3. Environmental Management and Reservation Activities

Setting

Much of Environmental Management (EM) work done on the ORR is performed as a result of the requirements of the Federal Facility Compliance Act and CERCLA. The Federal Facility Compliance Agreement (FFA), which preceded the Act (see Sect. 2.2.4), requires that all DOE facilities manage and dispose of waste in accordance with their respective Site Treatment Plans. The Legacy Waste program was established to address, in accordance with the Site Treatment Plan, waste generated and stored on the ORR from past operations. Another large part of EM work conducted at Oak Ridge is done according to the requirements of CERCLA, which is implemented by the FFA in Oak Ridge. The FFA is an agreement signed by DOE, TDEC, and EPA to address contamination resulting from past activities of DOE operations that remain in structures, buildings, facilities, soil, groundwater, surface water, or other environmental media. Most of the remaining part of EM work is operating and maintaining waste treatment, storage, disposal, and recycling facilities that support EM activities, and other DOE programs as well.

Update

This section will discuss the 1999 accomplishments of the EM program at each of the three Oak Ridge sites and throughout the reservation.

3.1 INTRODUCTION

For over half a century, one of the primary missions of DOE and its predecessor agencies was the production of nuclear weapons for the nation's defense. Production of materials for nuclear weapons, which began in 1943, produced hazardous and radioactive waste and resulted in contamination of facilities, structures, and environmental media. Two laws passed by Congress included requirements to address these problems. These two laws are the Federal Facility Compliance Act and CERCLA. The Federal Facility Compliance Agreement, which preceded it (see Sect. 2.2.4), requires that all DOE facilities manage and dispose of waste in accordance with their respective Site Treatment Plans. The Legacy Waste and Waste Operations programs address waste stored, treated, disposed of, or recycled on the ORR in accordance with the Site Treatment Plan. CERCLA addresses any environmental contamination resulting from past industrial operations, not just those performed at federal facilities. CERCLA requires that sites requiring cleanup actions be placed on a national list, the National Priorities List (NPL). Once on the list, federal agencies and private companies are required to investigate and remedy abandoned or uncontrolled hazardous waste sites where a release has occurred or may occur. The ORR was placed on the NPL in 1989. CERCLA also requires public involvement to ensure that citizens will be informed of cleanup decisions that may affect them or the area in which they live.

An additional aspect of the EM program is operating and maintaining waste treatment, storage, disposal, and recycling facilities at each of the three Oak Ridge sites (ETTP, ORNL, and Y-12). These activities are included in the Waste Operations program.

In 1990, DOE Headquarters (DOE-HQ) established the Office of Environmental Management, making the Oak Ridge Operations office responsible for cleanup of the reservation. Lockheed Martin Energy Systems, Inc., served as its managing and operating contractor until the end of March 1998, when responsibility was transferred to Bechtel Jacobs Company LLC. The following sections highlight some of the EM activities for 1999 and some related activities carried out to ensure good stewardship of the Reservation.

3.2 FEDERAL FACILITY COMPLIANCE ACT

The Site Treatment Plan, prepared in accordance with the Federal Facility Compliance Act, includes schedules, milestones, and target dates for appropriately dispositioning any mixed waste stored at any of the three Oak Ridge facilities. The Site Treatment Plan is updated annually according to the ongoing needs of Oak Ridge Operations and the character and nature of waste remaining to be dispositioned. Another waste type, transuranic (TRU) waste, is currently being addressed as an additional effort of the Legacy Waste program. TRU waste is waste contaminated with radioactive isotopes that have atomic numbers higher than 92.

3.2.1 Legacy Waste

In 1999, all 13 STP milestones were met on schedule and within budget, including disposition of an additional 572,000 kg of mixed waste. Significant contributions to this accomplishment included

- disposing of TSCA fire-sump sludge at the Envirocare facility in Utah,
- completing relocation of TSCA repackaging operation, and
- disposing of 172 m^3 of LLW, including 5.9 m^3 of liquid fissile waste.

3.2.2 TRU Waste

The TRU Waste program consists of designing and building a treatment facility (including vehicular access roads) for the TRU waste and preparing all project documents and permits required by environmental regulations. Upon completion of the facility, the waste will be treated so that it can be disposed of as LLW. In 1999, the permitting process was completed with the issuance of a RCRA Part B permit, and air and stormwater permits. The access road to Melton Valley was completed in September 1999. In 2000, the facility design and the EIS are expected to be completed.

3.3 WASTE OPERATIONS

The Waste Operations program consists of operating and maintaining several facilities throughout the ORR that treat, store, dispose of, or recycle waste generated from any of the ongoing DOE facility operations. The program also addresses some of the waste from past operations in accordance with the Site Treatment Plan. In addition to optimizing each facility's operating capability, a large part of this work entails ensuring that all applicable permit requirements and other environmental requirements are met for each facility.

3.3.1 Y-12 Waste Operations

Facilities operated and maintained at Y-12 by the Waste Operations program include the West End Treatment Facility, the Groundwater Treatment Facility, the Uranium Chip Oxidation Facility, the Central Pollution Control Facility, two industrial landfills (see Sect. 2.2.1.3), and four construction and demolition landfills (see Sect. 2.2.1.3). These facilities support both Y-12 Defense Programs and EM work. The Central Pollution Control facility had a Site Treatment Plan requirement to treat 237,000 gal of wastewater, and this requirement was met. The Y-12 Waste Operations program has increased construction landfill capacity by 469,000 yd^3.

3.3.2 ORNL Waste Operations

The Waste Operations facility at ORNL is the Process Wastewater Treatment Facility (PWTF). This facility supports both EM projects and ongoing research and development activities at ORNL. In addition to operating the PWTF, Waste Operations supports EM projects by providing waste management and disposition services to cleanup projects. Among the services provided in 1999 is the transfer of LLLW from the Gunite and Associated Tanks (GAAT) Project to the Melton Valley Storage Tanks (MVSTs).

3.3.3 ETTP Waste Operations

Waste Operations facilities at ETTP include the Toxic Substances Control Act Incinerator (TSCAI), the Central Neutralization Facility (CNF), and the Filter Test Facility. These facilities are operated in accordance with all applicable permit requirements and environmental regulations.

3.4 COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT

The sequential steps in a CERCLA project are assessment, investigation, feasibility studies, and remedial actions. To implement CERCLA requirements in Oak Ridge, the DOE-ORO EM Program adopted a watershed approach for assessing and investigating areas to determine the best methods for protecting and restoring ecosystems and protecting human health. The basic concept of the watershed approach is that environmental problems in industrial areas are best solved at the watershed level rather than at individual contamination sites. The watershed approach requires consideration of all environmental concerns, including needs to protect public health, as well as critical habitats, such as wetlands, biological integrity, and surface and ground waters. The watershed approach allows better management strategies for investigations and remediation, thereby maximizing the use of scarce resources.

