U.S. DEPARTMENT OF ENERGY

Plan for Deactivation and Decommissioning of Nonoperational Defense Nuclear Facilities

Report to Congress
December 2016

United States Department of Energy
Washington, DC 20585

Message from the Secretary

This report provides the Department of Energy's plans for deactivating and decommissioning nonoperational defense nuclear facilities as required by 50 U.S.C. 2603 (Section 3133 of the National Defense Authorization Act for Fiscal Year 2016 (P.L. 114-92), which amends the Atomic Energy Defense Act).

This report is provided to the following Members of Congress:

- **The Honorable Thad Cochran**
  Chairman, Senate Committee on Appropriations
- **The Honorable Barbara A. Mikulski**
  Vice Chairwoman, Senate Committee on Appropriations
- **The Honorable John McCain**
  Chairman, Senate Committee on Armed Services
- **The Honorable Jack Reed**
  Ranking Member, Senate Committee on Armed Services
- **The Honorable Lamar Alexander**
  Chairman, Subcommittee on Energy and Water Development
  Senate Committee on Appropriations
- **The Honorable Dianne Feinstein**
  Ranking Member, Subcommittee on Energy and Water Development
  Senate Committee on Appropriations
- **The Honorable Jeff Sessions**
  Chairman, Subcommittee on Strategic Forces
  Senate Committee on Armed Services
- **The Honorable Joe Donnelly**
  Ranking Member, Subcommittee on Strategic Forces
  Senate Committee on Armed Services
- **The Honorable Harold Rogers**
  Chairman, House Committee on Appropriations
- **The Honorable Nita M. Lowey**
  Ranking Member, House Committee on Appropriations
- **The Honorable Mac Thornberry**
  Chairman, House Committee on Armed Services

- **The Honorable Adam Smith**
  Ranking Member, House Committee on Armed Services

- **The Honorable Mike Rogers**
  Chairman, Subcommittee on Strategic Forces
  House Committee on Armed Services

- **The Honorable Jim Cooper**
  Ranking Member, Subcommittee on Strategic Forces
  House Committee on Armed Services

- **The Honorable Mike Simpson**
  Chairman, Subcommittee on Energy and Water Development
  House Committee on Appropriations

- **The Honorable Marcy Kaptur**
  Ranking Member, Subcommittee on Energy and Water Development
  House Committee on Appropriations

If you have any questions or need additional information, please contact me or Mr. Christopher King, Acting Assistant Secretary for Congressional and Intergovernmental Affairs, at (202) 586-5450.

Sincerely,

Ernest J. Moniz

Executive Summary

The Department of Energy's (DOE) 2016 Plan for Deactivation and Decommissioning of Nonoperational Defense Nuclear Facilities in response to the National Defense Authorization Act for Fiscal Year 2016 (NDAA) includes:

- A list of facilities that require deactivation and decommissioning (D&D) and their relative priority based on a risk assessment;
- Estimated lifecycle and deactivation/decommissioning costs;
- Options to accelerate cleanup and avoid costs;
- Plans for transfer of responsibilities for disposition of certain facilities; and
- Planned Fiscal Year 2017 deactivation and decommissioning activities.

In January 2015, the Secretary of Energy established the Excess Contaminated Facilities Working Group (ECFWG) to develop an analysis and options for how DOE may prioritize and address the numerous contaminated excess facilities owned by the various DOE Program Offices. Also, in early 2015 the DOE Inspector General (IG) and the Government Accountability Office (GAO) issued reports that raised concerns regarding DOE's management of high-risk excess facilities, particularly those awaiting transition to DOE's Office of Environmental Management. These reports described what the IG characterized as increasing levels of risk due to delays in the cleanup and disposition of contaminated excess facilities. The reports recommended that DOE conduct an updated analysis and report providing information to Departmental leadership to support decisions regarding the path forward to address these facilities.

The ECFWG collected enterprise-wide data to obtain updated cost estimates to D&D excess facilities and developed a qualitative assessment of the risks they may pose. DOE used this data to define the scope of the challenge and to identify better approaches for prioritization of excess facilities. In summary, as of March 2016, DOE has 2,349 excess facilities. The March 2016 Rough Order of Magnitude (ROM) cost estimate to D&D these facilities is $32 billion. The cost estimates presented throughout the report are ROM estimates with a range of -50 percent to +100 percent and are in constant 2016 dollars. The ROM cost for D&D includes the costs for stabilization, cleanout, deactivation, and final demolition. This estimate does not include related costs connected with D&D, such as waste disposal cells or treatment facilities, and the costs may change as DOE conducts additional characterization of the facilities.

The analysis identified those excess facilities that pose a relatively higher degree of risk compared to the other excess facilities. That subset totals 203 facilities as of March 2016, with a ROM D&D cost estimate of $11.6 billion, excluding the additional costs such as waste disposal cells and subsequent remediation. Thus, of those facilities that are currently excess, approximately nine percent of the total number were identified as having relatively higher risk, representing over 36 percent of the total estimated D&D cost. The subset of relatively higher risk facilities cost more to D&D. In addition to the facilities that have been designated as excess

as of March 2016, in the next 10 years an estimated 1,000 additional facilities may be designated as excess, adding to the number of facilities to D&D and the associated costs.

In addition to this data collection and risk assessment effort, the Department has focused on institutionalizing a corporate approach to addressing excess facilities. DOE's disposition priorities are to stabilize degraded relatively higher-risk facilities, characterize their hazards and conditions, remove hazardous materials, place them in the lowest risk condition possible, and ultimately eliminate the risk by demolishing the facility and disposing of the resulting waste.

An October 2015 report by the Congressionally-authorized Commission to Review the Effectiveness of the National Laboratories (CRENEL) provided recommendations to DOE regarding deferred maintenance and excess facilities. Specifically, CRENEL recommended that "DOE and the laboratories should continue efforts to improve laboratory facilities and infrastructure by halting the growth in deferred maintenance and speeding up the deactivation and decommissioning of excess facilities. DOE should work with Congress and OMB to agree upon the size and nature of the resources shortfall for facilities and infrastructure, and to develop a long-term plan to resolve it through a combination of increased funding, policy changes, and innovative financing." CRENEL, Volume 1 at p. 57. In its February 2016 response to the CRENEL report, DOE stated that it "agrees with this recommendation, and will continue to brief Congress and OMB on the updated data on the infrastructure and excess facilities challenges identified by the recent working groups." DOE Response to CRENEL at pp. 28-29.

DOE's response to CRENEL also states that the ECFWG "developed and executed an enterprise-wide data collection effort to obtain updated cost and risk assessments to deactivate, decontaminate, decommission, and demolish excess facilities. The updated data from the working group was used to define the scope of the challenge and to identify options for how DOE may better prioritize excess facilities. The group is developing policies to institutionalize a corporate approach, and updating and validating data gathered by the working group's efforts. The group also will be finalizing a report on its work. This report will be issued in 2016, also in response to a requirement of the 2016 National Defense Authorization Act." DOE Response at p. 27. This report follows through on that commitment.

This report also addresses the DOE commitment in response to the IG report. Specifically, DOE committed to the IG that it would issue a "report providing critical information on contaminated Department excess facilities that would be useful to policy makers for decisions regarding the path forward for addressing these facilities."

Plan for Deactivation and Decommissioning Nonoperational Defense Nuclear Facilities

Table of Contents

I. Legislative Language

This report responds to the National Defense Authorization Act for Fiscal Year 2016 Sections 3133, which amends the Atomic Energy Defense Act by adding new Section 4423.

SEC. 3133. PLAN FOR DEACTIVATION AND DECOMMISSIONING OF NONOPOERATIONAL DEFENSE NUCLEAR FACILITIES.

