

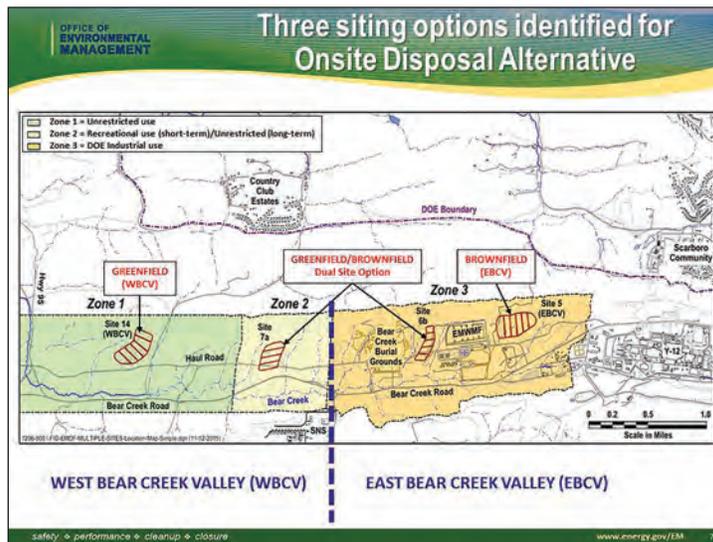
DOE Explores Options for Increased Disposal Capacity for Future ORR Waste

The U.S. Department of Energy's (DOE) Oak Ridge Office of Environmental Management (OREM) continues to make headway in its mission to clean up deteriorating facilities and legacy waste from operations that began in the 1940s at the onset of the Manhattan Project-era. With DOE's cleanup program making steady progress at the East Tennessee Technology Park (ETTP), the resulting debris is filling the current onsite disposal facility. With the future in mind, DOE and its regulators from the State of Tennessee and the Environmental Protection Agency (EPA) are exploring options to increase the disposal capacity that is needed for upcoming cleanup projects at the Y-12 National Security Complex (Y-12) and Oak Ridge National Laboratory (ORNL).

In recent years, much of OREM's efforts have been concentrated on the 2,200-acre site at ETTP in Oak Ridge. An enormous amount of infrastructure, including the mile-long landmark known as Building K-25, remained at the site long after the conclusion of its uranium enrichment activities in the 1980s. The deteriorating conditions at facilities and contamination of buildings, soil, sediment, and groundwater from more than forty years of operations have made the Oak Ridge site a high priority for cleanup.

OREM established several program goals to address the undertaking,

including "Vision 2016," the successful demolition and removal of all five gaseous diffusion buildings at ETTP, and "Vision 2020," the completion of cleanup and transfer of the site for reindustrialization and private use. With the demolition of Building K-27, the last remaining facility in ETTP's gaseous diffusion complex, expected to wrap up by the end of the year, Vision 2016 will soon become a reality. As OREM approaches near-term milestones and the end of cleanup at the ETTP site draws closer, focus shifts to future plans for remediation of the mercury-contaminated facilities at Y-12 and later efforts at ORNL. Though the



work scope for those facilities would not begin until post-FY 2020, the question that looms largest in near-term planning is where to put the waste from these subsequent cleanup projects.

In a recent presentation to the Oak Ridge Site Specific Advisory Board

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(ORSSAB), Brian Henry, Senior Project Manager for OREM, provided an update on current waste disposal capacity on the Oak Ridge Reservation (ORR) and DOE's interest in a new onsite disposal facility.

"With operations at ETTP approaching completion, future cleanup of legacy facilities at ORNL and Y-12 drives the need for additional waste disposal capacity," Henry reported.

Much of the waste generated by cleanup operations at ETTP goes into an existing disposal facility, the Environmental Management Waste Management Facility (EMWMP), which, due to the current rate of progress, is nearing capacity. The more successful and consistent

DOE's efforts (and the more generous the program's funding), the greater the need arises for additional disposal space.

Capacity at the current disposal facility, EMWMP, is estimated at 70% to date, which puts the time frame

(Continued on page 2)

More Capacity Needed to Complete Cleanup

(Continued from page 1)

for it to reach capacity and undergo closure at the mid-2020s. An estimated additional 2.5 million cubic yards of space will be needed to complete cleanup milestones slated for post-2020, including much of the work planned for Y-12 and ORNL.

