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2012

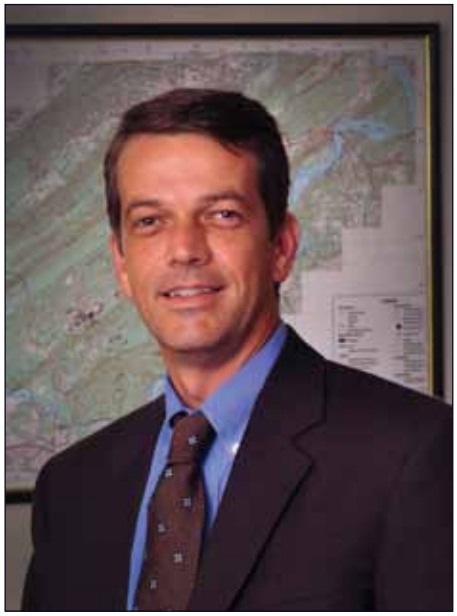
Cleanup Progress

Annual Report to the Oak Ridge Community




This report was produced by URS | CH2M Oak Ridge LLC, DOE's Environmental Management contractor for the Oak Ridge Reservation.

Message from the EM Manager Department of Energy Oak Ridge Office



Mark Whitney

To the Oak Ridge Community:

The U.S. Department of Energy's Oak Ridge Office of Environmental Management (EM) is, in many instances, approaching a new chapter of cleanup across the Oak Ridge Reservation. Many of Oak Ridge's American Recovery and Reinvestment Act projects are completed, and we are approaching the final phases of the site's most recognizable, long-standing cleanup projects. Following the successes of FY 2012, we are excited about the future as we develop cleanup strategies for the years ahead.

Some of our most notable success took place at the East Tennessee Technology Park (ETTP). We completed demolition on most of the K-25 Building's east wing, and the north end of the building will be taken down in FY 2013. The north end is the only remaining portion of the 44-acre facility with the exception of a small section of the east wing. With the progress at K-25, we are moving closer to finishing one of the Department of Energy's largest-ever cleanup projects. Additionally, employees completed removal of the K-33 Building and its slab. The 32-acre structure has been transformed into green space at ETTP, welcoming new development at the former uranium enrichment complex.

One of EM's greatest achievements this year was the formal completion of a Memorandum of Agreement between federal, state, and local historic preservation groups that will preserve the contributions of the K-25 site to the World War II Manhattan Project. We, along with our federal, state, and local partners, worked for nearly a decade to complete this multiple-party agreement, which honors the site's early workers and allows the EM program to continue cleanup at the site.

At the Oak Ridge National Laboratory (ORNL), EM continues moving forward with the Uranium-233 Disposition Project. Due to excellent federal oversight and innovative project management, we now have a plan that reduces the schedule by 10 years and the cost by $500 million. EM also removed Tank W-1A, ORNL's largest source of groundwater contamination, and excavated and disposed the 4,000-gallon waste storage tank and surrounding contaminated soil. Finally, EM removed four of Building 3026's hot cells in ORNL's central campus, and we continue processing transuranic waste at the site.

At the Y-12 National Security Complex, EM is intently focused on mercury remediation. In FY 2012, engineers began projects that focused on mercury abatement through treatability studies, removing mercury tanks, cleaning storm drains, and designing treatment facilities that will reduce mercury migration into the East Fork of the Poplar Creek.

Since arriving in Oak Ridge, I have been impressed by the level of stakeholder support and involvement. This is a tremendous asset that aids our program and community. In my time in Oak Ridge, area residents have displayed a shared commitment to protect and restore the environment for the betterment of the community and the advancement of the Department's missions. 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.

Contents



Note: All projects in this publication using American Recovery and Reinvestment Act funding are denoted with this symbol.

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 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 the 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 2012 (October 1, 2011, to September 30, 2012), the EM Program had many major achievements. At ETTP, workers completed demolition of most of the east wing of the massive K-25 Building and began preparing the K-27 building for demolition.

DOE's goal for ETTP is to transform the site into a private industrial park. Great strides were made in FY 2012 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, 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 completed. The tank and surrounding soil were shipped for disposal.

At Y-12, legacy waste removal and demolition of facilities were top priorities. Soil remediation was completed on the Old Salvage Yard, while mercury reduction, characterization, and planning efforts were under way for the complex.

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 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.

K-25 Building demolition continues

Most of the K-25 Building's east wing was demolished in FY 2012, and demolition was initiated on the facility's north end.

Besides the north end, the only other portion of the building left standing is the southernmost section of the east wing, which is contaminated with technetium-99, a slow-decaying radioactive metal. That section will require further neutralization before demolition.

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The K-25 Building was a former gaseous diffusion facility built as part of the Manhattan Project to enrich uranium. The mile-long structure was shut down in the early 1960s. It was composed of three major sections—the east and west wings and the north end—aligned in a "U" shape. The north end forms the base of the "U" and is the smallest section.

The north end was once considered a candidate for preservation, but its deteriorated condition made that option too costly. DOE signed an agreement with historic preservation groups in FY 2012 allowing demolition of the north end in lieu of other means to commemorate the building's history.

Pre-demolition activities continue to take place in the southern portion of the east wing, an area previously referred to as the technetium-99 area. These activities include characterization; vent, purge, drain, and inspection; foaming of equipment to stabilize contaminants in place; asbestos removal; and draining of lubrication oil and coolant. These activities are required to be completed prior to demolition.

Pre-demolition activities continue into 2013 in preparation for demolition, which will require the use of heavy machinery. As a cost-savings measure, UCOR has worked with other DOE sites to obtain excess heavy machinery. For example, in the second quarter of 2012, UCOR obtained an Ultra-High Reach excavator from the Hanford Site that will enable the project to eliminate costly rental fees.

Also, in cooperation with Oak Ridge DOE EM and the DOE Savannah River Site, UCOR identified excess demolition equipment from the Savannah River Site and transported it to ETTP. These shipments included more than 44,000 individual items with an original purchase value of more than $2,450,000. This material was obtained at a total cost of less than $100,000.

Last section of the east wing's non-technetium portion to be demolished

Debris generated from the K-25 demolition project was shipped for disposal as it was generated, with most being disposed of at the Oak Ridge Reservation's Environmental Management Waste Management Facility

DOE selects commemoration options for K-25

DOE and local historic preservation agencies agreed upon commemorative measures that will preserve the historic contributions of Oak Ridge's K-25 site to the World War II Manhattan Project.

