REDUCTION OF EM FOOTPRINT AND ESTABLISHMENT OF ENERGY PARKS

OFFICE OF ENVIRONMENTAL MANAGEMENT

DECEMBER 2008

EM strategic planning efforts to reduce the legacy footprint of the EM complex.

- Footprint reduction and small site completions will create thousands of new blue collar environmental jobs immediately (within 90-180 days).
- Footprint reduction and small site completions accelerates environmental clean-up in 14 states and reduces life-cycle costs by eliminating years of infrastructure maintenance.
- EM can achieve about ninety percent footprint reduction for a total reduction from 900 square miles to 135 square miles by 2015 or earlier.
- Footprint reduction makes large tracts of EM land and infrastructure available to support new beneficial site missions, such as, the establishment of Energy Parks that will sustain local and regional economies.
- Energy Parks on EM sites will:
    - Increase the supply of secure, diverse, affordable energy for the Nation
    - Increase the supply of green energy to enhance environmental quality and reduce emissions associated with global climate change
- Additional near term investments to support footprint reduction, small site completions and additional investment opportunities of over $6 billion could result in significant life-cycle savings and create over 40,000 man-years of additional contractor jobs (e.g. over 10,000 additional jobs for the next 4 years)

Overview

EM has strategic planning efforts underway to identify ways to reduce the legacy footprint of the EM complex. Footprint reduction will be accomplished by focusing cleanup activities on decontamination and demolition of excess contaminated facilities, soil and groundwater remediation, and solid waste disposition, all of which have proven technologies and an established regulatory framework. Ultimately, completions of these types of environmental cleanup activities reduce the monitoring and maintenance costs associated with managing large tracts of land. This allows EM to focus on dispositioning highly radioactive tank waste, special nuclear materials and/or used (spent) nuclear fuel; none of which lend themselves to quick, inexpensive, or uncomplicated technical or regulatory solutions.

Footprint reduction would allow the utilization of resources such as: large, secure tracts of land; state-of-the-art facilities and technologies; and a highly trained and experienced work force. All of which could then be leveraged in establishing Energy Parks on EM sites to both produce energy and demonstrate advanced technologies; and accelerating their replication across the Nation.

Capabilities and Benefits

EM is using its independently reviewed baselines and out-year planning estimates to establish a basis for strategic planning for the program to evaluate alternatives in policy,

program priorities or consideration of various business cases. Analyses so far indicate that our current baseline planning levels can fully support high risk activities of radioactive tank waste, special nuclear materials and spent nuclear fuel. Additional investments in the program could yield significant environmental cleanup progress and life-cycle savings if directed to *footprint reduction* at our large sites and accelerating *small site completions*. Funding these initiatives means that new appropriations could be quickly deployed to ship wastes for disposal, to cleanup and demolish contaminated buildings, and to remediate contaminated groundwater and soils.

EM is positioned to quickly leverage additional investments that will yield substantial benefits to address National economic, environmental, and energy security objectives.

- EM has on-the-shelf plans to redress past environmental contamination by utilizing existing flexible contract vehicles to accelerate the cleanup and quickly expand environmental cleanup workforces.
  - Established regulatory framework with regulator and community support allow for effective cleanup progress that will enhance environmental compliance posture.

- EM has a proven track record of significant expenditures in the year of appropriation. In FY 2008, EM spent in excess of 75% providing added economic stimulus to some communities already experiencing depressed conditions (e.g. South Carolina, Kentucky, and Ohio).

- EM work has been characterized by Senate staffers as “boots on the ground”.
  - Over 80 percent direct labor costs
  - Added jobs will be primarily blue collar environmental workers

- EM can be characterized as a “green initiative” in multiple ways:
  - Fulfilling the Government’s responsibility to address nuclear weapons waste,
  - Allowing early completion of legal compliance agreement milestones, and
  - Enabling reuse of Departmental facilities for other energy missions or community reuse.

