS

Advanced Sciences, Inc. (ASI)—Laboratory and field support.

Analytical Projects Office at Martin Marietta Energy Systems, Oak Ridge—Processing of all contracts for the analysis of samples collected. The Analytical Projects Office and Energy Systems Procurement determine which labs will perform analyses.

Army Corps of Engineers—Hydroacoustic study of the Clinch River arm of WBR to determine the water depth and the distribution, thickness, and type of bottom sediments.

Automated Sciences Group (ASG)—Support for various tasks in the management, collection, analysis, and interpretation of biota, water, and sediment samples. Also, provides program management assistance for the Clinch River ER Program.

Battelle/Pacific Northwest Laboratories (PNL)—Support for water, sediment, and contaminant modeling tasks.

Foster Wheeler Environmental Corporation—Baseline planning support for ORAU. Design and estimating services as the prime contractor for LEFPC.

Gilbert/Commonwealth—Scheduling for LEFPC.

Jacobs ER Team—Preparation of integrated RCRA/CERCLA/NEPA decision documents, including FSs, Proposed Plans, RODs, EAs, Environmental Impact Statements, documents for interim actions, and cost estimates associated with these documents. Provision of technical support for RIs, assessments and investigations of off-site locations, and remedial action verification; support for DOE and Energy Systems community relations activities; and support for the adherence to requirements associated with the Administrative Record and performance of risk assessments. Prepares the decision documents (FS and ROD) in support of the new LWBR OU. Is the prime contractor for the Proposed Plan and ROD for LEFPC.

JAYCOR—Data management activities and document maintenance in the production of risk assessment documents for the Clinch River ER Program.

Michigan State University—Breeding and raising of mink in conjunction with the Clinch River ER Program's study of reproductive effects of ingesting fish from the Clinch River-WBR System.

Midwest Technical, Inc.—Support of data management activities and document maintenance in the production of risk assessment documents for the Clinch River ER Program.

MK-Ferguson—Baseline planning support for ORAU. Is the construction contractor for LEFPC.

Oak Ridge Associated Universities—Radioanalytical support for Phase 1 of the RI.

Oak Ridge Institute of Science and Energy (ORISE)—Risk assessment and contaminant transport modeling support.

ORACLE—Support in the design and implementation of ORACLE-based data bases and applications.

PEER Consultants—Computer programming and bar coding support for the Clinch River ER Program.

Science Applications International Corporation (SAIC)—Support in the compilation of data packages; validation and verification of data packages; and coordination of analytical services. Provides support preparation of ROD for LEFPC.

SENES, Oak Ridge—Support for human health risk assessments.

Southern Illinois University—Assistance in biological data collection and sample design.

Tennessee Valley Authority (via an interagency agreement)—Support for the following tasks: (1) cross sections of sedimentation ranges; (2) aerial photography and topographic mapping of White Oak Creek Embayment; (3) numerical modeling of water, sediment, and contaminant transport in Clinch River/WBR; (4) sampling and analysis of water and sediment from potential sources of contaminants; (5) review of Tennessee Valley Authority sediment-disturbing activities; (6) sampling and contaminant analysis of key fish species in the Tennessee River System; (7) sediment and water toxicity studies; and (8) benthic macroinvertebrate community study of monitoring stations within the Clinch River and Poplar Creek. *[Tasks 1, 2, and 5 are closed.]*

University of California-Davis—Quantitative histopathological analysis of target organs of fish.

University of Tennessee—Assistance in data collection; data compilation; data base development and management; development of procedures and maintenance/coordination of training; coordination of the Clinch River/WAG 2 document management center with the other DMCs at Energy Systems in Oak Ridge; study of pollutant material transport, distribution, and characterization; and program management.

4.5 ENERGY SYSTEMS ER CENTRAL DIVISION

CDM Federal Programs—Regulatory compliance support and waste analysis support on the Portsmouth project.

Ecotect Laboratory Services, Inc.—Laboratory sample analysis.

Ekotek Laboratory Services, Inc.—Radiological/analytical data analysis.

H&R Technical Associates, Inc.—Consultation on cost/schedule control systems and groundwater data base management.

Lietzke Soil Services—Soil consulting services.

Lockheed Analytical Services—Chemical/analytical data analysis.

Lockheed Engineering and Sciences Company—Laboratory sample analysis.

Maxima Corporation—Project management.

Micro-Frame Technologies—Off-site training and professional training support.

SAIC—Site-specific plan support for the development of OREIS; training support; activity data sheet support; cost/schedule control system training; scheduling and technical support; waste

management treatment, storage, and disposal analysis; analytical needs assessment; support services for preparation of the five-year plan; and data management support.

University of Tennessee—Soil characterization, hydrogeology, and data base management support.

University of Waterloo (Canada)—Groundwater modeling.

4.6 JACOBS ENGINEERING

Geraghty & Miller—Environmental sciences and groundwater support for the production of integrated decision documents.

Lockwood Greene—Environmental engineering support for the production of integrated decision documents.

PAI Corporation—Support for the production of integrated decision documents.

STEP—Support for the production of integrated decision documents.

The University of Tennessee—Training and other support for the production of integrated decision documents.

United Science Industries—Support for the production of integrated decision documents.