

2011 Cleanup Progress

Annual Report
to the Oak Ridge Community



About the Cover

After recontouring and revegetation, the P1 Pond at East Tennessee Technology Park is flourishing. The contaminated pond was drained, recontoured, and restocked with fish that would not disturb the pond sediment.



Message from the Acting Manager

Department of Energy Oak Ridge Office

To the Oak Ridge Community:

Fiscal Year (FY) 2011 marked many accomplishments in Oak Ridge. Our Environmental Management (EM) program completed a majority of its American Recovery and Reinvestment Act (ARRA)-funded projects, initiated new phases of baseline work, and selected a new prime contractor for environmental cleanup. Although we face budgetary challenges, we will continue finding creative and strategic ways to conduct vital cleanup activities.

Most notably in FY 2011, our EM program spent \$330 million to complete 15 of 20 ARRA projects at the East Tennessee Technology Park (ETTP), Oak Ridge National Laboratory (ORNL), and Y-12 National Security Complex. These projects were completed almost \$100 million under budget, which allowed us to reinvest those savings in projects to remove contaminated soil from ORNL and the Y-12 Complex.

At ORNL, workers removed the west portion of the 2000 complex and 26 additional facilities within ORNL's central campus. We placed a special emphasis on projects that addressed contaminated soil and groundwater, specifically at the Bethel Valley Burial Grounds and Tank W-1A. Workers implemented a larger network of detection wells near ORNL, furthering our ability to monitor groundwater migration patterns. At the Bethel Valley Burial Grounds, we removed contaminated soil, added multiple layers of protection, and diverted clean groundwater sources from buried waste. We are also very encouraged with the progress of our U-233 project, which is investigating options to dispose the material in Building 3019.

At Y-12, we have removed 31,000 yd³ of scrap metal from the Old Salvage Yard. We've demolished Building 9735, a former research laboratory, and disposed of legacy waste in the Alpha 5 and Beta 3 and 4 facilities.

We continue to enjoy great success at ETTP. On August 1, URS | CH2M Oak Ridge (UCOR) became the new primary environmental cleanup contractor for the Oak Ridge Reservation. We are very pleased with our relationship thus far and look forward to working with UCOR to conclude the site's major cleanup activities. UCOR is demolishing K-25's east wing, moving us closer to finishing Oak Ridge's largest-ever cleanup project. The site has also removed one of its largest buildings—K-33. Demolition of the 1.4 million ft² structure was completed five months ahead of schedule, and we are now removing the 32-acre slab.

Our Reindustrialization Program continues its expansion. In August, we leased 282 acres to the Community Reuse Organization of East Tennessee, and efforts are under way to transfer an additional 233 acres for private investment and energy park initiatives by the end of 2012.

Most importantly, we are proud of our strong relationship with all of our stakeholders and the community. The residents of Oak Ridge and the surrounding areas share our commitment to protect and restore the environment to support our stakeholders, communities, and our critical missions in Science, National Security, and Reindustrialization. We are extremely grateful for your involvement and feedback concerning our ongoing operations, and it is our hope that this continues as we strive to advance future missions in Oak Ridge.



John Eschenberg



EM *Environmental Management*

safety ❖ performance ❖ cleanup ❖ closure

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Introduction

The 33,750-acre DOE Oak Ridge Reservation has played key roles in our nation's defense and energy research. However, past waste disposal practices and unintentional releases have left land and facilities contaminated. These contaminants include radioactive elements, mercury, asbestos, polychlorinated biphenyls, and industrial wastes.

The Environmental Management (EM) Program is responsible for cleaning up these sites, and numerous cleanup projects are under way at the Reservation's three major facilities: East Tennessee Technology Park (ETTP), Oak Ridge National Laboratory (ORNL), and Y-12 National Security Complex.

The contaminated portions of the Reservation are on the U.S. Environmental Protection Agency's National Priorities List, a list of hazardous waste sites across the nation that are to be cleaned up under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980. Efforts are under way to delineate the contaminated areas of the Oak Ridge National Priorities List Site, which DOE is cleaning up under a Federal Facility Agreement with the Environmental Protection Agency and the State of Tennessee.

Funding from the American Recovery and Reinvestment Act of 2009 (ARRA) has allowed more cleanup work to be performed on the Reservation and has created and retained jobs for the local area. DOE Oak Ridge received \$1.36 billion under the Act, with a large portion of that amount—\$755 million—going to EM projects. More than 30 cleanup projects across the Reservation have received ARRA funding. You can track the status of all ARRA funding, including the DOE Oak Ridge projects, on the Web at www.recovery.gov.

In FY 2011 (October 1, 2010, to September 30, 2011), the EM Program had many major achievements. At ETTP, workers began demolishing the east wing of the massive K-25 Building and completed demolition of the K-33 Building.

DOE's goal for ETTP is to transform the site into a private industrial park. Great strides were made in FY 2011 to achieve that goal, including the transfer of several acres of land for industrial development.

At ORNL, buildings that posed worker and environmental concerns were demolished, characterization efforts were initiated to identify soil and sediment contamination, waste storage area remediation efforts were under way or completed, and excavation of Tank W-1A, the principal source of groundwater contamination at ORNL, was initiated.

At Y-12, legacy waste removal and demolition of facilities were top priorities. Scrap removal was completed on the Old Salvage Yard, and soil characterization and excavation were performed.



K-25 Building east wing debris being loaded for disposal

East Tennessee Technology Park



The former K-25 Site began operations during World War II as part of the Manhattan Project. Its original mission was to produce enriched uranium for use in atomic weapons. The 2,200-acre plant site was permanently shut down in 1987 and is undergoing cleanup for ultimate conversion to a private sector industrial park. Restoration of the environment, decontamination and decommissioning of facilities, and disposition of wastes are the major activities at the site.

ETTP Cleanup At a Glance*

Facilities demolished	246
UF ₆ cylinders removed	7,000
Waste removed from site	1.6 million yd ³
Area cleared for unrestricted use	1,400 acres

*Totals since cleanup operations began

East Tennessee Technology Park



 = Demolished  = Leased/transferred  = Demolition ready  = Being demolished



K-25 Project Manager Mark Ferri, right, discusses the K-25 Building east wing demolition with UCOR President and Project Manager Leo Sain and ESH&QA Manager Cheryl Cabbil.

DOE Selects New Cleanup Contractor

URS | CH2M Oak Ridge (UCOR) is DOE's new cleanup contractor for East Tennessee Technology Park (ETTP) and other Oak Ridge Reservation sites.

After a competitive bid process, DOE selected UCOR to replace Bechtel Jacobs Company LLC, which had been the cleanup contractor since 1998. UCOR took over that role on August 1, 2011.

UCOR is a partnership between URS, a worldwide leader in engineering, construction, and project management, and CH2M HILL, the United States' largest environmental company. The team also includes subcontractor Restoration Services, Inc., one of Oak Ridge's most successful woman-owned businesses.

UCOR's scope of work mainly involves completing cleanup of ETTP, including completion of the K-25 Building demolition project, demolition of the K-27 Building, and demolition of buildings in the Poplar Creek area. These efforts will facilitate DOE's goal of converting ETTP, a former gaseous diffusion plant, into a private sector industrial complex.

UCOR's scope also includes managing DOE's on-site disposal cell, the Environmental Management Waste Management Facility (EMWMF) and performing various other operations at ORNL and the Y-12 Complex.

"We've assembled a very talented team to safely perform the scope of work at this historic site and assist DOE as it prepares ETTP for the future," said Leo Sain, UCOR President

and Project Manager. "We're building on the successes of our predecessor, using a combination of tal-

ented individuals brought from other successful projects and the skilled incumbent employees who were transitioned to our company."

The environmental cleanup contract, which is valued at \$2.2 billion, includes an initial 5-year term with a 4-year option.





K-25 East Wing Demolition Begins

After successfully demolishing the K-25 Building's west wing, workers are now bringing down the massive structure's east wing.

The former uranium enrichment facility was once the world's largest building under one roof, covering more than 44 acres. This demolition project is one of DOE's highest Environmental Management priorities and an integral part of completing cleanup of ETP.