- EM sites can be used to establish Energy Parks once they are cleaned up:
  - Enable reuse of EM infrastructure for other energy missions or community reuse
  - Ensure long-term mission at environmental cleanup sites—sustain jobs

Status of Footprint Reduction, Small Site Completions, and Additional Investment Opportunities

EM directed its sites to identify footprint reduction, small site completion and additional investment opportunities. EM has worked collaboratively with its field sites to define aggressive, but achievable scenarios for accelerating cleanup of distinct and discrete sites or portions of large sites to meet footprint reduction and small site completion objectives. This paper focuses on the footprint reduction and small site completion proposals that

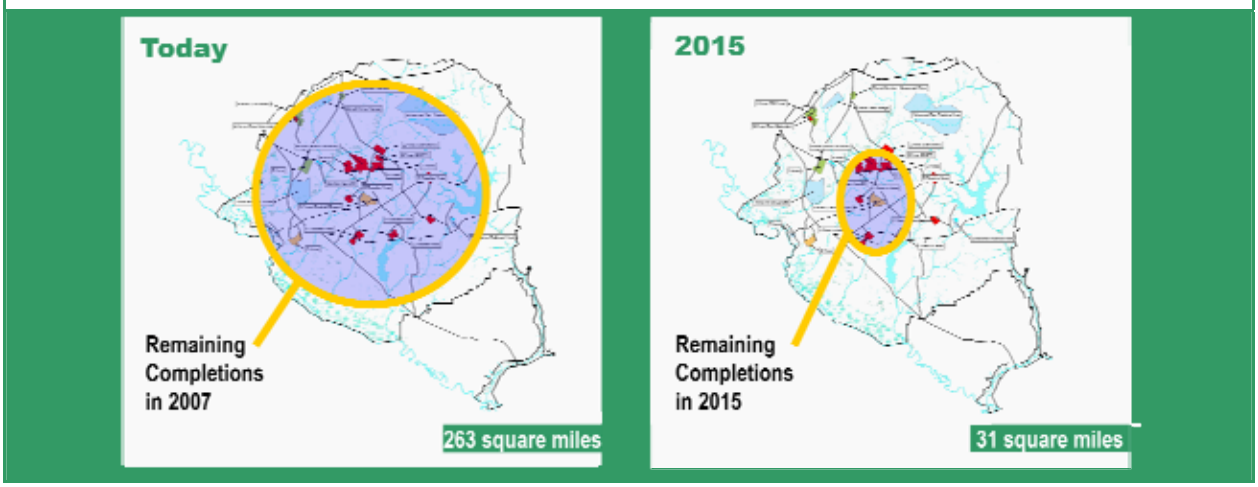
have been independently evaluated as part of EM's intensive year-long strategic planning effort. EM has also identified additional investment opportunities that are currently undergoing evaluation. These additional opportunities should yield similar footprint reduction benefits to those discussed in this paper.

Proposals for Footprint Reduction

EM has identified several footprint reduction and near term completion opportunities. If EM were to successfully implement its footprint reduction initiative it could effectively reduce the EM footprint by approximately 90 percent by 2015 or earlier. EM would need additional funds to achieve its 2015 footprint reduction goals. As a result, the footprint reduction initiative could realize a Return on Investments (ROI) of more than 100 percent at four of its largest sites (Savannah River Site in South Carolina, Hanford Site in Washington, Oak Ridge Reservation in Tennessee, Idaho National Laboratory). We are still analyzing similar opportunities at Portsmouth and Paducah and expect that the savings will also be substantial.

The Savannah River proposal focuses on accelerated cleanup of numerous reactor and industrial areas and associated soil contamination. It would result in approximately 90 percent footprint reduction and the release of a large majority of the entire site from access and security restrictions, nominally more than 200 square miles (see figure below). This land, along with the infrastructure and trained workforce that currently supports major industrial and nuclear operations and chemical processing, would be available for other uses such as advanced energy projects.