3.5 OAK RIDGE Y-12 PLANT

Y-12 EM projects are located in one of three hydrogeologic regimes: BCV, UEFPC, or the Chestnut Ridge Hydrogeologic Regime. BCV extends from the west end of the Y-12 Plant approximately 10.2 miles to the Clinch River. A 2-mile section of BCV immediately west of the Y-12 Plant contains numerous waste disposal sites that have been used since 1943. Of these, the three main disposal areas are as follows: (1) the S-3 Ponds, (2) the Oil Landfarm (OLF)/Bone Yard/ Burn Yard (BY/BY) area, and (3) the Bear Creek Burial Grounds (BCBG). Several auxiliary areas were used for the disposal of various liquid and solid wastes contaminated with both radionuclides and chemicals. The major contaminants to surface water and groundwater in the BCV Watershed are uranium and nitrate with lower concentrations of cadmium and technetium-99.

The Environmental Management Waste Management Facility (EMWMF) will be constructed in BCV. This facility will enable disposition of waste generated as a result of CERCLA activities on the ORR to be handled in Oak Ridge.

UEFPC begins in the western portion of the Y-12 Plant as an underground storm drain system that collects groundwater and stormwater. UEFPC encompasses the developed Y-12 Plant industrial area, including certain solid waste management units included in the RCRA Hazardous and Solid Waste Amendments permit and other dispersed areas of contamination resulting from past operations. Water in the storm drain system surfaces in the south-central area of the plant, initially flowing northeast along the southern boundary of the plant, then turning to the northwest as it passes through a gap in Pine Ridge, exiting UEFPC as Lower East Fork Poplar Creek (LEFPC). UEFPC is bounded by the base of Pine Ridge to the north, the base of Chestnut Ridge to the south, and the Bear Creek Watershed to the west. To the east, UEFPC extends to the DOE-ORO boundary at Scarboro Road and includes a contaminated groundwater plume, the East End Volatile Organic Compound (VOC) Plume, which extends eastward past the boundary to a spring at the intersection of Union Valley Road and Illinois Avenue. The creek drains portions of ORR and privately held lands to the northeast.

Chestnut Ridge Hydrogeologic Regime extends from the UEFPC southward to Bethel Valley Road and includes soil waste piles, closed disposal units, and abandoned quarries.

3.5.1 Bear Creek Valley Remedial Actions

3.5.1.1 Bear Creek Valley Phase 1 Record of Decision

This subproject captures actions that crosscut the watershed including the BY/BY, the S-3 Ponds (both of which are discussed below), the OLF Soils Containment Pad, and the BCV Disposal Area Remedial Action (DARA) Solid Storage Facility (SSF). A portion of this subproject will support the demonstration of a subsurface barrier system to isolate the waste to be funded by DOE Federal Energy Technology Centers (FETCs).

Following signing of the BCV Phase 1 Watershed and EMWMF RODs, remedial activities will begin. Construction activities at a number of sites throughout the watershed will impact wetlands and these impacted wetlands will be mitigated via the BCV wetlands mitigation project.

In the year 2000, design of the replacement wetlands associated with the EMWMF and BCV remedial actions (RAs) is expected to be completed and construction begun.

3.5.1.2 Bear Creek Valley S-3 Ponds Remediation

The S-3 Ponds have been closed with a RCRA cap and are now under RCRA post-closure care and monitoring. Capping of the old ponds has lessened the impacts of contamination. However, the remedial investigation (RI) Report for the BCV Characterization Area estimates that approximately 5,740 acre-ft of groundwater downgradient of the S-3 Ponds have been contaminated as a result of the waste leachate production prior to closure of the ponds. The contaminated groundwater acts as a secondary source of contamination as it discharges into Bear Creek and the creek's associated tributaries. The primary contaminants in the surface water are uranium, nitrate, and cadmium. The S-3 site currently contributes approximately 26% of the risk at the BCV Watershed Integration Point through releases of uranium. In addition, discharges of contaminated groundwater to surface water at the S-3 Site are the primary causes of current impacts on the aquatic ecology of Bear Creek.

Because the S-3 Ponds were located on a shallow groundwater and surface water divide, contaminated groundwater plumes emanate from the site and extend to the east and west. This project addresses the western plume and includes the design and implementation of treatment systems for contaminated shallow groundwater discharging to Bear Creek and its tributaries. The western plume consists of three primary pathways of groundwater flow. Two of the pathways (Pathways 1 and 2) are shallow-flow regimes that discharge to the main stem of Bear Creek. Both pathways are contaminated primarily with uranium. Pathway 3 is deeper and travels through the bedrock along strike, discharging nitrate- and cadmium-contaminated groundwater to two tributaries of Bear Creek (NT-1 and NT-2). The objective of this subproject is to capture and treat contaminated groundwater so that risk to human health and the environment can be reduced to levels consistent with the goals of the BCV Phase I ROD.

In 1999, removal action construction started that included mobilization, trench excavation, 750 ft of interceptor drainage line installation, backfill, treatment system and drain field installation, and system hookup. Plans for this project in 2000 include complete development of the extraction well at Pathway 2 and complete startup of the siphon system.

3.5.1.3 Bear Creek Valley Bone Yard/Burn Yard

There are three release sites associated with the BY/BY RA: (1) Hazardous Chemical Disposal Area (HCDA), (2) BY/BY including Bear Creek Tributary 3 Floodplain Soils, and (3) OLF Soils Containment Pad. These sites are located north of Bear Creek Road approximately 1 mile west of the main Y-12 Plant.

At the BY/BY, combustible wastes, including uranium turnings, were placed either on the surface or in trenches and burned. The area was also used for abandoned equipment laydown, which resulted in surface contamination. This

waste is now leaching to shallow groundwater that discharges to surface water. The site is the major contributor to risk levels in the valley.

The HCDA was historically used to dispose of chemicals that were deemed hazardous to plant workers, such as acids, bases, and miscellaneous liquids. The area was capped with a RCRA-like cap in the 1980s.

The OLF Soils Containment Pad is a below-grade storage pad covered with a Rubb™ temporary structure. The pad contains 570 yd^3 of PCB-contaminated soils excavated during the RCRA closure of the OLF as well as soils excavated from the banks of NT-7 during road construction in the late 1980s.

The objective for the BY/BY RA is to implement a series of hydraulic isolation measures designed to substantially reduce the uranium flux entering Bear Creek from this site and to "dry" the site out in preparation for excavation of the waste in FY 2001.