Both onsite and offsite options for additional waste disposal capacity are currently being considered by DOE and its regulators at EPA and the Tennessee Department of Environment and Conservation (TDEC).

The agencies are evaluating six alternatives:

- **No Action**—The no action alternative is a regulatory requirement and is not expected to be selected.
- **Onsite Disposal**—Three options for onsite disposal are under consideration.
- **Offsite Disposal**—Offsite disposal would require the cross-country transport of waste to facilities in Utah and Nevada by both truck and rail operations.
- **Hybrid Disposal**—The hybrid disposal alternative would include a combination of a small onsite facility with additional offsite disposal at existing facilities out of state.

Though DOE states no preference officially on any of the proposed alternatives under consideration, the possibility of a new disposal facility on the ORR has generated the most discussion among the three agencies.

As part of an initial screening process, 16 sites were evaluated as potential locations for an onsite disposal facility being referred to as the proposed Environmental Management Disposal Facility (EMDF). Factors in site suitability included topography and hydrology, available capacity, and future land use. Given these criteria, the search centered on Bear Creek Valley (BCV) as the most viable

location. Currently, three locations able to accommodate the estimated capacity needed for onsite disposal are under consideration.

One, the East BCV site, is situated near the existing EMWMF on the eastern side nearest Y-12. It is located in a “brownfield” area, or in an



industrial area already designated for waste management and restricted from future land use. A second option is the West BCV site. This “greenfield” site resides in an area not previously used for waste management and designated as unrestricted land. Both the East BCV site and the West BCV site would be able to accommodate the full projected capacity.

Previously, DOE strongly considered the East BCV site as a favorable location for a new onsite disposal facility due to its proximity to the current disposal facility (EMWMF), which would place the new facility in restricted area already used for disposing contaminated waste. The site also creates the potential to rely on some infrastructure from the existing facility and would be monitored within Y-12’s security border.

Recent discussions with regulators, however, have highlighted a smaller location between the East BCV-Brownfield option and the West BCV-Greenfield option. The third site, originally conceived of as part of a “dual site” option owing to its smaller

size is now thought to have sufficient space for the estimated capacity needed for future waste disposal. Plans to modify the cap design on the existing disposal facility will also provide some increased capacity at EMWMF, allowing the “middle” location to become a viable option as a single site.

“All three sites present a unique set of benefits and challenges,” said Dave Adler, DOE Alternate Deputy Designated Federal Officer, “but DOE and its regulators believe that all three sites could accommodate a new facility.”

Regulators have advocated for a location with favorable hydrogeology. An ideal option would avoid construction over seeps and streams, but given the naturally aqueous terrain in East Tennessee, none of the sites being considered allows

that possibility. The middle site comes closest, as a facility could be built between two streams rather than over a central stream, but it would still require subsurface drainage features.

If an onsite alternative is selected, design and construction would not begin for several more years. Ideally, the new facility would be operational 18–24 months before the current facility reaches capacity in the mid-2020s.

Presently, DOE is completing an analysis of all six alternatives. A formal preference will be stated in a Proposed Plan, targeted for release in summer 2016 with an official public comment period to follow in the fall. In an effort to inform the public and solicit input ahead of the Proposed Plan, DOE regularly meets with city officials and citizens’ groups like ORSSAB. In addition, a public information session on all of the alternatives, hosted by the Energy Technology and Environmental Business Association (ETEBA), will take place at the Pollard Center in Oak Ridge on July 27. 

Representatives Convene in Oak Ridge for EM SSAB Chairs Meeting

Officials from DOE Headquarters and members from each of the eight site-specific advisory boards that comprise the EM SSAB met in Oak Ridge April 19–21 for a tour, two days of meetings, and a bit of fellowship.

Twice a year the chairs and other representatives of the boards meet with DOE to discuss common issues and hear presentations by EM personnel that address common interests among the individual advisory boards.

The 2016 Spring Chairs Meeting was held on Wednesday and Thursday, April 20 and 21, at the DoubleTree

The first presentation was by DOE Principal Deputy Assistant Secretary for EM Mark Whitney, who provided an update on the EM Program. He then set three charges before the chairs to consider providing DOE with:

- recommendations for EM's strategic planning and communication for future cleanup,
- a statement on EM SSAB priorities and values for the next administration, and
- recommendations for best practices for transitioning from a nuclear waste facility to community reuse or reindustrialization.

updates on waste disposition, Waste Isolation Pilot Plant recovery, and communications and external affairs.