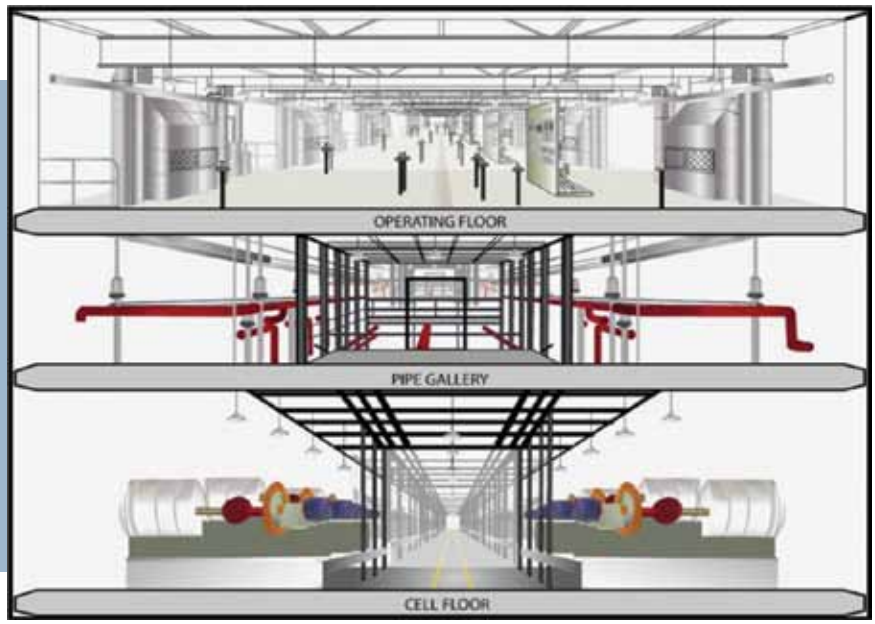
The K-25 complex contained more than 500 buildings and 12,000 workers at its peak. The project's enormous scale, which in 1945 included the world's largest building, was necessary to produce a few grams of uranium-235 that were used to build the atomic bomb that ended the war with Japan.

While preservation of the K-25 Building's north end was once consideration, the building's deteriorated condition made that option too costly. Instead, DOE will commemorate the site by implementing the following measures:

Artist concept of viewing tower on the south end of the K-25 Building footprint

- Approximately 40 acres located inside the road that currently surrounds the original K-25 Building will be dedicated for commemoration and interpretation activities. The agreement calls for the construction of a three-story equipment building at the property's southern end that will recreate a scale representation of the gaseous diffusion technology and contain authentic equipment used in the K-25 Building. The building will also house other equipment that was developed and/or used at the site. The project will include a viewing tower erected on the south end of the building's footprint (near the Oak Ridge Fire Station) and 12 wayside exhibits that will tell portions of the K-25 story.
- A K-25 History Center will be located nearby on the second level of the Fire Station, owned by the City of Oak Ridge. The History Center will provide space to exhibit equipment, artifacts, oral histories, photographs, and video.
- DOE will provide a grant of $500,000 to the East Tennessee Preservation Association to help preserve the Alexander Inn, a historic structure in Oak Ridge where visiting scientists and dignitaries stayed. The grant will be used to purchase the property and stabilize the structure until the Inn can be transferred to a private developer.

A three-story equipment room will be constructed that will recreate a scale version of the gaseous diffusion technology used in the K-25 Building



A worker drills a hole in the process gas system piping in K-27 as part of the sampling process

K-27 Building being prepared for demolition

In FY 2012, DOE and its EM contractor for Oak Ridge, URS | CH2M Oak Ridge LLC (UCOR) developed a plan to accelerate demolition of the K-27 Building. The building is in a severely deteriorated state, necessitating timely attention to ensure safe and efficient demolition. The K-27 Building is similar in structure to the K-25 Building and is approximately 900 feet long, 400 feet wide, and 58 feet in height.

K-27 Building

Pre-demolition work that has been initiated includes inventory management; collection of Non-Destructive Assay measurements of process pipe; vent, purge, drain, and inspection of process equipment; and the installation of safety controls.

Limited pre-demolition activities, including removal of high-hazard sodium fluoride traps, continued into FY 2013 in preparation for building demolition.

Inside the K-27 Building

K-33 Building demolition activities completed

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 ft^2 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 building's decontamination was performed. BNFL Inc. was awarded a fixed-price contract to decontaminate Building 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 ft^2 of floor space.

All three buildings were originally to be cleaned up and converted to usable facilities for private industrial tenants. However, DOE later determined that Buildings K-29 and K-33 were not suitable for reindustrialization. Building K-29 was demolished in 2006.

In 2010, DOE contracted with LATA/Sharp Remediation Services to demolish the K-33 Building. The demolition was completed, and the last waste was disposed ahead of schedule in September 2011. In FY 2012, LATA/Sharp Remediation Services removed the building's 32-acre slab, excavated contaminated soil, backfilled and seeded the area, and disposed the waste ahead of schedule. Excavation of the slab and soil resulted in 125 yds^3 of soil and 61,300 tons of concrete disposed.

At left: K-33 Building (foreground) before demolition. Below is the K-33 Building site after slab removal and seeding.

Workers are filling a sump at the TSCA Incinerator

Closure activities continue for TSCA Incinerator

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

Closure activities were completed in December 2010, and the State of Tennessee granted permit termination on Sept. 21, 2012.

During 2012, additional actions were taken to encapsulate remaining PCB and radioactive contamination to minimize water management actions and to reduce the cost of ongoing surveillance and maintenance. Other activities performed included cleaning, rinsing, and filling multiple sumps, and removing and disposing of the carbon vessels, which were part of the water management system. Upon completion of these activities, the facility will be under surveillance and maintenance until demolition.

A carbon vessel is being removed from the incinerator

Workers perform sampling activities in the Poplar Creek area at ETTP

Poplar Creek facilities characterized

Characterization of 22 structures in the Poplar Creek area at ETTP has been performed.

The objectives of this project, funded by ARRA, were to complete deactivation in preparation for demolition and perform waste characterization of selected facilities to determine the appropriate disposal facility to which the demolition debris could be sent.

The project began with a field investigation to evaluate the historical information and data that had been previously collected and then to determine where data gaps existed. Once the data gaps were identified, a characterization plan was prepared to describe how data would be collected. The collected data was then used to determine the proper disposal facility for each structure and to prepare the documentation required for the waste to be accepted.

This characterization included investigations of building and equipment surface locations using a combination of field screening instrumentation and collection of samples for laboratory analysis. Data gathering techniques included intrusive sampling, in situ gamma spectroscopy measurements, and radiation scans and direct measurements. The intrusive smear, residue, and liquid samples collected were analyzed for radionuclides, metals, semi-volatile organics, volatile organics, and PCBs, among other potential contaminants of concern.

Environmental contamination addressed at ETTP

Remediation activities to reduce ETTP groundwater and surface water contamination continued in FY 2012.

Releases to Mitchell Branch

Operation of the Chromium Water Treatment System began in FY 2012. This system provides a long-term solution for hexavalent chromium being released into Mitchell Branch. The source of this contamination has not been identified.

These releases affected the ambient water quality in Mitchell 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 and a non-time-critical Removal Action to install the Chromium Water Treatment System. Since completion of these Removal Actions, the concentration of chromium in Mitchell Branch has been reduced to compliant levels.

Groundwater Treatability Study

A groundwater treatability study was initiated in FY 2008 to evaluate the feasibility of in situ treatment of an ETTP groundwater plume contaminated with volatile organic compounds.

In FY 2009, the contaminated groundwater plume was delineated by characterization of 14 boreholes at depths of 110 to 160 feet.

In FY 2011, the groundwater treatability study was delayed, and in FY 2012, the treatability study site was closed and the wells grouted to limit the spread of contamination until the treatability study is resumed.

Zone 1

In FY 2012, a Final Remedial Investigation/Feasibility Study (RI/FS) was prepared to support development of a final Zone 1 Record of Decision. Activities included conducting groundwater, soils, surface water, and land use control workshops to review data and develop an alternative for the feasibility study.

The first draft RI/FS was transmitted to the regulators in March 2012; regulator comments were received in August 2012. FY 2013 work includes transmittal of the second draft RI/FS, preparation of the Proposed Plan, a public meeting, and preparation of the initial draft of the Zone 1 Final Record of Decision.

