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

Volume 2. January-March 1994

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

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**MARTIN MARIETTA ENERGY SYSTEMS, INC.
managing the
Environmental Restoration and Waste Management Programs at
Oak Ridge K-25 Site
Oak Ridge Y-12 Plant
Oak Ridge National Laboratory
under contract DE-AC05-84OR21400**

**Paducah Gaseous Diffusion Plant
Portsmouth Gaseous Diffusion Plant
under contract DE-AC05-76OR00001**

**for the
U.S. DEPARTMENT OF ENERGY**

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CONTENTS

ACRONYMS	v
1. EXECUTIVE SUMMARY	1
1.1 DOCUMENTS TRANSMITTED TO THE REGULATORS	1
1.2 DOCUMENTS PROPOSED FOR TRANSMITTAL	2
2. SIGNIFICANT ACCOMPLISHMENTS	3
3. TECHNICAL STATUS	7
3.1 OAK RIDGE Y-12 PLANT	7
3.1.1 Upper EFPC OU 1 (Groundwater)	8
3.1.2 Upper EFPC OU 2	9
3.1.3 Upper EFPC OU 3	10
3.1.4 Bear Creek OU 1	12
3.1.5 Bear Creek OU 2	14
3.1.6 Bear Creek OU 4 (Groundwater)	15
3.1.7 Chestnut Ridge OU 1	16
3.1.8 Chestnut Ridge OU 2	16
3.1.9 Lower EFPC OU	17
3.1.10 Reduction of Mercury in Plant Effluents (RMPE)	18
3.1.11 RCRA Closures	19
3.1.12 Rust Fuel Facility	21
3.1.13 Study Areas	21
3.2 OAK RIDGE NATIONAL LABORATORY	22
3.2.1 ORNL WAG 1	22
3.2.2 ORNL WAG 1 Gunitite and Associated Tanks OU 1	23
3.2.3 ORNL WAG 1 Surface Impoundment OU 2	24
3.2.4 ORNL WAG 1 Groundwater OU 4	25
3.2.5 Inactive Liquid Low-Level Radioactive Waste Tanks	25
3.2.6 Active Liquid Low-Level Radioactive Waste Tanks	26
3.2.7 ORNL WAG 2 (White Oak Creek Embayment/Tributaries/Soil OU 1)	27
3.2.8 ORNL WAG 4	28
3.2.9 ORNL WAG 5	29
3.2.10 ORNL WAG 6	29
3.2.11 ORNL WAG 7 Pipeline and Leak Site OU 2	30
3.2.12 ORNL WAG 10 Hydrofracture Wells Plugging and Abandonment OU 3	31
3.2.13 ORNL WAG 11	32
3.2.14 ORNL WAG 13	33
3.2.15 ORNL Groundwater OU/Well Plugging and Abandonment	33
3.3 OAK RIDGE K-25 SITE	34
3.3.1 K-770 OU	34
3.3.2 K-901 OU	35
3.3.3 K-1070 OU	36
3.3.4 K-1070 SW-31 Spring Project	37

3.3.5	K-1407 OU	37
3.3.6	Pond Waste Management Project	38
3.4	CLINCH RIVER	39
3.4.1	Clinch River OU	39
3.5	TECHNICAL OVERSIGHT AND TECHNICAL PROGRAMS	40
3.5.1	Background Soil Characterization Project	40
3.5.2	Oak Ridge Environmental Information System	41
3.5.3	Aerial Remote Sensing Surveys	42
3.5.4	Risk Assessment Program	44
3.5.5	Federal Facility Agreement and Tennessee Oversight Agreement	45
4.	RESPONSE ACTION CONTRACTOR ASSIGNMENTS	47
4.1	OAK RIDGE Y-12 PLANT	47
4.2	OAK RIDGE NATIONAL LABORATORY	48
4.3	OAK RIDGE K-25 SITE	49
4.4	ORAU AND EFPC	51
4.5	CLINCH RIVER-WATTS BAR RESERVOIR	51
4.6	ENERGY SYSTEMS ER CENTRAL DIVISION	53
4.7	JACOBS ENGINEERING	54

ACRONYMS

APO	Analytical Projects Office
BSCP	Background Soil Characterization Project
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
D&D	decontamination and decommissioning
DEM	Digital Elevation Model
DNAPLs	dense, nonaqueous-phase liquids
DOE	Department of Energy
DOE-HQ	DOE Headquarters
DOE-ORO	DOE Oak Ridge Operations Office
DQO	data quality objective
EA	environmental assessment
EFPC	East Fork Poplar Creek
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ER	Environmental Restoration
FFA	Federal Facility Agreement
FS	feasibility study
GWPP	Groundwater Protection Program
LLLW	liquid low-level radioactive waste
NEPA	National Environmental Policy Act
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
PA/SI	Preliminary Assessment/Site Inspection
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
RMPE	reduction of mercury in plant effluents
ROD	Record of Decision
SAIC	Science Applications International Corporation
SSAB	Site-Specific Advisory Board
SWSA	solid waste storage area
TDEC	Tennessee Department of Environment and Conservation
TOA	Tennessee Oversight Agreement
TVA	Tennessee Valley Authority
UST	underground storage tank
VOC	volatile organic compound
WAG	waste area grouping
WOC	White Oak Creek
WOCE	White Oak Creek Embayment
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 January through March 1994 (second quarter of FY 1994).

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 1994 commitments.

1.1 DOCUMENTS TRANSMITTED TO THE REGULATORS

The following documents were transmitted to the regulators during the second quarter of FY 1994 and can be requested from the Information Resource Center in Oak Ridge.

- Waste Area Grouping (WAG) 1 Groundwater Phase 2 Remedial Investigation (RI) Work Plan (DOE/OR/01-1194&D1)
- WAG 5 Seeps Removal Action Memorandum (DOE/OR/02-1235&D1)
- Melton and Bethel Valley Groundwater RI Work Plan (DOE/OR/01-1228&D1)
- Active Liquid Low-Level Radioactive (LLLW) Waste Tanks Secondary Containment Design of the Category B Pipelines (DOE/OR/03-1195&D1)
- Active LLLW Tanks Design/Installation Assessment for FFA Compliance Work, Building 3019A (DOE/OR/03-1097&D1)
- Lower East Fork Poplar Creek (EFPC) Feasibility Study (FS)/Environmental Impact Statement (EIS) (DOE/OR/02-1185&D1)
- K-1070 SW-31 Spring Phase 1 Postconstruction Notification

Regulatory Commitment Status

Document title	Appendix E commitment date	Transmittal date
WAG 1 Groundwater Phase 2 RI Work Plan	01/31/94	01/24/94
WAG 5 Seeps Removal Action Memorandum	03/18/94	02/24/94
Melton and Bethel Valley Groundwater RI Work Plan	03/31/94	03/30/94
Active LLLW Tanks Secondary Containment Design of the Category B Pipelines	03/31/94	02/28/94
Active LLLW Tanks Design/Installation Assessment for FFA Compliance Work, Building 3019A	01/31/94	01/28/94
Lower EFPC FS/EIS	02/21/94	02/21/94
Upper EFPC Operable Unit (OU) 2 RI Report	02/22/94	12/04/93
K-1070 SW-31 Spring Phase 1 Postconstruction Notification	04/29/94	03/15/94

1.2 DOCUMENTS PROPOSED FOR TRANSMITTAL

The following documents have been proposed for transmittal to the regulators during the third quarter of FY 1994.

- WAG 1 Guniting and Associated Tanks RI/FS/Environmental Assessment (EA) Report
- WAG 11 Postconstruction Report
- WAG 13 Postconstruction Report
- Active LLLW Tanks Design/Installation Assessment for Melton Valley
LLLW-Collection and Transfer Line Item
- Active LLLW Tanks Plans and Schedules Document
- K-1070 SW-31 Spring Phase 2 Remedial Design Report

2. SIGNIFICANT ACCOMPLISHMENTS

The following significant accomplishments are noted for the ER Program during the second quarter of FY 1994.

- **Y-12 Plant**

Lower East Fork Poplar Creek (EFPC) OU. The Lower EFPC OU extends from the outfall at Lake Reality at the Y-12 Plant boundary downstream to the stream's confluence with Poplar Creek. Upper EFPC originates within the Y-12 Plant and extends to the Lake Reality outfall. The Lower EFPC site consists of the 14-mile stream and 680-acre floodplain. As a result of the loss to the environment of contaminants associated with lithium processing operations at the Y-12 Plant, EFPC became contaminated with mercury and trace levels of other metals, organics, and radionuclides. Since 1953, a little over 2,000,000 lb of mercury are thought to have been either not accounted for or released to the environment. Approximately 733,000 lb are known to have been released. Of the remaining mercury not accounted for, it has been speculated that 645,000 lb were either not received or were held up in building structures, etc. Considerable amounts of the released mercury may still be in the floodplain soils.

The Sewer Line Beltway was constructed 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.

During the reporting period covered in this document, the FS/EIS for Lower EFPC was submitted to EPA and TDEC (on February 18).

- **Oak Ridge National Laboratory**

ORNL WAG 5. ORNL WAG 5 is comprised of 16 contaminated areas, including LLLW transfer lines and leak sites, hydrofracture surface facilities, waste storage tanks, a sludge basin and a holding pond, a shallow land burial ground containing radioactive and hazardous wastes [solid waste storage area (SWSA) 5 South], and a transuranic waste storage area (SWSA 5 North). These areas are located east of White Oak Creek (WOC), between SWSA 4 and Melton Branch. SWSA 5 is a fenced area of about 80 acres and was used for disposing of routine buried waste (south side) and transuranic contaminated waste (north side). The major contaminants detected in groundwater seepage have been ⁹⁰Sr and tritium.

To reduce the ⁹⁰Sr flux from these seeps, a non-time-critical removal action is being implemented. An Engineering Evaluation/Cost Analysis for this action, describing alternatives being considered to collect and treat the contamination in Seep Areas C and D at the Oak Ridge National Laboratory (ORNL), was released for public review. A combination of the alternatives has been proposed for collecting and treating the ⁹⁰Sr flux, and the unit will be operated until a final remediation is implemented for WAG 5. Because this type of action has not been completely field-tested, a parallel action will be implemented. This will involve the design and partial construction of a collection system that will allow the contaminated seep water to be sent by truck to the Process Waste Treatment Plant at ORNL for treatment.

During the quarter just concluded, a WAG 5 Seeps Removal Action Memorandum was completed (on February 24). The public comment period for the Engineering Evaluation/Cost Analysis for the removal action for Seep Areas C and D ended without any comments being received. The D1 version of the Action Memorandum for Seep C was submitted to EPA and TDEC on February 24, 1994, almost 1 month ahead of the March 18 FFA deliverable date. The approach to the removal action at Seep D was changed as a result of the receipt of new hydrogeological data, and a decision will be made by DOE whether to proceed under a revised plan. A separate Action Memorandum will be required for Seep D.

ORNL Groundwater OU. Surface drainage from the ORNL Groundwater OU is mostly into WOC or its one named tributary, Melton Branch. Areas that do not discharge to WOC include small watersheds that drain to Raccoon Creek west of WAG 3, unnamed streams that drain directly to the Clinch River via short surface streams, and areas east of the WOC watershed boundary that drain to Bearden Creek.

During the reporting period covered herein, the RI Work Plan for the ORNL Groundwater OU was completed (on March 31).