Additionally, the objective for the OLF Soil Containment Pad involves final disposition of the soils stored at the facility and demolition of the temporary storage building and concrete pad. The soils in the OLF Soil Containment Pad carry the RCRA listed waste codes.

Plans for FY 2000 include completing the BCV BY/BY OLF RA, which includes clearing and grubbing, hydraulic control, OLF Soils Containment Pad closure, off-site disposal, borrow area operation and maintenance, and site restoration.

3.5.2 Upper East Fork Poplar Creek Remedial Actions

3.5.2.1 Upper East Fork Poplar Creek Record of Decision—Phase 1 and Phase 2

The objective of this project is to select a cleanup remedy for the UEFPC Characterization Area and document it. The Phase 1 ROD focuses on mercury source control actions and natural attenuation of groundwater. The Phase 2 and final ROD will address soil RAs for worker protection; surface water actions including monitoring and other mercury source actions, as necessary; additional UEFPC sediment removal; building D&D; and additional groundwater actions. In 1999, agreement was reached among TDEC, EPA, and DOE on the UEFPC Watershed ROD proposed interim goals for groundwater and surface water and the long-term goal for soil.

3.5.2.2 East End Volatile Organic Compound Plumes

The purpose of this project is to mitigate off-site migration of the Y-12 East End VOC Plume by installing a pump-and-treat system. In 2000, the system will be installed and started, and an Innovative Treatment Remediation Demonstration (ITRD) will be conducted to provide information for conceptualization of in situ remediation and bioremediation for the East End VOC Plume.

3.5.2.3 Upper East Fork Poplar Creek Firing Range

The scope of the UEFPC Firing Range Soil Remediation is to excavate lead-contaminated soils from the Y-12 Plant Firing Ranges outside the Y-12 Plant fence line at the eastern end of the plant. In 1998, soil was excavated from two target berms, transported offsite, and disposed of at a RCRA-permitted facility. The Removal Action Report was published in 1999.

3.5.2.4 Basin 9822 Clean Out

The Basin 9822 Clean Out Project removed and disposed of liquid and sediment waste to prevent recontamination of Basin 9822 and the Building 81-10 Sump. This project was completed in 1999.

3.5.2.5 Reduction of Mercury in Plant Effluents

The purpose of this project is to comply with the limits for mercury concentrations in UEFPC required by the Y-12 NPDES permit by eliminating, mitigating, or capturing for treatment

mercury-contaminated effluent. The two specific actions currently identified are Mercury in Soils and Bank Stabilization. Reduction of Mercury in Plant Effluents (RMPE) is also responsible for monitoring the response of corrective actions, evaluating the technical practicability of meeting water quality standards in UEFPC, and preparing the annual Mercury Abatement Report. The technical objectives of this project include completing the noninvasive characterization technology demonstration and verification sampling and analysis and completing the Bank Stabilization and verification sampling.

On May 18–20, 1999, the project team hosted a Mercury Forum. The forum brought together more than 130 participants including representatives of federal agencies, regulatory agencies, site contractors, vendors, industry, and academia. Twenty-six vendors made presentations on their technologies and emphasized previous operational experience with mercury. The forum resulted in significant interaction among the participants and identified several viable characterization and remediation technologies to be considered for the planned demonstration.

Also, the RMPE project achieved a record low in August 1999 for the average mercury concentration at Station 17. The August average was 320 parts per trillion (ppt). The average for the period October through August has been 520 ppt. The average for FY 1998 was 650 ppt. The reduction is primarily a consequence of the Lake Reality Bypass completed in July 1998.

3.5.3 Environmental Management Waste Management Facility

The purpose of the EMWMF project is to build a CERCLA mixed-waste disposal facility for the ORR. More specifically, the objective of the project encompasses the design, construction, operation, and closure of two 400,000-yd^3 capacity cells as well as the preparation of associated CERCLA documentation. In 1999, the report *Environmental Management Waste Management Facility, DOE Oak Ridge Reservation: Report to U.S. Congress* (ORO 1999) was submitted for a 30-day review. An evaluation of including classified waste in the scope of the EMWMF is still under way. A contract to design and construct the facility has been awarded.

In 2000, plans are to complete timber removal at the EMWMF site, complete the OLF Class III Permit Modification, complete the EMWMF Phase IV site characterization, and begin EMWMF preconstruction activities.

3.6 EAST TENNESSEE TECHNOLOGY PARK

The CERCLA projects at ETTP can be divided into two broad categories: RA and D&D projects. RA projects address contaminant releases to the environment by cleaning or treating contaminated soil, water, sediment, or biota. D&D projects address contamination in facilities and structures. Both kinds of projects address hazardous and radioactive contamination and compliance issues resulting from implementation of the projects.

3.6.1 Remedial Actions

3.6.1.1 ETTP Site-Wide Record of Decision

The purpose of the ETTP Site-Wide ROD Project is to define the remedial strategy for ETTP. This entails evaluating data from all potential contaminant sources at ETTP to determine where RAs are required and which are the most effective RAs at specific sites. This project is also expected to identify areas where contaminants are not present above action levels or where existing conditions do not pose risks sufficient to justify RAs.

The first phase of the ROD is the RI. The RI is designed to define the nature and extent of contamination in the soils and sediments and to identify the areas that pose a risk to human health and the environment at ETTP. The information obtained from the RI will be used to develop, screen, and evaluate potential RA alternatives.

Both EPA and TDEC have expressed concerns on whether sufficient data exist in some geographic areas to make RA decisions based on the information in the RI Report. Consequently, the approach and strategy are being reviewed to redefine the ETTP Site-Wide ROD Project.

3.6.1.2 K-1070-A Burial Ground

The K-1070-A Burial Ground, located in the northwest corner of ETTP, was used for the disposal of several types of waste from the 1950s through the mid-1980s. The burial ground mostly contains uranium-contaminated waste from ETTP and other operations buried in unlined trenches and pits. Thorium-contaminated and pyrophoric waste and UF_6 cylinders are also included in records of burials at the site. Investigations have concluded that groundwater underlying the burial ground is contaminated with dense nonaqueous-phase liquids and that the plume is migrating southward toward the K-901-A Holding Pond. This project includes the excavation of waste deposited in the trenches and pits. Groundwater and adjacent soils will be addressed in the Site-wide ROD.