Workers completely cut through the East Wing to separate a portion of the building contaminated with technetium-99 from the portion being demolished. Technetium-99 is a slow-decaying radioactive metal that poses an inhalation and release risk. The contaminated

area, which accounts for approximately 20 percent of the facility, will be demolished once the technetium-99 is addressed.

Demolition of the east wing was initiated by Bechtel Jacobs Company LLC in July 2011 and taken over by UCOR on August 1, 2011. Demolition of the structure's west wing, measuring 844,000 ft², concluded in January 2010.

The K-25 Building was constructed in 1944 as part of the Manhattan Project. The structure enriched uranium for defense and commercial nuclear power until 1985 and was permanently shut down in 1987.



East wing before demolition began; the west wing was previously demolished.

As part of the K-25 Building east wing demolition, a converter is being removed from the building and staged for shipment.



Misters spray water over the demolition area to help prevent dust from flying up while the building is being demolished.



K-33 Building Demolished

Building K-33, one of the major uranium enrichment facilities at ETTP, has been demolished.

The building was a partially decontaminated multi-story building that contained more than 1.4 million ft² of concrete and steel and spanned 32 acres. Constructed in 1954, the facility enriched uranium for defense and naval fleet purposes until 1985.

As part of a Reindustrialization effort in 1997, most of the decontamination was performed. BNFL Inc. was awarded a fixed-price contract to decontaminate K-33, along with two other uranium enrichment buildings: K-29 and K-31. The company dismantled, removed, and dispositioned more than 159,000 tons of material and equipment from the three buildings, which comprise more than 4.8 million ft² of floor space.

All three buildings were originally to be cleaned up and converted to usable facilities for private industrial tenants. However, DOE later decided that K-29 and K-33 were not suitable for reindustrialization. K-29 was demolished by Bechtel Jacobs Company LLC in 2006.

In 2010, DOE contracted with LATA/Sharp Remediation Services to demolish the K-33 Building. The building demolition was completed, and the last waste was disposed in September 2011. In FY 2012, the K-33 slab and contaminated sites will be excavated and disposed. The building was demolished with ARRA funding of \$51 million.

K-33's demolition finished five months ahead of schedule, and debris removal was completed three months ahead of schedule. During the 9-month project, 164,000 tons of steel and concrete, accounting for 13,000 shipments, were disposed at EMWMF.



K-33 Building before demolition



Efforts Taken to Reduce ETTP Surface Water, Groundwater Contamination

Remediation activities to reduce ETTP groundwater and surface water contamination continued in FY 2011.

Releases to Mitchell Branch

Construction of the Chromium Water Treatment System was completed in FY 2011, and operation is planned for early FY 2012. This system will provide a long-term solution for hexavalent chromium being released into Mitchell Branch.

These releases affected the ambient water quality in the branch, potentially affecting the water quality in Poplar Creek. In response to this concern, DOE completed a time-critical Removal Action to extract the contaminated groundwater.

Since completion of this Removal Action, the concentration of chromium in Mitchell Branch has been reduced to ambient water quality. The treatment system will ensure the long-term treatment of this source remains in place.

Groundwater Treatability Study

To address groundwater contamination at ETTP, a groundwater treatability study was conducted to support selection of an acceptable, long-term treatment for groundwater.

The purpose of the study was to characterize and delineate suspected areas of solvent contamination. A total of 14 boreholes have been installed to depths of 110 to 160 feet below ground near the former K-1401 Vapor Degreasing Area. Based on the results of a workshop conducted with the regulators, a design characterization plan was developed and approved by the regulators. The purpose of the design characterization is to determine whether a pilot scale treatability study will be necessary to assess the effectiveness of in situ



Chromium Water Treatment System

thermal treatment after all contamination sources are addressed.

Soil Remediation Completed

Remediation of contaminated soil in ETTP's Zone 1, amounting to 604 yd³, was completed in FY 2011, and the soil was shipped for disposal.

Zone 1 covers the 1,400-acre area surrounding ETTP outside the main plant perimeter.

The Zone 1 Interim ROD was signed in November 2002. The Zone 2 ROD, covering 800 acres in the main plant area, was signed in April 2005.

The final focus of the Zone 1 soil remediation was completion of the K-770 Scrapyard and the duct bank. Soil hot spots along the duct bank contaminated with lead were excavated, and the duct bank manholes were grouted.

These cleanup efforts are designed to remediate ETTP to a level that protects a future industrial workforce and the underlying groundwater in Zones 1 and 2. Records of Decision (RODs), which detail the selected cleanup methods, are in place that address soil, slabs,

subsurface structures, and burial grounds for both zones.

Remediation of the K-1070-B Burial Ground in Zone 2 continued, and excavation of six trenches and two hotspot locations was completed. The excavation of the trenches and hotspots was performed to eliminate future sources and/or risks to surface water and groundwater.

The material excavated from the trenches was placed in piles for subsequent sorting and segregating. Shipments to EMWMF of debris removed from the trenches began in August 2011. Some debris will re-

quire disposal at off-site disposal facilities, such as the Nevada National Security Site.

At the end of FY 2011, 4,226 yd³ of soil and debris had been shipped to EMWMF for disposal.

Work continued in FY 2011 to prepare a Zone 1 Final ROD that will address finalizing the Zone 1 remediation cleanup goals, groundwater, surface water, and ecological protection. In support of the Zone 1 Final ROD, several groundwater monitoring wells were installed, unneeded groundwater wells were plugged and abandoned, and soil representing an ecological risk was remediated.



Workers are drilling a well in ETP Zone 1 to characterize the groundwater.

Parcel Transfers Highlight a Busy Year For the Reindustrialization Program

The DOE Oak Ridge Reindustrialization Program continued the transformation of ETTP into a private sector business/industrial park in FY 2011.

With the transfer of Parcel ED-9 to the Community Reuse Organization of East Tennessee (CROET), an additional 13 acres at the front of ETTP were made available for private use. CROET sold one of its Speculative Buildings, and a new commercial enterprise is being established on previously transferred property near Highway 58.

An additional 282 acres in the former Powerhouse Area along the Clinch River were made available via a lease to CROET for industrial development.

Improvements to the ETTP site infrastructure continued with investments from DOE, CROET, the City of Oak Ridge, and Oak Ridge Utility District. Highlights for FY 2011 include the following:

- DOE completed necessary improvements to the ETTP electric distribution system. On April 30, 2011, ETTP was connected to the City of Oak Ridge's electric power service supplied from the city's substation on Blair Road. With this major accomplishment, the direct power feed from TVA was removed.
- DOE purchased and installed new fire water pump houses for the K-1065 facilities and K-1600. The

pump houses are necessary to provide needed fire water pressure and volume for these facilities when the old ETTP Fire Water Distribution System pump house and fire water tanks are decommissioned in 2012 or 2013. Both K-1065 and K-1600 are slated for re-use after cleanup is completed at ETTP.

- Oak Ridge Utility District expanded its natural gas service to the west side of the site.
- AT&T began plans to bring commercial telecommunications service to ETTP for the private businesses that are established there.



Upgrading and transferring ETTP's electrical distribution system to the City of Oak Ridge marked a major Reindustrialization accomplishment

NPL Delineation Under Way

As many as 21,000 acres of the Oak Ridge Reservation may no longer be included in the National Priorities List (NPL) boundary that determines what areas need to be cleaned and/or controlled.

Oak Ridge Associated Universities (ORAU) was contracted in 2008 by DOE to study approximately 5,000 acres around ETTP to potentially delineate these areas from the NPL boundary. Their work included historic data reviews, site walkdowns, and sampling and analysis of surface water and groundwater.

ORAU was later contracted to complete verification activities for an additional 16,000 acres around ORNL and the Y-12 Complex believed to be uncontaminated.

In 2011, ORAU completed the Environmental Baseline Survey Report for the parcels around ETTP, and the report was submitted for regulatory review. Surface water and soil sampling was completed in the parcels around ORNL and Y-12, including a focused survey related to a 1960s release of strontium titanate in Melton Valley.

Groundwater sampling for the ORNL/Y-12 effort will be performed in FY 2012, and an Environmental Baseline Survey Report will be prepared for the ORNL and Y-12 parcels before the end of FY 2012. Completion of these activities will support the delineation of the NPL boundary.