(a) IN GENERAL.—Subtitle B of title XLIV of the Atomic Energy Defense Act (50 U.S.C. 2602 et seq.) is amended by adding at the end the following new section:

SEC. 4423. PLAN FOR DEACTIVATION AND DECOMMISSIONING OF NONOPERATIONAL DEFENSE NUCLEAR FACILITIES.

(a) IN GENERAL.—The Secretary of Energy shall, during each even-numbered year beginning in 2016, develop and subsequently carry out a plan for the activities of the Department of Energy relating to the deactivation and decommissioning of nonoperational defense nuclear facilities.

(b) ELEMENTS.—The plan required by subsection (a) shall include the following:

(1) A list of nonoperational defense nuclear facilities, prioritized for deactivation and decommissioning based on the potential to reduce risks to human health, property, or the environment and to maximize cost savings.

(2) An assessment of the life cycle costs of each nonoperational defense nuclear facility during the period beginning on the date on which the plan is submitted under subsection (d) and ending on the earlier of—

(A) the date that is 25 years after the date on which the plan is submitted; or

(B) the estimated date for deactivation and decommissioning of the facility.

(3) An estimate of the cost and time needed to deactivate and decommission each nonoperational defense nuclear facility.

(4) A schedule for when the Office of Environmental Management will accept each nonoperational defense nuclear facility for deactivation and decommissioning.

(5) An estimate of costs that could be avoided by—

(A) accelerating the cleanup of nonoperational defense nuclear facilities; or

(B) other means, such as reusing such facilities for another purpose.

(c) PLAN FOR TRANSFER OF RESPONSIBILITY FOR CERTAIN FACILITIES.—The Secretary shall, during 2016, develop and subsequently carry out a plan under which the Administrator shall transfer, by March 31, 2019, to the Assistant Secretary for Environmental Management the responsibility for decontaminating and decommissioning facilities of the Administration that the Secretary determines—

(1) are nonoperational as of September 30, 2015; and

(2) meet the requirements of the Office of Environmental Management for such transfer.[1]

(d) SUBMISSION TO CONGRESS.—Not later than March 31 of each even-numbered year beginning in 2016, the Secretary shall submit to the appropriate congressional committees a report that includes—

(1) the plan required by subsection (a);

(2) a description of the deactivation and decommissioning actions expected to be taken during the following fiscal year pursuant to the plan;

(3) in the case of the report submitting during 2016, the plan required by subsection (c); and

(4) in the case of a report submitted during 2018 or any year thereafter, a description of the deactivation and decommissioning actions taken at each nonoperational defense nuclear facility during the preceding fiscal year.

****

[1] In addition to the reporting requirement in the FY 2016 National Defense Authorization Act, the FY 2016 Joint Explanatory Statement accompanying the Consolidated Appropriations Act, 2016, Public Law 114-113) in the Congressional Record contained the following text; "The Office of Environmental Management shall not accept ownership or responsibility for cleanup of any National Nuclear Security Administration facilities or sites without funding specifically designated for that purpose." The Department is directed to identify all requests for transfers of facilities or projects from other DOE offices in its budget request justification in future years." (161 Cong. Rec. H10106 [daily ed. Dec.17, 2015.]).

II. Background

The Department of Energy (DOE) leads the largest nuclear cleanup effort in the world. DOE's objective is to remediate the environmental legacy of more than seven decades of nuclear weapons research, development, and production, and government-sponsored nuclear energy research. The disposition of contaminated excess[2] facilities is an important part of this cleanup mission. Since the Office of Environmental Management (EM) was established in 1989, DOE's other Program Offices have transferred thousands of contaminated excess facilities for deactivation and decommissioning (D&D). EM has made substantial progress in D&D of these legacy contaminated excess facilities having completed almost 3,000 facilities over the past 25 years. As of March 2016, DOE has 2,349 excess facilities.

While EM's mission includes D&D of excess contaminated facilities, it also includes responsibility for the cleanup of millions of gallons of liquid radioactive waste, thousands of tons of spent (used) nuclear fuel and special nuclear material, disposition of large volumes of transuranic and mixed/low-level waste, and treatment of huge quantities of contaminated soil and water. Many of EM's cleanup responsibilities other than D&D result from regulatory and legal requirements. Because of competing regulatory and other compliance obligations and performance challenges in some areas, EM is unable to D&D all of the excess facilities already transferred from other programs at this time.

Until EM accepts an excess contaminated facility meeting transfer conditions into its portfolio, the DOE Program Office responsible for the excess facility must maintain that facility in a safe condition and readying it for transition to EM. In addition, the Program Office owning the excess facility is also responsible for D&D of all excess facilities in its portfolio that are not contaminated. Long periods between shutdown and demolition can combine to create increased risks associated with both contaminated and uncontaminated facilities. DOE's disposition priorities are to stabilize higher-risk facilities, characterize their hazards and conditions, remove hazardous materials, place them in the lowest risk condition possible, and ultimately eliminate the risk by demolishing the facility and disposing of the resulting waste. Regardless of which DOE program is responsible for the excess facility, the risk to safety, security, and programmatic objectives is not completely eliminated until the facility is demolished.

In early 2015, both the DOE Inspector General (IG)[3] and the Government Accountability Office

[2] For the purpose of this report, the term "excess" is synonymous with "nonoperational" and refers to a facility for which DOE no longer has a mission need.

[3] DOE Office of Inspector General, Audit Report, The Department of Energy's Management of High-Risk Excess Facilities, DOE/IG-0931, January 23, 2015.

(GAO)[4] issued reports raising concerns with DOE's management of high-risk excess facilities, particularly those awaiting transition to EM. These reports describe what the IG characterized as increasing levels of risk assumed by DOE due to delays in the cleanup and disposition of contaminated excess facilities. The IG also found that these delays were exacerbated by DOE prioritization practices. As noted in these reports, DOE's progress in disposing of excess facilities, while substantial, has not included all of the relatively higher risk excess facilities. According to the reports, additional attention, improved strategic direction, and better prioritization would help maximize the use of available resources to address these issues. These reports recommended that DOE conduct an updated analysis and provide a report with critical information on contaminated excess facilities to DOE leadership to support decisions regarding the path forward for addressing these facilities.

In January 2015, the Secretary of Energy established the Excess Contaminated Facilities Working Group (ECFWG) to explore the issues and develop options for disposition of DOE's excess facilities. The ECFWG, with membership from across the DOE complex, collected enterprise-wide data and developed common metrics and definitions to provide a framework for evaluating options. The information gathered on each excess facility included rough order of magnitude (ROM) costs for D&D; cost ranges for maintenance, surveillance, repairs, and operations (MSRO); and an assessment of potential risk to public health and the environment, worker safety, and mission. The potential risk was assessed using a qualitative approach as described in III.B., Prioritization.

The updated data helped to further define the scope of the challenge and to suggest risk-informed approaches for addressing DOE's contaminated excess facilities. DOE is using this information to determine the best strategy to reduce risk from excess facilities.

In addition, DOE has made significant changes to improve management of facilities and infrastructure. For instance, NNSA established the Office of Safety, Infrastructure and Operations in January 2015 to ensure infrastructure needs are adequately represented and necessary investments are made. NNSA also deployed new data-driven, risk-informed decision-making tools such as the Master Asset Plan (MAP), Mission Dependency Index (MDI), BUILDER, and the G2 Program Management System to make most efficient use of resources. Finally, NNSA increased resources allocated to improving the condition of critical infrastructure and disposing of unneeded facilities.