3.6.1.3 K-1070-C/D G-Pit and Concrete Pad

The K-1070-C/D Classified Burial Ground is located on a hill at the eastern edge of ETTP. The burial ground is composed of several disposal areas: large trenches, small pits, three earthen dike areas, a land farm, and a concrete pad. Both low-level radioactive and nonradioactive, nonhazardous waste materials and equipment were buried in the large trenches. The small pits were used for the disposal of segregated liquid and glass wastes, including some hazardous and radioactive wastes. One of the pits, G-Pit, is considered to be a continuing source of contamination to groundwater. The K-1071 Concrete Pad was used for the compaction of metal drums before burial and has been identified as a source of radiological contamination. Contaminants of concern (COCs) at the burial ground are volatile and semivolatile organics, uranium-contaminated scrap metal, uranium compounds, lead, and other metals. The remedial decision for the K-1070-C/D OU mandates the excavation of wastes from the G-Pit and temporary storage of those wastes at ETTP and the placement of a soil cover over the concrete pad area. The concrete pad was capped in 1999. The contents of the G-pit are expected to be excavated and placed in temporary storage in 2000.

3.6.1.4 K-1070-C/D and Mitchell Branch Plumes

The K-1070-C/D and Mitchell Branch Plumes Removal Action is designed to capture and treat contaminated groundwater from the K-1070-C/D and Mitchell Branch areas at ETTP. The removal action involves collecting contaminated groundwater in trenches and installing the groundwater collection system to transport contaminated groundwater to the CNF for treatment and discharge under CNF's NPDES permit.

The groundwater collection system in the K-1070-C/D area consisted of 600 lin ft of interceptor trench installed to the top of bedrock. Groundwater is collected and pumped from the trench to the existing SW-31 Spring sump. The groundwater is then transferred by existing pipeline to CNF for treatment and discharge. The Mitchell Branch collection system consisted of approximately 1,200 lin ft of interceptor trench and an estimated 29 extraction wells. A subsurface vertical barrier was installed between the interceptor trench and Mitchell Branch to prevent dewatering of the system. A stream liner system was installed along an approximate 700-lin-ft section of Mitchell Branch where the extraction wells were installed to prevent dewatering of this section of the stream. Groundwater is routed to a central collection point and then transferred by pipeline to CNF for treatment and discharge. This project was completed in 1999.

3.6.1.5 ETTP Ponds

The K-1007-P1 Pond, formerly known as the K-1007-B Pond, is located outside Portal 2 on the southwestern boundary of ETTP. The K-1007-P1 Pond has historically received discharges from the laboratory complex and from process building

storm drains around ETTP. The pond currently receives discharges from five storm drains. Previous sampling activities in the late 1980s and the 1990s revealed high levels of PCBs in largemouth bass in the K-1007-P1 Pond and in sediment. If ingested by humans, the levels of PCBs in the fish present an unacceptable health risk. As a result of the elevated levels of PCBs found in the fish, warning signs were placed around the boundary of the pond, and guard patrols were increased. Contaminated sediment in the K-1007 Pond will be addressed in the Site-Wide ROD. This project was completed in 1999.

3.6.2 Decontamination and Decommissioning

3.6.2.1 K-25 Auxiliary Facilities Area Demolition Group I Building Demolition

The five facilities included in the K-25 Auxiliary Facilities Area Demolition (KAFaD) Group I Building Demolition are Bldgs. K-724, K-725, K-1031, K-1131, and K-1410.

The K-725 facility is a small (21,600-ft^2) building in the powerhouse area for which there are limited access controls. This building, along with the nearby K-724 Warehouse Building (8,600 ft^2), is known to be contaminated with beryllium and radioactivity in excess of release limits, and both buildings are structurally deteriorated.

Building K-1031 (2,900 ft^2) was a maintenance and storage facility in support of the decontamination operations in nearby K-1410. Building K-1131 (55,700 ft^2) was used to support the gaseous diffusion process. Building K-1410 (9,000 ft^2) was originally used for decontaminating equipment with uranium contamination and later for nickel plating the metal parts of uranium enrichment equipment. These facilities all contain high levels of radioactive contamination that exceed release limits and are in a deteriorated condition from roof leaks.

The decontamination of components of these buildings was performed as needed to protect workers and to facilitate the recycling or reuse of recovered materials. Mixed waste and LLW are being disposed of using approved facilities with selected materials (primarily structural steel) being stored for eventual decontamination and recycling under a future project.

After demolition, the building concrete slabs were scabbled in an attempt to remove fixed contamination. The K-724 slab and a large portion of the K-725 slab were successfully cleaned to unrestricted use levels. After two passes with scabbling equipment, contamination was still present on the K-1031, K-1131, and K-1410 concrete slabs. The exposed concrete slabs from K-1031, K-1131, and K-1410 had the potential to weather and create mobile, transferable contamination in proximity to surface waters and storm drains. A 2-in. layer of asphalt was applied to cover the concrete slabs to stop the weathering of the fixed contamination and, therefore, help reduce the potential for the spread of radioactive contamination. The ETTP Site-Wide ROD will determine the final remedy for the contaminated slabs, soils, and below-grade structures.

Accomplishments of this project in 1999 include

- completing the D&D activities of this removal action, including characterization, decontamination, demolition, material and waste packaging, and site restoration to a maintainable condition;
- disposing of more than 80,000 ft^3 of LLW at Envirocare of Utah;
- recycling more than 1.2 million lb of scrap metal after radiological surveys showed the material met unrestricted-use standards;
- achieving a successful safety record for the project;
- successfully using a radiological dose-based approach for on-site disposition of more than 55,000 ft^3 of earthen materials (i.e., crushed concrete and masonry); and
- developing plans for FY 2000, including completing the disposition of 40,000 ft^3 of LLW.

3.6.2.2 Process Equipment Decontamination and Decommissioning (Bldgs. K-29/K-31/K-33)

This RA addresses the decontamination and removal of process equipment and the decontamination of Bldgs. K-29, K-31, and K-33. These buildings were originally designed and built to house the low-enrichment operations of the gaseous diffusion plant. The process buildings were constructed in the early 1950s, placed in stand-by in 1985, and placed in permanent shutdown status in 1987. The condition of the buildings (three of the largest process buildings at ETTP) presents a threat of potential release of contaminants to the environment. The equipment in these three buildings totals over 126,000 tons of material. The scope of activities to be performed includes the preparation of endpoint specifications for the decontamination tasks followed by the decontamination and recycling of process equipment. Table 3.1 shows material dispositioned as of October 1999.

3.6.2.3 K-1401/K-1420 Sumps

Buildings K-1401 and K-1420 are located on the northeastern side of ETTP. Both buildings are equipped with basement sumps situated below the seasonal water table. Contaminated groundwater collects in these sumps and is transferred to storm drains that discharge directly to Mitchell Branch; this discharge water then flows to Poplar Creek and eventually to the Clinch River. This action consists of collecting and piping contaminated groundwater from the sumps to the ETTP CNF; the treated wastewater is then discharged directly to the Clinch River.