Savannah River Site Footprint Reduction Proposal

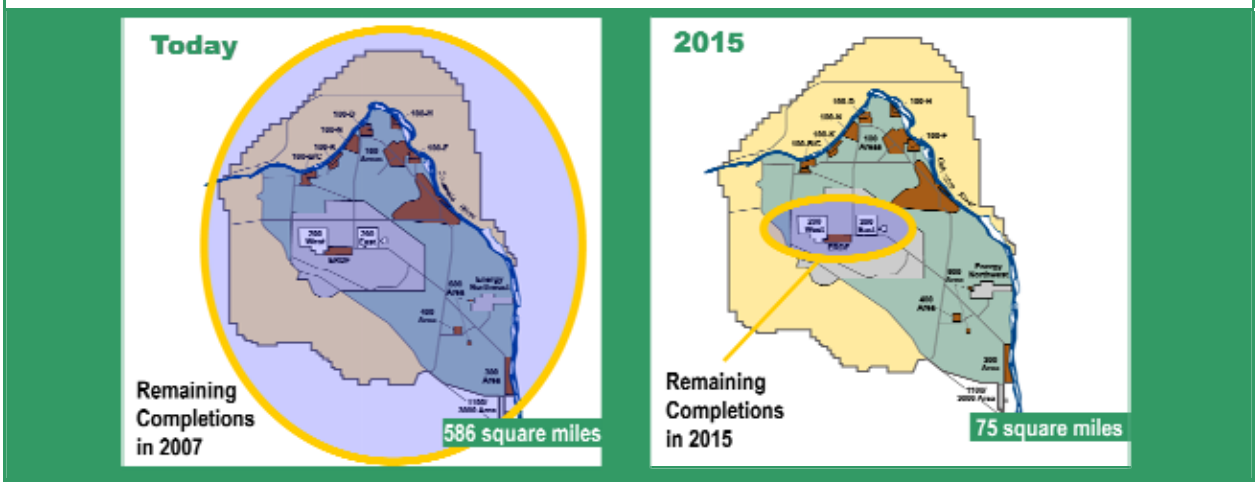


Similar analyses were conducted for the other large sites yielding similar savings and significant reductions in footprint. Those sites are Hanford, Idaho, and Oak Ridge: ORNL, Y-12, and East Tennessee Technology Park.

The Hanford proposal results in approximately 90 percent footprint reduction and is targeted at environmental cleanup and closure of the 100 and 300 Areas which abut the Columbia River. This includes completion of the River Corridor cleanup by 2015 which

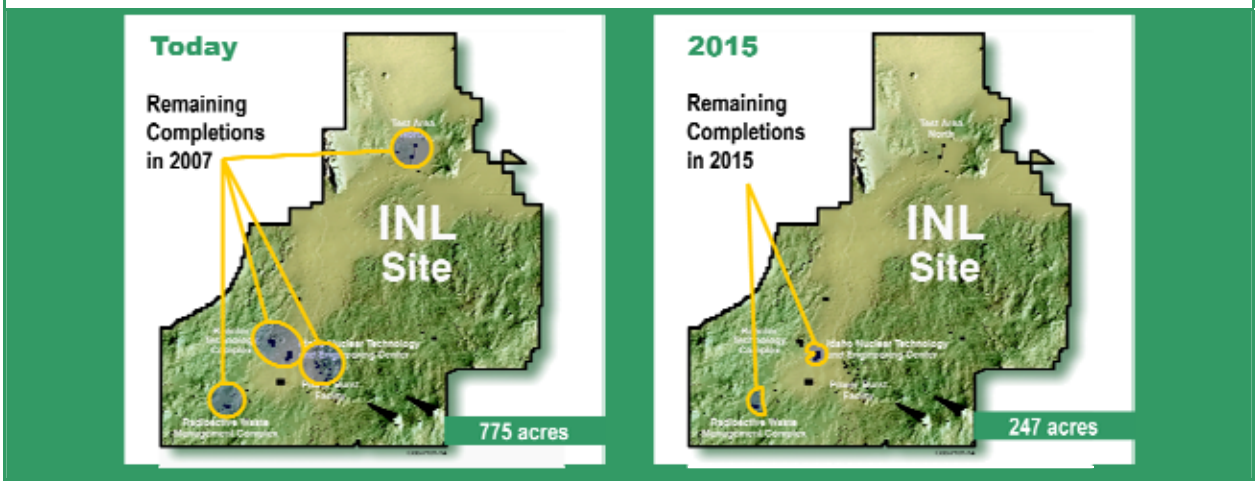
reduces significant environmental risk by focusing on ground water remediation and D&D of excess radioactive facilities.