More recently, the congressionally-authorized Commission to Review the Effectiveness of the National Laboratories (CRENEL) provided recommendations in its October 2015 report regarding DOE's deferred maintenance and excess facilities backlog including that DOE should "speed[] up the deactivation and decommissioning of excess facilities." In its February 2016

[4] United States Government Accountability Office, Report to the Chairman, Subcommittee of Energy and Water Development, Committee of Appropriations, U.S. Senate, DOE Real Property: Better Data and a More Productive Approach Needed to Facilitate Property Disposal, GAO-15-305, February 2015; and United States Government Accountability Office, Report to the Committee on Armed Services, U.S. Senate, DOE Facilities: Better Prioritization and Life Cycle Costs Analysis Would Improve Disposition Planning, GAO-15-272, March 2015.

response to the CRENEL report, DOE agreed with these recommendations and committed to "continue briefing Congress and OMB on the updated data on the infrastructure and excess facilities challenges identified by the recent working groups."

This report articulates the scope of the excess facilities challenge identified through these efforts, including identifying in Appendix B those facilities considered to present relatively higher risks based on the qualitative assessment, and discussing options to accelerate cleanup.

III. The Department of Energy's Nonoperational Defense Nuclear Facilities

III.A. Scope of the Challenge

Using common metrics and definitions, DOE obtained updated information relating to excess facilities, maintenance, and D&D of those facilities. The effort covered those facilities owned by the following DOE programs: EM, the Office of Science (SC), the Office of Nuclear Energy (NE), and the National Nuclear Security Administration (NNSA). The scope of the data collected was not limited to defense nuclear facilities but rather included all excess facilities to provide a complete picture of scope of the facilities to D&D. This effort obtained updated ROM cost to stabilize and D&D all of DOE's excess facilities and information on various levels of risk for each facility (public health and the environment, worker safety, and mission). The data in this report provides information on excess facilities as of March 2016. Excess facility inventory is not static; facility data are updated annually with ongoing stabilization and D&D projects underway each fiscal year. In the next 10 years, up to 1,000 additional facilities may be designated as excess, adding to the backlog of facilities awaiting D&D.

The data collection identified 2,349 excess facilities with a ROM cost to D&D of $32 billion. The cost estimates presented throughout this report are ROM estimates with a range of -50 percent to +100 percent and are in constant 2016 dollars. Figures 1 and 2 include the number of excess facilities and ROM D&D cost by current owner.[5]

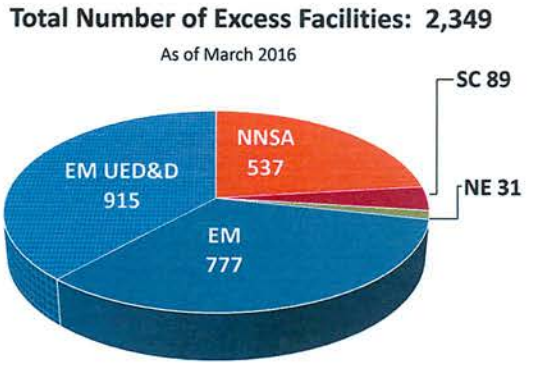

Figure 1

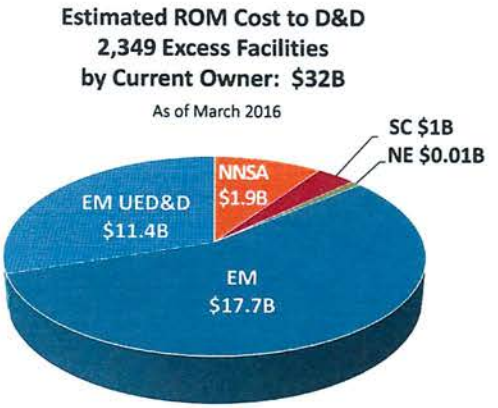

Figure 2

This report provides information on excess facilities as of March 2016.

[5] The Energy Policy Act of 1992 authorized annual contributions to the Uranium Enrichment Decontamination and Decommissioning (UED&D) Fund, which came from both a special assessment on domestic nuclear utilities and annual Congressional appropriations, to support the EM responsibilities at the nation's three Gaseous Diffusion Plants (GDPs) at Portsmouth, Ohio; Paducah, Kentucky; and Oak Ridge, Tennessee.

The ROM cost for D&D includes the costs for stabilization, cleanout, deactivation, and final demolition, as discussed below in Section III.C. Estimates will be further refined as part of project planning and revised as warranted by new information or the discovery of unexpected conditions.

III.B. Prioritization

The evaluation of excess facilities included an assessment of their potential risk. This risk posed by the contaminated excess facilities was determined using a qualitative approach that considered impacts to public health and the environment, worker safety, and the mission. DOE Program Offices, with input from the sites, used the Assessment Guide in Appendix A to determine the potential impacts from each excess facility

The ECFWG used this information to identify a subset of the total of excess facilities that pose relatively higher risk. These higher risk facilities fell into one of the two tiers described below. All other facilities were determined to be of lower relative risk.

> **Tier I.** Major or Significant risk to public health and the Environment; worker safety; **and** mission.
> **Tier II.** Major or Significant risk to public health and the Environment **and/or** worker safety (independent of mission impact).

These tiers were determined based on initial qualitative assessments; however, DOE is working on continuously improving the quality of its data and assessments, which may change the understanding of a given facility's relative risk.

The following sections summarize the scope of DOE excess facilities and the associated ROM cost to D&D those facilities, including a discussion of the subset of relatively higher-risk facilities. The subset of facilities currently owned by EM is identified first, followed by those excess facilities currently owned by other Program Offices.

III.C. EM Excess Facilities

This section focuses on the subset of excess facilities that have been transferred to EM and have not yet completed D&D. The EM D&D program is funded through annual Congressional appropriations, including the UED&D program for the former Gaseous Diffusion Plants (GDPs) at East Tennessee Technology Park (ETTP) in Oak Ridge, Tennessee; Portsmouth, Ohio; and Paducah, Kentucky. EM has historically spent between $500 and $900 million per year to D&D excess facilities located across the country. As of March 2016, EM had 1,692 excess facilities (previously accepted from other Program Offices) with a D&D ROM cost of $29 billion, not including additional associated costs detailed below. The EM responsibility for the currently estimated excess facility D&D scope represents approximately 91 percent of the total DOE D&D ROM cost. An estimated $11.4 billion of the $29 billion is associated with D&D of the former

GDP facilities through the UED&D program.[6] The facilities included in these cost estimates are located throughout the DOE complex. Figure 3 illustrates the sites where these facilities are located.

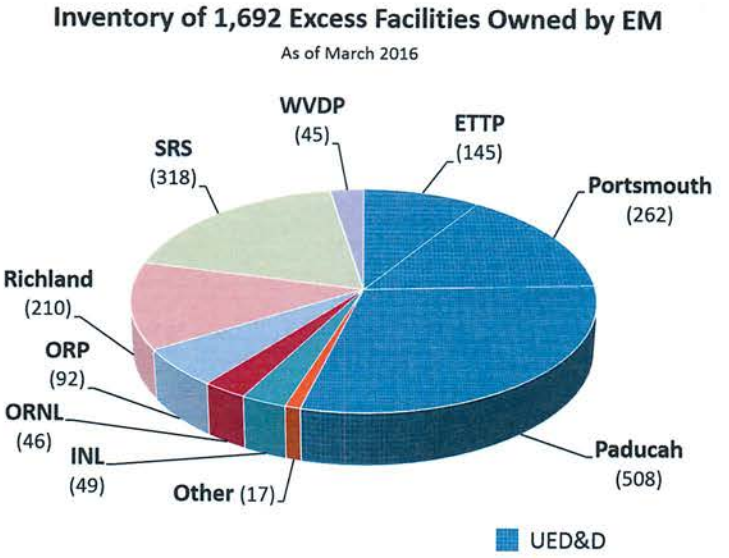

Figure 3

EM evaluates its projects based on risk, compliance and regulatory agreements, cost/benefit, and the optimized order of implementation for each project. This effort results in a prioritization of site-wide activities covering the following five major EM mission cleanup areas:

1. Radioactive tank waste stabilization, treatment and disposal;
2. Spent (used) nuclear fuel storage, receipt, and disposition;
3. Special nuclear materials consolidation, stabilization, and disposition;
4. Transuranic and mixed/low-level waste disposition;
5. Soil and groundwater remediation; and
6. Excess facilities deactivation and decommissioning.