Oak Ridge National Laboratory



Oak Ridge National Laboratory is becoming one of the world's most modern campuses for scientific discovery in materials and chemical sciences, nuclear science, energy research, and super-computing. However, among all this modern infrastructure are large contaminated areas that resulted from past operations and waste disposal practices. The Environmental Management Program has divided ORNL into two major cleanup areas: Bethel Valley and Melton Valley. The Bethel Valley area includes reactors and the principal research facilities, and Melton Valley includes reactors and waste management areas.



Unneeded ORNL Facilities Demolished

Legacy material removal and demolition activities were in progress in FY 2011 at several ORNL facilities. These contaminated non-reactor facilities are no longer needed.

As part of the 34 Buildings D&D Project, legacy material was removed from more than 32,000 ft² of facility space, 26 buildings (a total of 84,015 ft²) were demolished, and more than 24,720 ft³ of demolition de-

bris was disposed. The 26 buildings, located in the busy central campus portion of ORNL, were safely and successfully demolished without impacting adjacent laboratory facilities. One of the more challenging structures was the 2061 Smoke Stack, which stood 175 feet tall and was formerly used to power the ORNL coal plant in the World War II era. Demolition of the remaining 8 of the 34 buildings is scheduled for completion in FY 2012.



The 175-ft tall 2061 Smoke Stack, pictured left, has been demolished. The photo above shows the building site after demolition and debris removal.



Hot Cells Being Prepared for D&D

Building 3026 C&D, one of the original buildings constructed in the 1940s to support the war effort, has been inactive since the 1990s. Entries into the highly contaminated hot cells have been minimal.

Characterization and planning have been in progress in FY 2011 to appropriately evaluate the levels of contamination and develop the technical approach to prepare these facilities for demolition. A Waste Handling Plan for hot cell demolition and waste disposition was approved by EPA and the Tennessee Department of Environment and Conservation (TDEC) in FY 2011.

In 2010, a stabilization (polyurea) coating was applied to the surface of the remaining hot cell structures.

Two of the six structures in 3026 C&D (3026C “Counting Room” and 3026C “Tritium Lab”) were decontaminated in FY 2011. This work included removal of internal equipment, the final step to make these structures ready for demolition.

Decontamination of the four remaining structures is under way. In March 2011, higher levels of contamination than anticipated were found in 3026D while performing initial characterization. The project is re-evaluating the technical approach for hot cell clean-out. Mock-ups were created for 3026D to simulate entering the facility through ports using a remote arm to collect samples.



A worker conducts the final status survey inside the 3026 counting room, which is now ready for demolition.



Building 3038, the Isotope Development Laboratory, is a 6,900-ft² nuclear facility located in the ORNL Central Campus area.

Building 3038 was constructed in 1949 and housed the packaging, inspection, and shipping activities for radioisotopes. Radioactive materials are located in hot cells, glove boxes, and containers at the facility. A Waste Handling Plan for Building 3038 was submitted in FY 2011.

In May 2011, the contractor took over operational responsibility for surveillance and maintenance activities for Building 3038. As of September 2011, the team had cleaned out approximately 750 ft² of floor space and packaged material for disposal in preparation for Building 3038 intrusive work. Work in FY 2011 also included constructing mock-up units, performing pre-work demonstrations, characterizing waste, and submitting a Waste Handling Plan for EPA and TDEC review.

The 3026 C&D hot cells are pictured right. Below, workers practice sample collection on the mock up of 3026D to simulate entering the facility through ports using a remote arm.



2000 Complex Demolition Completed

The remaining two facilities associated with the 2000 Complex at ORNL were demolished in FY 2011. The complex, located in the northwest corner of the ORNL central campus, included a total of eight facilities and structures totaling approximately 58,000 ft².

The facilities were constructed in the late 1940s to support various ORNL research projects. They were in severe disrepair and had been vacant for approximately six years. DOE determined that the resulting risks warranted implementing a time-critical Removal Action.

In FY 2010, demolition of the first phase (six buildings with a combined area of approximately 35,000 ft²) was completed. Demolition of the second phase was completed in FY 2011 with the removal of Buildings 2000 and 2034, a combined area of 23,200 ft².

The specific hazards encountered in this facility complex included the extremely poor physical condition of the structures, constant flaking of PCB-containing paint, extensive quantities of friable and non-friable asbestos in restricted attic areas, and radiologically contaminated ductwork and fume hoods. Phase 2 demolition work in FY 2011 resulted in 180 shipments of building debris (more than 1900 yd³ of waste) disposed at the EMWMF.



2000 Complex demolition



Workers inspect a shielded carrier used for disposal of Isotope Row legacy material.



Isotope Row Material Removal Begins

Work was initiated in FY 2011 on the removal of legacy materials from the Isotope Row area in the central portion of ORNL.

Historically, Isotope Row facilities served as radioisotope production laboratories and support facilities.

Work to characterize, inspect, package, and dispose of 44 shielded carriers located outside of Building 3028 was completed in FY 2011. A contract is in place for planned work in FY 2012 to remove, package, and dispose lead shielding in Buildings 3030 and 3031.

4500 Waste System to be Upgraded

Initial project planning and facility characterization was completed in FY 2011 for the 4500 Area Gaseous Waste System Upgrades Project. Design of the replacement localized ventilation systems was also accomplished.

The objective of the project is to deactivate one of the five Cell Ventilation System branches and remove several facilities from the central Hot Off-Gas system. The ventilation system branches and off-gas system are part

of the Central Gaseous Waste System at ORNL that vent through the 3039 Central Stack.

The project will provide localized ventilation systems to the 4501, 4505, 4500N and 4507 facilities, stabilize the hot cells in 4507, clean out filter pits 3106 and 4556, and stabilize hundreds of feet of underground ductwork. Fabrication and installation of the replacement ventilation systems and stabilization of the 4507 hot cells will begin in FY 2012.



Workers perform underground duct sampling as part of the 4500 Gaseous Waste System Upgrades Project





Workers practice tank removal inside the Tank W-1A enclosure.

Tank W-1A to Be Removed

UCOR, DOE's cleanup contractor for Oak Ridge, began excavation in September 2011 to remove Tank W-1A at ORNL. The project completed operational readiness reviews prior to excavation of the contaminated area. The fieldwork is expected to be completed in Spring 2012.

A plume of contamination emanates from soil surrounding the tank, which is located in the central portion of ORNL, and migrates southward to the Corehole 8 groundwater plume and then westward to First Creek.

The principal plume contaminants are strontium-90 and uranium isotopes. Since late 1994, DOE has been implementing various coordinated actions to minimize the release of contaminants to the environment from Tank W-1A and the pipeline feeding it.

The remediation process includes excavating, packaging, and transporting contaminated soil for disposal, as well as removing, size-reducing, containerizing, and transporting the concrete pad and tank supports and tank shell to the Nevada National Security Site. Addi-



Contaminated soil from Tank W-1A excavation is being shipped to the Nevada National Security Site for disposition.

tional soil sampling and characterization, completed in 2010, was performed along a Tank W-1A feed pipeline to delineate the extent, type, and concentration of contamination north of the Tank W-1A site.

Based on the analytical data from the soil sampling, additional soil along the pipelines will require removal. A Remedial Action Work Plan to address the additional soil removal will be submitted to the regulators in 2012.

Bethel Valley Burial Ground Remediation Completed



Workers have completed the Bethel Valley Burial Grounds Remediation Project, which included capping of two solid waste storage areas (SWSAs): SWSA 1 in Central Bethel Valley and SWSA 3 in West Bethel Valley. Remediation of contaminated soil hot spots and five landfills near the two SWSAs were also part of the project.

Capping of SWSA 1 was completed in 2010, and the SWSA 3 cap was completed in August 2011. Two areas of soil contamination and the former Closed Scrap Metal Area were also covered by the SWSA 3 cap. A gravel road that crosses the capped area was rebuilt on top of the cap. Both caps are constructed of several layers of impermeable cap material placed to prevent migration of contaminants. This process is called hydrologic isola-

tion, which also involves various other methods to keep water from infiltrating the buried waste. The SWSA 3 cap included two upgradient French drains and surface water ditches that will divert shallow groundwater and rain water away from the capped area, further enhancing the hydrologic isolation of the waste.