- **Oak Ridge K-25 Site**

K-1070 SW-31 Spring. The Phase 1 collection system for the K-1070 OU SW-31 Spring became operational on January 13, 1994. Since that time SW-31 Spring water flowing into storm drain 180 (SD180) has been collected and transported to the Y-12 Groundwater Treatment Facility for treatment and eventual discharge through a National Pollutant Discharge Elimination System (NPDES)-permitted outfall. As of February 11, 1994, 31 shipments (186,000 gal) of the SW-31 Spring water had been shipped to the Y-12 Groundwater Treatment Facility.

Until early April 1994 the system will be operated under an interim operational agreement, while an enclosure is being procured and installed to surround the collection sump. An enclosure unlike the one described in the Remedial Design was needed to house two filters used to filter out insoluble iron that naturally precipitates out of the solution. The need to filter out insoluble iron became a requirement of the Y-12 Groundwater Treatment Facility after the Remedial Design was submitted to and approved by the EPA and TDEC.

Phase 1 of the Interim Remedial Action will be complete upon receipt and installation of the collection sump enclosure. A postconstruction notification letter was submitted in lieu of a postconstruction report as indicated in the 1994 Appendix E of the FFA for the ORR.

Pond Waste Management Project. The K-1417 Drum Storage Yard was a Resource Conservation and Recovery Act (RCRA) interim status waste storage area at the K-25 Site. There were originally ~78,000 drums stored at K-1417 containing sludge (1) that had been removed from the K-1407-B Holding Pond and the K-1407-C Retention Basin during RCRA closure activities in 1988 and (2) that contained inorganic, organic, and radioactive contamination. Prior to storage at K-1417, the sludge had been either drummed or stabilized in a concrete grout mixture at the K-1419 Sludge Fixation Facility. Approximately 45,000 of the drums contain sludges that have been stabilized to meet disposal requirements; they have now been moved into regulation-compliant waste

storage vaults on-site and are scheduled for disposal by Envirocare. The raw sludges stored in the other drums will need to be treated prior to final disposal.

Recently, a RCRA Part B Permit Modification that would allow raw sludge from the drums to be stored in the K-1065 facilities was approved by the TDEC, and the repackaging of raw sludge waste into 21st Century containers began. During the quarter just completed, a Request for Proposal for proof-of-process was issued to vendors for the treatment of the raw sludge.

Also during the reporting period described herein, demobilization activities on the K-1417 pad were completed. One area of concern relates to achieving a final disposal agreement with EPA and TDEC for the wood pallets from the K-1417 pad.

- **Clinch River**

Clinch River OU. The Clinch River ER Program submitted an addendum to the Clinch River RI Phase 2 sampling and analysis plan on March 25. DOE submitted it immediately to EPA and TDEC for review; comments are due by June 27. The purpose of the addendum is to streamline the Clinch River RI by reducing the number of samples required to be collected. The RI Report is tentatively scheduled for delivery to the regulators on August 17, 1995.

Lower Watts Bar Reservoir OU. On January 18, EPA approved DOE's proposal to create the Lower Watts Bar Reservoir OU. TDEC had previously approved the request on November 22. A combined RI/FS and a Proposed Plan are due to the regulators on August 1, 1994, in anticipation of a signed Record of Decision (ROD) by May 1995.

- **Community Relations**

Stakeholders Information Workshops. Stakeholders information workshops were held on March 17 at the new Kingston Elementary School in Kingston and on March 22 at the Jefferson Junior High School in Oak Ridge. Attendees at the March 17 and March 22 public meetings had the opportunity to attend break-out sessions and hear updates on current on- and off-site environmental restoration and waste management activities. Topics included current activities involving the Clinch River, Gunite Tanks, Federal Facility Compliance Act, Activity Data Sheets, Ponds Waste Management Project, EFPC, Atomic City Auto Parts, and other current environmental restoration and waste management projects.

Union Valley Information Meeting. Three volatile organic compounds (VOCs) exceeding the maximum concentration level of the EPA primary drinking water standard were observed in a groundwater monitoring well east of the Y-12 Plant and outside the reservation boundary and reported in an occurrence report dated March 3. The compounds are carbon tetrachloride, chloroform, and tetrachloroethylene. The well is located ~2,500 ft east of the Y-12 Plant in the vicinity of Union Valley Road. The area where the well is located is generally industrial and has no known domestic users of groundwater. The Oak Ridge Environmental Quality Advisory Board was briefed, a media advisory was issued to the news media, and a public briefing was held for Union Valley property owners and employees of businesses in the valley. Attendees at the briefing were encouraged to share any information they had regarding unknown users of this groundwater. In conjunction with Y-12 ER Program technical staff, a follow-up

mailing and personal visits to these businesses are planned for the weeks ahead to verify that there are, in fact, no uses of this groundwater for human consumption.

Site-Specific Advisory Board (SSAB) Steering Committee. A 17-member steering committee initiated a study of the possible creation of an SSAB for the ORR. The advisory board's purpose would be to provide recommendations on environmental restoration, waste management, and related activities to DOE, EPA Region IV, and TDEC.

The SSAB Steering Committee is a subcommittee of the DOE-sponsored Stakeholders Forum. The members are volunteers who have committed themselves to making a recommendation for an Oak Ridge SSAB by late spring. That recommendation will be discussed at DOE stakeholders meetings and in public meetings.

Environmental Update. The winter edition of the *Environmental Update* newsletter was distributed to over 30,000 readers in the community.

3. TECHNICAL STATUS

3.1 OAK RIDGE Y-12 PLANT

The Oak Ridge Y-12 Plant was built by the U.S. Army Corps of Engineers in 1943 as part of the Manhattan Project. The original mission of the Y-12 Plant was to separate the fissionable isotope of uranium (^{235}U) by the electromagnetic process. After World War II, the electromagnetic separation process was discontinued in favor of the more economical gaseous diffusion process.

Since the early years of the Y-12 Plant operations, the facility has developed into a highly sophisticated manufacturing and developmental engineering facility. It occupies ~800 acres and is located immediately adjacent to the city of Oak Ridge. The total work force consists of ~8000 persons, including employees of ORNL.

The Oak Ridge Y-12 Plant is located on the DOE ORR immediately adjacent to the city of Oak Ridge, Tennessee. Until 1993, the primary mission of the Y-12 Plant was the production and fabrication of nuclear weapon components. Activities associated with these functions included the production of lithium compounds, recovery of enriched uranium from scrap material, and fabrication of uranium and other materials into finished parts. Fabrication operations included vacuum casting, arc melting, powder compaction, rolling, forming, heat treating, machining, inspection, and testing.

Currently, personnel are refocusing the technical capabilities and expertise at the Y-12 Plant to serve the DOE and other DOE-approved customers. The Y-12 Plant is a key manufacturing technology center for the development and demonstration of unique materials, components, and services of importance to DOE and the nation. Specific focus areas for the Y-12 Plant in coming years include: (1) weapons dismantlement and storage; (2) enriched uranium material warehousing and management; (3) nuclear weapons process technology and development support; (4) Y-12 Plant management/landlord activities, including the renovation of stand-by or shut-down facilities by decontamination and decommissioning (D&D); (6) the provision of unique capabilities and technologies not found in the private sector on DOE-approved tasks; (7) the transfer of technology developed at DOE facilities to enhance the United States's industrial competitive edge in world-wide markets; and (8) the maintenance and support of the National Security Program Office for DOE.

An additional responsibility of the Y-12 Plant is to provide support and assistance to other government agencies whenever time or technology considerations warrant interagency agreements with DOE.

A number of areas of concern have been identified at the Y-12 Plant site resulting from past waste management practices. Many of these areas have been grouped into OUs based on priority and common assessment and remediation requirements. Numbers of areas have been grouped into prioritized study areas for additional assessment within the plant boundaries and surrounding environs.

Two OUs have been defined for groundwater and surface water contained within the Bear Creek and Upper EFPC hydrologic regimes. Groundwater will be investigated separately because of the overlapping nature of source plumes and the observation that most plumes

share a common hydrologic unit for off-site transport. Also, many releases to groundwater are historical, and the resulting plumes are no longer likely to be associated with the original source. As the groundwater plumes are defined, they will be associated with sources to the extent practical. Groundwater contamination in the Chestnut Ridge hydrologic regime is associated with each source OU.

3.1.1 Upper EFPC OU 1 (Groundwater)

Description

Upper EFPC OU 1 consists of both surface water and groundwater components of the hydrogeologic system within the Upper EFPC hydrologic regime. This coupled groundwater and surface water regime is bounded by the crests of Chestnut and Pine ridges and extends east from a topographic high near the west end of the Y-12 Plant to the point where Lake Reality discharges to Lower EFPC. This OU is concerned with the surface water, including minor amounts of sediment in the Upper EFPC channel, and groundwater pathways that have the potential to transport contaminants to off-site receptors.

Surface Water and Groundwater. Numerous sources of contamination to both the surface water and groundwater flow systems exist within the plant area. Infiltration from the S-3 Ponds Waste Management Area dominates groundwater contamination in the western portion of the hydrologic regime. In addition to potential surface water and groundwater contamination sources identified in Upper EFPC OUs 1 and 3, the majority of the potentially contaminated units making up the Y-12 Study Area are within the Upper EFPC hydrologic regime. Potential surface water contamination associated with the Storm Sewer System and Mercury Use Areas is of primary interest and will be addressed in this OU.

Storm Sewer System. The Storm Sewer System consists of an extensive array of storm drains that gather runoff from the main plant area in catch basins located across the plant. In addition, this drainage system, which was once connected to process equipment, discharged untreated waste streams. No untreated waste streams are currently discharged into the storm sewer system. The storm sewer network contains several miles of drainage pipes and culverts that range up to 108 in. in diameter. Upper EFPC begins near the middle of the Y-12 Plant and is fed entirely from Storm Sewer System discharges. Surface-water runoff from the Y-12 Plant production areas and groundwater seepage are additional sources of Upper EFPC flow.

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 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.

Surface water and groundwater within the Upper EFPC hydrologic regime will be characterized and treated as an integrator OU distinct from source term OUs contributing contamination. This approach is warranted because (1) efforts to establish the horizontal and vertical extent of groundwater contaminant plumes from individual areas indicate that the plumes are significantly intermingled, making assessment and potential remedial actions of individual plumes impractical, and (2) the units share a common exit pathway from the hydrologic system, which is best addressed by a comprehensive approach. Where site-specific

groundwater or surface water data are needed to better identify the source or to support a screening-level risk assessment, groundwater or surface water assessment activities (e.g., piezometers or well points) may be conducted during the RI/FS process for the source-control OUs.

Accomplishments

The dry weather sampling of the Phase 1 surface water RI effort was completed. Laboratory analysis of the 1,400 water samples is nearing completion, with one of four scheduled data packages being complete.

An occurrence report was filed in response to groundwater monitoring data that suggest contamination in an off-site monitoring well may be attributable to the Y-12 Plant. Planning sessions were held in order to determine appropriate short- and long-term actions. Specifically, suggestions were presented on how groundwater studies could support future FS activities.

Concerns

None.

Scheduled Activities for Next Quarter

In concert with the regulators, the results of the dry weather analysis will be reviewed. Planning for the wet weather sampling events will be initiated.