EM balances the prioritized site lists with regulatory and other compliance requirements and related programmatic priorities, with practices to be as efficient as possible.

With respect to excess facilities, 158 of the 1,692 EM excess facilities have been identified as higher-risk facilities using the prioritization approach described above. The total ROM cost to complete D&D of these facilities is $9.3 billion as of March 2016, as shown in Figure 4 below.

[6] This estimate was based on the approved D&D costs at the end of FY 2015 and includes such activities as stabilization, cleanout, deactivation, and final demolition. These D&D estimates are then updated and adjusted to account for pending change requests and environmental liability adjustments at the 50% budget confidence level for D&D operating activities costs, and 80% budget confidence level for D&D capital projects for Project Baseline Summary (PBS-40), adjusted to account exclusively for D&D Activities.

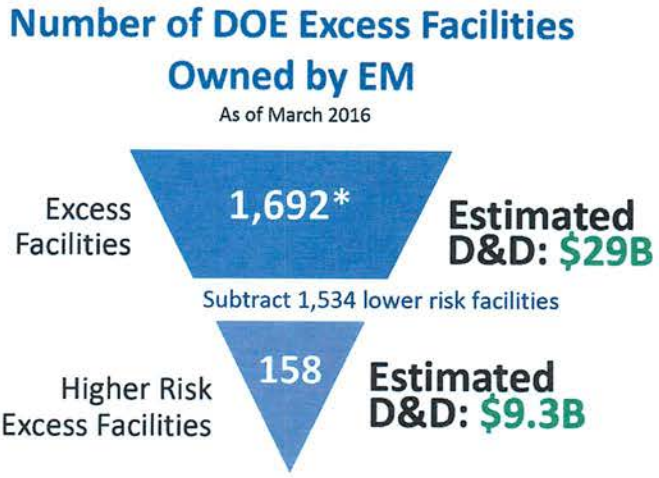

Figure 4

The ROM D&D cost of $29 billion discussed above does not include funding for additional projects that must be completed prior to initiating D&D. These precursor or prerequisite activities can involve the construction of new, or the expansion of, existing on-site CERCLA disposal cells to handle the increased volume of D&D waste. Another example is the requirement to build the Outfall 200 Mercury Treatment Facility at Oak Ridge before D&D of facilities contaminated with mercury can start at the Y-12 National Security Complex (Y-12). Projects that are not a prerequisite to D&D may also effect costs. For instance, the ROM costs for the D&D of a number of facilities at Y-12 assume reconfiguration of the protected area, which would avoid costs associated with D&D inside of a secured area. Examples of precursor or prerequisite activities for D&D include: design/construction of a new on-site CERCLA disposal cell at Portsmouth, design/construction of a new on-site CERCLA disposal cell at Paducah, construction and operation of the Outfall 200 Mercury Treatment Facilities at Y-12, and the Fast Flux Test Facility (FFTF) at Hanford. Each of these activities would cost in the hundreds of millions of dollars, and would represent additional expenditures before D&D can begin.

In addition to the above precursor activities, there are post-D&D expenditures also not incorporated in the $29 billion estimate. Many sites will need substantial additional work (e.g., soil and groundwater remediation, long-term monitoring) following D&D before an area is cleaned up, closed, or returned for public reuse.

III.D. Excess Facilities Owned by Programs Other than EM

This section focuses on the total of 657 excess facilities that as of March 2016 were owned and maintained by DOE Program Offices other than EM. The total ROM cost to complete D&D of these facilities is $2.94 billion, as shown in Figure 5 below. The precursor and prerequisite activities, as discussed above are not included in these estimates.

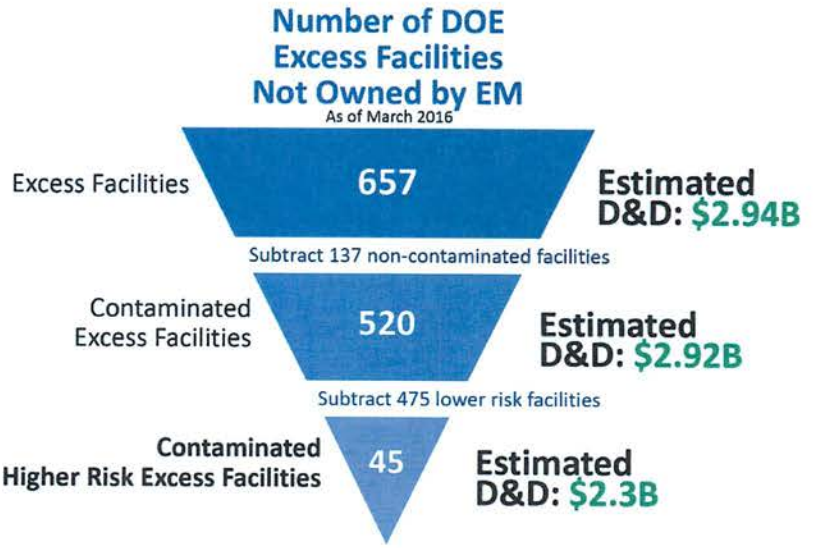

Figure 5

The facilities in Figure 5 above were grouped as follows:

1. **Excess Facilities**. The 657 excess facilities owned by programs other than EM have an estimated ROM D&D cost of $2.94 billion.
2. **Contaminated Excess Facilities**. This is a subset of category #1 and reflects the subtraction of 137 non-contaminated facilities that are not owned by EM and will remain the responsibility of the current program office to D&D. The 520 contaminated facilities have an estimated ROM D&D cost of $2.92 billion.
3. **Contaminated Higher-Risk Excess Facilities**. This is a subset of category #2, which reflects those facilities identified as relatively higher risk based on the prioritization factors described above. The 45 higher-risk facilities owned by programs other than EM have a ROM D&D cost of $2.3 billion as of March 2016.

As shown in Figure 5, almost 80 percent of the total estimated cost to D&D the facilities currently owned by other programs resides in the 45 higher-risk facilities (seven percent of the facilities), underscoring the higher costs to address the risks and contamination from these facilities.

III.E. DOE Contaminated Higher-Risk Excess Facilities

Appendix B contains a list of the facilities across the DOE/NNSA complex that have been identified as relatively higher risk (both EM facilities and those owned by other programs),

along with the estimated D&D and MSRO (carrying) costs. These are listed as either "Tier I or Tier II, as explained above in Section III.B. Lower risk facilities are not included in this Appendix. Table 1 below provides a summary of both the total inventory of excess facilities and the facilities identified as relatively higher risk.

Table 1: Summary of Inventory of Excess Facilities as of March 2016

Program	Total Excess Facilities		Higher Risk Facilities	
	# Facilities	ROM Cost	# Facilities	ROM Cost
EM	1,692	$29 B	158	$9.3 B
NNSA, SC, NE	657	$3 B	45	$2.3 B
TOTALS	**2,349**	**$32 B**	**203**	**$11.6 B**

Of the 45 relatively higher risk facilities owned by programs other than EM, 33 may be process contaminated[7] and therefore eligible for transfer to EM. These facilities have a ROM D&D cost of $2.0 billion, not including additional associated costs. The remaining relatively higher risk facilities owned by programs other than EM are industrially contaminated and therefore the program owner is responsible for D&D. Figure 6 below shows the breakout of the higher-risk excess facilities by program owner and ROM cost to D&D.