Building K-1401 was built in 1944 as a maintenance facility supporting the gaseous diffusion process. It is a large, steel-framed structure with brick and fiberglass siding and a built-up roof. The building housed tanks of trichloroethylene and hydrochloric acid used to clean equipment (e.g., pumps, piping, coolers, etc.).

Building K-1420 was built in 1954 as a decontamination and uranium recovery facility. It is a two-story, three-bay, noncombustible building with concrete floors. Equipment from every process building, including equipment used to produce highly enriched uranium, has been decontaminated and serviced in Bldg. K-1420. Solvents were used extensively in the cleaning and decontamination of various parts, an operation conducted primarily in the basement.

The RA for these two buildings consists of capturing the discharge water from the basement sumps in Bldgs. K-1401 and K-1420 and installing piping to route this water to CNF. Work at Bldg. K-1401 involved the installation of sump pumps and transfer pumps to transfer groundwater collected in the sumps via a new pipeline to CNF. Work at Bldg. K-1420 involved routing the discharge from the east sump to the west sump. New pumps were installed in the west sump. Discharge from these pumps is routed directly to CNF. This project was completed in 1999.

3.6.2.4 Building K-1420 Decontamination and Decommissioning Project

The scope of this project consists of removing obsolete equipment, systems, and components from K-1420 and decontaminating the interior of the facility. In addition, the K-1421 Incinerator and the K-1422 Storage Building will be decon-

Table 3.1. Material dispositioned (as of October 1999)

K-33 material surveyed/released for unrestricted use	1,804 tons
K-33 process gas pipe sent to MSC for decontamination/release	1,239 tons
Switchyard material released for unrestricted use	4,500 tons
LLW shipped to Envirocare	860 tons
Mixed waste (stabilized pond) shipped to Envirocare	10,744 drums
Polychlorinated biphenyl (PCB) transformers shipped for disposal in Alabama	642 tons

taminated and demolished. The contractor conducting this work, a private-sector lessee, will also complete the RCRA closure of the K-1417-B Drum Storage Yard and will perform surveillance and maintenance at the project area. In 1999, Buildings K-1421 and K-1422 were decontaminated and demolished, and the K-1417 Drum Yard was closed (it is now being used for commercial operations). The instrument shop and lab area in K-1420 have been decontaminated, resulting in downgrading the facility from a Category 2 nuclear facility to a radiological facility. In 2000, plans for this project include dismantling of all internal systems in K-1420, beginning decontamination of the K-1420 High Bay Area, completing copper processing, and continuing decontamination and free release of equipment and materials.

3.6.2.5 K-1200 Equipment Removal and Cleanup Project

The scope of the K-1200 project is to remove existing gas centrifuge process equipment and support structures and classified residuals from the buildings. In 1999, ductwork and internal enclosures were removed. This project will continue through 2000 and into 2001.

3.7 OAK RIDGE NATIONAL LABORATORY

As at Y-12, CERCLA activities can be grouped into RA and D&D projects with similar definitions to those at ETTP. Additionally, ORNL hosts a Nuclear Material and Facility Stabilization (NMFS) program that is addressing radioactive contamination in abandoned reactors before they become candidates for D&D.

3.7.1 Remedial Actions

RAs at ORNL are being addressed in one of two watersheds, Bethel Valley (BV), the main area of ORNL, and Melton Valley (MV), also referred to as WOC Watershed, which is south of the ORNL main plant area, where most of the historic waste disposal operations took place.

3.7.1.1 Melton Valley Remedial Actions

Melton Valley Watershed Record of Decision

The purpose of the MVROD Project is to define the remedial strategy for Melton Valley Watershed. This entails evaluating data from all potential contaminant sources to determine where RAs are required and which are the most effective RAs at specific sites. Several CERCLA areas located in the MV portion of the WOC Watershed at ORNL will be addressed under this project. The project is utilizing existing data, supplemented by a small amount of new data, to develop a remedial strategy. Groundwater, surface water, floodplain soils, and source units in the watershed are being evaluated as a single entity (i.e., watershed) to ensure that (1) a consistent approach to remediation is implemented across the valley and (2) RAs at specific sites are prioritized to achieve the greatest risk reduction. The draft ROD was submitted to the regulators in August 1999. Final groundwater decisions are being deferred to a future ROD, after the effect of the remedial actions in the watershed ROD are known.

Old Hydrofracture Facility Tanks and Impoundment

Between 1964 and 1980, waste liquid and suspended solids from the ORNL main plant liquid low-level waste (LLLW) system were decanted and pumped to five tanks at the Old Hydrofracture Facility (OHF), from which the radioactive liquid was mixed with grout and injected deep in to shale bedrock. The OHF Impoundment is a riprap-lined pond used between 1965 and 1979 to receive various types of wastes from OHF operations. In 1998, residual sludge from the five tanks was removed. In 1999, an action memorandum (AM) that included grouting of the five OHF tanks and stabilization of the impoundment was issued, and a Removal Action Work Plan was submitted to the regulators. In

addition, radioactively contaminated sludge in another small impoundment near OHF will be stabilized and consolidated in the OHF impoundment, which will then be covered with a soil cap.

3.7.1.2 Bethel Valley Remedial Actions

Bethel Valley Watershed Record of Decision

As in MV, a ROD is being developed for the BV Watershed. The remedial investigation/feasibility study (RI/FS) Report in support of the ROD was approved by the regulators in August 1999.

Gunite and Associated Tanks

The Gunite and Associated Tanks (GAAT) project consists of the eight underground gunite tanks associated with two tank farms located in the center of the ORNL main plant area. Tanks W-3 and W-4 are in the North Tank Farm, and tanks W-5–W-10 are located in the South Tank Farm. These inactive tanks (installed in 1943 to store liquid wastes) were used as the main holding tanks for the LLLW system at ORNL. The GAAT Project is separated into two components: (1) removal of residual sludge in the tanks as part of an Interim Action ROD, and (2) closure of the tanks and site as an element of the BV Watershed ROD.

Removal of tank contents began in June 1997. Through 1999, six of the eight tanks have been successfully cleaned, and approximately 300,000 gal of slurry, which contained approximately 40,000 gal of sludge from the tanks, have been transferred to the active LLLW system for future treatment. A proposal was made to the regulators in 1999 to use supernate returned from the active system, rather than clean water, to slurry the sludge in the tanks. This change in operation is expected to reduce waste generation by approximately 100,000 gal.