SWSAs 1 and 3 and the associated remediated areas will be inspected periodically and maintained to ensure that they remain in good condition, and that damage, if any, is quickly repaired. Groundwater and surface water sampling and analyses will be performed and reported annually in the Remediation Effectiveness Report.

Workers install a French drain at SWSA 3 to divert shallow groundwater and rain water away from the capped areas.



U-233 Disposition Plan Under Way

Oak Ridge has a significant inventory of Uranium-233 (U-233) stored in Building 3019A at ORNL. In FY 2011, the U-233 Project completed the final design for Building 3019 modifications necessary to support the dissolution and downblending of the U-233 inventory.

U-233 is a special nuclear material that requires strict safeguards and security controls to protect against access.

The U-233 Project was initiated to address safeguards and security requirements, eliminate safety and nuclear criticality concerns, and ship the material to an approved disposal site.

Treating the U-233 inventory as expeditiously as possible will reduce the substantial annual costs associated with safeguards and security requirements, eliminate the risk of a nuclear criticality event, and avoid the

need for future facility upgrades to Building 3019A to ensure safe storage of the inventory.

DOE commissioned a review of alternatives for positioning the U-233 inventory. Phase I of the Alternatives Analysis, which screened and identified potential alternatives, was completed in January 2011. The Deputy Secretary of Energy endorsed the review recommendations in April 2011, and the team began planning a two-part direct disposition campaign. This campaign involved identifying inventory for other programmatic uses and potentially disposing of an inventory associated with a uranium solidification project.

Phase II of the Alternatives Analysis will provide a more detailed evaluation of processing options for the inventory unable to be directly dispositioned.



Building 3019

Soils, Sediment to be Remediated

At the end of FY 2011, the Bethel Valley Soils and Sediment Project was preparing to begin removal of selected slabs and begin remediation of contaminated soils at ORNL.

The Bethel Valley Soils and Sediment Project is tasked with removing contaminated soils and sediments at ORNL to protect workers and groundwater in the area.

The Remedial Action Work Plan for the project provides the approach that will be followed to characterize and evaluate soils and sediments, ensuring that the soil cleanup requirements for Bethel Valley are met. The Work Plan was submitted to the regulators in 2008 and was approved in early FY 2010. The cleanup strategy includes a series of workshops to identify sampling needs

in specific portions of Bethel Valley. More than 20 workshops have been conducted, and field sampling activities, which focused on the northwest corner of the ORNL main campus, has been completed with sampling results received. This effort has resulted in more than 487 acres being identified as requiring no action.

Additional workshops and field characterization activities on the remaining areas will be continued in FY 2012.



Workers sample the 2000 area slab, one of the selected areas where slab removal will be conducted as part of the Bethel Valley Soils and Sediment Project.



Corehole 8 extraction well drilling

Bethel Valley Groundwater Addressed

Several activities were initiated in FY 2011 to address Bethel Valley groundwater, including the following:

7000 Area Groundwater Treatability Study

The 7000 Area covers the maintenance facilities on the east end of ORNL. A treatability study was initiated in 2010 to determine the feasibility of using bacteria to eliminate TCE in groundwater. In late December 2010 and early January 2011, a dilute solution of emulsified vegetable oil was injected into the TCE plume through four existing groundwater monitoring wells.

The purpose of the injection is to provide a source of carbon to stimulate existing TCE-degrading microbes in the groundwater system. The injection will aid in destructing the TCE and its daughter products. Post-injection monitoring is being conducted to measure the effectiveness of the pilot test injections. The monitoring results have shown that the TCE is decreasing.

Corehole 8 Intercept Extraction System

Surface water monitoring in First Creek indicates the Strontium-90 in groundwater is bypassing the Corehole 8 intercept extraction system and surfacing at First Creek on the west side of ORNL.

A groundwater engineering study concluded that the Corehole 8 plume, which is the source of Strontium-90 in groundwater, is moving along the bedrock deeper than the current interceptor extraction system components. The source of the Corehole 8 plume is Tank W-1A (see article on p. 23). The solution is to install deeper extraction wells to intercept the groundwater before it reaches First Creek.



Two new bedrock wells were installed and connected to the extraction system in FY 2011. The extraction system flow controls and piping were upgraded to provide added transfer capacity and to improve the reliability of the system, which will be restarted in FY 2012.

SWSA 3 Exit Pathway Monitoring

Three new monitoring wells were installed west of Highway 95 along Raccoon Creek. The wells were installed to monitor a Strontium-90 plume that originates at the SWSA 3 landfill.

Wells were installed at 50 and 100-foot depths. Information about these wells will be published in the SWSA 3 Phased Construction Completion Report at the conclusion of the capping activities. Monitoring conducted to date shows strontium-90 at concentrations below drinking water standards in a shallow well in the area where seepage from SWSA 3 is known to enter the headwaters of Raccoon Creek.

Monitoring of the new wells will continue, along with monitoring at SWSA 3 and Raccoon Creek to measure the effectiveness of remedial actions completed in 2011.

Monitoring Wells Will Help Identify Potential Contaminant Migration

DOE completed installation in 2010 of 16 new monitoring wells opposite the Oak Ridge Reservation side of the Clinch River. These wells are monitoring for potential ORNL site-related contaminants.

Four quarters of groundwater sampling have been completed. DOE is continuing to monitoring these off-site wells as well as several residential wells. Data from the off-site well monitoring will be included in the annual Remediation Effectiveness Report.

The wells, financed by the American Recovery and Reinvestment Act, were drilled to depths from 250 to 650 feet.

The off-site monitoring wells are sampled quarterly to detect contaminants that may have migrated from ORNL.



Y-12 National Security Complex



The Y-12 National Security Complex is a premier manufacturing facility dedicated to making our nation and the world a safer place. The Y-12 Complex helps ensure a safe and reliable U.S. nuclear weapons deterrent. The site also retrieves and stores nuclear materials, fuels the nation's naval reactors, and performs complementary work for other government and private-sector entities.

UEFPC Remediation Under Way

Cleaning and lining of storm sewers in Upper East Fork Popular Creek (UEFPC) were completed in September 2011. More than 8,000 linear feet of storm sewer have been cleaned, and approximately 1,200 linear feet have been lined.

The cleaning operations resulted in more mercury entering UEFPC, much like what occurred during a similar project completed in the late 1980s. Now that cleaning operations have been completed, mercury levels are expected to decrease to those observed immediately prior to starting cleaning or less.

Wastewater and solid wastes generated by the project remain to be treated and disposed. This work should be completed in 2012.

This project is part of the UEFPC Watershed Remediation Project, which is being conducted in stages under Records of Decision using a phased approach. Phase 1 addresses remediation of mercury-contaminated soil, sediment, and groundwater discharges that contribute contamination to surface water.

The initial project of the Phase 1 Record of Decision, construction of the Big Springs Water Treatment System, was completed in 2006. The system has been fully operational since September 2006, removing mercury from local spring and sump waters that discharge to UEFPC.

With ARRA funding, cleanup and repair of storm sewers in the West End Mercury Area (historic mercury use area) was initiated in FY 2009. The initial phase, videotaping the storm sewer system, was completed and the videotape evaluated.

The storm sewers consist of more than 20,000 linear feet of pipe, which were inspected by a track-mounted video camera. An engineering study was completed in 2009 that documented the results of the camera survey and the extent of remediation required, as the pipes are a known mercury pathway to UEFPC.



Workers perform testing at the West End Mercury Area



Scrap Removed from Old Salvage Yard

Scrap removal in the Old Salvage Yard at Y-12 was completed in FY 2011. Removal activities began in 2010, and when completed, workers had removed approximately 31,000 yd³ of radioactively contaminated scrap metal in five large open piles and 1,087 containers of radioactive scrap metal. Several large pieces of equipment and machinery were also included in the scope.

Scrap removal, soil characterization, and soil remediation at the yard are being performed in accordance with the Record of Decision for Phase II Interim Remedial Actions for Contaminated Soils and Scrap-

yard in UEFPC. The interim Remedial Action prevents the exposure of on-site workers to hazardous substances associated with the scrap metal and fulfills the project requirements described in the Record of Decision.