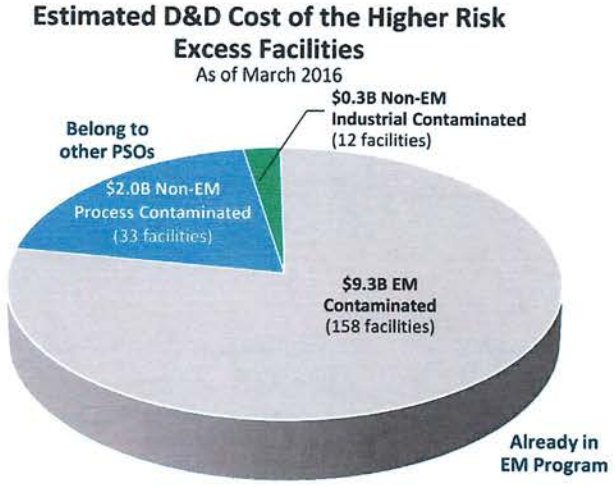

Figure 6

[7] Process contaminated facilities are those that are contaminated with hazardous chemical and/or radioactive substances. This definition excludes facilities that contain no residual hazardous substances other than those present in building materials and components, such as asbestos, lead-based paint, or equipment containing PCBs (DOE Order 430.1B).

IV. Options to Accelerate Cleanup and Avoid Costs

Addressing the contaminated higher-risk excess facility scope in the near term will require substantial resources. For example, the President's FY2017 budget request included a request for $37M to begin addressing the higher-risk facilities of Alpha 5 and Beta 4 at Y-12. The subsequent D&D of these facilities is estimated to cost hundreds of missions of dollars. DOE considered several approaches to accelerating the disposition of higher-risk facilities. These options consider different resource requirements, timeframes, and benefits. These options are scalable in the number of facilities addressed and the duration of execution.

In general, accelerating the D&D of excess facilities would reduce the risk posed by these facilities, and avoid annual maintenance and other costs associated with delaying D&D. As the data in Appendix B shows, MSRO costs can run into the millions of dollars per year to keep the facilities safe and stable. These costs are avoided when a facility is demolished. In addition to incurring ongoing MSRO costs delaying D&D may:

- Expose individuals and the environment to increasing levels of risk;
- Lead to escalating disposition costs. As an example, the IG report indicated that roof degradation of the Alpha 5 building at Y-12 has resulted in a spread of contamination; and
- Affect ongoing mission work (such as excess facilities located nearby ongoing mission work).

As explained above, if DOE were to accelerate the D&D of all of the facilities currently designated as higher risk, the ROM D&D cost as of March 2016 would be $11.6 billion. Additional funding would be needed for precursor and post D&D cleanup costs such as waste disposal costs or soil and groundwater remediation.

Alternatives

D&D could be accelerated either in a manner that is distributed at sites across the DOE complex, or it could be focused on addressing risks at a single location.

One alternative is a distributed approach; stabilizing, deactivating, or demolishing certain contaminated relatively higher-risk excess facilities in a manner that would be distributed across different DOE locations around the country. This approach would address buildings currently owned by various programs across a number of DOE labs and sites. Pursuing a mix of both full demolition and deactivation[8] of a number of the relatively higher-risk excess facilities identified in Appendix B would reduce risk without requiring funding for a full D&D of each facility. For instance, a distributed option could involve characterization and stabilization of the

[8] Deactivation includes, but is not limited to, de-inventorying the buildings of hazardous materials, which places the facilities into a safer, more stable condition while awaiting D&D.

Alpha 5 facility at Y-12 to reduce risk and MSRO costs, but would not fully D&D the facility, which could cost an estimated $400M more. Since some facilities might only be deactivated and not decommissioned under this approach, there would be less cost avoidance since some surveillance and maintenance costs would need to continue. In addition, although this approach lowers the risk from the facilities by stabilizing them and removing some contamination, it would not eliminate the risk.

A second alternative that focuses on accelerating D&D at a specific location – a site-specific approach – could have several benefits. First, a site-specific approach could be risk-based, by focusing on a site that houses a substantial portion of the relatively higher-risk facilities. Alternately, such an approach could focus on eliminating the substantial MSRO costs of maintaining the higher-risk facilities at a single location. As examples, 34 of the 44 "Tier 1" "higher risk" facilities reflected in Appendix B are located at Oak Ridge; five of the "Tier 1" facilities are located at Livermore; the estimated lifecycle costs (MSRO) to maintain the "higher risk" excess facilities at Portsmouth and Paducah are substantial.

Focusing efforts on a single location could provide additional benefits by utilizing a trained workforce and maximizing efficiencies of an integrated project. As a practical matter, D&D at crowded sites with ongoing mission work, such as Y-12, involves an integrated approach, as it is necessary to create space to conduct the D&D at some of the "higher risk" facilities. This could involve executing D&D at an adjacent lower-risk facility in order to facilitate the safe D&D of a higher-risk facility. A site-specific approach at location where there is ongoing mission work also could reduce impacts to those ongoing missions.

V. Plan for Transfer of Responsibility of Certain Facilities

Over the past 25 years, EM has completed the D&D of approximately 3,000 facilities previously owned by other Program Offices. In 2008 and 2009, EM reviewed over 300 facilities and found many to be appropriate for transfer pending the availability of funds to complete the D&D. Since that time, a number of these excess facilities were demolished under American Recovery and Reinvestment Act of 2009 (ARRA) and several additional process contaminated facilities have become excess. Because of competing regulatory and other compliance obligations and performance challenges in some areas, EM is unable to D&D all of the excess facilities already transferred from other programs at this time. In addition, the Joint Explanatory Statement accompanying the Consolidated Appropriations Act, 2016,[9] included the following:

> The Office of Environmental Management shall not accept ownership or responsibility for cleanup of any National Nuclear Security Administration facilities or sites without funding specifically designated for that purpose. The Department is directed to identify

[9] Public Law 114-113, Consolidated Appropriations Act, 2016, December 18, 2015.

all requests for transfers of facilities or projects from other DOE offices in its budget request justification in future years.

Per EM's Standard Operating Policies and Procedures number 34, for a facility to meet the requirements for transfer into the EM Program, the following must be true:

- The facility must no longer be needed for a DOE mission;
- The facility must be process contaminated with hazardous chemical and/or radioactive substances, such as plutonium, uranium, beryllium, or mercury. This does not include contaminants normally present in building materials and components, such as asbestos, lead-based paint, and equipment containing PCBs; and
- The facility must be an individual, self-contained facility, and not part of a larger complex.
- Specifically designated funds to disposition the facility must be available.

Also, after a facility is identified as acceptable for transfer to EM, it must meet the following general conditions before it can transfer:

- Wastes and materials removed;
- Facility hazards and conditions characterized;
- Site utilities isolated; and
- Facility condition is known and stable.

EM, in coordination with other DOE Program Offices, evaluates facilities identified for transfer to determine if these facilities meet the requirements. This evaluation includes an assessment of the facility, commonly referred to as a walk down. A team of subject matter experts from EM and other DOE Program Offices conducts the walk down and evaluates the facility; this serves as the basis of EM's decision regarding whether the facility meets the conditions of transfer or identifies the conditions that must be met prior to transferring the facility.

DOE is developing a plan for walk downs at all process-contaminated excess facilities evaluated as higher risk. These walk downs will establish a specific set of conditions for each facility that must be met for transfer so that Program Offices can plan for the necessary activities to meet them. DOE will prioritize the walk downs based on relative risk, with the relatively higher-risk facilities at Lawrence Livermore National Laboratory (LLNL) and Y-12 being walked down in FY 2016 and the remaining facilities to be walked down starting in FY 2017.