ORNL Main Plant Surface Impoundments

The Main Plant Surface Impoundments originally consisted of four surface impoundments located in the south-central portion of the ORNL main plant area that were used to collect, mix, or store untreated wastewaters. Removal and transfer of the sediment and subimpoundment soil from the two smaller impoundments, C & D (3539 and 3540), to the larger impoundment B (3513) was completed in 1998. Construction of a treatment facility for the sludge and subimpoundment soil from the two larger impoundments A (3524) and B will begin in 2000.

The seeps from surface impoundments operable unit (SIOU) are currently monitored and controlled under the ORNL Surveillance & Maintenance project. Methods have been developed to control the seeps during the remediation. The seeps will be monitored during remediation to verify effectiveness of the control methods.

Inactive Tanks Remediation Project

ORNL has a comprehensive program under way to upgrade the LLLW system to meet FFA requirements. As of the end of 1998, all LLLW tanks that did not meet the FFA requirements for active service had been removed from service. The inactive tanks are remediated within the CERCLA framework. Tanks with little associated risk are remediated as maintenance actions with regulatory concurrence. Tanks with more associated risk are remediated upon approval of an approved engineering evaluation/cost analysis (EE/CA) and AM. Final decisions on the tanks will be documented in the BVROD.

An AM was approved in 1999 for removal of waste from 11 inactive LLLW tanks and was subsequently modified to include the remaining 16 inactive tanks. A Removal Action Work Plan for the 11 tanks was approved in 1999; an addendum to include the remaining 16 tanks was submitted to the regulators, and approval was pending at the end of 1999. Remediation of these 27 tanks will complete the inactive tanks remediation project.

Core Hole 8 (Tank W-1A) Plume Source Removal

The liquid radioactive waste collection/storage Tank W-1A was commissioned in 1951 and remained in service for 35 years, until 1986. Tank W-1A was used as a storage tank for wastes from the high-radiation analytical facilities, Bldgs. 2026, 3019, and 3019B. During rock coring activities in 1991, high concentrations of radiological contamination were detected in groundwater in the central main plant area of ORNL at a location designated as Core Hole 8. Subsequent groundwater sampling in 1995 indicated significant gross beta and alpha contamination in the vicinity of Tank W-1A in the North Tank Farm. Actions have been taken to intercept and treat the contaminated groundwater.

The plume source removal project is focused on the removal of Tank W-1A and the surrounding soils suspected of being a primary source of contamination to groundwater. A Removal Action Work Plan was approved by the regulators in March 1999, and field work began in August 1999. Removal of the tank and soils will begin in 2000. Additional soil analyses performed in 1999 indicate that more blending than was originally assumed may be needed to meet the waste acceptance criteria (WAC) for cesium for Envirocare of Utah, the selected disposal facility.

Bethel Valley Groundwater Action: Well 4411

Well 4411 is located in the southwest corner of the North Tank Farm in the ORNL main plant area. Well 4411 is downgradient of Tank W-1A (Core Hole 8 Plume Source) and intersects the Core Hole 8 plume. The total depth of Well 4411 is approximately 90 ft. Well 4411 is outfitted with a submersible electric pump and plumbing that routes extracted water to Process Manhole 24 at the North Tank Farm. Process Manhole 24 routes extracted water to the ORNL PWTF. At the completion of the Core Hole 8 Source Removal Action, groundwater extraction is scheduled to be initiated at Well 4411. Pump tests conducted at Well 4411 will aid in determining optimum extraction rates as well as treatment requirements for extracted groundwater. In conjunction with plume collection actions already being taken, this Well 4411 project will enhance containment of the Core Hole 8 plume in the ORNL main plant area.

3.7.2 Decontamination and Decommissioning

3.7.2.1 Molten Salt Reactor Experiment Reactive Gas Removal

The Molten Salt Reactor Experiment (MSRE) facility was an experimental reactor fueled by molten uranium tetrafluoride salt and cooled by molten salts of lithium and beryllium. It operated from 1965 to 1969. After being shut down, the reactor was mothballed. The fuel was solidified in tanks for long-term storage, and surveillance and maintenance programs were initiated.

In subsequent years, a number of potential problems were found in the facility. Samples of off-gas revealed that fluorine and uranium hexafluoride gas were being emitted, leading to the discovery of a 7-lb deposit of uranium in a charcoal-bed off-gas filter. Because the charcoal bed was within a water-filled chamber, it raised a concern that a nuclear criticality was possible. In addition, the fluorine had reacted with the charcoal to form chemically unstable compounds. These discoveries led to the initiation of remedial actions, which began in 1994, to reduce or eliminate three potential risks: a nuclear criticality accident, an explosive release of radioactive material, and a release of reactive and/or radioactive gases.

Removal of reactive uranium hexafluoride gas began in 1996 and was completed in 1999, resulting in the removal of approximately 22.6 kg of uranium.

In 1996, an AM for removal of uranium deposits from the charcoal bed was issued. A Removal Action Work Plan was approved in 1999, but examination of the charcoal revealed that it is nongranular rather than granular, as had been assumed. Consequently, a revised approach and Removal Action Work Plan were being developed as of the end of 1999.

A ROD for removal of fuel and flush salts was signed in 1998. The Remedial Design Report/Remedial Action Work Plan was approved by the regulators in 1999.

3.7.3 Nuclear Material Facility Stabilization

The purpose of the NMFS Program is to place surplus facilities and spent nuclear fuel (SNF) at ORNL in a safe and stable condition as quickly as possible.

Surplus facilities are being prepared for an extended period of minimal surveillance and maintenance (S&M) pending acceptance for D&D. In 1999, radioactive materials were removed from one facility, and a scrap metal storage area at another facility was cleaned up. In addition, wet-pipe fire protection systems in several buildings were converted to dry systems to eliminate potable water and steam services to the buildings.

SNF on the ORR is being retrieved from underground storage wells, repackaged, certified, and placed in interim storage until it can be shipped to Idaho Engineering and Environmental Laboratory (INEEL). This work began in 1996 and continued through 1999.