The afternoon session included discussion of a draft recommendation presented by the Portsmouth SSAB that DOE include community investment clauses in all contracts related to cleanup work within EM projects. A second recommendation was also proposed at the meeting that DOE should continue to fully fund operations of the individual SSABs. The recommendations were approved and were subsequently distributed to all the boards after the meeting for concurrence.



Above: ORSSAB members Mary Smalling, Bob Hatcher, and Dave Hemelright at the Tuesday reception. Right: ORSSAB Chair Belinda Price, DOE's Mark Whitney, Oak Ridge Mayor Warren Gooch, and OREM's Jay Mullis.



David Borak suggested that the chairs begin work on these charges during summer conference calls and try to have something in draft form for the fall chairs meeting.

Next on the agenda was a round robin from the chairs outlining issues specific to their sites, followed by

The featured presentation on Thursday was a panel discussion on reindustrialization and land use.

The 2016 Fall Chairs Meeting will be in Las Vegas, Aug. 30–Sept. 1. 🍃

Hotel. On April 19, many of the participants went on a half-day tour of the ORR, and that evening they gathered again at the Event Center on Melton Lake for a reception sponsored by ETEBA, followed by a dinner.

Entertainment was provided by MCH Corporation featuring musician Daniel Kimbro.

The SSAB members and DOE officials got down to business on Wednesday morning after opening comments and welcomes by ORSSAB Chair Belinda Price, EM SSAB Designated Federal Officer David Borak, Oak Ridge Mayor Warren L. Gooch, and Deputy Manager for OREM, Jay Mullis.



ORSSAB Chair Belinda Price and Vice Chair Alfreda Cook represented the board at the EM SSAB meeting.

Reservation Update

Vision 2016 in Sight

A major milestone for Oak Ridge cleanup is on the horizon. DOE estimates a September completion date for the demolition activities underway at Building K-27 of ETTP. The completion of that work will cap



the achievement of OREM's Vision 2016, a significant program goal set for the safe and successful completion of the demolition and removal of all five gaseous diffusion buildings at ETTP. OREM's signature vision moves the program closer to its plans for future

reindustrialization of the site at ETTP.

Cleanup of the former gaseous diffusion plant in Oak Ridge has long been a high priority. The rapidly disappearing K-27 is the last of five buildings removed from the site. Four other uranium enrichment process buildings have all been successfully demolished, K-29, K-33, K-31, and the massive Building K-25, whose mile-long footprint once dominated the site at ETTP.



Left, demolition began at building K-27 on February 8, 2016. Right, progress on K-27 in May 2016 (photo by Lynn Freeny).

Demolition crews took the first "bite" at Building K-27 in early February with a ceremony attended by members of the board. As of May 2016, demolition activities were more than 50% complete. If progress continues smoothly, DOE will complete the project well within its goal set for the end of the calendar year. A celebration, tentatively scheduled for August, will commemorate the achievement.

The teardown of Building K-27 marks not only meaningful progress in cleanup for the Oak Ridge community, but it will also accomplish an impressive milestone in making the East Tennessee site the first in the world to successfully complete the cleanup and removal of a uranium enrichment complex. 

ORSSAB Tours ORNL's Aquatic Ecology Lab

Following the June board meeting and a presentation on technology development to support the Mercury Cleanup Strategy, board members toured the Aquatic Ecology Laboratory and chemistry laboratories at ORNL to learn more about the research activities underway to address mercury concerns in Oak Ridge's East Fork Poplar Creek (EFPC).

Mark Peterson, ORNL Group Leader, organized the tour, which highlighted various projects in an ongoing effort to better understand mercury in the EFPC ecosystem. Board members learned about soil sampling techniques along the banks of the creek, research on sorbents that could be used to remove mercury from the water, studies to limit inorganic mercury conversion to the more toxic methylmercury, and studies of potential food-chain manipulations

that could decrease "bioaccumulation," or increased concentrations of methylmercury in biological organisms. The latter research included experiments that change algae, mussel, and fish populations to limit the bioaccumulation of mercury up the food chain.