VI. Accomplishments and Planned Activities

DOE is committed to disposing of excess properties, making more efficient use of real property assets, and reducing its total square footprint in support of the Administration's Reduce the Footprint initiative.[10] As part of this effort, DOE is engaged in a number of ongoing activities to D&D and otherwise reduce the risk associated with excess facilities. DOE used the recently

[10] OMB, National Strategy for the Efficient Use of Real Property, Spring 2015.

collected data to identify appropriate projects that will reduce risk. Much of the ongoing or planned work described below addresses specific risks identified in the GAO and IG reports.

VI.A Recent Accomplishments and Planned Activities

EM

From 2010 to 2015 EM completed D&D of approximately 630 facilities, including the entombment of 16 facilities, and characterized, reduced risk, deactivated, or prepared another 22 facilities. This work was facilitated by $6 billion received under ARRA. Significant completions under ARRA included the following:

- Entombment of P- and R-Reactors at SRS, the Experimental Breeder Reactor-II (EBR-II) and certain facilities at the Idaho Nuclear Technology and Engineering Center (INTEC) at the Idaho National Laboratory (INL);
- Partial in-situ decommissioning of U Plant Canyon at Hanford;
- Partial deactivation and cleanout of NNSA's Alpha 5 at Y-12 (although still one of the highest-risk facilities as identified in recent GAO and IG Reports);
- Risk reduction at building 235-F at SRS;
- Continued deactivation of the West Valley Main Plant Process Building and removal of ancillary facilities; and
- Completion of facility D&D of certain facilities at Idaho Nuclear Technology and Engineering Center (INTEC) and Material and Fuels Complex (MFC).

FY 2016 EM work includes the ongoing D&D of the Plutonium Finishing Plant (PFP) at Hanford, continued risk reduction and partial deactivation of 235 F at SRS, and continued deactivation of the Main Plant Process Building at West Valley.

EM UED&D Program activities in FY 2016 include the following:

- Deactivation and completion of removal of contaminated process gas equipment at the Portsmouth Process Facility (X-326), preparation for deactivation of the X-333 Process Building, and continue construction of the On-Site Waste Disposal Facility;
- Deactivation and preparation for uranium deposit removals from Paducah Process Facilities (C337 and C337A) and complete facility modifications in Buildings C-335 and C-310 in support of uranium deposit removals; and
- Completion of D&D of K-31 GDP and beginning demolition of K-27, which is the fifth and final GDP at ETTP.

Also in FY 2016, the Oak Ridge Environmental cleanup program received $68 million in additional funding for work on contaminated excess facilities at Oak Ridge. EM and NNSA are working in concert to develop an integrated approach that addresses the most urgent needs in and around the relatively higher-risk facilities. This entails characterizing and abating hazards and stabilizing the condition of the facilities while they await demolition. This work will improve worker safety and reduce the costs and complexity of future cleanup by removing potential threats and helping prevent further migration of contaminants. The planned work includes:

- EM Building 9201-04 (Alpha 4)
    - Deactivation including characterization of COLEX equipment located on the West and East exterior sides of the building in preparation for equipment removal.
    - Risk reduction on high-risk equipment with potential mercury contamination and roof repairs to prevent water intrusion and contamination migration. This work will complement NNSA's FY 2016 planned roof repairs for Alpha-5 and Beta-4 resulting in stabilization of roofs for all former uranium processing buildings where mercury was used and is a major contaminant.
- EM Building 3026 risk reduction (one of SC's highest mission priorities) for the hot cell, including removal of the 3026 Wind Enclosure and covering 3026 C & D Pads, universal waste removal; fogging; grouting process drains; air gapping electric; and, limited surveying and coring behind stainless liners;
- EM ORNL Building 7500 characterization and hazard abatement;
- EM Building 3038 risk reduction and cleanout to allow downgrading the facility hazard categorization to less than Hazard Category 3, which will reduce MSRO costs;
- EM Buildings 3029 and 3028 risk reduction to mitigate the potential for migration of radiological contamination; and
- SC Biology Complex characterization and planning. This allows Oak Ridge to begin abatement and D&D of the high priority SC Biology Complex at Y-12 (Building 9207).

NNSA

Beginning in FY 2014 NNSA began directly funding the D&D of relatively higher priority facilities. The initial funding amount in FY 2014 was $13 million, increasing to $15.4 million in FY 2015 and $58 million in FY 2016.

In FY 2014, NNSA accomplished the following disposition and risk reduction activities:

- Demolition of the significantly degraded building 9744 at Y-12;
- Priority roof repairs at Y-12's Alpha 5;
- Preparation of the Bannister Road Complex in Kansas City for transfer to the private sector for redevelopment;
- Demolition of 17 buildings and 28 trailers at the Los Alamos National Laboratory (LANL); and
- Demolition by Sandia National Laboratories (SNL) of two buildings in California and seven trailers in New Mexico.

In FY 2015, these activities included:

- Demolition of the significantly degraded building 9808 at Y-12;
- Demolition of eleven buildings and nine trailers at LANL, including the Sheba Critical Building in TA-18 and a chemistry lab in TA-54;
- Disposal by Sandia of nine small facilities in New Mexico;
- Continued preparation of the Bannister Road Complex in Kansas City for transfer to the private sector for redevelopment; and
- Demolition of trailer 8710 at LLNL.

In FY 2016, Congress provided NNSA an additional $25 million to reduce the risk posed by its higher-risk excess facilities at Y-12 and LLNL. NNSA is executing work funded by that increase and other efforts through the following activities:

- Disposal by Sandia of 17 small facilities in New Mexico;
- Complete preparation of the Bannister Road Complex in Kansas City for transfer to the private sector for redevelopment;
- Demolition of SNL buildings at the Tonopah Test Range;
- Extensive roof repair work and addressing the flooded basement at Y-12's Alpha-5 to reduce risks identified by the GAO and IG;
- Extensive roof repair work and installation of a temporary electrical distribution system at Y-12's Beta-4 to address risks identified by the GAO and IG;
- Roof maintenance and de-inventorying to lower Material at Risk at Y-12's Building 9206;
- Demolition of Casa 2 and 3 complexes at LANL;
- Initial characterization of buildings 280, 292, 251, and 175 at LLNL to assess risks identified by the IG and GAO and prepare for transfer to EM; and
- Roof life extension of buildings 292, 251, and 175 at LLNL to address risks identified by the GAO and IG.

SC

In FY 2014, SC disposition and risk reduction activities included:

- Demolition of Building 589 and trailers at Brookhaven National Laboratory (BNL); and
- Demolition of several small structures at Argonne National Laboratory (ANL), ORNL and Stanford Linear Accelerator Center (SLAC).

In FY 2015, these activities included:

- Continued de-inventory of transuranic waste from the Alpha-Gamma-Hot-Cell-Facility (AGHCF) at ANL (identified in GAO and IG Reports);
- Demolition of contaminated Buildings 810 and 811 at BNL; and
- Removal of miscellaneous small structures and equipment at various SC laboratories.

In FY 2016, SC plans to continue these activities, including:

- Continued de-inventory of transuranic waste from the AGHCF at ANL;
- Demolition of Building 180 at BNL;
- Demolition of Buildings 2643 and 7751, and several small structures at ORNL;
- Removal of miscellaneous small structures and equipment at SC laboratories; and
- Ongoing phase 1 deactivation and continued D&D of LBNL (Old Town) buildings 5, 16, and 16A using Congressional funding within the EM Program.

NE

In FY 2014, NE demolished three guardhouses (B21-606, B27-602, B8-602), a water chemistry building (CF-1605), and an office building (CF-629) at INL.