3.8 TECHNOLOGY DEVELOPMENT

3.8.1 ORNL Technology Deployments, Demonstrations, and Treatability Evaluations

3.8.1.1 Improved Systems for Tank Sludge Retrieval, Conditioning, and Transfer

ORNL is utilizing an integrated systems approach for managing tank wastes through deployment of innovative, but proven, technologies for retrieving, conditioning, and transferring radiologically contaminated low-level tank wastes. This task involves utilization of the following technologies: Modified Light-Duty Utility Arm (MLDUA), Houdini II remotely operated vehicle, confined sluicing end effector, remote tank cleaning system, ultra high pressure scarifier, Flygt mixer system, PulsAir mixer, collimated analyzing radiation probe, gunite scarifying end effector, and pipeline slurry monitor. These technologies were demonstrated and deployed to remediate gunite tanks at the ORNL North and South Gunite Tank Farms. About 222,541 gal of waste were transferred from GAAT to MVST; about 42,030 kg of solids, or approximately 37% of the original 88,000 gal of estimated sludge inventory, were removed from GAAT; and approximately 48% of the rad inventory has been removed from GAAT.

3.8.1.2 Modular Evaporator and Ion Exchange Systems for Waste Reduction in Tanks and Waste Tanks Pretreatment

State-of-the-art evaporators remove excess water from liquid waste before solidification by processing sluice water generated during the retrieval of sludges and/or treatment of secondary wastes generated during treatment operations. Cesium and strontium removal is being implemented to minimize the volume of high-activity waste, thus reducing costs for waste treatment facilities' construction and operation, waste form transportation, and disposal. A solid/liquid separation system is used to manage the excess liquids generated during sluicing of sludges between tank farms and/or to maintain desired feed composition for subsequent treatment operations. Technologies deployed for processing wastes from the MVSTs W-29 and W-30 include a single-stage, subatmospheric evaporator, a highly selective crystalline silicotitanate ion exchange system, and a cross-flow filtration system. In 1999, five wastewater treatment campaigns were completed. Approximately 120,000 gal of MVST waste were processed, removing 6,700 Ci of ^{137}Cs while reducing overall supernate inventory by approxi-

mately 50%. Six additional wastewater treatment campaigns are scheduled for FY 2000.

3.8.1.3 Waste Tank Retrieval and Closure

Robotics and sensing technologies are being developed and demonstrated for the characterization and remediation of USTs. Five areas of research, development, and demonstration are being conducted to support the tank remediation and closure efforts. These activities include in situ grouting for stabilization and immobilization of radioactive and mixed wastes; GAAT retrieval technologies for the efficient retrieval of bulk wastes; GAAT tank isolation technologies for cutting, cleaning, and plugging pipelines; and demonstration of closure techniques for small-diameter FFA tanks. In 1999, the cold-field demonstration of the Multi-Point-Injection (MPI) Technology was completed, as well as the documentation of performance data for the PulsAir mixer, slurry monitor, and pipe-plugging system. Plans for 2000 include completing demonstration of the Russian Pulsating Mixer and completing hot demonstration of MPI grout on the OHF Tanks.

3.8.1.4 Armed-Based Tank Waste Retrieval TWR-1

Oak Ridge is leading the DOE effort to develop, test, and demonstrate robotics technologies for the characterization and remediation of underground storage tanks (USTs). The emphasis is on the development and demonstration of remote technologies for the removal and mobilization of tank wastes. The focus of the effort is twofold: (1) transferring slurries over long distances from a waste tank being remediated to a processing and treatment facility; and (2) deploying characterization and retrieval tools through small risers into large underground tanks. The MLDUA is being used to deploy a variety of characterization and waste-retrieval tools for the remediation of GAAT at ORNL. In 1999 this project completed the design package and guidance for the remote maintenance design for tank waste compact processing units and completed Scarab-3 qualification testing. Plans for FY 2000 include (1) completing design and fabrication of the Heavy Waste Retrieval System and initiating deployment in Tank W-9 and (2) completing design, fabrication, and acceptance testing of the inspection camera and deployment platform for deployment at MVST.

3.8.1.5 Vehicle-Based Tank Waste Retrieval

Oak Ridge is leading the DOE effort to develop, test, and demonstrate robotics technology for the characterization and remediation of USTs. Emphasis in this task is on the development and demonstration of a small, remotely operated vehicle capable of deployment in the large number of horizontal tanks in the DOE Complex. Lessons learned from cold testing of the Houdini and Scarab vehicle systems will be used to improve the reliability and user access of the Houdini II and Scarab-3 systems. Accomplishments in 1999 include completing the Houdini II and Scarab-3 summary reports and defining floor-cleaning system requirements.

3.8.1.6 Comparative Testing of Pipeline Slurry Monitors

Several DOE sites are planning cross-site transfers of radioactive waste slurries. It is critical that the slurry is transported safely and successfully. ORNL is testing, demonstrating, and evaluating state-of-the-art, commercially available, and DOE-developed slurry-monitoring instruments. Accomplishments in 1999 included deploying the Particle Size Density Monitor and the Density Monitor at GAAT. Plans for 2000 include demonstrating and evaluating the Coriolis meter in radioactive applications.

3.8.1.7 Fission Products Separations Testing

The ORNL Corehole 8 area has groundwater contaminated with cesium, strontium, and uranium. Technologies are being investigated to remove and/or stabilize these radionuclides.

Existing sorbents are not selective and generate large volumes of waste. New, more selective sorbents such as crystalline silicotitanate (CST) are being compared to the zeolites presently in use for cost and performance. Accomplishments in 1999 included completing demonstration of CST for removal of ^{90}Sr from groundwater at the Corehole 8 2016C sump and comparing breakthrough profiles and bed volume loadings for CST and zeolite.

3.8.2 ETTP Technology Demonstrations and Treatability Evaluations

3.8.2.1 Toxic Substances Control Act Incinerator Test Bed for Continuous Emissions Monitors

A national test bed has been established at the TSCAI in Oak Ridge to evaluate promising, continuous emissions-monitoring technologies. The TSCAI—a continuously operated, full-scale, mixed waste treatment facility—is being used to conduct field tests of emerging continuous emissions monitors in a real-world operating environment. This test bed facilitates passing continuous emissions monitoring technology from the engineering development phase to the demonstration phase. Testing of continuous emissions monitors is also enhancing public and regulatory acceptance of thermal treatment technologies for treatment of DOE mixed wastes. Accomplishments in 1999 included completing trial testing of the continuous metals sampling system and completing comparison testing against the EPA reference method for metals emissions.

3.8.2.2 Dense Non-Aqueous Phase Liquid Remediation

In situ degradation of chlorinated solvents is feasible where indigenous degrader populations, sufficient electron donors, and/or acceptors are available. Because of the large size of many of the plumes, intrinsic remediation or natural attenuation based on use of electron donors at the site is favored. The focus of the ETTP study was twofold: (1) to assess the potential for natural attenuation of trichloroethene at several ETTP areas and (2) to compare the measured potential with that found at other sites to help identify controls on natural attenuation potential. Accomplishments in 1999 include demonstrating a new characterization method to determine the potential for natural attenuation of chlorinated solvents at the K-1070A Burial Grounds and K-1232, K-1413, K-1401, and K-1035 plume areas.