K-1070-B Burial Ground

Excavation of six trenches and two hot spots was completed at the K-1070-B Burial Ground, a 6-5 acre landfill located near the K-25 Building. It was used from the early 1950s to the mid-1970s to dispose of equipment, materials, parts, and drums. The debris and soil were excavated down to 10 ft below surface for protection of the groundwater. Approximately 100,200 yds^3 of soil and debris were excavated and shipped for disposal.

After excavation of the trenches and hot spots, the site was graded and contoured. A cover was placed on the burial ground that consisted of a combination of layers of riprap/concrete rubble, backfill, and topsoil for seeding. The project received more than 4,100 dump truck loads of concrete rubble, rip-rap, backfill, and topsoil to provide the final cover for the burial ground.

K-1070-B remediation activities

ETTP cleanup at a glance*

Facilities demolished	374
UF_6 cylinders removed	7,000
Waste removed from site	1.77 million yds^3
Area cleared for unrestricted use **	1,400 acres

*Totals since cleanup operations began
**Unrestricted industrial use down to 10 ft

ETTP before cleanup began

Site changes continue as Reindustrialization Program transfers property to private sector

The DOE Oak Ridge Reindustrialization Program continued the transformation of ETTP into a private sector business/industrial park in FY 2012.

With the transfer of Parcel ED-10 to the Community Reuse Organization of East Tennessee (CROET), an additional 13 acres in the central area of ETTP were made available for private use. Babcock Services purchased 2.5 acres of Parcel ED-10 and began construction of an 11,400 ft^2 facility. The property will be used to manage, recover, and refurbish radioactively contaminated components from commercial nuclear power plants and is projected to create more than 100 jobs.

An additional 26.5 acres in the former Powerhouse Area along the Clinch River were made available via a lease to CROET for industrial development, increasing the total to 308 acres. Oak Ridge Forest Products is leasing a portion of this site from CROET in support of its operations to supply wood chips that fuel a biomass gasification plant at ORNL.

In Spring 2012, a 200 kW photovoltaic solar farm at the entrance to ETTP began generating enough electricity to power 22 homes. The land for the solar farm was purchased from CROET by RSI, the developer and operator of the system. This project required collaboration with the Tennessee Valley Authority, DOE, UCOR, and the City of Oak Ridge.

The new $35 million Carbon Fiber Technology Facility at Oak Ridge's Horizon Center is nearing completion. This advanced materials facility will allow researchers to develop and demonstrate the commercial viability of low-cost carbon fiber products for several industry sectors. Long considered a desirable lightweight substitute for steel and other materials, use of carbon fiber has been limited due to its high production costs. The development of low-cost production methods is expected to create new possibilities for its use in a wide array of applications for building structures, industrial products, wind turbines, and others.

The DOE Oak Ridge Office hosted an Asset Revitalization Workshop in June 2012. The workshop brought together DOE officials, government contractors, and community stakeholders from across the nation to gain a better understanding of transitioning federal land and facilities for beneficial reuse. Asset Revitalization experts from Oak Ridge were able to share their many years of experience, successes, and lessons learned in implementing this unique program.

Workers install panels for the solar farm near the ETTP entrance

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.

Contaminated Tank W-1A and soil removed

Removal and disposal of a 4,000-gallon contaminated tank at ORNL was completed in FY 2012. Tank W-1A and its pipelines were the largest source of groundwater contamination at the site. The contaminated soil surrounding the vessel was also disposed.

The remediation process included excavating, packaging, and transporting contaminated soil for disposal, as well as removing, cutting up, containerizing, and transporting the concrete pad, tank supports, and tank shell for disposal.

DOE's cleanup contractor UCOR began excavating the tank in September 2011 and removed the tank in January 2012. It was then shipped to be cut up for disposal in February 2012. Soil and secondary waste shipments were completed in May 2012.

Tank W-1A was commissioned in 1951 to collect and store liquid wastes from radiochemical separations and high-radiation analytical facilities at ORNL. During its operation, a transfer line to the tank was suspected of leaking near the tank intake, causing significant soil and groundwater contamination. It was emptied and removed from service in 1986 after high levels of contamination in the groundwater were discovered.

Over the years, attempts to move the project forward and remove the tank were largely unsuccessful. In 1995, a system was installed to pump and treat the groundwater plume that originated from the tank, helping to mitigate environmental impacts to the groundwater. That system continues to operate.

Materials from the remediation were disposed at the Environmental Management Waste Management Facility (EMWMF) and the Nevada National Security Site. Fifteen containers met the acceptance criteria for on-site disposal and were sent to EMWMF. A total of 333 containers were sent to the Nevada National Security Site in Department of Transportation approved containers.

Additional 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 pipeline soil sampling, additional soil along the pipelines will require removal. A Remedial Action Work Plan to address the additional soil removal was submitted to the regulators in March 2012.

Removal of Tank W-1A at ORNL eliminated the main source of groundwater contamination at the site

Isotope Row material removed

Work was completed in FY 2012 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 completed in FY 2012 included the removal, packaging, and off-site disposal of lead shielding from the exterior of the hot cells in Buildings 3030 and 3031, and the packaging and disposal of shielded casks, carriers, and miscellaneous materials staged to the west of Building 3028. A completion report documenting the work performed was prepared, submitted, and approved in FY 2012.

Workers remove lead bricks in the Building 3030 hot cell

Uranium-233 disposition plans considered

Oak Ridge has a significant inventory of uranium-233 (U-233) stored in Building 3019A at ORNL.

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 dispositioning 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 executing the two-part direct disposition campaign on Jan. 1, 2012.

By October 2012, 126 items were dispositioned to the Nevada National Security Site, and 10 items were safely and securely transferred to ORNL for programmatic re-use.

Phase II of the Alternatives Analysis, which provided a more detailed evaluation of processing options for the inventory unable to be directly dispositioned, was approved by DOE's EM and Science Offices and endorsed by the Secretary of Energy in July 2012.

Upgrade of 4500 waste system under way

The objective of the 4500 Area Gaseous Waste System Upgrades 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 Building 4507; clean out filter pits 3106 and 4556; and stabilize hundreds of feet of deactivated underground ductwork.

Demolition and removal of existing equipment and the fabrication and installation of the replacement ventilation system for the 4501, 4505, and 4500N facilities began in FY 2012 and will be completed during FY 2013.

Design, fabrication, installation, and operation of the local ventilation system for Building 4507 was completed in FY 2012, along with stabilization of the 4507 hot cells. Characterization of the underground ductwork was completed and planning initiated for clean out of the 3106 filter pit. Clean out of the 4556 filter pit was initiated in FY 2012 and will be completed in FY 2013, along with clean out of the 3106 filter pit and stabilization of the underground ductwork once the remaining facilities are removed from the central systems.

At left, workers are installing a new exhaust duct on the Building 4507 hot cells, and above, workers are stabilizing a glovebox in the building.

Pits beneath the Building 2000 slab are being remediated

Remediation of slab areas completed

During FY 2012, remedial actions were completed for 18 slabs and associated concrete structures, associated inactive process waste drains, and underlying soil following building demolition in the Bethel Valley area of ORNL.

The slabs that were removed and disposed covered an area of approximately 2.4 acres, and these sites were restored to either open grassed areas or gravel lots—depending on the planned use of the area—to support ongoing ORNL research and operations.

Waste from the removal of the slabs and associated structures was packaged and disposed. The inactive process waste pipelines were removed and disposed or backfilled in place, depending on the depth of the piping below ground. A completion report documenting the work performed was prepared, submitted, and approved in FY 2012.