In FY 2015, NE demolished a Naval Proving Ground (NPG) Officers Garage (CF-632), Fuel Oil Pump House (MFC-755), a Cold Storage Building (TRA-669), several other small facilities, and conducted remediation of the Technical Center Buildings (CF-688, CF-689). NE also accepted the return of the Paducah GDP from the United States Enrichment Corporation back into DOE responsibility and then transferred responsibility for cleanup and D&D of the Paducah GDP to the EM Program in FY 2015.

In FY 2016 NE will continue remediation of asbestos in the NPG buildings (CF-606, 607, and 613) and initiate other disposition activities for those buildings.

VI.B. Plans for FY 2017 D&D

EM

In FY 2017, EM plans to complete the following:

- D&D of three nuclear facilities, including the Vitrification Facility and Vaults, and 4 radiological facilities at West Valley; and
- Continuing deactivation and D&D at West Valley of remaining facilities.

EM expects to D&D PFP to slab-on-grade and complete installation of a cap over the slab.

In FY 2017, the EM UED&D program plans include completing deactivation of Portsmouth Building X-326 (the first process building to be declared demolition ready), and continuing site infrastructure upgrades and site preparations for construction of the On-Site Disposal Facility. At Paducah, uranium deposit removals will continue in C-337 and will begin in the C-333 Process Building, and design activities will continue for the first expansion cell of the On-Site Waste Disposal Facility. At ETTP, demolition and disposal of the K-27 GDP will be completed and demolition of the balance of site facilities will continue. At Oak Ridge, regulatory analysis will continue for the proposed new On-Site Waste Disposal Facility, and design will continue for the Outfall 200 Mercury Treatment Facility.

NNSA

In FY 2017, NNSA plans to provide nearly $250 million to continue reducing the risk posed by excess facilities and demolishing buildings. NNSA plans to complete the following work:

- Transfer of the Bannister Road Complex in Kansas City to the private sector for redevelopment;
- Continued risk reduction at Y-12's Alpha-5 and Beta-4, including de-inventory of equipment and material to reduce risks identified by the GAO and IG;
- Demolition of the HE Pressing Complex in TA-16 and the Press Building in TA-03 at LANL;
- Final characterization of the hazards and contamination at building 280 at LLNL to assess risk and prepare building for D&D; and
- Demolition of buildings 9111 and 9112 at Y-12.

SC

In FY 2017, SC plans include:

- Initiation of Phase 2 facility D&D of the facilities at LBNL (Old Town);
- Continue the de-inventory of the Alpha Gamma Hot Cell Facility at ANL to reduce risks identified by the GAO and IG;
- Initiate the de-inventory of the New Brunswick Laboratory at ANL;
- Demolish Building 134 at BNL;
- Continue removal of miscellaneous small facilities and equipment at SC laboratories;
- Demolish Building 7701 and several small structures at ORNL; and
- Demolish the Mod VI trailers at Princeton Plasma Physics Laboratory.

NE

In FY 2017, NE will continue the disposition of the NPG buildings and initiate the disposition of the Radiological Environmental Laboratory CF-690 and the Scoville Ordnance Offices (CF-633).

VII. Conclusion

DOE is continuously improving its enterprise-wide assessment, planning, and prioritization of excess facilities in order to address the potential risks these excess facilities pose to DOE's mission, workers, the public, and the environment. DOE's disposition priorities are to stabilize degraded higher-risk facilities, characterize their hazards and conditions, remove hazardous materials, and place them in a lower risk condition until the risk is eliminated by demolishing the facility and disposing of the resulting waste.

The recent efforts to define the scope of the excess facilities challenge identified over 2,300 excess facilities as of March 2016, with a ROM estimate to D&D of $32 billion, not including related costs such as waste disposal cells or treatment facilities. Approximately nine percent of these facilities were identified as higher risk and these higher-risk facilities represent over 36 percent of the total estimated D&D cost. Moreover, in the next ten years an estimated 1,000 additional facilities may be designated as excess, adding to the number of facilities to D&D and the associated costs.

Going forward, DOE will continue to address the challenges of managing contaminated excess facilities through the following steps:

- Conduct walk downs of the highest-risk facilities starting in FY 2016 to assess risks and to clarify conditions of transfer to EM, if funding is available.
- Update guidance for use by the Program Offices that builds on enterprise-wide expectations for excess facilities management and disposition and can be tailored for specific program needs. Items to be addressed include:
    - Planning and executing projects in a logical and cost effective manner;
    - Identifying and planning for additional resources that may be needed to support disposition, such as new waste treatment, handling, or disposal facilities;
    - Placing excess facilities in safe, stable, and lower cost conditions through deactivation while awaiting D&D;
    - Evaluating the physical condition of facilities annually to determine increased risk that may be associated with those conditions, and changes in priorities for addressing those risks; and
    - Ensuring DOE remains focused on the higher-risk facilities as a management priority.
- Improve the data collection used to track and report progress on the D&D of excess facilities.
- Evaluate strategies that increase efficiencies for D&D, such as streamlining requirements where appropriate and investing in technology research and development.
- Implement the CRENEL recommendations on excess facilities and infrastructure, as reflected in the DOE February 2016 response to the CRENEL report.

Appendix A: Assessment Guide for Prioritization

MISSION	PUBLIC HEALTH/ENVIRONMENTAL STEWARDSHIP	SAFETY
No Impact - Retention of the facility that has no impact on Site mission.	No Impact – Over the retention period of the facility, the facility and its contents are not expected to pose radiological, chemical, or hazardous material release to the environment that could impact local employees, site visitors, and/or public health. Compliant with environmental requirements, slight probability for near term non-compliances.	No Impact – Facility condition poses no safety concerns to Site employees.
Minor Impact - Retention of the facility that has minor impact on Site mission. Mission can be achieved with minor adjustments to scientific/programmatic schedule and cost operations.	Minor Impact – over the retention period of the facility, if not actively managed, the facility and its contents could present minor radiological, chemical, or hazardous material release to the environment that could impact local employee health. Occasional minor deviation of environmental compliance requirements.	Minor Impact – Facility condition poses minor safety concerns to Site employees due to deterioration/deferred maintenance.
Major Impact - Retention of the facility has major impact on Site mission. Mission can be achieved with major adjustments to scientific/programmatic schedule and cost operations.	Major Impact – over the retention period of the facility, if not actively managed, the facility and its contents could present a significant radiological, chemical, or hazardous material release to the environment that could impact site employees and visitors, along with local employee health. Frequent minor violations of environmental compliance requirements.	Major Impact – Facility condition poses major safety concerns to Site employees due to deterioration/deferred maintenance.
Significant Impact - Retention of the facility has significant impact and is preventing the achievement/progress of specific Site mission goals.	Significant Impact – over the retention period of the facility, if not actively managed, the facility and its contents could present a very significant radiological, chemical, or hazardous material release to the environment that could impact off-site public, site employees and visitors, along with local employee health. Serious frequent violations of environmental compliance requirements.	Significant Impact – Facility condition is unsafe for any access as a result of deterioration/deferred maintenance.

Appendix B: Higher-Risk DOE Excess Facilities as of March 2016

Notes:

- The list of numbers is for reference and do not indicate a priority ranking. As described in the preceding report, all excess facilities on this list are relatively higher risk with those listed as Tier I being higher risk than Tier II. All excess facilities on this list have either processed-related or industrial-related contamination.
- The EM total lifecycle ROM D&D costs for the higher risk excess facilities in this Appendix is $9.3 billion. This cost represents a subset of the total EM D&D direct program ROM cost estimate of $29 billion and is not broken out on a facility-by-facility level. The "ROM Costs" cell for the EM facilities is shaded light blue.
- The gray shaded rows indicate disposition of the facility is included in a NNSA's five-year planning/budget profile.