3.8.3 Y-12 Site Technology Deployments, Demonstrations, and Treatability Evaluations

3.8.3.1 In Situ Reactive Barriers at the Y-12 Plant

Two reactive barriers have been installed at the Y-12 BCV S-3 Pond area. The treatment system at Pathway 1 is approximately 220 ft long and consists of two wing walls designed to funnel groundwater to a below-ground treatment module and canisters. The treatment system at Pathway 2 consists of a 225-ft-long and 30-ft-wide trench containing gravel and reactive media to intercept and treat uranium and nitrates migrating to Bear Creek. In 1999, this project installed six new piezometers at Pathway 1 to evaluate the capture zone of the funnel and gate and to determine the quality of influent and effluent groundwater; completed two tracer tests at Pathway 2 using multiple tracers to assess groundwater transport rates, flowpaths, and residence times with the reactive media at Pathways 1 and 2; and completed media, geochemical, and hydraulic evaluations.

3.8.3.2 Reactive Barriers Performance Monitoring and Verification

Technologies are needed to evaluate and maximize the effectiveness of permeable reactive

barriers. The colloidal borescope is an instrument capable of directly observing the movement of colloidal-size particles within boreholes to quantify groundwater flow rate and direction. The instrument was used at the two reactive barriers installed at the Y-12 BCV S-3 Pond area to monitor the performance of the treatment system.

3.8.3.3 Demonstration of Mercury Sorbents to Meet DOE Customer Needs (OR09MW16)

ORNL and Y-12 are facing increased stringency in regulations controlling mercury in the water and must find a technology that can remove the mercury to very low levels. The purpose of this activity is to test and evaluate self-assembled mercaptans on mesoporous silica and other resins for efficiency and cost-effectiveness in removing mercury from aqueous media. Accomplishments in 1999 included completing long-term, field-scale tests of mercury sorbents and issuing a performance report on the test sorbents.

3.9 POLLUTION PREVENTION

In 1999, the DOE Pollution Prevention Program completed a 5-year effort to reduce waste generated from routine operations based on 1996 generation rates. These reduction goals were established by the Secretary of Energy for the DOE complex and implemented on a site-by-site basis by the DOE-ORO Pollution Prevention Program manager. The Oak Ridge sites successfully met these goals, due in large part to increased awareness by operations personnel of the value of pollution prevention and waste reduction. Table 3.2 summarizes the reductions in individual waste types and the goals set for each waste type.

In addition to the goals established for routinely generated waste types, an additional goal for waste generated by cleanup and stabilization activities was established for FY 1999. That goal is to reduce the amount of waste generated by these activities by 10% from that originally estimated in project-planning documents. The Oak Ridge sites exceeded this reduction goal. In fact, the waste generated in FY 1999 was reduced by 50% over that originally projected due in large part to metal recycling at the Tower Shielding Facility and process improvements in the GAAT project at ORNL.

Funding cuts in the 2000 budget have necessitated a change in implementing the Pollution Prevention Program in Oak Ridge. Funds from the EM Pollution Prevention Program have been distributed among other DOE programs in Oak Ridge, Defense Programs at Y-12, and the Office of Science at ORNL. These funds will be used to assess pollution prevention opportunities at those sites and continue meeting the requirements of the DOE Pollution Prevention Program.

3.10 EM-SUPPORTED ENVIRONMENTAL MONITORING ON THE ORR

The Water Resources Restoration Program (WRRP) was established by the DOE-EM to implement a comprehensive and integrated environmental-monitoring and assessment program for the ORR and to minimize duplication of

Table 3.2. Waste reductions and goals, 1999

Waste type	Reduction goal (%)	Actual reduction (%)
Radioactive waste	50	57
Low-level mixed/hazardous waste	50	78
Sanitary waste	33	69
Toxic chemical releases/transfers	50	50

field, analytical, and reporting efforts. The WRRP and associated site-specific Water Quality Programs are successors to the Integrated Water Quality Program that was established in 1996. The DOE is under a regulatory requirement from the FFA to conduct post-remedial action monitoring. The FFA requires the evaluation and annual reporting on the effectiveness of completed remedial actions. Specific monitoring requirements are typically included in documents supporting CERCLA RODs, AM, or Remediation/Removal Action Reports. Additional monitoring includes baseline water quality, pre-ROD monitoring to support watershed management decisions, and monitoring conducted to satisfy post-closure permit requirements for sites closed under RCRA.

There are Water Quality Projects (WQPs) for each of the three sites on the ORR: the XWQP is responsible for monitoring activities within the BV and MV administrative watersheds at ORNL, the EWQP is responsible for monitoring at ETTP, and the YWQP is responsible for monitoring within the BCV and UEFPC administrative watersheds at Y-12 and at selected non-ORR localities. The WRRP provides a central administrative and reporting function that integrates and coordinates the activities of the watershed-specific projects. The WRRP also provides coordination and integration among the respective WQPs for the development and implementation of long-term monitoring strategies and plans to support future groundwater remediation decisions.

The annual *Remedial Effectiveness Report* (BJC 2000a), an FFA primary document, provides analytical results and evaluations of performance assessment monitoring, as required by CERCLA decision documents and/or the project-specific remedial action work plans or remedial action reports. The RER will provide any recommendations for changes to the facility WQP monitoring plan for the subsequent year. Additionally, the RER includes a summary of stewardship activities for completed CERCLA remedial actions that, together with the performance assessment monitoring data, support the completion of a CERCLA 5-year review. A CERCLA 5-year review will be performed as part of the RER starting with FY 2001, and subsequent RERs will contain all required information to support future reviews.

3.11 SITE-SPECIFIC ADVISORY BOARD

The Oak Ridge Site-Specific Advisory Board (SSAB) was formed in 1995 and is a primary source of stakeholder input to DOE on EM matters. It also functions as a major communication link between DOE and the public. In 1999, the SSAB continued to advise DOE on EM issues, such as long-term stewardship, environmental sampling, waste management, and waste transportation. Throughout 1999, the SSAB held regular board meetings as well as topic-specific meetings, all of which were open to the public. SSAB information, including meeting schedules and minutes, membership, and recommendations to DOE, are available on the Web at www.oakridge.doe.gov/em/ssab. Major highlights and accomplishments are also available to the public in the *Oak Ridge Site-Specific Advisory Board 1999 Annual Report*, which was published in December 1999. The various SSAB project teams are described along with their primary missions. Abridged text of each recommendation submitted to DOE is given along with DOE's response and relevant background information.