3.1.2 Upper EFPC OU 2

Description

Upper EFPC OU 2 is the Abandoned Nitric Acid Pipeline, which was used between 1951 and 1983 to transport a waste stream made up of nitric acid and depleted uranium from Building 9215 to the S-3 Ponds for disposal. The S-3 Ponds consisted of four unlined surface impoundments that underwent RCRA closure in 1988. The pipeline was constructed of 1.5- to 3.0-in.-diam stainless steel pipe and was buried at an average of 5 ft below the ground surface. Numerous leaks have been determined, with the earliest in 1951 at a weld about 350 ft east of the discharge point.

The primary exposure pathways evaluated with the Nitric Acid Pipeline were related to potential soil contamination resulting from adsorption from leaked solutions, groundwater contamination resulting from waste solutions infiltrating to the groundwater table, and surface water contamination resulting from groundwater seeps. Nitrate and uranium were the primary contaminants of concern. However, biased soil sampling data collected in early spring 1993 do not indicate detectable concentrations of these contaminants, and this OU will be proposed as a no further action ROD. A comprehensive evaluation of the extent of groundwater and surface water contamination within the watershed will be conducted as part of Upper EFPC OU 1.

Accomplishments

As a result of work accomplished in working groups with the regulators, the Risk Assessment has been combined with the Site Characterization Report to create an abbreviated RI Report. This was issued to the regulators for approval. The Proposed Plan was also issued to the regulators for comment.

Regulatory comments on the D1 Proposed Plan were received and incorporated. The 30-day public comment period for the Abandoned Nitric Acid Pipeline was initiated on March 21, 1994.

Concerns

None.

Scheduled Activities for Next Quarter

Approval will be sought for the RI Report and the Proposed Plan.

The ROD will be issued for comment.

3.1.3 Upper EFPC OU 3

Description

Upper EFPC OU 3 is a source term OU composed of seven areas in the western portion of the Y-12 Plant. For the most part, the Upper EFPC OU 3 areas served unrelated purposes and are geographically removed from one another. The seven areas include Building 81-10, S-2 Site, Salvage Yard Oil Storage Tanks, Salvage Yard Oil/Solvent Drum Storage Area, Tank Site 2063-U, Salvage Yard Drum Deheader, and the Salvage Yard Scrap Metal Storage Area. Three other areas (Waste Coolant Processing Facility, Machine Coolant Storage Tanks, and the Coal Pile Trench) were originally placed in the Upper EFPC OU 3 but have been transferred from the OU to the Upper EFPC study areas. The Coal Pile Trench was removed from the OU because it is located beneath an active Coal Pile; the other areas were removed because they are currently active facilities.

S-2 Site. The S-2 Site is in the southwestern portion of the main Y-12 Plant area, south of Building 9720-32 and on the southern side of Third Street at the base of Chestnut Ridge. The unit was an unlined earthen reservoir that was operated from approximately 1943 to 1951 to dispose of corrosive and toxic liquid wastes generated by the Y-12 Plant. The unit originally consisted of a 45- by 128-ft reservoir that was ~ 20 ft deep. The reservoir was back-filled, leveled, and stabilized when disposal operations ended during the 1950s. Heavy metals (including mercury in soil), volatile organic compounds, and radioactive chemicals are contaminants of concern.

Building 81-10. The Building 81-10 site is within the Y-12 Plant at the northwest corner of the intersection of "G" Road and Third Street, south of Upper EFPC. Included as part of the site are two sumps. One sump (Building 9822) is on the east side of "G" Road, and the other sump is 25 ft east of the northeast corner of Building 81-10. Building 81-10 was built in 1943 as a tin shop. In 1957, Building 81-10 was converted for mercury recovery

operations by physical separation or distillation by furnace. The furnace was in operation for approximately 5 years, closing in 1962. Mercury releases associated with handling during physical separation and from furnace operations have been documented. In 1984, the site was used as a storage area to stockpile mercury-contaminated soil. Use of the site to stockpile soil was discontinued and the soil was removed; however, the date of soil removal is unknown. Initial assessments of the site indicate mercury contamination of soil surrounding the building and storage pad.

Salvage Yard Area. The Salvage Yard Area is in the northwestern area of the plant, south of Bear Creek Road and North of Second Street. The Salvage Yard Area is about 11 acres and contains five separate OU 3 areas. The following areas are contained within the Salvage Yard Area.

- Salvage Yard Oil Storage Tanks
- Salvage Yard Oil/Solvent Drum Storage Area
- Salvage Yard Drum Deheader
- Salvage Yard Scrap Metal Storage Area
- Tank 2063-U Site

Salvage Yard Oil Storage Tanks. The Salvage Yard Oil Storage Tanks consist of two tanks surrounded by a rip-rap earthen dike in the northwest corner of the Salvage Yard Area. Waste oils stored in the Salvage Yard Oil Storage Tanks were generated by various operations within the Y-12 Plant. The southern tank with a capacity of 6000 gal was put into service in 1978 and stored automotive crankcase oils, vacuum pump oils, hydraulic systems, and machining oils. The northern tank with a capacity of 5000 gal was put into service in 1980 and contained mineral oils generated from transformer oil changeout. In 1986 use of the tanks were discontinued, and their contents were emptied. The tanks are still at the site and contain bottom sludges contaminated with polychlorinated biphenyls (PCBs) and chlorinated solvents.

Salvage Yard Oil/Solvent Drum Storage Area. The Salvage Yard Oil/Solvent Drum Storage Area is in the northwest portion of the Salvage Yard and operated from 1976 to 1989. It has since been closed under RCRA. Originally, the drum storage area consisted of two compacted gravel areas on top of soil. Each area had a dike constructed of clay and gravel on the downgradient side. The combined storage area had a capacity of up to 175,000 gal of drummed waste oils and solvents. These drums rested on pallets and contained waste oils contaminated with chlorinate organics, uranium, and/or beryllium; chlorinated organic solvents; and nonchlorinated flammable solvents. In 1986 the western dike portion was closed and approved by the Tennessee Department of Health and Environment (now TDEC). No soil removal was required to satisfy closure criteria. Closure of the eastern portion began in 1988, when soil was removed to a depth of 1 to 2 ft and replaced with clean clay backfill and covered with a polyethylene membrane. The closure was approved by Tennessee Department of Health and Environment after soil and groundwater analysis data showed arsenic below ORR background levels and PCBs below the health based criteria values. The area is included in OU 3 until completeness of closure can be determined and, if appropriate, no further action can be pursued.

Salvage Yard Drum Deheader and Tank 2063-U Site. The Salvage Yard Drum Deheader is in the northwest portion of the Salvage Yard and operated from 1959 until 1989. It was used to cut the tops off empty drums that had contained oils and solvents. Operations of the drum deheader ceased in March 1989, and all drums have since been removed. The drum deheader and crusher were removed from the site in 1991. Residual materials present in the drums at the time of crushing were transferred to the Tank 2063-U site. This site was used to store the liquid waste until it could be removed and treated elsewhere at the Y-12 Plant. Tank 2063-U consisted of three concrete and cinder block tanks separated by a rubber baffle for water separation. In March 1989, the tanks failed a hydrostatic hold test and were excavated under federal underground storage tank (UST) regulations in July 1989. The excavated soil was returned to the pit after a plastic geomembrane liner was installed. Possible contaminants at the drum deheader include volatiles, PCBs, and heavy metals.

Salvage Yard Scrap Metal Storage Area. The Salvage Yard Scrap Metal Storage Area has been operating in the northwestern portion of the Y-12 Plant since 1950, when it was used solely for storage of uranium-contaminated and noncontaminated scrap metal. Visual evidence of surface soil contamination has been observed on aerial photographs taken over the past few years. Soil contamination resulting from uranium-contaminated salvage materials is of primary concern at this site.

Accomplishments

A data quality objectives (DQO) workshop was held with the regulators.

The final version of the RI Work Plan was submitted for review.

Concerns

Concern: Outyear funding does not appear to be available to support this effort through the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. **Impact:** Significant dollar amounts could be spent in a sampling effort that would be invalid by the time of remediation. **Action:** Work will be stopped if it is determined that funding is not available.

Scheduled Activities for Next Quarter

None.

3.1.4 Bear Creek OU 1

Description

Bear Creek OU 1 comprises the following units: S-3 Ponds, Oil Landfarm Waste Management Area, and 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.

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 was ~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. VOCs in soil resulting from groundwater transport are of primary concern.

The nature and extent of soil contamination within each of the listed units in Bear Creek OU 1 and the nature and extent of sediment and surface water contamination within each associated tributary to Bear Creek will be determined during the CERCLA investigation.

Accomplishments

A DQO workshop for the OU 1 RI was held February 16-23, 1994. The workshop resulted in significant cost savings due to a reduction in the number of samples required and the use of field screening techniques in lieu of laboratory analysis.

Regulator comments on the RI Work Plan were received and incorporated in the document. The D2 version of the RI Work Plan was issued on March 30.

Concerns

Concern: A health and safety concern related to drilling or digging through hazardous or radioactive waste exists at the Bear Creek Burial Grounds and to a lesser extent at the S-3 Ponds because of many uncertainties at these sites. ***Impact:*** Investigations will focus on the periphery of the sites. ***Action:*** Existing waste inventory data will be used as the primary source of site characterization for the Burial Grounds.

Scheduled Activities for Next Quarter

A contract will be negotiated for the implementation of the RI Work Plan.

Field mobilization activities will begin.

3.1.5 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 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

Data analysis and validation were completed on samples taken for the RI completed in December 1993. Work began on development of the RI and FS reports.

Concerns

None.

Scheduled Activities for Next Quarter

Work will continue on the development of the RI and FS reports.

3.1.6 Bear Creek OU 4 (Groundwater)***Description***

The hydrologic system at the Y-12 Plant has been subdivided into three distinct hydrologic regimes based on topography, surface-water drainage, and groundwater flow. Bear Creek OU 4 addresses contamination within the coupled groundwater/surface water system and floodplain sediments. The area of interest within Bear Creek Valley extends west from a topographic high near the west end of the Y-12 Plant (S-3 Waste Management Area) to the point where Bear Creek exits the valley near State Highway 95. Potential sources of groundwater, surface water, and sediment contamination are being addressed in Bear Creek OUs 1 and 2.

Groundwater and surface water within the Bear Creek hydrologic regime will be characterized and remediated as an integrator OU distinct from the contaminated units. This approach is warranted because (1) efforts to establish the horizontal and vertical extent of groundwater contaminant plumes from individual sites indicate that the plumes are significantly intermingled, making assessment and remediation of individual plumes impractical, and (2) the sites share a common exit pathway from the hydrologic system that is best addressed by a comprehensive approach. Where site-specific groundwater or surface water data are needed to better identify the source or to support a screening-level risk assessment, groundwater or surface water assessment activities (e.g., monitoring wells, piezometers, or well points) may be conducted during the RI/FS process for the source control OUs. The primary groundwater contaminants in the Bear Creek hydrologic regime are nitrates; VOCs; radionuclides; and, to a lesser extent, trace metals. Dense, nonaqueous-phase liquids (DNAPLs) have been discovered at a depth of 270 ft below the Bear Creek Burial Grounds. The DNAPLs consist primarily of perchloroethylene, trichloroethylene, 1,1,1-trichloroacetic acid, and high concentrations of PCBs.

Accomplishments

A contract was negotiated for the implementation of the Phase 1 RI Work Plan. Fieldwork began January 19, 1994.

Concerns

None.

Scheduled Activities for Next Quarter

Field sampling activities will continue.