Aquatic life plays a major role in

mercury methylation and bioaccumulation. Even small amounts of mercury can be magnified by ecosystems,



resulting in higher methylmercury concentrations in water and fish. Contaminated fish is the primary route of mercury exposure to humans and wildlife. 

ORSSAB members toured ORNL's Aquatic Ecology Lab. Left: Elizabeth Ross, Ed Trujillo, and Greg Paulus. Above: Richard Burroughs examined sorbents in the lab.



DOE Hosts Community Workshop on Priorities for Cleanup Funding

OREM held its annual community workshop on May 26 to present its priorities for funding and gather input from stakeholders. The meeting, titled “Purpose, Progress, Partnerships,” was held in the Pollard Center at Oak Ridge Associated Universities and was a prelude to OREM submitting a budget request to DOE Headquarters for FY 2018.

The event started out with a videotaped message from Rep. Chuck Fleischmann, who congratulated OREM on its progress in cleaning up the ORR. Sue Cange, OREM’s Manager, then discussed cleanup progress, near-term priorities, and budget. The goals of the workshop, she said, were to:

- raise awareness about the mission, vision, and plans for Y-12, ORNL, and ETTP;
- explore OREM’s role in enabling ongoing missions across the ORR; and
- inform participants how DOE and its contractors are interconnected, and how they are working together to achieve their diverse missions.

Budget planning revolves around the three key “visions” OREM has established: Vision 2016—to complete gaseous diffusion process building demolition at ETTP; Vision 2020—to clean up and reindustrialize the remaining portion of ETTP; and Vision 2024—to expand cleanup work to Y-12 to address mercury contamination.

Cange devoted much of her presentation to explaining what OREM is doing to prepare for Vision 2024. Activities for this vision focus on three areas:

- Planning for waste disposition. The current disposal facility is ~70% full and is expected to be nearly full when cleanup of ETTP is complete.



DOE’s Sue Cange addressed the crowd at the Community Workshop.

- Design/construction of the Mercury Treatment Facility. The facility is needed to reduce the concentration of mercury leaving the site today and will be an important control measure in the future.
- Preparing facilities for future demolition under the Excess Facilities Initiative. Tasks include characterizing facilities, preparing Critical Decision documents where appropriate, and abating hazards/reducing risks.

Other priorities, she said, include implementing a Groundwater Strategy, which has been developed to study and address groundwater contamination on and around the ORR. OREM is currently finishing a three-year Offsite Groundwater Assessment Project that included collecting data and performing modeling to learn more about the area’s groundwater migration patterns. OREM is also working with TDEC and EPA to determine what the next project will be under the strategy.

As to the FY 2018 budget request, Cange said that budget development will focus on the following priorities:

- Maintain safe, compliant operations
- Continue work at ETTP to meet Vision 2020

- Prepare and begin the Uranium-233 processing campaign
- Continue transuranic waste processing and shipments to the Waste Isolation Pilot Plant
- Construct and operate Transuranic Sludge Test Facility and work on design of the system
- Construct the Mercury Treatment Facility and begin operations
- Complete design of a new onsite disposal facility and begin construction
- Continue implementing the Groundwater Strategy
- Continue addressing excess facilities and critical infrastructure needs

Following Cange’s presentation, ORSSAB Secretary Dave Hemelright presented ORSSAB’s recommendations on the FY 2018 OREM budget request (see story on page 8).

The workshop concluded with a panel discussion featuring Steve Dahlgren from UCOR, Jane Nations from Consolidated Nuclear Security (the Y-12 prime contractor), and Lee McGetrick from UT-Battelle, which manages ORNL. Each discussed the



ORSSAB Vice Chair Dave Hemelright presented the board’s recommendations on OREM’s FY 2018 budget request.

ongoing missions at their site and how EM activities impact their site and enable future plans and goals. 🌱

FY 2015–2016 Student Representatives Honored . . .

Alana Joldersma and Sophia Cui were recently honored by DOE and ORSSAB as outstanding student representatives for the 2015–2016 term. Sue Cange, Manager for OREM, thanked the pair for their participation over the past year. “We hope to see you both return as members of the public at our future meetings,” added Cange.

Belinda Price, ORSSAB Chair, also thanked the students for their time and acknowledged their commitment to the board. “You have both made valuable contributions to our proceedings and aided in the success of our board during the past year. It has been our pleasure to work with you both,” she said on behalf of the board.