Soil Characterization Continues

Scrap removal allowed access to subsurface soil, and the Old Salvage Yard Scrap Removal Project received additional ARRA funding in August 2010 for soil characterization. The Phase II Record of Decision defines the soil contaminants of concern for industrial workers,

groundwater, and surface water protection. Soil characterization data indicated soil remediation was required at the former Drum Deheader area.

Groundwater modeling results determined that a sufficient volatile organic compound (VOC) contaminant mass was present and posed a threat to local groundwater that could result in contaminant concentrations above permissible industrial use levels.

A remedial action was taken to remove soil VOC contamination that could contribute to future groundwater contamination. A 50-ft by 50-ft area was excavated to a depth of 5 feet to remove sufficient VOC concentration to mitigate the impact. The excavated area was then backfilled. Site restoration was completed for non-remediation areas.

Excavated soils were staged within the West Old Salvage Yard and will be characterized and disposed. Two areas contained soil known to exceed Toxic Characteristic Leaching Procedure values and were segregated from the excavated soil and packaged in roll-off-type containers. The soil is not anticipated to meet EMWMF waste acceptance criteria and, if it doesn't, will be characterized and shipped offsite for treatment and disposal. The Y-12 Old Salvage Yard remediation activities, including characterization and disposal of staged soil, will be completed in 2012.



Old Salvage Yard East before and after cleanup



ARRA Funds Assist with Waste Removal, Demolition Projects

ARRA funding was used to expedite removal of legacy wastes and building demolition at the Y-12 National Security Complex in FY 2011. These projects include the following:

Building 9735 Demolition

Demolition of Building 9735, referred to as the Research Services Laboratory, was completed in July 2010. This building was the last one to be removed from Engineering Row. Demolition of Engineering Row reduced the Y-12 footprint by 92,690 ft².

The other six buildings that once comprised Engineering Row were demolished in 2008. Building 9735 was a two-story, masonry (glazed terra cotta tile), wood-truss structure with a slab-on-grade foundation. The south end consisted of a two-story rectangular

structure with a former basement that housed a development calutron.

The project involved complete deactivation and demolition of the building as well as the disposition of 2,964 m³ of material and waste to the Y-12 Sanitary and Industrial Waste landfills and approximately 8 m³ to the Nevada National Security Site. In addition to eliminating safety risks, this project allowed Y-12 to add an employee parking area and contribute to ARRA goals of creating and saving jobs and stimulating the local economy.



A worker dismantles infrastructure associated with Building 9735 as part of the demolition project.

Building 9206 Bag Filter House Removal

The Building 9206 Bag Filter House Removal project at the Y-12 Complex was unlike other ARRA-funded deactivation and demolition projects. Only a section of the building was demolished. The primary furnace chamber, ash removal unit, and its major control equipment were located inside Building 9206. The remaining components of the system were located on the roof and in the south yard exterior to the building. This project also deactivated the recovery furnace exhaust system. The scope required Y-12 operations personnel to characterize, isolate, disassemble, decontaminate, and dispose of all equipment, support equipment, and waste from demolition of the identified Building 9206 Bag Filter House.

Deactivating the recovery furnace exhaust system reduced exposure from potential release of radiological and hazardous materials in out-of-service equipment. Deactivation also eliminated the need for daily monitoring of the process systems and was a key step in preparing the building for D&D. The Building 9206 Filter House project team removed and disposed of a total of 268 m³ of waste.

Alpha 5 Legacy Materials Disposition Project

The Alpha 5 Legacy Material Disposition Project was the largest ARRA-funded project at the Y-12 Complex. Alpha 5 (Building 9201-5) is the largest building at Y-12, measuring 613,642 ft².

The work scope for the project included removal and disposal of legacy materials from the building (floors 1 through 4) as well as characterization of building materials to prepare for eventual deactivation and demolition under the Integrated Facility Disposition Program.

Legacy materials were defined as those being easily removed and involving minimal reconfiguration efforts (e.g., unbolting, unplugging, wire cutting,



Building 9735 demolition

cold cutting). The building was organized into 82 units, and legacy material was present in 67 of the units located on four floors. Legacy materials not salvaged or reused were managed as waste and characterized, segregated, size-reduced, compacted, and/or treated to meet the waste acceptance criteria for disposal at approved on-site and off-site facilities.

The building was completely emptied of its legacy materials, and those materials were appropriately disposed at on-site and off-site facilities. Approximately 464,000 ft³ of legacy waste was disposed.

Beta 3 (9204-3) Legacy Material Disposition Project

The Beta 3 Legacy Material Disposition project work scope included completing the refurbishment of the Actinide Lab area glove boxes and associated ventilation systems to maintain and ensure containment capability, completing glove box post-refurbishment maintenance evaluation, completing glove box debris characterization, and removing and disposing debris. A total of 36 m³ of low-level waste, 8 m³ of mixed low-level waste, and 15 m³ of transuranic waste were removed and packaged for disposal.

Beta 4 Legacy Material Disposition Project

The Beta 4 Legacy Material Disposition project consisted of removal and disposal of legacy materials from the second floor and second floor mezzanine of Building 9204-4. This work will prepare the facility for deactivation and demolition as part of the site transformation



plan. As with the Alpha 5 Project, legacy materials were defined as those being easily removed with minimal re-configuration efforts. The second floor and second floor mezzanine were likewise organized into 16 units, and legacy materials not salvaged or reused were managed as waste and characterized, segregated, size-reduced, compacted, and/or treated to meet the waste acceptance criteria for disposal at approved facilities. Approximately 128,000 ft³ of legacy waste was disposed.

Disposition plans for Beta 4 waste were accelerated with ARRA funding. Results of these efforts were improved site safety and security, reduced operating costs, and reduced environmental risk to site personnel and to the immediate and surrounding areas.

Biology Complex and Building 9769 Deactivation and Demolition Project

The Biology Complex and Building 9769 Deactivation and Demolition Project involved four of the seven buildings in the Biology Complex that were deactivated

and demolished. Buildings 9211, 9220, 9224, and 9769 were demolished, and the work took place in six phases: building characterization, utilities deactivation, hazardous material abatement, radiological contaminated surfaces stabilization, building demolition to grade level, and site stabilization.

Support activities such as waste size reduction, waste packaging, and shipping were integrated within the activities of these six major phases. Sanitary and construction/demolition debris that met the facility waste acceptance criteria were disposed at the Y-12 Sanitary Landfill. Radiologically contaminated waste were disposed at the on-site EMWME. Approximately 32,000 yd³ of waste were generated and properly disposed from this project.

The Biology Complex project was part of Y-12's ongoing footprint reduction effort, designed to minimize maintenance and security costs. The project eliminated 135,812 ft² of unused building space and the risk associated with the deteriorated facilities. These buildings were vacant since 2003.



Workers are draining oil from legacy processing equipment in the Beta 4 facility.

Waste Management



Wastes on the Oak Ridge Reservation are being disposed in a variety of ways. Much of the waste is going into the on-site Environmental Management Waste Management Facility. Wastewater is treated at the Central Neutralization Facility at ETTP and the Process Waste Treatment Complex at ORNL.



As part of the closure process for the incinerator, workers manually shoveled sludge from the bottom of a firewater sump to be shipped for disposal. The sump was used to collect water from the fire sprinkler systems as well as rainwater from the various secondary containment areas. Throughout the years, mud, debris, and runoff from the off-gas cleaning system accumulated and formed a layer of sludge at the bottom of the sump. A backhoe was used to remove most of the sludge, with workers taking care of the remainder.

TSCA Incinerator Undergoes Closure

The Toxic Substances Control Act (TSCA) Incinerator, located at ETPP, was shut down permanently on Dec. 2, 2009, after treating 35.6 million pounds of liquid and solid waste over a 19-year period.

Field closure activities initiated in 2009 were completed in December 2010. These activities included removing residual waste such as sludge, ash, incinerator refractory and scrubber packing material; triple-rinsing equipment and tanks; and surveying and sampling to

confirm regulatory status. The certified closure report was submitted to the State of Tennessee and EPA in June 2011.

After completion of permit closure activities, additional activities were initiated in 2011 to encapsulate remaining PCB and radioactive contamination to reduce the cost of ongoing surveillance and maintenance. Upon completion of these activities, the facility will be under surveillance and maintenance until demolition.