Workers are remediating the Building 2009 and 2010 slab areas

Workers prepare to demolish hot cell structures

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.

A Waste Handling Plan for the 3026 hot cells demolition and waste disposition was approved by the Environmental Protection Agency and the Tennessee Department of Environment and Conservation in FY 2011. The six structures that comprise Building 3026 C&D were in various stages of characterization, planning, decontamination, and demolition in FY 2012. Two structures (3026C "Counting Room" and 3026C "Tritium Lab") were decontaminated in FY 2011. Three additional structures (3026C "Cell Bank 1", 3026C "Cell Bank 2", and 3026D "Storage/Sorting Cell") were decontaminated in FY 2012. This work included removal of internal equipment, the final step to make these structures ready for demolition. The four 3026C structures were also demolished and disposed of in FY 2012.

Preparation for demolition of the two remaining structures (3026D Storage/Sorting Cell and 3026D Cell A and B) is under way. In March 2011, higher levels of contamination than anticipated were found in the 3026D structures while performing initial characterization. The project's revised technical approach for hot cell clean-out was approved in FY 2012, the Operational Readiness Review was completed in July 2012, and demolition will be completed in FY 2013.

Workers are preparing to remove shield plug from a hot cell in Building 3026D

Bethel Valley groundwater addressed

Several activities were initiated in FY 2012 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. Groundwater monitoring continued in 2012, with a Treatability Study Report documenting the results.

The purpose of the injection was to provide a source of carbon to stimulate existing TCE-degrading microbes in the groundwater system. The post-injection monitoring of the field-scale amendment injections indicated that anaerobic reductive dechlorination can be successfully implemented at full scale at this site for treating TCE in groundwater. Monitoring of the wells will continue to document the degradation process.

Corehole 8 intercept extraction system

Surface water monitoring in First Creek in 2009-2010 indicated that strontium-90 in groundwater was bypassing the Corehole 8 intercept extraction system and surfacing at First Creek on the west side of the ORNL Central Campus.

During FY 2011 and continuing into FY 2012, two new bedrock wells were installed to extract contaminated groundwater and send it to the onsite wastewater treatment system. As part of the project, older system components were replaced with new pumps, power supply, and pump control systems. The new wells and refurbished pumping system resumed operation in March 2012.

Corehole 8 intercept extraction system

Monitoring in First Creek and wells associated with the plume subsequent to the system restart shows that plume containment has been again established.

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 20-, 50-, and 100-ft depths. Monitoring results show strontium-90 at concentrations below drinking water standards in the shallowest 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 SWSA 3 remedial actions completed in 2011 to decrease the groundwater contamination level.

Monitoring wells along Racoon Creek

Off-site well monitoring

Several unneeded ORNL facilities demolished

Legacy material removal and demolition activities were completed in FY 2012 at several ORNL facilities. These contaminated non-reactor facilities are surplus buildings, some dating from the original Manhattan Project, that were no longer needed.

As part of the 34 Buildings D&D Project, legacy material was removed from more than 32,000 ft^2 of facility space, and a total of 115,600 ft^2 of building space was demolished and the demolition debris disposed. The 34 buildings, located in the busy central campus portion of ORNL, were safely and successfully demolished without impacting adjacent laboratory facilities. This project has eliminated the risk associated with these unused facilities and will allow re-use of the area to support ORNL's ongoing and future research activities.

Unnecessary structures that were demolished at ORNL include Building 3504 (above), Building 3550 (left), and the 3085 tanks (below).

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 highly skilled, specialized manufacturing work for other government and private-sector entities.

Old Salvage Yard after scrap removal

Old Salvage Yard soil characterized, disposed

The excavated soil from the Old Salvage Yard at Y-12 was characterized, profiled, and disposed in FY 2012. Approximately 988 yds^3 of contaminated soils and miscellaneous debris were disposed at EMWMF. Site restoration was completed for remediated and non-remediation areas.

Scrap removal in the Old Salvage Yard at Y-12, which began in 2010, was completed in 2011. Workers removed approximately 31,000 yds^3 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 allowed access to subsurface soil, and the Old Salvage Yard Scrap Removal Project received additional funding from ARRA in August 2010 for soil characterization.

Soil characterization data and groundwater modeling indicated soil remediation was required at the former Drum Deheader area.

A remedial action was taken to remove contaminated soil that could contribute to future groundwater contamination. A 50-ft by 50-ft area was excavated to a depth of five feet to remove sufficient volatile organic compound concentration to mitigate the impact. The excavated area was then backfilled.

Old Salvage Yard East before scrap removal

Storm drain material disposal completed

Cleanup and repair of storm sewers in the West End Mercury 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 Upper East Fork Poplar Creek (UEFPC).

Cleaning and lining of storm sewers in UEFPC were completed in September 2011. More than 8,000 linear feet of storm sewer were cleaned, and approximately 1,200 linear feet were lined. Final closure documentation was submission of the D1 version of the Phased Construction Completion Report for the storm sewer remediation project to EPA and the Tennessee Department of Environment and Conservation (TDEC) on Jan. 4, 2012. Their comments were received in March 2012. A revised D2 version of the Phased Construction Completion Report was submitted to the regulators in May 2012, and their approval was received in August 2012.

The cleanout project generated 518,000 gallons of wastewater, 16,980 yd^3 of solid wastes, and 54 pounds of elemental mercury that were properly treated and disposed.

Personnel prepare to insert a vacuum line into the storm sewer basin

Alpha 5 characterization work performed

Alpha 5 (Building 9201-5) is the largest building at Y-12, measuring 613,642 ft^2.

Previously completed work scope for the project included removal and disposal of legacy materials from the building (floors 1 through 4). Legacy materials were defined as those being easily removed and involving minimal reconfiguration efforts (e.g., unbolting, unplugging, wire cutting, cold cutting). The building was organized into 82 units, and legacy material was present in 67 of the units located on four floors. 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 ft^3 of legacy waste was disposed.

In FY 2012, characterization of building materials and equipment that was physically connected to the building was completed. This effort was a critical necessary step in preparation for the eventual deactivation and decommissioning of the building. The final Characterization Report was completed in January 2012.

Mercury reduction, characterization, and planning efforts under way at Y-12

Exposure Unit 9

An 11.7-acre Exposure Unit (EU) 9 at the Y-12 National Security Complex was addressed in FY 2012.

This project included characterization of the EU and development of a Remedial Design Report (RDR) that had an FFA milestone of Sept. 30, 2012. The characterization strategy followed the UEFPC Remedial Action Work Plan (RAWP) and included radiation walkover surveys and soil sampling and analyses. The goal was to identify contaminants exceeding industrial worker remediation limits and contaminants that were a threat to surface and groundwater below 2 feet.

Workers prepare a soil sample for containerization at Exposure Unit 9

Characterization results were presented in a Technical Memorandum and indicated that a remedial action is required in the former 81-10 Area for protection of the industrial work force. The proposed remedial action is excavation of a 45-ft by 70-ft by 2-ft deep area with an estimated volume of 6,300 ft^3 of soil in the remedial action boundary. An RDR detailing the method of accomplishment, waste management, and waste disposition was prepared and submitted to EPA and TDEC ahead of the FFA milestone.

Mercury Reduction Planning and Remediation Projects

The Mercury Reduction Project was initiated in FY 2012 to facilitate reduction and lessened mobility of mercury at Y-12.