3.1.7 Chestnut Ridge OU 1

Description

Chestnut Ridge OU 1 is the Chestnut Ridge Security Pits Hazardous Waste Disposal Unit located on the crest of Chestnut Ridge, southeast of the central portion of the Y-12 Plant. Operated since 1973, the unit consists of a series of trenches that were used for the disposal of classified hazardous and nonhazardous wastes until December 1984 and November 1988, respectively. Ten major categories of unclassified wastes have been identified: acids, fiberglass, beryllium, biological material, debris, heavy metals, inorganics, organics, thorium, and uranium. Other classified waste forms are present. The unit was closed in 1988 in accordance with a TDEC-approved closure plan consisting of a low-permeability, low-maintenance cover over the trenches. Groundwater impacts from the disposal operations are the primary focus of this OU.

Accomplishments

A DQO workshop was held prior to the resubmittal of the D2 version of the RI Work Plan. The work plan was modified to incorporate FS needs into the data collection process.

Concerns

Concern: Outyear funding does not appear to be available to support this effort through the CERCLA process. *Impact:* Significant dollar amounts could be spent in a sampling effort that would be invalid by the time of remediation. *Action:* Work will be stopped if it is determined that funding is not available.

Scheduled Activities for Next Quarter

None. Work on this OU has been put on hold based on the results of the prioritization.

3.1.8 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 miles 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 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 Roger's Quarry has shown a biological impact potentially from the ash pond operations.

Accomplishments

Data analysis and validation for the Phase 2 field investigation were completed. Work was initiated on the RI Report and FS.

Concerns

None.

Scheduled Activities for Next Quarter

Work on the RI Report and FS will continue.

3.1.9 Lower EFPC OU

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

As a result of the loss to the environment of contaminants associated with lithium processing operations at the Y-12 Plant near Oak Ridge, Tennessee, EFPC became contaminated with mercury and trace levels of other metals, organics, and radionuclides. Since 1953, a little over 2,000,000 lb of mercury are thought to have been either not accounted for or released to the environment. Approximately 733,000 lb are known to have been released. Of the remaining mercury not accounted for, it has been speculated that 645,000 lb were either not received or were held up in building structures, etc. Considerable amounts of the released mercury may still be in the floodplain soils.

The Sewer Line Beltway was constructed 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.

Accomplishments

Floodplain soil was sent to two vendors for the Low Temperature Thermal Desorption Pilot Demonstration.

The EFPC Citizens' Working Group continued to provide public input for the alternative selection process in the FS. The group continued to thoroughly examine the seven possible remediation alternatives. A video was produced to assist the public in understanding the complex alternatives.

The Environmental Sciences Division, ORNL, continued its study to determine the mechanism of mercury/PCB uptake of periphyton and stoneroller minnows in EFPC. Personnel also continued their investigation into determining the chemical form of mercury in the floodplain soils.

The RI Report and FS/EIS were submitted to EPA and TDEC for approval.

Concerns

None.

Scheduled Activities for Next Quarter

Meetings will continue with the Citizens' Working Group.

An RI and FS addendum will be submitted to EPA and TDEC for review.

The preliminary results of the pilot demonstration will be received.

The Proposed Plan will be initiated.

3.1.10 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, NPDES, requirement. The formal baseline change proposal is currently being submitted. Completed projects have been removed from the project description, and the new project scope consists of the Mercury Use Building Source Elimination and the Mercury Treatment Facility.

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.

Mercury Treatment Facility. A new on-line effluent treatment process will be installed to remove mercury from the Y-12 Plant storm water. The design is for a small-scale filtration process with associated pumps and piping to collect the contaminated sump water from Outfall 49 and Outfall 55 for treatment. The mercury-contaminated waters from the Mercury Use Building sumps (9201-2, 9201-4, 9201-5, and 9204-4) will be collected, and long-term treatment will be performed at the Mercury Treatment Facility. The facility will be housed at the existing Central Pollution Control Facility. The facility will replace the interim treatment unit(s) once the facility is on-line.

Accomplishments

The 60% conceptual design for the Mercury Treatment Facility was completed. This design will be performed by ENSERCH (formerly Ebasco). Work began on the installation of the interim unit of carbon filters for 9201-2 sumps. Additional requirements for interim units will be determined.

Comments from the state regulators on the postconstruction report for the mercury tanks interim action were addressed and returned to the regulators.

Work began on the sampling plan for the mercury use buildings and associated sumps and piping systems for the source elimination activity. More detailed investigations of the Mercury Use Building sumps and piping systems continued.

Source elimination construction began on 9201-2.

The NPDES permit that is consistent with the proposed site-specific criteria and compliance schedule was issued by the state for public comment.

Concerns

Concern: An NPDES permit is currently being negotiated for the Y-12 Plant that may contain mercury limits that are not attainable due to the nature of contamination at the plant. **Impact:** The Y-12 Plant and ER Program could be issued a permit that would result in numerous noncompliances. **Action:** The project team has presented a compliance strategy to TDEC that involves a site-specific criterion for mercury and a plan for reductions in loading to EFPC to achieve the site-specific number.

Scheduled Activities for Next Quarter

Work on design activities for the Mercury Treatment Facility subproject will continue. The Title I and II design should begin in the third quarter of FY 1994.

The data collection phase of the evaluation of the Mercury Use Building will continue in the next buildings. Source elimination construction work in 9201-2 should be in the field.

The installation, testing, and checkout of the Interim Mercury Treatment Unit will be completed. The 9201-5 source elimination certified-for-construction package will be completed.

3.1.11 RCRA Closures

Description

This subproject consists of three areas: (1) the Building 9409-5 Tank Storage Facility, (2) the Garage USTs, 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 having a capacity of ~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. Approval is pending for all three sites.

YS-019 Garage Underground Tanks. The Garage USTs 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 under 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 by the excavation and decontamination of the tanks, sampling of surrounding soil, and removal of contaminated soil.

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, ACN, methylene chloride, organics, Freon-113, cyanide, PCBs, uranyl nitrate, penetrant solution and emulsifiers, asbestos, and sodium hypochlorite.

Soil sampling has indicated that the underlying surface soil and gravel were contaminated.

The facility is due to be closed under CERCLA, at which time all wastes stored in the yard will be removed. A small area of the south side was previously closed. Soil contamination at the northern part of the drum yard will be addressed at closure.

Accomplishments

All of the three contaminated tanks that are part of the Garage USTs subproject have now been cleaned and removed from the site. The Closure Plan is in the public comment stage.

Field sampling was completed for the Interim Drum Yard and the Diked Tank Storage Area, and work on preparing characterization summaries was initiated.

TDEC issued a technical directive that makes it unnecessary to perform corrective action on sites that pose a very small risk to human health and the environment. Small risk determination is made by completing a standardized form provided by TDEC. Because of this regulation, permission has been received from the state regulators to terminate corrective action design on the Rust Fuel Facility and close out the project. These efforts are on schedule.

Concerns

Concern: Strict compliance with the RCRA program could result in remediation of low-priority sites in a fashion that does not integrate with CERCLA activities. **Impact:** Costly remediation could be driven that does not achieve risk reduction or acknowledge surrounding contamination. **Action:** Wording has been added to closure plans to transfer remediation authority to CERCLA, and the project team has made regulators aware of the situation.

Scheduled Activities for Next Quarter

The remaining closure activities on the Garage USTs subproject will be continued.

3.1.12 Rust Fuel Facility**Description**

The Rust Fuel Facility is located in the western end of the plant and originally consisted of three steel underground tanks in a single bay north of Building 9831 and a smaller tank south of Building 9720-15. These tanks consisted of one 12,000-gal diesel tank and a 12,000- and an 8000-gal gasoline tank. The tank south of Building 9720-15 contained 1000 gal of gasoline. The leakage of these tanks and connecting pipeline is well documented. The tanks, piping, and all free liquid gasoline have been removed and disposed of. Clean closure will be accomplished in accordance with UST regulations by excavation and decontamination of affected soil, which will then be returned to the approximate original contour.

Accomplishments

None.

Concerns

None.

Scheduled Activities for Next Quarter

Activities aimed at project termination will be completed.

3.1.13 Study Areas**Description**

The Study Areas of Upper EFPC consist of ~180 individual sites within the Y-12 Plant that have been identified as having the potential of containing or having contained one or more hazardous substances or materials. The preponderance of these sites lie in the western exclusion area of the plant.

The scope of work is currently defined as those tasks required to conduct Preliminary Assessments and Site Investigations (PA/SIs) of all sites to determine if further action is necessary under one of the existing OUs. For those sites requiring further action, the balance of the CERCLA process of RI, FS, and remedial action, as necessary, will be conducted.

It is anticipated that ~60% of these sites will be determined to require "no further investigation" subsequent to the conclusion of a formal PA/SI. The balance of the sites are expected to be subject to the CERCLA process.

As the PA/SIs progress and more information is accumulated and assimilated relative to the current and historical operations in selected areas of the plant, it is anticipated that there will be additions to and deletions from the list of sites for this activity.

Accomplishments

None.

Concerns

None.

Scheduled Activities for Next Quarter

The top 25 study areas will be identified on the basis of the prioritization methodology and historical evidence.

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 mission is 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

Description

ORNL WAG 1 (the main plant area) comprises 167 remediation sites consisting of low-level liquid waste collection and storage tanks, leak and spill sites and contaminated soils, ponds and impoundments, waste treatment facilities, shallow land burial and other solid waste storage areas, and other miscellaneous chemical and sanitary waste facilities. A variety of contaminants, including radionuclides, heavy metals, and organics, are present within this WAG.

Accomplishments

Reviews were conducted of the 30% and 60% design packages for the construction of the process waste surge tank.

The enhanced life cycle baseline report, Rev. 0, and the cost and schedule document for the process waste surge tank were issued in January 1994.

Concerns

None.

Scheduled Activities for Next Quarter

None.

3.2.2 ORNL WAG 1 Gunitite and Associated Tanks OU 1

Description

OU 1 consists of the underground steel and gunitite tanks associated with the tank farms located in the center of the ORNL main plant area. The Gunitite and Associated Tanks OU 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 OU are primarily the large gunitite tanks installed to store liquid wastes in 1943 and subsequently used as the main holding tanks for the low-level liquid radioactive waste system at ORNL. A number of steel tanks associated with the North Tank Farm are also included in this OU. The strategy of this grouping is to allow those tanks that are geographically similar to be remediated as a group. Some tanks contain sludge and require isolation to mitigate further releases, while other tanks do not contain sludge and require remedial action because of groundwater infiltration from inleakage through the tank domes.

The Gunitite and Associated Tanks OU is commonly referenced as three separate tank groups as described below:

- 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

A meeting was held with representatives from the ORNL Robotics Systems Division, Westinghouse Hanford, and Spar Aerospace to discuss the light duty utility arm being developed as part of the EM-50 UST Integrated Demonstration Program and its potential applications for use in the gunitite remediation.

Briefings were made to DOE-HQ personnel on March 9, 1994, and to FFA project managers on March 16, 1994, to acquaint personnel with issues that must be resolved before a ROD can be obtained.

Concerns

Concern: Several policy questions must be answered before an alternative can be selected for the Gunitite and Associated Tanks OU remedial action. These issues include the ability to

isolate transuranic wastes, availability of a DOE transuranic waste storage/disposal facility, and future use of the ORNL site. **Impact:** Failure to resolve these issues may preclude the issuing of a ROD. **Action:** Briefings are bringing these matters to the attention of appropriate regulatory personnel so that the issues may be resolved.