Generated Wastes Disposed at Oak Ridge Reservation Landfills

Much of the waste generated during FY 2011 cleanup activities was disposed at facilities on the Oak Ridge Reservation.

EMWMF, located in east Bear Creek Valley near the Y-12 Complex, received 19,507 truck-loads of waste accounting for approximately 197,000 tons during FY 2011. This engineered landfill consists of six disposal cells and accepts low-level radioactive and hazardous waste that meet specific waste acceptance criteria.

Waste types that qualify for disposal include soil, dried sludge and sediment, solidified wastes, stabilized waste, building debris, scrap equipment, and personal protective equipment.

EMWMF operations collected, analyzed, and dispositioned approximately 4.8 million gallons of leachate and 1.3 million gallons of contact water at the ORNL Liquid/Gaseous Waste Operations Facility in FY 2011. An additional 10 million gallons of contact water was collected, analyzed, and released to the storm water retention basin after determining that it met the release criteria. Operating practices also effectively controlled site erosion and sediment.

Projects that disposed of waste at EMWMF during FY 2011 include the K-25 Building Demolition Project; K-33 Building Demolition Project; ETPP Decontamination and Decommissioning Project, including K-770 Scrap Yard, K-1070-B Burial Ground, and K-1093 Scrap Yard; Y-12 Old Salvage Yard; Alpha 5 and Biology Projects; and several ORNL demolition projects.

DOE also operates solid waste disposal facilities called the Oak Ridge Reservation Landfills, which are located near the Y-12 Complex.

The Oak Ridge Reservation Landfills are engineered facilities used for the disposal of sanitary, industrial, construction,



Dump truck at EMWMF scales

and demolition waste. In FY 2011, approximately 83,000 yd³ of industrial wastes and construction/demolition debris were disposed in the landfill.

Operation of the Oak Ridge Reservation Landfills generated approximately 1.3 million gallons of leachate that was collected, monitored, and discharged to the Y-12 Complex sanitary sewer system, which discharges to the Oak Ridge sewer system under an industrial sewer user permit.



EMWMF

Waste Disposal Facilities Expanded

Expansions of two of the Reservation's primary disposal facilities were completed in FY 2011.

Construction of Cell 6 at EMWME, which kicked off in May 2010, was completed in the spring of 2011. The completion of Cell 6 marked the final expansion effort for EMWME, which now has a total disposal capacity of 2,180,000 yd³.

Cell 6 construction also added two 30,000-gallon leachate storage tanks, four 250,000-gallon Contact Water Tanks, and a new leachate loading station to improve the facility's water management capability.

The ORR Landfills Capacity Increase Project was conducted with ARRA funding. Construction of the ARRA-funded project, which started in April of 2010, was completed in January of 2011.

The landfill increase project was comprised of three main work scope components: design and construction of the Industrial Landfill V (ILF-V), Area 4 and its associated systems; design and construction of the Truck Receiving Station at the ORR Landfill Complex; and construction of a leachate conveyance pipeline

connecting the ILF-IV leachate holding facility directly to the Y-12 sanitary sewer system.

The ILF-V Area 4 construction encompassed approximately 4.6 acres to provide approximately 385,000 yd³ of new disposal capacity. The project included the design, construction, and independent quality control verification necessary for development of Area 4. The Truck Receiving Station was designed and constructed to provide a safe and efficient area for landfill acceptance technicians to receive paperwork, inspect the waste shipments, and direct trucks through the newly placed Vehicle Portal Monitors and to the appropriate landfill. The ILF-IV Leachate conveyance pipeline was designed and constructed for the controlled release of leachate into the Y-12 sanitary sewer system.



Workers construct a concrete sump at Cell 6



EMWMF with Cell 6 expansion

Future CERCLA Waste Disposal Alternatives Being Considered

Preparation of a Focused Feasibility Study (FFS) for CERCLA Oak Ridge Reservation Waste Disposal was in progress in FY 2011 to meet a Federal Facility Agreement milestone in September 2012.

The ongoing FFS analysis will provide an evaluation of alternatives for disposal of waste generated from CERCLA cleanup actions on the Reservation after the maximum capacity of EMWMF is reached.

Construction of a new on-site disposal facility is one of the alternatives being considered. Off-site disposal alternatives will also be evaluated. A screening evaluation of sites considered in previous studies and other potential locations is under

way as part of the FFS analysis. If the On-site Disposal Alternative is identified as the preferred alternative, the preferred site would be identified in the Proposed Plan, which would be reviewed by the public. A final site would be identified in the Record of Decision.

A presentation about the FFS was made by DOE staff to the Oak Ridge Site Specific Advisory Board's (ORSSAB) Environmental Management Committee in December 2010. The ORSSAB provided recommendations about the decision process that are being addressed in the ongoing FFS effort. Another update related to the ongoing FFS effort to the ORSSAB is planned in FY 2012.

TWPC Treating Transuranic Waste

Transuranic radioactive waste, or TRU, is one of several types of waste handled on the Oak Ridge Reservation. Transuranic waste contains man-made elements heavier than uranium, such as plutonium, hence the name “trans,” or “beyond,” uranium.

TRU waste material is generally associated with the human manipulation of fissionable material dating back to the Manhattan Project and primarily consists of clothing, tools, rags, residues, soil, and debris.

The TRU Waste Processing Center’s (TWPC) function is to characterize and package TRU waste for transportation and disposition at DOE’s Waste Isolation Pilot Plant (WIPP) in New Mexico, which provides permanent isolation and disposal in underground salt caverns.

Any mixed low-level waste or low-level waste processed from the TRU waste inventory is prepared for compliant disposal at the Nevada National Security Site.

Currently, two waste streams, contact-handled

(CH) TRU solids and remote-handled (RH) TRU solids, are being processed at the TWPC.

During FY 2011, the TWPC processed 53.2 m³ of the RH-TRU waste, reaching a total of 118.2 m³ of processed RH waste. The TWPC also processed 126 m³ of CH-TRU waste, reaching a total of 939 m³ of processed CH waste.

During FY 2011, the TWPC shipped a total of 10 m³ of original RH-TRU inventory, reaching a total of 44 m³ disposed. The TWPC also shipped 178 m³ of original CH-TRU waste inventory to disposal facilities in FY 2011, reaching a total of 767 m³ disposed.

During FY 2011, the Central Characterization Project, working with the assistance of TWPC personnel, continued the development of documentation required for certification of TRU waste for shipment to WIPP.

Processing of the final waste stream, RH sludge, is scheduled to begin in 2016.



At left, a worker is looking for prohibited items in contact-handled TRU waste being processed in a glove box at the TWPC. At right, workers are in the process of downsizing a large waste glove box in preparation for shipment to the Waste Isolation Pilot Plant for disposition.



Millions of Gallons of Wastewater Treated at Reservation Facilities

The Central Neutralization Facility, located at ETTP, treated approximately 7.3 million gallons of wastewater in FY 2011. The facility is ETTP's primary wastewater treatment facility and has processed both hazardous and nonhazardous waste streams arising from multiple waste treatment facilities and remediation projects.

The facility removes heavy metals and suspended solids from the wastewater, adjusts pH, and discharges the treated effluent into the Clinch River. Sludge from the treatment facility is processed, packaged, and disposed off-site.

With the shutdown of the TSCA Incinerator, the Central Neutralization Facility has continued to operate with a reduced work force on day shift only. The main waste stream in FY 2011 was hexavalent chromium-contaminated groundwater extracted to prevent discharge into Mitchell Branch. The facility also continued to treat wastewaters generated at the TSCA Incinerator as part of the closure activities. In FY 2012, the Central Neutralization Facility will be shut down and transitioned to long-term surveillance and maintenance.

At ORNL, approximately 117 million gallons of wastewater were treated and released at the Process Waste Treatment Complex. In addition, the liquid low-level waste evaporator at ORNL treated 163,610 gallons

of such waste. The ORNL 3039 Stack Facility has treated a total of 2.2 billion m³ of gaseous waste.

These waste treatment activities supported both EM and Office of Science mission activities in a safe and compliant manner during FY 2011.

The National Nuclear Security Administration (NNSA) at the Y-12 Complex treated 127 million gallons of contaminated ground/sump water at the Groundwater Treatment Facility, the Central Mercury Treatment System, Big Springs Water Treatment System, and the East End Volatile Organic Compounds Treatment System.