Subprojects under the Mercury Reduction Project included Outfall 200 Conceptual Design, Secondary Pathways, Free Mercury Recovery, Mercury Soils Treatability Study, and Disposal of Five Tanks. Physical actions on The Mercury Reduction Project began in May 2012. Efforts will continue into Fiscal Year 2013.

Five Tank Remediation Project

A tank removal project was initiated to remove five tanks used for mercury-related activities at Y-12. These tanks were removed from service in the 1980s. Characterization was completed along with the necessary documentation needed for disposal of these tanks. Based on characterization results, two tanks will be sent to the sanitary landfill at Y-12. Three tanks will be transported to Materials and Energy Corporation for residual removals of tank contents and size reduction of the tanks. After size reduction, the tank residuals and debris will be disposed. Disposal of each tank will take place in FY 2013.

Worker prepare the five tanks used for mercury-related activities for shipping

Outfall 200 Conceptual Design Project

Outfall 200 is the major outfall at which mercury entrained with storm sewer effluents discharges into UEFPC.

During FY 2012, a treatability study and conceptual design were begun to remove mercury and decrease discharge of mercury at Outfall 200. Samples were collected from Outfall 200 A6, Outfall 169, Outfall 163, and Outfall 150. Collected samples of storm water effluent and grit from the bottom of the storm sewers were analyzed for constituents of concern and subjected to treatability analysis for removal of suspended solids and mercury. A draft alternatives analysis was performed for an Outfall 200 treatment system, and a conceptual design based on the alternatives was started. The conceptual design is expected to be completed in FY 2013.

A junction box floor is being prepared to receive a mercury trap

Mercury Removal Projects

Free mercury is free phase elemental mercury. The Mercury Recovery Project designed and installed innovative passive free mercury recovery traps at locations upstream of outfalls 150, 160, 163, and 169. The traps will collect free mercury, and Y-12 personnel will remove that mercury from the traps. As part of the Free Mercury Recovery Project, Y-12 began collecting free mercury from storm sewer structures and removed approximately 20 pounds of mercury from the storm sewers since August 2012. Free Mercury Recovery Project completed design and began procurements for a decanting facility necessary to separate mercury from co-collected gravel and water, and potential amalgamation of collected free mercury for disposal purposes.

Trapping and removing free mercury from the storm sewers will benefit UEFPC by removing free mercury from the storm

sewers before that mercury is discharged into UEFPC.

Workers excavate prior to placement of a new storm sewer catch basin behind 9201-5

Mercury Contaminated Soils Treatability Study

A treatability study for mercury-contaminated Y-12 soils started in FY 2012. The treatability study was initiated to define treatment options and available disposal options for Y-12 soils contaminated with mercury. Mercury-contaminated soil samples from EU-9 were shipped to three laboratories for treatment. In addition, the treatability study began identifying post-treatment disposal pathway and regulatory requirements for the soils.

Each of the laboratories used a different treatment methodology for stabilizing mercury in the soil matrix to ensure the mercury could not leach out of the soil. If the study proves successful and is approved by the EPA and TDEC, treated soils may be disposed of in an environmentally sound method at a lower cost than is currently possible for disposal of untreated soils. A mercury-contaminated soils treatability study report will be produced that captures the results of all of these activities in FY 2013.

Secondary Pathways

An evaluation of mercury pathways of direct discharge points and/or structural factors that mobilize soil movement was conducted in the immediate vicinity of Alpha 4 (9201-4), Alpha 5 (9201-5), and Beta 4 (9204-4). Drains that could potentially discharge to soils were inspected.

Designs were completed to retrofit selected building drains with mercury collection devices prior to building drain discharge to the storm sewer system. Additionally, designs for installation of impervious surfaces and direct drainage to the storm sewer system were completed.

Installation of impervious surfaces at Alpha 4 and Alpha 5 will be completed in FY 2013. The impervious surfaces will prevent percolation of water through the mercury-contaminated soils and direct rain water to the storm sewer system.

Beta 3 disposition work completed

The Beta 3 Legacy Material Disposition project work scope included completing the refurbishment of 36 glove boxes, 4 Plexiglas enclosures, and associated ventilation systems to maintain and ensure containment capability within the facility Actinide Lab area.

Debris stored and accumulated within the glove boxes was characterized, removed, packaged, and disposed as either low-level radioactive waste, mixed low-level waste, or transuranic waste. Following removal of the debris, the Hazard Analysis for the facility was re-evaluated, resulting in a revised Hazard Assessment Document and lower hazard category, which will reduce the long-term surveillance and maintenance costs for the facility. A completion report documenting the work performed was prepared, submitted, and approved in FY 2012.

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.

Environmental Management Waste Management Facility

Wastes disposed at Oak Ridge Reservation landfills

Much of the waste generated during FY 2012 cleanup activities was disposed at facilities on the Oak Ridge Reservation.

EMWMF, located in east Bear Creek Valley near the Y-12 Complex, received 16,660 truckloads of waste, accounting for approximately 185,000 tons during FY 2012. This engineered landfill consists of six disposal cells and accepts low-level radioactive and hazardous waste that meets 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 5.59 million gallons of leachate at the ORNL Liquid/Gaseous Waste Operations Facility in FY 2012. No contact water required treatment in FY 2012. An additional 16.5 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 2012 include the K-25 Building Demolition Project; K-33 Building Demolition Project; ETTP Decontamination and Decommissioning Project, including the K-1070-B Burial Ground; Y-12 Old Salvage Yard; Alpha 5; 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, and demolition waste. In FY 2012, approximately 44,351 yd^3 of industrial wastes and construction/demolition debris were disposed in the landfill.

Operation of the Oak Ridge Reservation Landfills generated approximately 1.166 million gallons of leachate that was collected, monitored, and discharged into the Y-12 Complex sanitary sewer system. The Y-12 Complex sanitary sewer system discharges to the Oak Ridge sewer system under an industrial sewer user permit.

Planning under way for new on-site disposal facility

The existing on-site disposal facility for low-level, mixed, and classified waste, EMWMF, is predicted to reach capacity before all ORR cleanup waste has been generated and disposed. In order to evaluate alternatives for disposal of future cleanup waste, DOE issued a Remedial Investigation/Feasibility Study report in September 2012. Following regulator review and approval, the report will serve as the initial document supporting DOE's selection of a preferred alternative for waste disposal post-EMWMF. Similar to a previous study completed for the EMWMF, the report analyzes three alternatives:

- The no action alternative provides a benchmark for comparison with the action alternatives. Under the no action alternative, no coordinated ORR-wide strategy to manage wastes generated by future CERCLA actions would be implemented.
- The on-site disposal alternative would provide consolidated disposal of most future-generated CERCLA waste in a newly-constructed, engineered facility referred to as the Environmental Management Disposal Facility (EMDF).
- Under the off-site disposal alternative, future CERCLA waste would be transported off-site for disposal in approved disposal facilities in Nevada and Utah, primarily by rail.

The RI/FS report concludes that both the on-site and off-site disposal alternatives would be protective of human health and the environment long-term by disposal of waste in a landfill designed for site-specific conditions.

The off-site disposal alternative could isolate the wastes more effectively due to the arid climate and fewer receptors at facilities in western states. While the on-site disposal alternative would require permanent commitment of additional ORR land for waste disposal and would impact environmental resources, it would be less costly and provide a greater level of certainty that long-term disposal capacity would be available.