Scheduled Activities for Next Quarter

The RI/FS/EA Report for the Gunite and Associated Tanks OU will be issued to EPA and TDEC on May 2, 1994.

3.2.3 ORNL WAG 1 Surface Impoundment OU 2

Description

The following is a brief description of each of the four surface impoundments included in OU 2:

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. The impoundment basically was constructed by excavating into the clay soil overlying the limestone bedrock at the site, and no lining was added.

Basin 3524. Basin 3524 is one of four holding basins located in the south central portion of the Bethel Valley ORNL facilities complex. 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.

Basin 3539 and 3540. ORNL Basins 3539 and 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 to the process waste treatment system via Basin 3524 or to WOC. Currently, the ponds are only used as surge capacities for the collection of storm water during peak storm events.

Accomplishments

A DQO meeting was held to finalize DQOs for the sampling of impoundments. The meeting included representatives from the Streamlined Approach for Environmental Restoration Committee, which is preparing a strategy for the streamlined RI/FS in progress.

Concerns

None.

Scheduled Activities for Next Quarter

Work on the RI/FS/EA for this OU will continue. Additional samples of sediments in the impoundment will be collected to supplement existing data.

3.2.4 ORNL WAG 1 Groundwater OU 4

Description

The Groundwater OU includes the shallow groundwater beneath the WAG 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 movement to off-WAG receptors. Deeper groundwater movement through bedrock underneath WAG 1 is discussed in the Bethel Valley Groundwater OU.

Accomplishments

The WAG 1 Groundwater Phase 2 RI Work Plan was submitted to the regulators on January 31, 1994, for review.

Concerns

Concern: The Davis Bacon Committee recently ruled that some types of well installation and well plugging and abandonment activities are considered construction activities. Adhering to the requirements that would be imposed by such a ruling could mean a significant delay in the installation of groundwater characterization wells. **Impact:** Current well installation and well plugging and abandonment activities planned may be delayed for several months. **Action:** Well installation will be accomplished under a separate subcontract so that investigation tasks will not be delayed.

Scheduled Activities for Next Quarter

Work will begin in April 1994 on preparing the Engineering Evaluation/Cost Analysis for a non-time-critical removal action for the Corehole 8 plume.

Regulator comments on the Phase 2 RI Work Plan should be received by May 2, 1994.

3.2.5 Inactive Liquid Low-Level Radioactive Waste Tanks

Description

Liquid low-level radioactive wastes have been collected at ORNL since 1943 in tank systems used for storage, transfer, and neutralization. Some of the tanks have been removed from service and are no longer in use. The majority of these tanks are owned by ER and are in the CERCLA remediation process. However, a few of these tanks are owned by Waste Management and LLLW generators. These remaining tanks are in the process of being transferred to ER. Liquids and sludges remain in many of the tanks, with several tanks receiving inleakage from rainwater. The tanks are located in various WAGs but primarily in WAGs 1 and 5.

Accomplishments

The action plan for treatment of the PCBs in the sludge in Tank WC-14 was updated and discussed with EPA and TDEC. Potential treatment technologies were also identified.

The transfer of liquids from Inactive Liquid Low-Level Tank W-3 to W-22 was completed since the tank level had neared capacity. The amount transferred was 1620 gal.

Concerns

None.

Scheduled Activities for Next Quarter

Approximately 90% of the LLLW will be removed from gunite tanks W-1, W-2, W-3, and W-4.

The existing LLLW system will be used to attempt to empty tanks T-1, T-2, T-3, T-4, and T-9. If the existing system does not function properly, the project will be delayed until a new valve box can be built that will bypass the existing valve box and pumphouse.

Work will begin on removing ~7000 gal of LLLW from Gunite Tank TH-4.

Foam will be placed in tanks WC-15 and WC-17 to prevent groundwater from occupying these tanks.

A stainless steel Moyno pump will be purchased for use in tank emergencies. This pump can also be used if needed for tanks T-1, T-2, T-3, T-4, and T-9.

3.2.6 Active Liquid Low-Level Radioactive Waste Tanks

Description

Although the FFA addresses the entire ORR, specific requirements are set forth for the LLLW tanks at ORNL. Liquid low-level radioactive wastes 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 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

A 2-day meeting was held with EPA and TDEC to discuss issues that related to the FFA and the application of the FFA to the ORNL LLLW system. Topics included general tank issues, non-programmatic waste identification and elimination, current FFA implementation plans for the LLLW system, design demonstrations for tanks, the status of the leak testing efforts on the singly contained systems, and comments from the EPA and TDEC on the detailed leak detection plan for pipelines. A tour was conducted for EPA and TDEC, and a demonstration of the leak testing program was provided.

The document on the active LLLW tanks secondary containment design of the Category B pipelines was submitted to the regulators on February 28, 1994.

Routine leak tests were performed on eight small tanks. A videotape of the video inspections of Tanks WC-4, WC-5, WC-6, WC-8, WC-10, WC-11, WC-13, and WC-14 was compiled and will be used in identifying and eliminating non-programmatic waste inputs to the tanks.

The installation of the new pump and discharge line for WC-9 and a one-time use of inactive Tank WC-8 to facilitate this work as approved by TDEC and EPA were completed. The waste that had accumulated in WC-8 during this activity was removed.

The 30% and 90% design review packages for the removal of 100 ft of inactive LLLW lines that must be removed prior to installing the surge tanks were issued.

The document entitled *Active LLLW Tanks Design/Installation Assessment for Compliance Work, Building 3019A* was submitted to the regulators on January 28, 1994.

Concerns

None.

Scheduled Activities for Next Quarter

An implementation plan that will present updated relevant plans and schedules will be submitted to the regulators.

A design/installation assessment for the Melton Valley LLLW-Collection and Transfer Systems upgrade during the design phase will be submitted to the regulators.

A response to EPA's request for additional information on the untestable pipeline segments described in the detailed leak detection test plan and schedules will be submitted.

A response to a request for the verification that LLLW tanks at ORNL are covered by the FFA will be submitted.

3.2.7 ORNL WAG 2 (White Oak Creek Embayment/Tributaries/Soil OU 1)

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 (WOCE) 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 Valley and Bethel Valley. 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. WOCE 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 ⁹⁰Sr; ¹³⁷Cs; ⁶⁰Co; thorium; uranium;

transuranics; metals (mercury, zinc, and chromium); and some organic compounds (including PCBs) located primarily in bottom sediments.

Accomplishments

The surveying of WAG 2 seep and tributary sampling locations using the Global Positioning System began. Data obtained through this survey will result in the production of more accurate site maps and documentation for these sampling locations.

Water samples were collected from key locations in the WOC watershed during a major storm event to identify potential contaminant sources discharging directly to the tributary (and therefore not visible as seeps). These data will be used to prioritize upstream source areas for possible remedial actions based on relative contributions to off-site risk, and the data will be used to establish baseline contaminant concentration/discharge relationships that can be used in an evaluation of the effectiveness of future remedial actions.

Automatic water samplers were installed at three locations in Melton Branch as part of the WAG 2 baseline monitoring plan for the WAG 5 removal actions planned for seep areas C and D. A partial storm sampling effort (that took place February 21-28) resulted in ^{90}Sr samples being collected above and below each of the seep areas. These samples will help characterize the ^{90}Sr discharge prior to the planned removal actions.

Concerns

None.

Scheduled Activities for Next Quarter

None.

3.2.8 ORNL WAG 4

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 OUs: (1) a shallow land burial ground containing radioactive and hazardous wastes; (2) two pilot-scale LLLW waste seepage pits; and (3) an underground pipeline used to transfer liquid radioactive wastes from the main plant area to waste pits and trenches (WAG 7).

Accomplishments

A determination was made to pursue confirmatory field samples for suspected discrete seeps. This activity will support the non-time critical removal action.

Concerns

None.

Scheduled Activities for Next Quarter

Soil sampling will be conducted, and drive points to locate ^{90}Sr sources will be installed.

3.2.9 ORNL WAG 5

Description

ORNL WAG 5 is comprised of 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 (SWSA 5). The major contaminants detected in shallow groundwater are ^{90}Sr and ^3H .

Accomplishments

Drive point wells were installed in support of the focused seep investigation completed for all seeps. Scoping was completed for the program portion of the removal action for seep areas C and D, and a baseline change was requested. The seep area D geohydrology has complicated removal action options, and a limited investigation of the area is being conducted to resolve the issue.

A sample was collected from each of two newly identified seeps associated with "bath-tubbing" of trenches in seep areas B and C. Sampling included measurements of the discharge area and estimates of seep flow rates. Samples will undergo Close Support Laboratory analyses only.

The public comment period for the Engineering Evaluation/Cost Analysis for the removal action for seep areas C and D ended without any comments being received except from TDEC. The D1 version of the Action Memorandum for seep C was submitted to EPA and TDEC on February 24, 1994, almost 1 month ahead of the March 18, 1994, FFA deliverable date. The approach to the removal action at seep D was changed because of the receipt of new hydrogeological data, and a decision will be made whether to proceed under a revised plan. A separate Action Memorandum will be required for seep D.

Concerns

Concern: Additional funding will be required to support the Seep Area D removal action. *Impact:* Seep Area D has a complex geohydrology that will require a limited additional investigation to develop more complete removal actions. *Action:* Funding issues have been brought to the attention of finance and management.

Scheduled Activities for Next Quarter

An Action Memorandum will be prepared and issued for Seep D if a decision is made to proceed with this removal action.

3.2.10 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 northern 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

Well logging activities at the WAG 6 site were completed.

The Phase 1 well plugging and abandonment was completed. To date 636 wells have been plugged and abandoned.

Maintenance and upgrading of existing monitoring wells began.

Tumulus closure construction began.

The bid and award process for Monitoring Stations 1, 2, and 3 was initiated.

Concerns

Concern: The revised WAG 6 strategy needs to be documented in writing in order to meet the legal requirements of the FFA and other regulatory requirements. **Impact:** There are no immediate impacts. **Action:** The revised WAG 6 strategy is planned to be documented in a Record of Agreement at the April 18, 1994, FFA project managers' meeting.

Scheduled Activities for Next Quarter

Work will continue on the WAG 6 Environmental Monitoring Plan.

3.2.11 ORNL WAG 7 Pipeline and Leak Site OU 2

Description

The pipelines and associated leak sites run throughout the WAG and carry the liquid waste to each of the seven seepage pits; several known leak sites are associated with the subsurface pipelines. These units are located to the west and southwest of SWSA 4 in Melton Valley about 0.5 miles southwest of the main ORNL complex and are bounded on the south side by WOC. Several radioactive contaminants have been identified with major activities of ^{90}Sr , ^{137}Cs , ^{60}Co , and transuranic isotopes.

Accomplishments

A quality assurance project plan was completed for Phase 2 activities associated with the in situ vitrification treatability study.

In situ radioactivity logs for pit 1 were nearly completed leaving only a few new vertical pipes to be completed; this information is needed to set in situ vitrification depth and lateral targets for the fieldwork to be accomplished next year.

Draft procedures for conducting laboratory soil and water analyses were prepared and are undergoing review; a draft procedure for driving rods, pipes, drill rods, and Geoprobe rods was developed as required by the Phase 1 quality assurance plan.

Three groundwater sampling wells were driven into ORNL Pit 1. Samples of perched water in Pit 1 were also obtained and characterized.