The Big Springs Water Treatment System treated 112 million gallons of mercury-contaminated groundwater. The East End Volatile Organic Compound Treatment System treated 11 million gallons of VOC-contaminated groundwater.

The West End Treatment Facility and the Central Pollution Control Facility at the Y-12 Complex processed 1.2 million gallons of wastewater primarily in support of NNSA operational activities.

The Central Pollution Control Facility also down-blended more than 37,175 gallons of enriched wastewaters using legacy and newly generated uranium oxides from on-site storage.



Central Neutralization Facility

Public Involvement



The public is involved in all cleanup decisions made by DOE. To keep the public informed, DOE provides information to the public through a variety of outlets, including fact sheets, public notices in newspapers, meetings, the monthly *Public Involvement News* newsletter, and other publications.

Public Participation Helps Determine Reservation Cleanup Strategy

Public input is an integral part of the cleanup process. Comments are often solicited from the public to help develop strategies for remediation. Documentation is also made publicly available to keep the public informed on decisions that have been made. Following are some of the issues for which DOE sought input or provided information to the public.

- Covenant Deferral Request for Parcel ED-12 at ETTP: request to transfer a 13-acre tract of land at ETTP to Heritage Center LLC
- Explanation of Significant Differences to modify the Record of Decision for Interim actions in ETTP Zone 1: changed end use designations for certain areas, removed some items from the scope, and removed restrictions for the disturbance of soils below 10 feet in some areas
- Final Sitewide Environmental Impact Statement for the Y-12 National Security Complex: analyzed the potential environmental impacts of the reasonable alternatives for ongoing and foreseeable future operations and activities at Y-12
- Permit Modification Request to add storage capacity at the Transuranic Waste Processing Center

To keep the public informed about comment periods and other matters related to cleanup activities on the Oak Ridge Reservation, DOE publishes a monthly newsletter called *Public Involvement News*. DOE also keeps the public informed by publishing meeting notices in local newspapers, issuing fact sheets, and conducting public meetings.



Public meetings are key tools to keep the public informed on cleanup activities. The Oak Ridge Site Specific Advisory Board sponsors many of these meetings.



ORSSAB Provides Community Input to DOE's Cleanup Activities

The Oak Ridge Site Specific Advisory Board (ORSSAB) is a federally appointed citizens' panel that provides independent advice and recommendations to the DOE Oak Ridge EM Program. The board was formed in 1995 and is composed of up to 22 members, chosen to reflect the diversity of gender, race, occupation, views, and interests of persons living near the DOE Oak Ridge Reservation. Members are appointed by DOE and serve voluntarily, without compensation.

ORSSAB continued its mission during FY 2011 with a number of activities. Information about ORSSAB activities can be found on a quarterly basis in its *Advocate* newsletter, which also features articles on current EM projects and includes information on how the public can learn about the EM Program and provide comments on its activities. To subscribe to the *Advocate*, see www.oakridge.doe.gov/em/ssab.



EM Budget and Prioritization

In FY 2011, ORSSAB formed a new standing committee to help the board and the public better understand the budget request prioritization process and provide the prioritization recommendations the board makes each year on the EM budget. For several months the EM Budget and Prioritization Committee worked closely with DOE Oak Ridge in assessing cleanup priorities for the Oak Ridge Reservation.

A critical part of this process involved a new computer program called the Dynamic Planning Model, which can take a work breakdown structure and split it incrementally, from a high-level overview of the cleanup program down to individual projects. The model takes each program baseline summary and analyzes it through three funding situations:

1. Fixed expenses
2. Level of effort (funding must be sufficient to sustain operations, but costs can be eliminated if a project is finished)
3. Dynamic (discretion in scheduling a project is possible)

The committee reviewed six scenarios generated by the model for funding and prioritizes completing the various cleanup projects on the Reservation. The committee then used these scenarios in developing the board's recommendations to DOE Oak Ridge on its FY 2013 EM budget request. In addition to its specific recommendations on the budget request, the committee also recognized the value of the Dynamic Planning Model by recommending that other sites across

the DOE complex consider implementing its use. The recommendations were approved by the board in May 2011.

As part of its work, the committee assisted DOE by helping coordinate a public workshop on the FY 2013 budget priorities. The workshop, which was attended by approximately 75 members of the public, was held at the American Museum of Science and Energy in Oak Ridge on February 24. The workshop provided attendees with an opportunity to understand the full scope of the cleanup work under way and that remains to be done at the Oak Ridge Reservation.

Oak Ridge Reservation Stewardship

In 2008, ORSSAB's Stewardship Committee worked with DOE Oak Ridge to produce a stewardship map showing all remediated areas on the Oak Ridge Reservation and what land use controls are currently in place. To supplement the map, DOE has been working to develop an accompanying reference book containing data sheets for the contaminated areas. The sheets will provide information about the types of contamination, how safe the area is for use, what restrictions are on the properties, what permits may be required before using the parcels, and other information.

In FY 2011, the ORSSAB Stewardship Committee provided input on the sheets, offering a public perspective on what is understandable by the average citizen. The resulting map and reference book will be a valuable resource to citizens and local officials in understanding



ORSSAB's EPA liaison, Connie Jones (standing), discusses her agency's list of suggested EM cleanup topics for the board to consider adding to its FY 2012 work plan. The presentation was made during the ORSSAB annual planning meeting, held August 20 at Whitestone Country Inn near Kingston.

what areas of the reservation will be suitable for future use.

Establishment of a Site Transition Process Upon Completion of Remediation at Ongoing Mission Sites

In November 2010, several members of the ORSSAB Stewardship Committee attended the Long-term Surveillance and Maintenance Conference in Grand Junction, Colo. The ORSSAB chair made a presentation on long-term stewardship, noting that there was no process for assuring long-term stewardship at continuing mission sites after EM has finished cleanup.

It was learned at the conference that Letitia O'Connor had been appointed the point of contact for long-term stewardship within the DOE EM program at Headquarters. Ms. O'Connor attended the January ORSSAB Stewardship Committee meeting, and she told the committee of a fact sheet that the Office of Legacy Management uses at closure sites once EM completes cleanup. Members of the committee thought a similar fact sheet would be useful at ongoing mission sites and drafted a recommendation to that effect, which was later adopted by the board.

DOE EM accepted the recommendation and is crafting a fact sheet to guide the transfer of remediated parcels from EM to site landlords. The fact sheet is a first step in ensuring long-term stewardship of remediated areas at DOE facilities with continuing missions.

Removal of Uncontaminated Areas of the Oak Ridge Reservation from the National Priorities List

The Oak Ridge Reservation encompasses roughly 34,000 acres, but only about 10 percent of the reservation is actually contaminated from research and production activities by DOE. The entire reservation, however, was placed on EPA's National Priorities List for cleanup under the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act. Even though all of the reservation is on the National Priorities List, EPA policy states that only areas with contamination are considered to be part of the list.

In 2009, a white paper was written describing the process to clearly document areas of the National Priorities List, as well as those areas that are not part of the list. The board reviewed the paper and subsequently issued a recommendation to DOE, stating that the board

believes that defining only contaminated areas of the reservation in the list would be beneficial in presenting a more positive image of the reservation and the Oak Ridge community to the public.

Mitigation of Contamination in Bear Creek Burial Grounds

Bear Creek Burial Grounds is an area that was used by DOE for disposal of depleted uranium from production operations at the nearby Y-12 Plant (now the Y-12 National Security Complex). Remediation efforts have reduced concentrations of uranium and other contaminants in adjacent Bear Creek, but releases of uranium to the creek continue to exceed acceptable safe drinking water standards.

Current budget limitations and technical challenges prevent any near-term final remediation of the burial grounds, but ORSSAB believes DOE can take some steps now to help define possible actions for future remediation.

The board approved a recommendation, drafted by its EM committee, that asked DOE to compile informa-

tion related to potential remedial actions. The information would include a description of the actions; estimated costs; target contaminants; and comments regarding practicality, technical risk, maintenance costs, and budgetary feasibility.

DOE agreed with the recommendation and has pledged to provide a compilation, saying that such an analysis will enable informed decisions concerning possible near-term control measures for Bear Creek Burial Grounds.