EMWMF is expected to reach full capacity before cleanup work is completed, necessitating a new on-site facility

Environmental sampling helps identify which Reservation locations are not contaminated

Uncontaminated Oak Ridge Reservation sites identified for removal from National Priorities List

The DOE Oak Ridge Reservation, which includes ETTP, the Y-12 Complex, and ORNL, is surrounded by approximately 20,100 acres of mostly wooded parcels. These buffer parcels have little-to-no process-related history and are considered uncontaminated. However, with the listing of the Reservation on the National Priorities List (a listing of the country's most contaminated sites) in 1989, the natural assumption was that all the property was contaminated. The U.S. Environmental Protection Agency has since clarified that NPL sites are not based on property boundaries, but rather the areas of contamination.

Beginning in 2008, the DOE Oak Ridge Office initiated a process to achieve Federal Facility Agreement (FFA) party consensus that the buffer parcels require no further investigation and to modify the FFA appendices to better represent the known contaminated areas constituting the NPL site. Oak Ridge Associated Universities was contracted to complete the verification activities (initiated in the late 1990s as a footprint reduction project), including review of historical documents, sampling and analysis, risk analysis, and reporting of study results, with recommendations for no further investigation, where appropriate.

The first Environmental Baseline Survey Report addressing five parcels around ETTP (approximately 4,600 acres) was submitted to the FFA parties in September 2011, and regulator comments were received in 2012.

The second Environmental Baseline Survey Report addressing fourteen parcels around ORNL and the Y-12 Complex (approximately 15,500 acres) was submitted to the FFA parties in September 2012.

Based on the recommendations included in these reports, a total of 19,300 acres could be approved for no further investigation.

Millions of gallons of wastewater treated

The Central Neutralization 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.

The Central Neutralization Facility continued to operate on day shift only as the incoming wastewater has been greatly reduced over the historic volumes. The hexavalent chromium-contaminated groundwater, which is extracted to prevent discharge into Mitchell Branch, was treated at CNF until the Chromium Water Treatment System became operational in 2012. The facility also continued to treat wastewaters generated at the TSCA Incinerator as part of the closure activities. In FY 2013, the Central Neutralization Facility will be shut down and transitioned to long-term surveillance and maintenance.

The National Nuclear Security Administration (NNSA) at the Y-12 Complex treated 134 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 116 million gallons of mercury-contaminated groundwater. The East End Volatile Organic Compound Treatment System treated 12 million gallons of VOC-contaminated groundwater.

The West End Treatment Facility and the Central Pollution Control Facility at the Y-12 Complex processed 955,020 gallons of wastewater primarily in support of NNSA operational activities.

The Central Pollution Control Facility also down-blended more than 64,020 gallons of enriched wastewaters using legacy and newly generated uranium oxides from on-site storage.

Chromium Water Treatment System

TWPC treating transuranic waste for disposal

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.

Two waste streams, contact-handled (CH) TRU solids and remote-handled (RH) TRU solids, are being processed at the TWPC. During FY 2012, the TWPC processed 64 m^3 of the RH-TRU waste, reaching a total of 193 m^3 of processed RH waste. The TWPC also processed 169 m^3 of CH-TRU waste, reaching a total of 1,263 m^3 of processed CH waste. During FY 2012, the TWPC shipped a total of 7 m^3 of original RH-TRU inventory, reaching a total of 51 m^3 disposed. The TWPC also shipped 109 m^3 of original CH-TRU waste inventory to disposal facilities in FY 2012, reaching a total of 876 m^3 disposed.

Processing of the final waste stream, RH sludge, is scheduled to begin in 2018.

TWPC crew members work on cask waste on a table that allows for immediate groundwater separation from wastes.

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.

Stakeholder newsletter undergoes changes

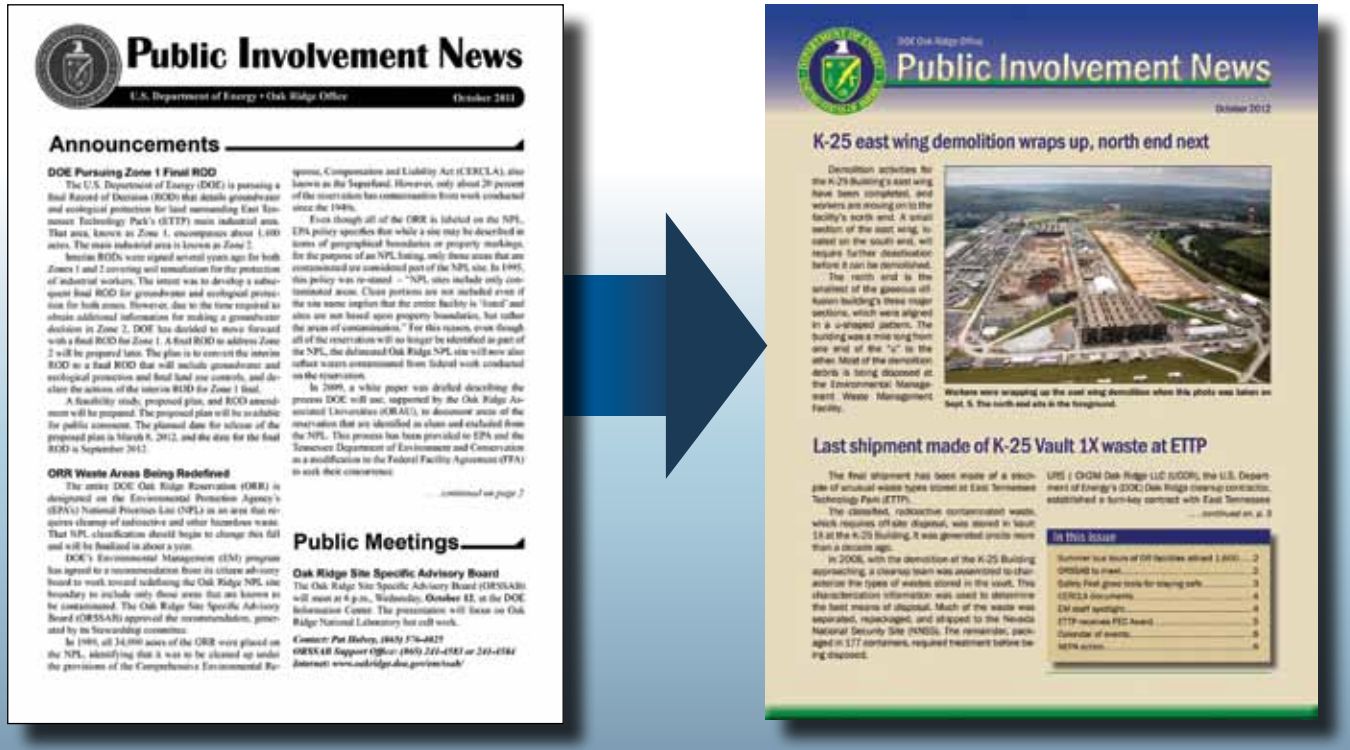
For almost two decades, Oak Ridge stakeholders have learned about the latest public involvement and other environmental management activities through the monthly newsletter, *Public Involvement News*. In FY 2012, major changes were made to the newsletter that has made it more efficient to produce and more informative to readers.

Instead of being distributed by hard copy, *Public Involvement News* has become an electronic publication. DOE worked with UCOR, which produces the newsletter, to develop a plan for converting the publication. Elimination of printing and mailing costs saves about $24,000 of taxpayers' money each year.

Because the publication is electronic, concerns about including color photographs, which would have increased printing costs, were eliminated. Now the newsletter provides monthly visual updates of cleanup work in addition to written articles.