As high school seniors, both Alana and Sophia maintained busy schedules in addition to the time they spent at board and committee meetings.

Alana, a graduating senior at Oak Ridge High School, received regional

recognition for a letter she wrote to Gov. Bill Haslam regarding the Syrian Refugee Crisis. She also earned 2nd Chair as a cellist in Tennessee’s All-East Orchestra.

After graduation, Alana will attend the University of California, Davis to major in communications and nutritional sciences.

Sophia, a graduating senior at Hardin Valley Academy, served as past president of the American Red Cross Club at her school. She has also been a member of the Hardin Valley

varsity team for several years.

After graduation, she will attend the University of Tennessee (UT), Knoxville as a Haslam Scholar to study neuroscience and public health. 



Sue Cange (center), Manager for OREM, presented plaques to student representatives Sophia Cui (left) and Alana Joldersma.

. . . As New Students Seated for FY 2016–2017

Lara Manning will be a senior at Oak Ridge High School in the fall. Her love of the outdoors as well as her studies in advanced placement environmental science led to her interest in serving on the site-specific advisory board and learning more about DOE’s cleanup efforts in the Oak Ridge community.

Gabrielle McAllister will be a senior at Hardin Valley Academy in the fall. Also a student in advanced placement environmental science, Gabrielle currently participates in two internships with Tremont and UT related to environmental research in East Tennessee. One involves collecting data on insects to study phenology and another uses environmental DNA to detect salamander species in the Great Smoky Mountains National Park.

Sue Cange, OREM’s Manager and ORSSAB’s Deputy Designated Federal Officer, encouraged the students’

interests as she welcomed them at the board’s May meeting. “We look forward to you being a part of the board this year,” said Cange.

Board chair Belinda Price added a note of gratitude as well. “Thank you, both. We appreciate your time and commitment and are pleased to have you join us on the advisory board this year.”



Student Representative Gabrielle McAllister joined ORSSAB for 2016–2017.

Both students will participate in the board’s monthly meetings, assist in public comment periods, and aid the board in public outreach activities throughout the year. 



ORSSAB Chair Belinda Price with new student representative Lara Manning (right).

Two new students joined the board as representatives for 2016–2017. Each year ORSSAB seats non-voting student representatives from area high schools to engage the perspectives of local students on environmental issues. This year, Lara Manning and Gabrielle McAllister have been seated for one-year terms.

Six Outgoing Board Members Recognized for Service

Six outgoing members were recognized in June for service to the advisory board. Alfreda Cook, Bob Hatcher, Jennifer Kasten, Donald Mei, Scott Stout, and Wanfang Zhou will retire from ORSSAB after completing their terms at the end of June.

ORSSAB's members are federally appointed by DOE to two-year terms with the Oak Ridge board. Those appointments can be renewed for up to three terms, so some of the board's members extend their commitments for a total of six years. Many of the members retiring from the board in June have served lengthy terms.

Bob Hatcher has been with ORSSAB since 2009. His six-year term on the board was preceded by a one-year interim appointment to fill a vacancy, bringing his total service to seven years. "Bob has been with us a long time," said Sue Cange, Manager for OREM. "He has had a tremendous impact on our board, and we are grateful for his contributions," said Cange.

Alfreda Cook, Jennifer Kasten, Donald Mei, and Scott Stout all joined ORSSAB

in 2012 and have completed two consecutive terms. Wanfang Zhou has been a member since 2014.

ORSSAB's members contribute the expertise and experience from culturally diverse backgrounds to a common communal goal for environmental cleanup and stewardship in Oak Ridge. They are scientists, researchers, teachers, civil servants, volunteers, parents, spouses, and caregivers. Many of them are equal parts prestigious professionals and local

philanthropists. All have contributed to ORSSAB's success during their tenures.

Wanfang Zhou is a hydrogeologist with ERT, Inc., who lives in Knoxville.

Scott Stout, Rockwood resident, is the acting director of the Office of Emergency Services for Roane County.

Jennifer Kasten, a resident of Knoxville, is a retired nuclear engineer who has worked in nuclear and environmental research for Tennessee Valley Authority, UT, and ORNL. She also enjoys fundraising for local non-profits.