Contaminated solids from ORNL WAG 7 Seepage Pit 1 were found to contain up to 2 microcurie per gram of ^{137}Cs . This relatively high level of radioactive contamination is consistent with estimates based on 40-year-old disposal records.

Concerns

None.

Scheduled Activities for Next Quarter

None.

3.2.12 ORNL WAG 10 Hydrofracture Wells Plugging and Abandonment OU 3

Description

The objective of this OU 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 piezometers or water quality sampling wells.

Accomplishments

Wellhead taps on 20 observation wells associated with Old Hydrofracture Facility injection operations were completed.

Groundwater sampling of the tapped wells was completed. Samples are being analyzed at the ORNL ER Close Support Laboratory. Geophysical logging of the wells will begin in April.

A total of 3 of the 13 wells tapped to date were found to be artesian with pressures in excess of 15 pts. Pressure gauges have been installed on these three wells, and pressures will be monitored over time to assist in determining the cause of the pressurization.

The wellhead air space in three of the wells sampled to date contained a potentially explosive mixture of gas (probably naturally occurring methane). The gas mixtures will be sampled, and the wellheads will be purged before work on these wells continues.

Concerns

None.

Scheduled Activities for Next Quarter

Sampling, analysis, and geophysical logging of the wells will continue.

3.2.13 ORNL WAG 11***Description***

ORNL WAG 11 is the White Wing Scrap Yard located at the west end of East Fork Ridge between State Highway 95 (White Wing Road) and the Oak Ridge Turnpike. The site, which covers ~30 acres, was used to store contaminated materials from the three Oak Ridge plants. Wastes (equipment, tanks, and trucks) were stored above ground. Much of the stored materials and contaminated soil was removed between 1966 and 1971; however, smaller quantities of contaminated debris (e.g., scrap metal and concrete) remain at the site. Contaminants of concern identified to date are ^{137}Cs , ^{234}Th , ^{235}U , and PCBs.

Accomplishments

Debris removal work continued with 99% now having been removed from the grids (110 out of 115 grids). Seven potentially pressurized containers and a bottle containing an unknown liquid have been isolated and are being handled by the proper ORNL personnel. The survey of areas outside of the current grid structure (but within the WAG 11 fence parameter) continued. An estimate will be prepared for the cleanup of debris that has been found in these areas.

The Interim Record of Decision cleanup continued with 99% of the cleanup complete as of February 25. Several "specialty items" were discovered during the cleanup and will require characterization before their transport to the main ORNL site. Estimates are currently being formulated to evaluate the appropriate options.

Concerns

Concern: The newly discovered "specialty items" may delay the completion of the Interim ROD work. **Impact:** There could be a delay in the total completion of the debris removal effort. **Action:** Efforts are under way to secure a vendor with experience in characterizing compressed gas cylinders.

Scheduled Activities for Next Quarter

The "specialty items" will be characterized and a postconstruction report submitted to EPA and TDEC for review.

3.2.14 ORNL WAG 13

Description

ORNL WAG 13 consists of the Cesium-137 Contaminated Field and the Cesium-137 Erosion/Runoff Study Area. The contaminated field is located ~330 ft north of the Clinch River at Clinch River Mile 20.5. The 50-acre area was set aside for studying the ecological effects of simulated fallout of ^{137}Cs , which would occur in the event of a nuclear war. The contaminant consisted of ^{137}Cs fused at high temperature to silica particles. After ~20 years (since contamination), about 5.2 Ci of activity remains.

The Erosion/Runoff Study Area is located due north of the confluence of WOC and the Clinch River. The purpose of this study area was to use the field contamination to study runoff, erosion, and infiltration of ^{137}Cs on a silt-loam soil.

Accomplishments

The completion of plots 6 and 7 continued to be delayed due to inclement weather. Ten rectangular silos were delivered to WAG 6. Five of these were filled with B-25 boxes, and four of the five remaining silos were placed in the ground.

Concerns

Concern: There is no funding for the additional contaminant removal from plot sidewalls. **Impact:** There will be a delay in the total completion of the debris removal. **Action:** Resources are being organized for resuming field activities, and funds will be reallocated from other areas of the ORNL ER Program.

Scheduled Activities for Next Quarter

Excavation work is scheduled to resume on April 18, 1994. Twenty-one silos have been installed at WAG 6 to accept the WAG 13 cesium-contaminated soil. Of the 21 silos installed, 19 have been filled with B-25 boxes.

The WAG 13 postconstruction report will be submitted to the regulators for approval.

3.2.15 ORNL Groundwater OU/Well Plugging and Abandonment

Description

Groundwater flowpaths and restoration activities are not constrained by WAG boundaries. Therefore, groundwater activities associated with individual WAG source OUs have been integrated over a larger geographic area. The groundwater OU consisting of Melton Valley and Bethel Valley has been established and will be the focus of a multi-year, long-term investigation.

The ORNL Well Plugging and Abandonment Project was established for the purposes of developing, implementing, and managing the plugging and abandonment of unneeded wells and coreholes at ORNL with the exclusion of WAG 6 wells and certain unique hydrofracture wells (WAG 10).

Accomplishments

A field survey was begun to inventory ORNL wells/boreholes and to verify and update the existing ORNL well data base. In addition, an ORNL well P&A plan was prepared that presents the strategy and detailed approach to be used for well/borehole decommissioning at ORNL.

The RI Work Plan for the groundwater OU component of this activity was submitted to regulators for review and comment.

Concerns

None.

Scheduled Activities for Next Quarter

Planning documents required for the implementation of well plugging and abandonment field activities will be identified and initiated.

3.3 OAK RIDGE K-25 SITE**3.3.1 K-770 OU*****Description***

The K-770 OU includes a contaminated scrap metal yard and associated contaminated debris, two buildings used as part of a thermal diffusion plant in the 1940s, and a sewage treatment plant. The unit is located southwest of the main plant area near the Clinch River. Operation time frame for the various subunits ranged from 1943 to the early 1960s. The scrap metal yard and sewage treatment plant are still in operation.

The K-770 Scrap Metal Yard contains ~20,000 ft³ of asbestos-containing metal along with waste materials contaminated with uranium, transuranics, mercury, and asbestos. Building K-726, located within the K-770 Scrap Metal Yard, was used for storing PCBs. Suspected contaminants of concern in Buildings K-722 and K-725 are beryllium, mercury, asbestos, and uranium. In 1950, a transformer exploded at the K-709 switchyard, releasing PCB-contaminated oil in the area. Sewage that may contain traces of radioactive contaminants is present at the K-710 sewage treatment plant.

Accomplishments

EPA and TDEC review comments on the RI Work Plan for the K-770 OU were received.

Concerns

Concern: Funding for K-770 OU work could be withdrawn. **Impact:** A withdrawal of funding would prohibit additional work on this project. **Action:** Funding was withheld on March 30, 1994.

Scheduled Activities for Next Quarter

Responses to EPA and TDEC comments on the RI Work Plan will be prepared.

3.3.2 K-901 OU***Description***

The K-901 OU consists of a contaminated burial ground, landfarm, holding pond, and two construction waste disposal areas. The OU 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 ~35,575 ft³ 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

A portion of the analyses of biota collected from the K-901 Holding Pond as part of the K-901 OU RI was received. The data were reviewed for technical completeness and quality control. Three gizzard shad were analyzed for PCBs and were found to have concentrations from 5.5 to 15.0 ppm. The Food and Drug Administration action level for PCBs is 2 ppm. The appropriate occurrence reporting was completed.

EPA and TDEC approvals were received on the RI Work Plan for the K-901 OU.

The National Environmental Policy Act (NEPA) Compliance Request for the K-901 OU was completed. The floodplains assessment and the penetration permits were initiated. SAIC issued a drawing showing proposed and existing sampling points at the K-901 OU. Endangered plants and animal assessments as well as the historical assessment have been completed.

The wetland assessment for the K-901 OU RI was initiated. (The wetland survey and rare plant surveys were completed October 8, 1993.) An internal review of the NEPA file indicates that these activities were initially addressed in prior years; however, current NEPA directions make it necessary to readdress these actions.

The installation of power poles and electrical utilities for the K-901 OU RI field investigation was begun. Electricity is needed for field trailers that will be used on site.

Work was initiated on validating Phase 1 ecological risk assessment data for the K-901 OU.

Penetration permits for SAIC to perform soil borings as part of the K-901 OU RI were completed. Approximately 50 soil borings will be required to characterize this site.

Final approvals of the Sampling and Analysis Plan, Health and Safety Plan, and Waste Management Plan for the K-901 OU RI were received. Resolution of the potential withdrawal of the K-901 OU RI funding by DOE is pending.

Concerns

Concern: Funding for K-901 OU RI work could be withdrawn. ***Impact:*** A withdrawal of funding would prohibit identifying the extent of the contamination migrating from the K-1070-A Contaminated Burial Ground, quantifying the types and extent of contamination in the K-901-A Holding Pond, identifying the potential contamination at associated sites, and determining the associated risk posed to human health and the environment. ***Action:*** A DQO scoping workshop will be held to rescope the work to be performed at the K-901 OU. Activities at the pond will be addressed at this meeting. Funding was reduced for the K-901 OU on March 30, 1994.

Scheduled Activities for Next Quarter

Rescoping for a reduced investigation/interim action will be integrated with a review of the DQOs in a meeting of DOE, Energy Systems, and regulator personnel.

3.3.3 K-1070 OU

Description

The K-1070 OU consists of the K-1070-C/D Classified Burial Ground, located on a hill at the eastern edge of the K-25 plant. The burial ground is comprised of three major disposal areas: large trenches, small pits, and three earthen dike areas. Both low-level radioactive and nonradioactive, nonhazardous waste materials and equipment were buried in the large trenches. The small pits were used for the disposal of hazardous liquid wastes and glass. The earthen dike areas were used for storing drums of hazardous waste. Contaminants of concern at the burial ground are volatile and semivolatile organics, uranium-contaminated scrap metal, uranium compounds, lead, and other metals. In addition, an interim corrective action is planned for the SW-31 leachate seep, which is located immediately west of the site and has been likely contaminated by the burial ground.

Accomplishments

All remaining field activities defined in the original scope—including soil, groundwater, and surface water sampling—were completed.

Concerns

None.

Scheduled Activities for Next Quarter

Three additional groundwater monitoring wells will be installed, and soil sampling will be conducted inside two pits.

3.3.4 K-1070 SW-31 Spring Project

Description

This project will implement 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 pending regulations. The seep appeared after an attempted reclamation of the area bordering the west end of the K-1070-C/D Classified 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 seep currently flows into a storm drain that discharges into Mitchell Branch. The preferred remedial action involves air stripping the discharged water to remove volatile contaminants after pretreatment to remove iron, followed by carbon filtration (polishing) to remove PCBs. Required unit processes will be added to the Central Neutralization Facility as an upgrade for the Phase 2 design.

Accomplishments

The Phase 1 postconstruction letter was submitted to EPA and TDEC on March 15.

Flow collection, transport, and treatment activities began at the Y-12 Groundwater Treatment Facility on January 13, 1994.

Concerns

The initiation of flow collection, transport, and treatment activities for the SW-31 Spring entails risk(s) that could result in environmental noncompliances.

Scheduled Activities for the Next Quarter

The remedial design for Phase 2 will be submitted to EPA and TDEC for approval.

3.3.5 K-1407 OU

Description

The K-1407 OU 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 OU 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. Both ponds are RCRA Interim Status Units and are awaiting closure. Since sludge removal during 1987 and 1988, radionuclides are the only remaining contaminants.