Support/Public Outreach for EM Projects

During FY 2011, ORSSAB was actively involved in providing a public forum for major projects that had significant impact on the Oak Ridge EM program this year and that will continue to have ramifications for years to come. Through presentations at the ORSSAB board and committee meetings, the public received detailed briefings on a variety of topics:

- FY 2011 Remediation Effectiveness Report
- Groundwater Management Strategies
- FY 2013 DOE Oak Ridge EM Budget Request



DOE's Dave Adler provided the public with an update on the Bear Creek Burial Grounds at an ORSSAB meeting.

- Uranium-233 Disposition Project
- Focused Feasibility Study and Proposed Plan for Zone 1 at East Tennessee Technology Park
- Oak Ridge National Laboratory Central Gaseous Waste System
- Oak Ridge Reservation Site Treatment Plan
- K-1007 Ponds Ecological Restoration
- Bear Creek Valley Response Actions
- CERCLA Waste Facility Expansion
- Molten Salt Reactor Engineering Study
- Wastes Stored Longer Than One Year at East Tennessee Technology Park
- Corehole 8/Tank W-1A Removal
- Transuranic Waste Processing Center
- National Pollution Discharge Elimination System Permit for Y-12



FY 2012 ORSSAB members, liaisons, and student representatives. Bottom row, left to right: Sue Cange (DOE Deputy Designated Federal Officer), Connie Jones (EPA Liaison), Fay Martin, Gloria Mei, Greg Paulus. Second row: Betty Jones, Ron Murphree, Maggie Owen (Chair), Ed Juarez (Vice Chair), Amira Sakalla (Student Representative), Steve Stow. Third row: Howard Holmes, Dave Hemelright, Jan Hart, Scott McKinney. Top row: Melyssa Noe (DOE Federal Coordinator), Tom Valunas, Dave Adler (DOE Liaison), David Martin, John Owsley (TDEC Liaison). Not pictured: Jimmy Bell, Bob Hatcher, Charles Jensen (Secretary), and Kasey McMaster (Student Representative).

ORSSAB student representative Josh Monroe and more than 60 of his Oak Ridge High School classmates participated in a tour of EM sites at ETTP and ORNL. Also included in the tour was a stopover at ORNL's biofuels lab.



DOE Information Center



DOE Information Center staff, from left: Eva Butler, Wanda Joyce, and Michelle McMillan

The DOE Information Center is a one-stop information facility that maintains a collection of more than 45,000 documents involving environmental activities in Oak Ridge.

The Center hosts various meetings, including the ORSSAB meetings, relevant to cleanup activities in Oak Ridge. Staff are available Monday through Friday, 8 a.m. to 5 p.m., to assist with your information needs. A web site is available for users to search for information at the Center. Go to www.oakridge.doe.gov and click on "Public Activities." Select the "Online Catalog" to begin the search.

Visit the DOE Information Center on the Web at www.oakridge.doe.gov/info_cntr

Phone: 865-241-4780

Note: Effective Feb. 27, 2012, the DOE Information Center will relocate from 475 Oak Ridge Turnpike to the Office of Scientific and Technical Information, Building 1916 - T1, 1 Science.Gov Way, Oak Ridge, Tennessee

FY 2011 Stats

Average number of visitors per month	115
Number of public meetings held	147
Total citizen inquiries	1,260
Total number of documents at the center	45,964
Total number of documents on-line	23,793



Information Resources

DOE Information Center
475 Oak Ridge Turnpike
Oak Ridge, Tennessee 37830
Phone: (865) 241-4780
Fax: (865) 574-3521
E-mail: DOEIC@oro.doe.gov
Hours 8 a.m. to 5 p.m., Monday – Friday

DOE Public Affairs Office
(865) 576-0885

DOE-ORO Public Information Line
1-800-382-6938

Oak Ridge Site Specific Advisory Board
(865) 241-4583, (865) 241-4584
1-800-382-6938

Tennessee Department of Environment
and Conservation
(865) 481-0995

U.S. Environmental Protection Agency
Region IV
1-800-241-1754

Agency for Toxic Substances and
Disease Registry
1-888-422-8737

Internet Sites

DOE Main Web Site	www.energy.gov
DOE-ORO Home Page	www.oakridge.doe.gov
DOE-ORO Environmental Management Program	www.oakridge.doe.gov/external (Click on “Programs,” then select “Environmental Management”)
Oak Ridge Site Specific Advisory Board	www.oakridge.doe.gov/em/ssab
Agency for Toxic Substances and Disease Registry	www.atsdr.cdc.gov
U.S. Environmental Protection Agency	www.epa.gov/region4/
Tennessee Department of Environment and Conservation	www.state.tn.us/environment/
DOE Information Center	www.oakridge.doe.gov/info_cntr
American Recovery and Reinvestment Act	www.recovery.gov www.energy.gov/recovery

Commonly Used Acronyms

ARRA	American Recovery and Reinvestment Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CH	Contact-handled
CROET	Community Reuse Organization of East Tennessee
DOE	U.S. Department of Energy
EM	Environmental Management
EMWMF	Environmental Management Waste Management Facility
EPA	U.S. Environmental Protection Agency
ETTP	East Tennessee Technology Park
FFS	Focused Feasibility Study
FY	Fiscal year
NNSA	National Nuclear Security Administration
NPL	National Priorities List
ORNL	Oak Ridge National Laboratory
ORSSAB	Oak Ridge Site Specific Advisory Board
PCB	Polychlorinated biphenyl
RH	Remote-handled
ROD	Record of Decision
SWSA	Solid Waste Storage Area
TDEC	Tennessee Department of Environment and Conservation
TRU	Transuranic
TSCA	Toxic Substances Control Act
TWPC	Transuranic Waste Processing Center
UEFPC	Upper East Fork Poplar Creek
VOC	Volatile organic compound
WIPP	Waste Isolation Pilot Plant in New Mexico

Commonly Used Terms

CERCLA: The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 established prohibitions and requirements concerning closed and abandoned hazardous waste sites, provided for liability of persons responsible for hazardous waste releases at these sites, and established a trust fund to provide cleanup when no responsible party could be identified. The law authorizes two kinds of response actions: short-term removals, where actions may be taken to address releases or threatened releases requiring prompt response, and long-term remedial actions, which permanently and significantly reduce the dangers associated with releases or threats of releases. Long-term actions can be conducted at sites on the Environmental Protection Agency's (EPA's) National Priorities List, a listing of the nation's most hazardous waste sites. The Oak Ridge Reservation was added to that list in 1989.

Environmental Management Waste Management Facility: *The Record of Decision for the Disposal of Oak Ridge Reservation Comprehensive Environmental Response, Compensation, and Liability Act of 1980 Waste, Oak Ridge, Tennessee* was issued in 1999 to construct a dedicated disposal facility on the Reservation to receive low-level radioactive waste, Resource Conservation and Recovery Act hazardous waste, Toxic Substances Control Act waste, and mixed wastes generated from cleanup programs conducted under CERCLA. While the ROD did not establish a formal name for this facility, it has been designated as the Environmental Management Waste Management Facility.

Federal Facility Agreement: Cleanup activities are performed in accordance with state and federal laws, and CERCLA requires an interagency agreement to facilitate the interaction between state and federal entities (for the DOE Oak Ridge Office, that would be DOE, EPA, and the Tennessee Department of Environment and Conservation). The Federal Facility Agreement for Oak Ridge was initiated in January 1992 to satisfy the interagency agreement requirement.

Record of Decision: Under the CERCLA process, a Record of Decision formally documents the selection of a preferred cleanup method at Superfund sites after a series of steps, including a Remedial Investigation/Feasibility Study. After a preferred cleanup alternative is selected, it is presented to the public for comment in a Proposed Plan. EPA, the state, and the lead agency then select a remedy and document it in the Record of Decision.

Removal Actions: Some cleanup activities on the Oak Ridge Reservation are conducted as Removal Actions under CERCLA. These actions provide an important method for moving sites more quickly through the CERCLA process. When a site presents a relatively time-sensitive, non-complex problem that can and should be addressed, a Removal Action would be warranted.

For more information, please contact the DOE Public Affairs Office
at (865) 576-0885 or 1-800-382-6938.