Hanford Footprint Reduction Proposal



The Idaho proposal results in approximately 70 percent footprint reduction and would focus on accelerated D&D of INTEC facilities, the Materials Test Reactor Complex, and buried waste exhumation which would allow for an accelerated D&D of the Radioactive Waste Management Complex.

Idaho National Laboratory Footprint Reduction Proposal



At the Oak Ridge Reservation footprint reduction would focus on three primary areas: the Oak Ridge National Laboratory central campus; the Y-12 facility; and the demolition of ETTP buildings K-25 and K-27. These efforts would address some of the highest environmental risks on site and reduce the overall surveillance and maintenance costs across the site.

Oak Ridge Reservation Footprint Reduction Proposal

Oak Ridge National Laboratory Central Campus

Today

177 IFDP Facilities

2016

One IFDP Facility

Y-12 National Security Complex

Today

510K sf demolished (Alpha 4)

2016

672K sf additional demolished (Alpha 5 & 9206)

East Tennessee Technology Park

Circa 2000

Baseline Completion in 2017

2015

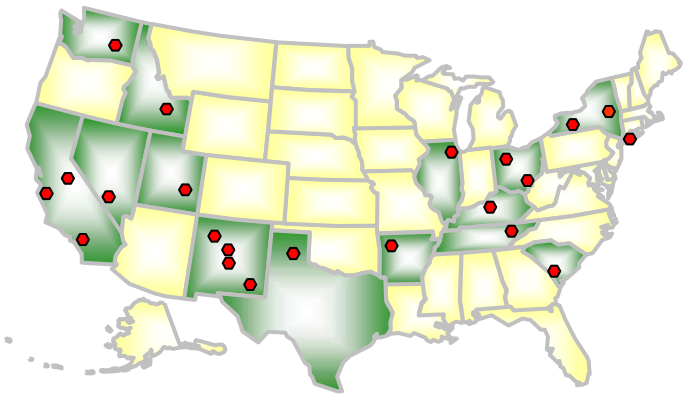
Accelerated Completion in 2015

In addition, EM is proactively examining footprint reduction opportunities at both Gaseous Diffusion plants in Portsmouth, Ohio and Paducah, Kentucky. We anticipate similar results allowing investments to energize these depressed economies and freeing up land for potential reuse

Status of Small Site Completions

Small sites analyzed near-term completion options that accelerate their remaining EM work scope. This footprint reduction would allow management to focus resources on large site cleanup. With additional investments EM can close 12 sites by 2015, 10 of these sites are on schedule to be complete between now and 2015 and two others would be accelerated to 2015. Three other sites would be accelerated from current planning completions – West Valley in New York, Energy Technology Engineering Center (ETEC) in California, and Moab in Utah. As a result of a mission change at Argonne National Laboratory additional environmental cleanup scope has been identified. This work scope is being evaluated for potential acceleration.

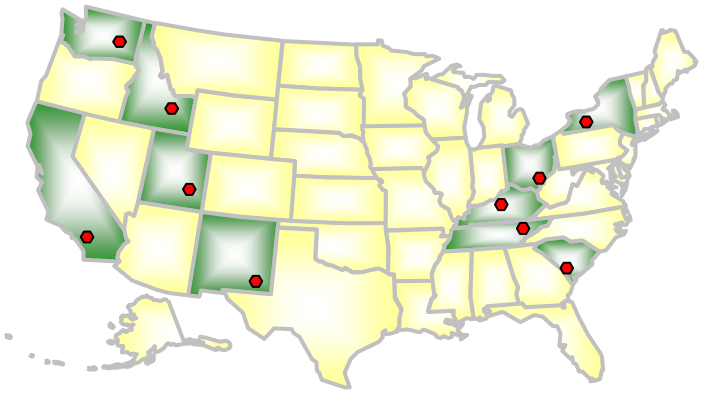
Sites with Active EM Programs as of 2008



Examples of work at sites that can be accelerated:

- Uranium Mill Tailings Remedial Action Project in Moab, Utah, cleanup would be accelerated by 9 years, from 2028 to 2019. This project involves the remediation of the former uranium-ore processing facility which abuts the Colorado River.
- At ETEC, the remaining work is focused on the D&D of nuclear and non-nuclear facilities, remediation of a few soil contamination areas, and one groundwater plume. The scope of this project is being re-evaluated as the result of new legislative requirements.
- The West Valley Demonstration Project is divided into two phases. The first phase involves the relocation of canisters of radioactive tank waste to a newly constructed on-site facility for temporary storage, the remediation of contaminated soil areas, and the decommissioning of several nuclear facilities including the original reprocessing plant and stabilization

Remaining Active EM Sites in 2015



facility. Completion of this work would be accelerated to 2018. The second phase of work would be completed at a later date when a disposition alternative is selected for the high-level waste

Status of Energy Parks Initiative

Department of Energy (DOE) resources, in partnership with industry and regional stakeholders, can be used to establish Energy Parks. Designated tracts of land would be transferred to a third party for rapid development of large scale energy-related facilities, particularly those with potential to significantly influence energy, environment, and economy. Relevant technologies include but are not limited to, wind, solar, biomass, nuclear power, desalinization, geothermal, liquefied natural gas transfer stations, hydrogen generation, central-station coal power with carbon sequestration, and specialty manufacturing capability.

The Nation is facing several significant energy and environmental challenges:

- Providing secure, safe, and affordable energy supplies
- Promoting energy sources to protect the environment

EM has extensive resources that can be applied to address these issues:

- Large tracts of land, including buffer zones
- Site environments that have been well characterized
- Existing infrastructure, including electrical transmission lines, abundant water supplies, roads, and railroads
- On-site resources that can be used to harness energy from renewable resources (e.g. solar, wind, geothermal)
- Nuclear operations and nuclear materials management capabilities
- State-of-the-art technologies and facilities
- Thousands of highly trained and experienced scientists, engineers, craftspeople, and equipment and process
- Established relationships with local and state regulators and surrounding communities

A way to leverage Departmental and EM assets to address the Nation's critical energy and environmental needs is through the Energy Parks Initiative (EPI). Under the EPI, the Department would work with the commercial sector and stakeholders to facilitate the building and operating of commercial energy supply facilities. In addition to the EM resources listed above, the EPI could involve other DOE tools such as loan guarantees to assist in the development of energy facilities.

A significant benefit of implementing the EPI is that states and local communities would see that there are future activities which could provide jobs and a tax base. Without that future, some local stakeholders are concerned of the economic impact to the area once cleanup is complete. Some, including labor unions, view the completion of the EM

mission as a negative event. At some EM sites, like Savannah River, there is already interest by the local community reuse organizations in utilizing part of the site for energy facilities.

Also, very preliminary feedback from some members of the energy industry indicates a significant interest in the energy parks concept, subject to a demonstrable return on investment.

The impact of transforming DOE sites to Energy Parks in all types of clean fuel / green energy production would be:

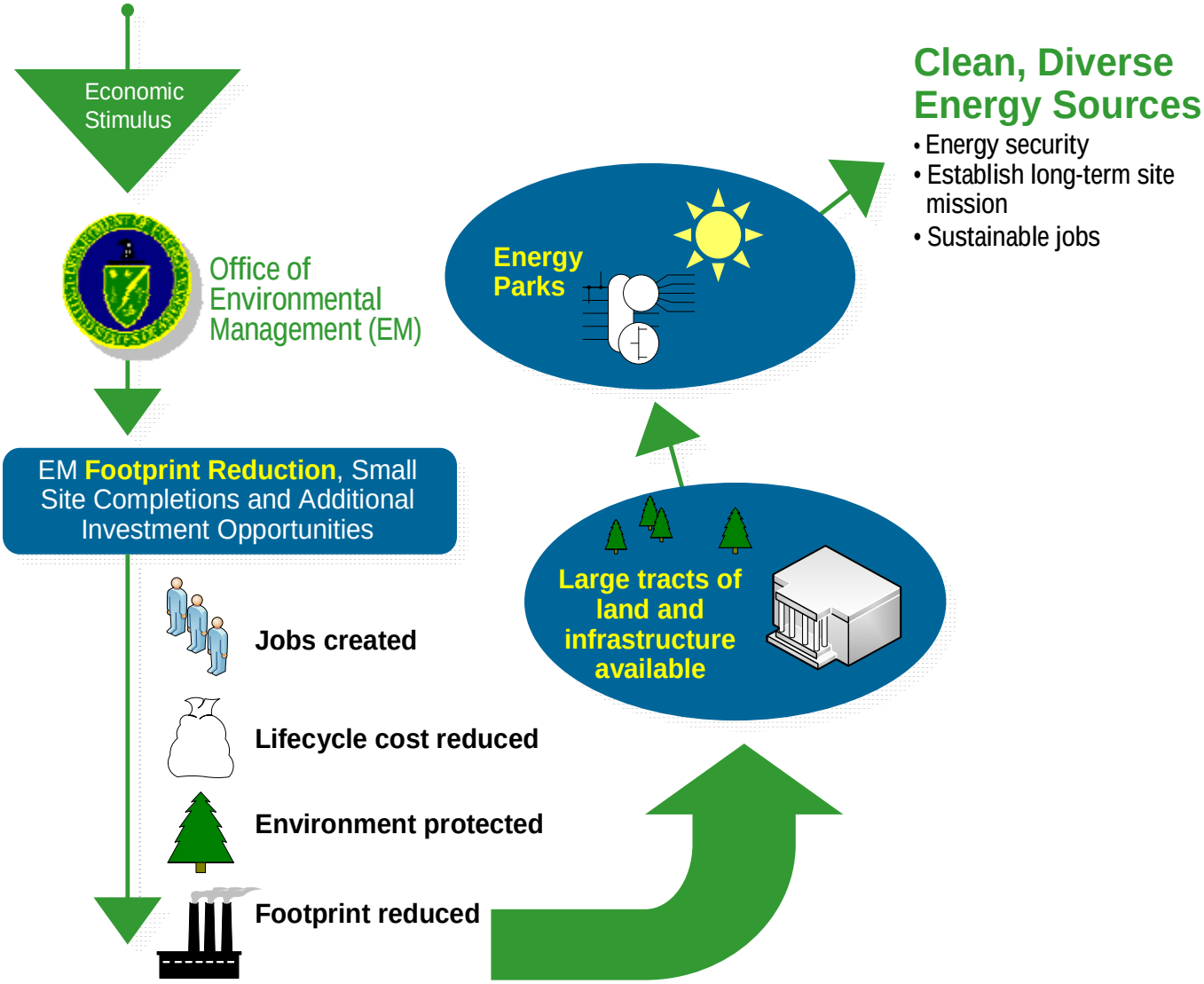
a. Energy production with clean technologies sited on "brownfields" with existing infrastructure and a trained workforce.
b. Accelerate the siting and permitting of new energy facilities due to extensive meteorological, technical and natural resource data gathered over the past 50 years of DOE Operations; these sites are as close to license ready than any other sites in the US.
c. Transition of the current work force and recruit the future work force to take advantage of the wealth of technical knowledge and operational experience.
d. Potential to create thousands of new jobs for the long term.

The initiative involves four phases: (1) initial evaluation of key assets for which accelerated completion of the EM mission is feasible, and in collaboration with state and local stakeholders, define the boundaries for opportunity; (2) optimizing the value of the assets in relation to opportunity; (3) enabling development by a third party; and (4) participation, as appropriate, in achieving performance objectives.

An investment of about $25 million would initiate phases (1), (2) and (3). The approach emphasizes early success, enabling the initiation of the process and public visibility within six months of Secretarial commitment, such as to secure industry commitment to Energy Parks at a DOE site. The Department will explore alternative re-use opportunities with the local communities.

EM has been carrying out preliminary planning activities such as working on a Request for Interest to be able to move out expeditiously if the new Administration chooses to pursue the EPI.

Summary

EM has strategic planning efforts underway to create jobs and stimulate the economy by accelerating cleanup at EM sites and dramatically reducing the legacy footprint of the EM complex. These footprint reduction efforts will lower monitoring and maintenance costs enabling EM to focus on critical long term activities like managing highly radioactive liquid tank waste. They will also enable the leveraging of DOE/EM site assets to address National energy and environmental goals through the Energy Parks Initiatives.

EM Footprint Reduction