Donald Mei spent much of his career with Duke Energy in Charlotte, North Carolina, as a nuclear engineer working in radiation protection and dosimetry. He retired to Oak Ridge with his wife,

Appalachia and the Southeast.

As a resident of Oak Ridge, Bob has long held both a personal and professional passion for environmental issues in his local community. He was senior author to ORNL's effort in the 1990s to produce a new geologic map on the ORR. He currently serves as a co-chair to the board's EM & Stewardship Committee, keeping a keen eye on developments in geologic modeling for DOE's Groundwater Monitoring Strategy and collaborating with the committee on a potential board recommendation related to the proposed EMDF.

Alfreda, ORSSAB's current vice chair and Oak Ridge resident, is a retired data and systems analyst. As a contrac-

tor for OREM, she managed the development of various electronic systems that enhanced the accuracy and reliability of waste performance data reported to DOE. During her appointment, Alfreda has been an active member of the board engaged in a variety of environmental issues. "Her commitment has been substantial," noted ORSSAB's secretary

Dave Hemelright. "She will certainly be missed."

Alfreda has contributed to a number of board recommendations, and she currently serves on the EM & Stewardship Committee, along with Bob Hatcher and others, as an issue manager for groundwater monitoring as well as the proposed EMDF, the latter of which will likely be the focus of the board's next recommendation to DOE. 🌱



OREM Manager Sue Cange (center), with retiring ORSSAB members (from left) Donald Mei, Scott Stout, Bob Hatcher, and Alfreda Cook.

Gloria, also a former board member who currently works in radiation protection at ORNL. The pair hold a strong interest in Oak Ridge wildlife and environmental issues. Both are involved with the board's EM & Stewardship Committee.

Bob Hatcher is a research scientist in the Department of Earth and Planetary Sciences at UT, Knoxville. His primary interest is in geologic mapping, and he has dedicated much of his research time to the regional geology of

Recommendations on the FY 2018 OREM Budget Request

Complete text of all ORSSAB recommendations and DOE responses can be found on the board's website at www.energy.gov/orssab.

Each year the DOE's EM program develops its budget request two years ahead of the current fiscal year, incorporating requests from field offices into the overall EM program budget request that is submitted to the president.

In spring 2016, OREM briefed ORSSAB on the Oak Ridge budget and described near-term and long-term priorities, broadly grouped into program "visions":

- **Vision 2016**—An effort to complete the demolition and removal of all five gaseous diffusion buildings at ETTP by the end of 2016.
- **Vision 2020**—An initiative to extend Vision 2016 to include cleanup of all facilities at ETTP and prepare to release the land for reindustrialization by the end of 2020.
- **Vision 2024**—The transition from cleanup at ETTP to address the mercury contaminated facilities at Y-12.

With respect to the intricacies of sequencing and prioritization, the board believes the following recommendations would have minimal impact on the overall budget and should be incorporated into OREM's FY18 budget request.

1. The design and construction of the Y-12 Outfall 200-Mercury Treatment System could be accomplished in FY16–18 by using some funding for the second half of FY16 and FY17

2. Rather than waiting for the completion of decontamination and decommissioning of above-ground structures, additional, although minimal, funding could be identified in the FY18 budget request for more in-depth groundwater activities at select locations, particularly to address questions related to offsite contaminant migration. The increased activity would yield data that would benefit the out-year groundwater efforts, help address unanswered questions, and dispel current perceptions of inactivity on this important aspect of environmental media. 



Oak Ridge Site Specific Advisory Board

P.O. Box 2001, EM-942
Oak Ridge, Tennessee 37831
www.energy.gov/ORSSAB

UPCOMING MEETINGS

All meetings are held at the DOE Information Center
1 Science.gov Way, Oak Ridge, Tennessee

ORSSAB Board meeting

Wednesday, September 14, 6 p.m.

EM & Stewardship Committee Meeting

Wednesday, September 28, 6 p.m.

ABBREVIATIONS

DOE — Department of Energy
EM — Environmental Management
EPA — Environmental Protection Agency
ETTP — East Tennessee Technology Park
OREM — Oak Ridge Office of Environmental Management
ORNL— Oak Ridge National Lab
ORR — Oak Ridge Reservation
ORSSAB — Oak Ridge Site Specific Advisory Board
TDEC —Tennessee Department of Environment and Conservation
Y-12 — Y-12 National Security Complex