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/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 pond and several area underground storm drain systems.

The K-1202 Hazardous Waste Storage Tanks consist of two elevated storage tanks of 15,000 gal capacity each. The tanks originally contained processing equipment lubricating oils, but in recent years the tanks have been used for the interim storage of mixed wastes.

For each unit, an RI/FS Report, a Proposed Plan, and a ROD will be prepared. The constituents not addressed in the formal RCRA process will be addressed in the CERCLA process. This will meet the need to address the radionuclide contamination. The above actions will achieve complete 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

The D2 version of the Remedial Design/Remedial Action Work Plan for the K-1407-B and -C ponds was submitted on February 4 to EPA and TDEC for approval.

Concerns

None.

Scheduled Activities for Next Quarter

CERCLA remedial action for the K-1407-B and -C ponds will begin June 1.

3.3.6 Pond Waste Management Project

Description

The K-1417 Drum Storage Yard was a RCRA interim status waste storage area. There were ~28,000 drums stored on the yard and ~2,000 drums stored in the K-25 vaults containing raw sludge from the K-1407-B Holding Pond and the K-1407-C Retention Basin. There were ~45,000 drums of stabilized sludge stored in the K-33 and K-31 buildings. The sludge contains inorganic, organic, and radioactive contamination and was removed from the ponds during

RCRA closure activities in 1988. Prior to storage at K-1417, the sludge was either drummed or stabilized in a concrete grout mixture at the K-1419 Sludge Fixation Facility.

Accomplishments

Compliant storage activities continued for the Pond Waste Management Project. There were 853 drums repackaged (for a total of 2679 repackaged to date), 1213 drums crushed (for a total of 2622 crushed to date), 695 21st Century containers filled (for a total of 626 filled to date), and 221 containers moved to K-1065 storage (for a total of 415 containers moved to storage to date).

The Request for Proposal for the proof-of-process for treatment of the raw sludge was issued to vendors.

The Chemical Waste Management demobilization activities on the K-1417 Drum Storage Yard were completed.

Concerns

Concern: Agreement has not been reached with EPA and TDEC on the final disposal of wood pallets from the K-1417 Drum Storage Yard. **Impact:** The pallets are being stored on the K-1417 Drum Storage Yard until direction has been received from TDEC and EPA, and, therefore, space is being taken up in areas where repackaging efforts could be occurring. **Action:** A letter has been sent to EPA and TDEC outlining a plan for disposal and requesting approval to proceed with the plan.

Scheduled Activities for Next Quarter

The repackaging of raw sludge in 21st Century containers will continue.

Work will continue on revising the action plan once the regulators have approved the scope of work.

3.4 CLINCH RIVER

3.4.1 Clinch River OU

Description

The Clinch River RI focuses on the portions of the Poplar Creek and Clinch and Tennessee rivers that may have been adversely affected by contaminants released from the mid-1940s to the present from the DOE ORR. The Melton Hill Reservoir and the Clinch River, downstream from Melton Hill Dam, form the southern and eastern boundaries of the ORR. Poplar Creek drains the K-25 Site and receives inflow from EFPC. The 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 the Clinch River from Melton Hill Dam to Kingston.

The contaminants released from the 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 the Clinch River; however, much of the waterborne 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 Watts Bar Reservoir. Arsenic, chromium, mercury, selenium, zinc, ^{137}Cs , and ^{60}Co constitute a risk only if deep-channel sediments are dredged and dredged spoils are placed on land.

Accomplishments

The trial date for the Watts Bar Resort Owners' lawsuit against Martin Marietta Energy Systems, Inc., and Union Carbide, Inc., was rescheduled for August 8, 1994.

A presentation on the status of the Clinch River ER Program was given to the Roane-Anderson Counties Economic Development Council.

An addendum to the Phase 2 sampling and analysis plan for the Clinch River RI was submitted to EPA and TDEC. This addendum was based on discussions at a series of meetings on DQOs and substantially modified the original Phase 2 sampling and analysis plan.

Concerns

None.

Scheduled Activities for Next Quarter

Phase 2 sampling and analysis will continue based on the revised Phase 2 sampling and analysis plan.

There will be continued discussions with TDEC and EPA Region IV about further dividing the Clinch River OU for the purpose of breaking off Poplar Creek. As a separate OU, Poplar Creek would require its own set of decision documents, and the work schedule could be easily brought in line with the remedial action taking place for Lower EFPC.

3.5 TECHNICAL OVERSIGHT AND TECHNICAL PROGRAMS

3.5.1 Background Soil Characterization Project

Description

The main objective of the Background Soil Characterization Project (BSCP) is to provide comprehensive, reservation-wide background soil concentration data on significant potential contaminants of concern [organics, inorganics (metals), and radionuclides] in natural soils on the ORR. The BSCP addresses variability of analyte concentrations in terms of the dominant

soil types that occur in the different geologic formations on the reservation, soil sampling horizons, and natural variations in soils. Other project objectives include providing baseline data for contaminated site assessments and estimates of human health risks associated with background levels of potentially hazardous constituents in soils on the ORR.

Accomplishments

None.

Concerns

None.

Scheduled Activities for Next Quarter

BSCP records management activities will be completed, storage requirements met, and the project closed out, including the completion of final quality assurance surveillance action items.

3.5.2 Oak Ridge Environmental Information System

Description

The Oak Ridge Environmental Information System (OREIS) is mandated by DOE-ORO to fulfill the environmental data base requirements established by both the FFA and the Tennessee Oversight Agreement (TOA). At the direction of DOE-ORO, OREIS is being developed as a consolidated data base for environmental measurements for all facilities managed by Energy Systems. These facilities include ORNL, the Y-12 Plant, and the K-25 Site located in Oak Ridge and the gaseous diffusion plants located at Paducah, Kentucky, and Portsmouth, Ohio. The environmental data include data generated pursuant to the FFA and data generated under federal and state environmental permits. All data used in compiling regulatory reports will be included in OREIS.

Accomplishments

The recent stage of OREIS development has focused on conducting user orientation for and evaluation of OREIS in preparation for fully supported operations later in FY 1994. To support this effort, the following documents were issued during this quarter for review and comment:

- OREIS User's Guide (ES/ER/TM-93)
- Annual Report on OREIS Operations: Services and Products (ES/ER/TM-108)
- Computer Operations Manual for OREIS (ES/ER/TM-94)

Two-day orientation sessions were held for 30 users who will participate in the evaluation of the system. Followup exercises have been held with each of these users to test the system further. The evaluation users include representatives from ER, Environmental Compliance, DOE, and TDEC.

Data from portions of ER reports have been loaded into the data base. Records documenting the quality assurance review of the data have been established. Additional data from new ER reports have been received.

Concerns

Concern: Data generated as a result of site ER program work are often deficient with respect to several basic data management principles, making it extremely difficult to incorporate such data into OREIS in a timely manner. ***Impact:*** The loading of ER project data into OREIS is being delayed, thereby affecting the ability to provide data to the regulators on schedule. ***Action:*** DOE has directed ER to establish a data management program that will define a data management policy, process, and procedures to be executed within all ER projects. The roles and responsibilities of the ER projects, site programs, and OREIS data management will be clearly defined. Consistency in data management practices throughout the ER Program will be established through regular reviews by this central data management program. The operational effectiveness of OREIS will be significantly enhanced when the data management program is fully implemented.

Scheduled Activities for Next Quarter

The survey of current user practices and requirements (functional and data base) related to OREIS will be validated.

The user evaluation of OREIS will be completed so that system enhancements can be identified. Descriptions of enhancements will be submitted for review.

The installation of OREIS version 2.0 on site workstations will be completed.

Computing resources compatible with OREIS will be delivered to TDEC on behalf of DOE.

System and operational procedures will be assessed in preparation for the release of the baseline production system by the end of June 1994.

Training and user support materials for the production system will be prepared.

3.5.3 Aerial Remote Sensing Surveys

Description

Remote sensing technologies provide efficient means for acquiring data for site characterization, change detection, and identification of potential areas of previous waste activities and acquiring updated information to support geographic data bases (e.g., facility data, land cover, and topography). The objectives of the Remote Sensing and Special Surveys Program (Aerial Remote Sensing Surveys) are to promote and manage routine examinations of the ORR and associated off-site areas and to provide screening-level site characterization data and aerial photography to the ER site programs. The program is dedicated to providing an experienced team of individuals to DOE and other federal agencies to demonstrate and test emerging remote sensing characterization technologies and technologies being transferred

from other industries that may prove to be useful tools in environmental restoration and waste management characterization activities.

Accomplishments

National Technical Means sensor data revealed several features that are of interest for environmental site characterization and remediation purposes. These features have not been readily apparent on low altitude aerial photographs. The features that were identified include a submerged grid at WOL, possible burial trenches at WAG 5, and nighttime burning at Y-12.

A new document was released by the Environmental Sciences Division at ORNL entitled *Resource Management Plan for the Oak Ridge Reservation, Volume 30: Oak Ridge National Environmental Research Park Natural Areas and Reference Areas—Oak Ridge Reservation Environmentally Sensitive Sites Containing Special Plants, Animals, and Communities* (ORNL/NERP-8). This document provides information on the occurrence or possible occurrence of special or protected plants, animals, and communities on the ORR.

A preliminary seeps and springs analysis of predawn thermal imagery from April 1992 was completed and hard copy prints and documentation were delivered. These products along with some digital thermal data from other concern areas were reviewed on February 8, 1994, with T. Zondlo and R. Poling. The need for additional differential temperature thermal analysis of the K-901 pond, at the Clinch River near the K-25 Site, and of lower Poplar Creek was identified.

Digital Elevation Model (DEM) raster images were created for use in surface and groundwater modeling near the L2 facility in Bear Creek Valley. These DEMs were derived from U.S. Geological Survey DEM data. A July 1993 model airplane photograph of the WAG 4 seeps area has been rectified to a raster cell size of 1 ft for use in overlays of geophysical data. Rectifications are under way on April 1992 6000-ft natural color and color infrared photographs of the White Wing Scrap Yard. These will be used as backdrops for geophysical data.

The acquisition of high resolution aerial geophysical survey data for the White Wing Scrap Yard and adjacent area near K-25 has been completed. Discussions with the White Wing Scrap Yard ER project team are scheduled for early April.

Concerns

None.

Scheduled Activities for Next Quarter

EG&G Energy Measurements will conduct aerial tests of the laser induced fluorescence imaging system on selected portions of the ORR. EG&G will also be collecting MSS imagery of the same areas for the purpose of correlating the two data sets.

3.5.4 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 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 where the human health risk assessment identifies, analyzes, and characterizes adverse health effects in human receptors and an 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 critical risk assessment data gaps.

Accomplishments

The DOE-ORO Risk Assessment strategy document entitled *Defining the Role of Risk Assessment in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Remedial Investigation Process* was transmitted to EPA and TDEC.

A risk assessment data evaluation workshop and meeting were conducted. The workshop and meeting were arranged by the Risk Assessment Council upon request by TDEC and were part of the Risk Assessment Council's continuing effort to improve interfaces with TDEC and to increase understanding of the risk assessment process.

The results of the Human Health Baseline Risk Assessment for Chestnut Ridge OU 2 were presented at the monthly regulatory meeting in Chattanooga (attended by

representatives of EPA, TDEC, DOE, Energy Systems, and CDM Federal Programs). A summary of the RI Report, including the ecological and human health risk assessments, was presented at this meeting, and the FS alternatives were reviewed and discussed in order to narrow the scope of the FS.