Notices were included in the final issues of the hard copy version to let readers know how to get on the mailing list for the newsletter, which is also available on the Web.

If you would like to be added to the distribution list, please send an email to wayne.mckinney@ettp.doe.gov and place in the subject line "Add to PIN distribution." You may view the newsletter on-line at www.ucor.com/public_involvement_news.html.



ORSSAB provides input to DOE's EM activities

The Oak Ridge Site Specific Advisory Board (ORSSAB) is a federally appointed citizens' panel that provides independent advice and recommendations to DOE Oak Ridge Office's EM Program. The board is composed of up to 22 members, who are chosen to reflect the diverse occupations, perspectives, and interests of people living near the Oak Ridge Reservation (ORR).

Since 1995, ORSSAB has actively provided input to the DOE Oak Ridge EM Program on cleanup operations and stewardship of remediated areas and permanent waste disposal sites. The board continued that tradition in FY 2012. All of ORSSAB's activities can be viewed by accessing the board's website at www.oakridge.doe.gov/em/ssab/ .

Following are some of the board's major contributions and activities for FY 2012.

White Paper Explaining Oak Ridge's Environmental Cleanup Challenges

In FY 2012, ORSSAB developed a white paper for the EM Program that outlined the complexities of cleaning up the contamination and hazardous waste on the ORR. The white paper, entitled 'Balancing Environmental Management Challenges with the Complexity of the Oak Ridge Reservation,' summarizes the issue succinctly for non-professionals and a wider audience beyond the Oak Ridge community.

Some of the main reasons Oak Ridge was chosen as a Manhattan Project site—water supply, topography, nearby population centers for workforce—now present unique challenges for remediation and cleanup when coupled with other factors such as high rainfall and complex geology. The paper specifically discusses waste types, disposal methods, remediation technologies, geology, rainfall, hydrology, and nearby dense population centers. The paper concludes that these combined factors make the ORR the most complex cleanup site in the DOE complex.

ORSSAB provided the white paper to DOE to illustrate the unique technical and environmental challenges to consider during budgetary discussions. In addition, ORSSAB recommended that the white paper be used, as needed, by DOE in its efforts to keep the public informed of the cleanup challenges and progress at Oak Ridge.

In its response to the paper, DOE said the paper "provides a concise assessment of the challenges associated with the environmental management mission of Oak Ridge. Concepts captured by the paper align with the rationale being advanced by Oak Ridge EM representatives for completion of ORR cleanup."

Community Outreach

In FY 2012, ORSSAB achieved numerous successes engaging the public concerning Oak Ridge's EM mission. Through monthly public board and committee meetings and various activities coordinated by its Public Outreach Committee, the board strives to provide meaningful opportunities for dialogue between EM and the surrounding communities.

A key accomplishment was the development of five new infomercials. These 30- and 60-second television spots were created to air as public service announcements on local channels, serve as introductory materials for the monthly meeting broadcast DVDs, and provide new content on the board's Facebook and YouTube sites. The videos invite public participation and inform the public about ORSSAB's work and EM activities on the ORR. The launch of the board's Facebook and YouTube sites was an important addition to the outreach program. The sites provide a plethora of materials and information on the numerous ways the public can become involved with the board and the DOE Oak Ridge EM program.

A new interactive display for the ORSSAB exhibit was installed at the American Museum of Science and Energy in Oak Ridge in 2012. This colorful touch-screen kiosk focuses on waste management activities and challenges for the EM program and features five programs designed to engage the public: Building the Weapons Complex, Categorizing Nuclear Waste, The Lifespan of Nuclear Waste, Waste Management Challenges, and Transporting Radioactive Waste. The kiosk complements an already robust exhibit of touch-screen kiosks, displays, and posters that tell the Oak Ridge cleanup program story.

ORSSAB's new interactive display at the American Museum of Science and Energy

In addition to these activities, the board maintained an aggressive public outreach effort throughout the year that included participation in the Oak Ridge Earth Day festival, an ongoing program of advertisements and cable television broadcasts, and publication of the ORSSAB annual report and quarterly Advocate newsletters.

Recommendation on Fiscal 2014 DOE Oak Ridge EM Budget Request

Each year, the DOE's Oak Ridge Office of EM develops a cleanup budget request to DOE EM Headquarters for the upcoming fiscal years, and Oak Ridge's EM program always requests input from ORSSAB on these budget exercises.

In February 2012, members of ORSSAB's EM Budget & Prioritization Committee learned of the DOE Oak Ridge EM Program's near-term cleanup goals:

- Continue demolition of Buildings K-25 and K-27 at East Tennessee Technology Park
- Remove half of the uranium-233 inventory at Oak Ridge National Laboratory and make final decisions on remaining nuclear material
- Continue processing transuranic debris and prepare for sludge processing
- Continue to identify ways to address mercury releases at Y-12 National Security Complex, including characterizing potential sources and preparing facilities for decontamination and decommissioning
- Reduce risk posed by nuclear materials by removing excess materials, addressing sources of groundwater contamination, and demolishing facilities in and around the Oak Ridge National Laboratory Central Campus.

In March, the committee met again with EPA and TDEC officials. They informed the committee that their agencies basically agree with DOE's primary cleanup goals.

After reviewing DOE's explanation for its priorities and hearing EPA's and TDEC's concurrence on those priorities, the committee drafted a recommendation on the budget request, which was passed by the board at its April meeting.

In its recommendation, the board said the cleanup strategies outlined by DOE could only be achieved with an FY 2014 funding of at least $420 million. It said that anything less would achieve little and could result in penalties from EPA and TDEC for missed milestones. The board said it understood the climate of tight budgets, but it encouraged DOE to consider the effects of reducing risk to the Oak Ridge environment and the long-term cost savings by providing additional funding for the FY 2014 budget and subsequent allocations.

The board said funding levels of $470 million to $500 million would allow DOE Oak Ridge to address mercury contamination in East Fork Poplar Creek and disposal of uranium-233 from Oak Ridge National Laboratory more quickly.

Recommendation to Automate Stewardship Verification Process for the Remediation Effectiveness Report

Each year, the DOE Oak Ridge Water Resources Restoration Program (WRRP) prepares the Remediation Effectiveness Report (RER) for the ORR. The RER is a document required by the Oak Ridge Federal Facility Agreement to assess the progress of remedial actions toward goals stated in CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) decision documents and compares pre- and post-remedial conditions at cleaned up sites.

At the June 2011 Stewardship Committee meeting, representatives of WRRP explained the steps involved in documenting the stewardship requirements for remediated areas with residual contamination. The process is a time-consuming, labor-intensive endeavor that requires input from multiple companies and organizations.

Currently, about 180 check sheets must be completed by facility managers across the ORR and compiled for the annual RER. As more sites on the reservation are remediated and incorporate stewardship requirements, the amount of documentation will increase

significantly. Because of the amount of documentation required to track CERCLA-required stewardship activities, the Stewardship Committee drafted a recommendation, which the board approved at its October 2011 meeting, suggesting that DOE explore ways to automate the stewardship tracking process.

ORSSAB recommended that DOE pursue a solution for managing long-term stewardship information on the ORR. Without such a system, the process could become overwhelming using current methods.

Automating these processes provides a more streamlined system for annual verification for the RER. It also allows for data summary reports to be generated and could be linked to the DOE geographic information system web site providing anyone online access to details of the long-term stewardship components on the reservation.