A review of the Tennessee Valley Authority (TVA) biomonitoring and toxicity studies was prepared for the Lower Watts Bar Reservoir RI. These studies suggest that the sediments of the Lower Watts Bar Reservoir are toxic to ecological receptors and that the benthic invertebrate community is degraded relative to the best TVA reservoirs. However, the fish community data provide mixed results that cannot be so clearly interpreted.

An assessment of the exposure of plants and soil heterotrophs to contaminants of concern was completed for the Chestnut Ridge OU.

The ER Benefit Assessment Matrix was developed and applied. This was the first application of this risk-based matrix to ER projects. The matrix provides a semiquantitative ranking to support budget prioritization decisions.

Support was provided to the ORNL WAG 1 Surface Impoundment 3513 Corrective Action Investigation. Criteria to be used for the screening human health risk assessment were developed, and a risk assessment evaluation was initiated.

A meeting was held with Dr. Al Brooks, a citizen residing along the Lower EFPC in Oak Ridge. The purpose of the meeting was to discuss the results of courtesy reviews of papers prepared by Dr. Brooks regarding the investigations of the Lower EFPC floodplain and Brooks's concerns regarding the conservatism in these investigations required by the regulatory agencies.

The preliminary results of the Human Health Baseline Risk Assessment for Y-12 Bear Creek Valley OU 2 (the Rust Spoil Area, SY-200 Yard, and Spoil Area 1) were presented to the U.S. EPA, Region IV, and TDEC. Additional topics of discussion were the status of the RI Report for OU 2, the preliminary results for and draft of the RI Report, and the plans for the FS.

Concerns

None.

Scheduled Activities for Next Quarter

Four new toxicity profiles for contaminants of concern will be submitted.

3.5.5 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 TOA 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 TOA obligates DOE to provide technical and financial support for Tennessee's oversight of and participation in the FFA, in addition to establishing and maintaining complaint programs.

Accomplishments

The updated FFA Appendix C was approved by the FFA project managers. This updated version reflects three subsections: (1) remediation areas, (2) pre-remediation areas (study areas), and (3) areas for future consideration. The third subsection contains all solid waste management areas on the ORR that are currently not a part of the ER Remedial Action Program.

The updated FFA Appendix E containing FY 1994 milestones was approved by the regulators.

A modification request was completed with the active LLLW tank staff for FFA section IX.F, and the request was transmitted to the regulators.

FFA project managers met on March 16, 1994, to discuss—among other agenda items—the documenting of classified material searches for all OUs and the scheduling logic for the ORR FFA.

Concerns

None.

Scheduled Activities for Next Quarter

A generic schedule of activities will be prepared for the ORR.

A new operating instruction will be prepared to resolve concerns on the classified information gathering process.

4. RESPONSE 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

Camp, Dresser, and McKee—Development of an RI Work Plan for Chestnut Ridge OU 1.
Development of an RI Report for Chestnut Ridge OU 2.

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. 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]

BTE Consulting Engineering Inc.—Provision of professional services.

Geraghty & Miller, Inc.—Support in preparation of all postclosure permit applications and preparation of Bear Creek Valley OU 4 RI plan.

Highland Drilling Company—Characterization well drilling.

IT Corporation—Sampling and analysis.

Jacobs ER Team—Preparation of integrated RCRA/CERCLA/NEPA decision documents, including FSs, Proposed Plans, RODs, Environmental Assessments, EISs, 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.

SAIC—Field sampling at Bear Creek Valley OUs 2 and 4, development of an RI Report for Bear Creek Valley OU 2, fieldwork for Upper EFPC OU 2 RI, data management support, support for ER strategic plan development and field mobilization, and assistance to on-site laboratories with the implementation of Contract Laboratory Protocol reporting.

SONSUB—Underwater surveying of Rogers Quarry. There is a separate subcontract for the closure of Kerr Hollow Quarry.

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

University of Tennessee—Hydrogeological support.

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

4.2 OAK RIDGE NATIONAL LABORATORY

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

Analyses—Administrative support.

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.

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

BOOTECH—Assistance in the analysis of surface water.

ENSERCH Environmental Corporation—Remedial design activities.

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.

Geotek Drilling—Drilling services.

Gilbert Commonwealth—Preparation assistance for 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.

Highland Drilling Company—Construction and well plugging and abandonment.

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

Hydrocomp—Expert review of field monitoring and modeling of contaminated sediment transport in WOC.

Jacobs ER Team—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.

JAYCOR—Sampling and analysis support for benthic macroinvertebrate samples from WOC and its tributaries.

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

Lockheed—Analytical services.

MK-Ferguson—Construction management.

Midwest Technical, Inc.—Assistance in budgeting, planning, and cost tracking; to provide laboratory and field technical support.

North Carolina State University—Assistance in biological monitoring and abatement tasks.

Oak Ridge Associated Universities—Field services coordination.

OGDEN—Geotechnical services as required to support the remedial design architect-engineer and the Performance Assessment Program.

Pzer Consultants—Administrative support (team member of SAIC).

Radian—Preparation of environmental assessments and CERCLA decision documents.
[Closed]

SAIC—Monitoring coordination, performance assessments, and hydrologic modeling activity for the WAG 6 Performance Assessment Program.

Southwest Research—Outside laboratory services.

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 coreholes 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.

University of California Davis—Histopathological analyses of fish tissues.

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 surface water monitoring.

Vista Research, Inc.—LLLW tank system leak testing methodology development.

43 OAK RIDGE K-25 SITE

Adams Craft Hertz Walker—Site surveying (Pond Waste Management Project).

Advanced Sciences, Inc.—Data validation.

- Analysis Corporation**—Records management (Pond Waste Management Project).
- Battelle, Columbus Laboratories**—Preparation of a simplified EA (Pond Waste Management Project).
- Brooks Rand Laboratory**—Mercury speciation analyses.
- CDM Federal Programs**—PA/SI 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 (Pond Waste Management Project).
- Dennis Weiter Assoc.**—Study of available filter press operations (Pond Waste Management Project).
- Enterprise Advisory Services, Inc.**—Management systems support.
- ESE Biosciences Group**—Bioremediation of a former UST site.
- ETE Consulting Engineers**—Surveying.
- Geraghty and Miller**—Technical support [K-25 Site Groundwater Protection Program (GWPP)].
- GH Cofer**—Professional services.
- Gilbert Commonwealth**—Estimating support.
- Highland Drilling**—Characterization well drilling; drilling services for K-25 Site GWPP.
- HSW Environmental Consultants, Inc.**—Technical support (K-25 Site GWPP).
- IT Corporation**—Analytical support.
- Jacobs ER Team**—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.
- Labat-Anderson**—Assistance for Radian Corporation with environmental assessment for K-1407 B&C Ponds.
- Lockwood Greene**—On-site project engineering support and Title II design (Pond Waste Management Project).
- A. L. Lotts**—Operational Readiness Review Board; independent member (Pond Waste Management Project).
- PAI**—Technical consulting; generation of a project management plan and operational oversight management plan (Pond Waste Management Project).
- SAIC**—RI subcontract services for the K-770 and K-1070 OUs.
- Singleton Laboratories**—Soil, geochemical, and geophysical analyses.

Tenere—Technical consulting; conduct of operations (Pond Waste Management Project).

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

4.4 ORAU AND EFPC

Alcon Corporation—Quantitative uncertainty analysis.

Brooks Rand Laboratories—Analytical support.

CompuChem Laboratories—Analytical laboratory services.

ENSERCH—Baseline support for ORAU.

ETE Consulting Engineers—Surveying.

GEOTEK—Field investigation support.

Jacobs HR Team—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.

Labat-Anderson—NEPA, FS, and Administrative Record support.

MK-Ferguson—Baseline planning support for ORAU.

SAIC—EFPC RI/FS, data management, quality assurance, community relations, and NEPA support.

Singleton Laboratories—Geotechnical laboratory services.

University of Tennessee—Technical support of bioremediation and consulting.

4.5 CLINCH RIVER-WATTS BAR RESERVOIR

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

Analytical Projects Office (APO) at Martin Marietta Energy Systems, Oak Ridge—Processing of all contracts for analyses of samples collected. The APO determines which labs will perform the analyses.

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

Atlan-tech, Inc.—Procedure writing support for the low-level radiological laboratory being used to analyze Phase 2 samples. *[Closed]*

Automated Sciences Group—Support for various tasks in the management, collection, analysis, and interpretation of biota, water, and sediment samples; also program management assistance.

Battelle Pacific Northwest Laboratory—Technical support with water, sediment, and contaminant modeling tasks.

CDM Federal Programs—Regulatory compliance support on the WOCE time-critical CERCLA removal action. *[Closed]*

Gilbert Commonwealth—Assistance, through a subcontract with Central Engineering, in the publishing of the first Lifecycle Baseline document. *[Closed]*

Jacobs ER Team—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.

JAYCOR—Support of data management activities and document maintenance in the production of risk assessment documents.

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

Midwest Technical, Inc.—Support of data management activities and document maintenance in the production of risk assessment documents. *[Closed]*

Oak Ridge Institute of Science and Energy—Support for risk assessments and contaminant transport modeling.

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

ORAU—Radioanalytical support for Phase 1 of the RI. *[Closed]*

PEER Consultants—Computer programming and bar coding support.

SAIC—Technical support and assistance in the compilation of data packages, validation and verification of data packages, and analytical services coordination.

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

Skidaway Institute of Oceanography, University of Georgia—Analysis of speciation of arsenic. *[Closed]*

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

Tennessee Valley Authority—Support for the sedimentation range cross-sections *[Closed]*; aerial photography and topographic mapping of WOCE *[Closed]*; numerical modeling of water, sediment, and contaminant transport in Clinch River-Watts Bar Reservoir; sampling and analysis of water and sediment from potential sources of contaminants; review of TVA sediment-disturbing activities; sampling and contaminant analysis of key fish species in the Tennessee River System; sediment and water toxicity studies; and benthic macroinvertebrate community study at monitoring stations within the Clinch River and Poplar Creek.

University of California-Davis—Quantitative histopathological analyses 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 Energy Systems document management centers in Oak Ridge; study of pollutant material transport, distribution, and characterization; and program management.

4.6 ENERGY SYSTEMS ER CENTRAL DIVISION

Analyses—Technical integration support and DOE Model Conference support. *[Closed]*

Authorization Systems, Inc.—Subcontract support to Wye Technologies for support of the Intelligent Document Control System for the FFA. *[Closed]*

Automated Compliance Systems, Inc.—Analysis of sample management and data handling. *[Closed]*

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

Dr. Stanley N. Davis—Groundwater consulting at Paducah. *[Closed]*

Ecotect Laboratory Services, Inc.—Laboratory sample analysis.

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

ERC, Inc.—Support for a feasibility study.

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.

ORAU—5-year plan review. *[Closed]*

Penn Accord—Facilitation training. *[Closed]*

SAIC—Site-specific plan support for the development of the Oak Ridge Environmental Information System; 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 5-year plan; and data management support.

S. M. Stoller Corporation—Video preparation. *[Closed]*

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

University of Waterloo (Canada)—Groundwater modeling.

Dr. William B. White—Consulting for karst hydrogeology on the ORR. *[Closed]*

4.7 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.

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