DOE is implementing such a system, called the Land Use Manager, which will be available for use in the next RER. It could also be used as a model at other DOE sites around the country.

The 'Wild West Tour'

With all of the cleanup activities under way on the ORR, a lot of waste is generated for disposal. Much of it stays in Oak Ridge in approved waste disposal facilities on the reservation. But some of it contains high contamination levels that must be disposed at facilities out west built especially for higher activity material.

During ORSSAB meetings, discussions often involve talk about waste being 'shipped out west,' but that has little meaning unless the locations are actually seen. In March 2012, several board members traveled to locations where Oak Ridge's higher activity waste is disposed.

The group visited the Nevada National Security Site, which accepts low-level and mixed low-level waste. While in Nevada, the travelers were guests at the Nevada Site Specific Advisory Board meeting, where the discussion centered on receiving uranium-233 waste, some of which originates from Oak Ridge, and on safe transfer of waste to the site. The 'wild west' tour finished with a visit 2,150 feet underground at the Waste Isolation Pilot Plant near Carlsbad, N.M. They saw how contact-handled and remote-han-

Several ORSSAB members visited the Waste Isolation Pilot Plant in New Mexico in March 2012. Their hosts took them more than 2,000 feet underground in an ancient salt bed to show them how transuranic wastes are permanently disposed.

dled transuranic waste is stored in caverns, or drifts, mined from an ancient salt bed. Oak Ridge sends both contact- and remote-handled waste to Carlsbad.

Groundwater Researcher

For some time, ORSSAB's EM Committee has been working to identify an independent researcher to study groundwater flow through fractured rock on the ORR. Understanding how groundwater flows would be useful in understanding how contamination on the reservation can make its way into groundwater and where the contamination may migrate.

Dan Goode, with the U.S. Geological Survey, a possible candidate to do the work, was invited to spend two days in Oak Ridge in August to become better acquainted with the ORR and its geologic characteristics. Goode, along with several members of the EM Committee and representatives of EPA and TDEC, visited several locations on and off the reservation.

Discussions among ORSSAB, DOE, EPA, and TDEC continue on a path forward for groundwater flow study.

ORSSAB EM Committee Chair Bob Hatcher, left, points out some geologic features to Dan Goode, U.S. Geological Survey. Dr. Hatcher is a Distinguished Scientist and Professor in the Department of Earth and Planetary Sciences at the University of Tennessee-Knoxville. Dr. Goode was invited to spend two days in Oak Ridge in August to become better acquainted with the ORR and its geologic characteristics.

ORSSAB members, pictured from left, front row: Fay Martin; Bob Hatcher; David Martin, Chair; and Dave Adler, DOE Liaison; second row: Robert Stansfield; Jan Hart; Alfreda Cook; Lisa Hagy; third row: Greg Paulus, Scott Stout, Corkie Staley; Connie Jones, EPA Liaison; Scott McKinney; fourth row: Donald Mei; Chuck Jensen, Secretary; Ross Landenberger, student representative; Tom Valunas; back row: John Owsley, TDEC Liaison; Jennifer Kasten; Melyssa Noe, DOE Federal Coordinator; Sam Yahr, student representative; Howard Holmes; Dave Hemelright, Vice Chair.

DOE Information Center

DOE Information Center staff, seated from left, are Eva Butler and Michelle McMillan; standing, Wanda Joyce

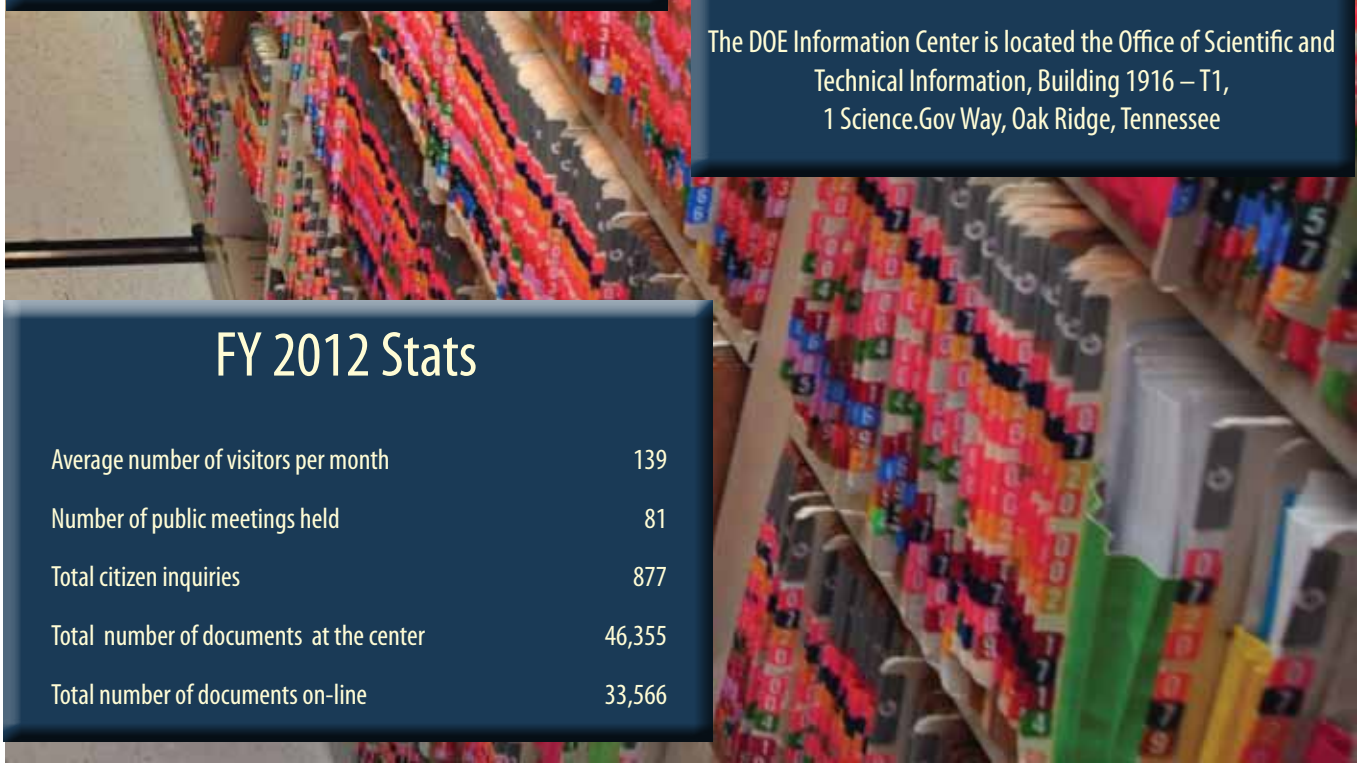
The DOE Information Center is a one-stop information facility that maintains a collection of more than 46,000 documents involving environmental activities in Oak Ridge.

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

The DOE Information Center is located the Office of Scientific and Technical Information, Building 1916 – T1,
1 Science.Gov Way, Oak Ridge, Tennessee



FY 2012 Stats

Average number of visitors per month	139
Number of public meetings held	81
Total citizen inquiries	877
Total number of documents at the center	46,355
Total number of documents on-line	33,566

Information Resources

DOE Information Center
Office of Scientific and Technical Information
Building 1916 – T1, 1 Science.Gov Way
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
EU	Exposure Unit
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
RDR	Remedial Design Report
RER	Remediation Effectiveness Report
RH	Remote-handled
RI/FS	Remedial Investigation/Feasibility Study
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

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.