Higher Risk Contaminated Excess Facilities									
List #	Priority Tier	Site Name	PSO	Property ID	Property Name	ROM Costs ($M)	Estimated Disposition Year	Avoided MSRO Costs ($M)	
								Annual MSRO Costs	Lifecycle MSRO Costs[11]
1	Tier I	ETTP	EM	1037	Materials Lab		2021	9.7	58.4
2	Tier I	ETTP	EM	1037-C	Smelter House		2021	0.01	0.1
3	Tier I	ETTP	EM	131	Maintenance Shop		2019	0.6	2.3
4	Tier I	ETTP	EM	1435-D	Incinerator Facility		2021	1.3	7.9
5	Tier I	ETTP	EM	1435-C	Tnk Farm & Drum Strg -- >Tnker Unload		2021	0.1	0.4

[11] Determined by multiplying Annual MSRO (maintenance, surveillance, repair, and operations) costs by the number of years until facility is dispositioned, or 25 years if estimated disposition year is unknown at this time.

Higher Risk Contaminated Excess Facilities									
List #	Priority Tier	Site Name	PSO	Property ID	Property Name	ROM Costs ($M)	Estimated Disposition Year	Avoided MSRO Costs ($M)	
								Annual MSRO Costs	Lifecycle MSRO Costs[11]
6	Tier I	ETTP	EM	27-402-01	Process Building 402-1		2018	1.4	4.2
7	Tier I	ETTP	EM	27-402-02	Process Building 402-2		2018	1.4	4.2
8	Tier I	ETTP	EM	27-402-03	Process Building 402-3		2018	1.4	4.2
9	Tier I	ETTP	EM	27-402-04	Process Building 402-4		2018	1.4	4.2
10	Tier I	ETTP	EM	27-402-05	Process Building 402-5		2018	1.4	4.2
11	Tier I	ETTP	EM	27-402-06	Process Building 402-6		2018	1.4	4.2
12	Tier I	ETTP	EM	27-402-07	Process Building 402-7		2018	1.4	4.2
13	Tier I	ETTP	EM	27-402-08	Process Building 402-8		2018	1.4	4.2
14	Tier I	ETTP	EM	27-402-09	Process Building 402-9		2018	1.4	4.2
15	Tier I	ETTP	EM	633	Demonstration Facility		2019	0.2	0.9
16	Tier I	LLNL	EM[12]	280	Livermore Pool Type Reactor	52.2	TBD	0.01	0.1
17	Tier I	LLNL	NNSA	175	MARS E-Beam Facility	16	TBD	0.1	3.4
18	Tier I	LLNL	NNSA	241	Pluto Project Testing and Fabrication Facility	5.4	TBD	0.1	1.6
19	Tier I	LLNL	NNSA	251	Heavy Elements Facility	62	TBD	0.1	1.4

[12] While EM is the owner in DOE's Facilities Information Management System, NNSA maintains Building 280 at LLNL.

Higher Risk Contaminated Excess Facilities									
List #	Priority Tier	Site Name	PSO	Property ID	Property Name	ROM Costs ($M)	Estimated Disposition Year	Avoided MSRO Costs ($M)	
								Annual MSRO Costs	Lifecycle MSRO Costs[11]
20	Tier I	LLNL	NNSA	292	Rotating Target Neutron Source	52	TBD	0.1	2.4
21	Tier I	ORNL (X-10)	EM	7025	Tritium Target Preparation Facility		2033	0.01	0.2
22	Tier I	ORNL (X-10)	EM	7512	Stack (For 7503)		2043	0.01	0.2
23	Tier I	ORNL (X-10)	EM	3038	Radioisotope Laboratory		2026	0.2	1.7
24	Tier I	ORNL (X-10)	EM	3121	Vessel Off Gas Filter House for 3019A		2037	0.1	1.2
25	Tier I	ORNL (X-10)	EM	7500	Nuclear Safety Pilot Plant		2041	0.1 M	2.6 M
26	Tier I	RL	EM	324	Waste Technology Engineering Laboratory		2024	2 M	18 M
27	Tier I	RL	EM	242B	Radioactive Particle Research Laboratory		2047	0.01	0.2
28	Tier I	RL	EM	224B	Concentration Facility		2022	0.3	2.1
29	Tier I	SRS	EM	221000	F-Canyon		2038	10.8	248.3
30	Tier I	SRS	EM	235000	Metallurgical Building		2035	7	140
31	Tier I	Y-12	NNSA	9206	Production	188.7	TBD	1	25
32	Tier I	Y-12	NNSA	9201-05	Production (Alpha 5)	520.5	TBD	1	25
33	Tier I	Y-12	NNSA	9204-04	Production (Beta 4)	321.9	TBD	1	25
34	Tier I	Y-12	SC	9201-02	Fusion Energy Building	237.3	TBD	0.6	15

Higher Risk Contaminated Excess Facilities									
List #	Priority Tier	Site Name	PSO	Property ID	Property Name	ROM Costs ($M)	Estimated Disposition Year	Avoided MSRO Costs ($M)	
								Annual MSRO Costs	Lifecycle MSRO Costs[11]
35	Tier I	Y-12	EM	9213	Development/Offices		2033	0.1	2.3
36	Tier I	Y-12	EM	9201-04	Environmental Management (Alpha-4)		2032	3	51.2
37	Tier I	Y-12	SC	9207	Biology	56.1	TBD	0.6	15
38	Tier I	Y-12	SC	9210	Mammalian Genetics	14.2	TBD	0.6	15
39	Tier I	Y-12	SC	9422	Helium Compressor Building	5.8	TBD	0.01	15
40	Tier I	Y-12	SC	9204-01	Fusion Energy-Eng Tech	171.9	TBD	1	25
41	Tier I	Y-12	SC	9207A	9207 Annex	1.4	TBD	0.01	0.25
42	Tier I	Y-12	SC	9732-02	Storage Building	0.3	TBD	0.01	0.25
43	Tier I	Y-12	SC	9743-02	Pigeon Quarters	0.9	TBD	0.01	0.25
44	Tier I	Y-12	SC	9770-02	Radiation Source Bldg.	0.5	TBD	0.01	0.25
45	Tier II	BNL	SC	491	Medical Research Reactor	8.1	TBD	0.01	0.1
46	Tier II	BNL	SC	650	Former Custodial Storage	11.5	TBD	0.1	1.4
47	Tier II	BNL	SC	701	Former BGRR Project Offices	33.5	TBD	0.1	1.4
48	Tier II	BNL	SC	Reactor - BMRR	Medical Reactor	24.4	TBD	0.01	0.1
49	Tier II	BNL	SC	Reactor - HFBR	HFBR	129.1	TBD	0.1	2.5

Higher Risk Contaminated Excess Facilities									
List #	Priority Tier	Site Name	PSO	Property ID	Property Name	ROM Costs ($M)	Estimated Disposition Year	Avoided MSRO Costs ($M)	
								Annual MSRO Costs	Lifecycle MSRO Costs[11]
50	Tier II	ETTP	EM	1407-H	Central Neutralization Fac		2021	0.1	0.4
51	Tier II	KCP	NNSA	1	Manufacturing Building[13]	228	2017		
52	Tier II	LANL	NNSA	18-0032	Critical Assembly Bldg (Casa 2)	1.3	2016	0	0
53	Tier II	LANL	NNSA	18-0116	Critical Assembly Bldg Casa 3	2.4	2016	0	0
54	Tier II	LANL	NNSA	16-0430	He Pressing	6.1	2019	0	0
55	Tier II	LANL	NNSA	03-0016	Ion Beam Facility	53.4	TBD	0	0
56	Tier II	LANL	NNSA	16-0280	Inspection Bldg	2.4	TBD	0	0
57	Tier II	LANL	NNSA	16-0306	Plastics Bldg	14.7	TBD	0	0
58	Tier II	LBNL	SC	016	Laboratories and Research Offices	11.8	2016	0.1	0.1
59	Tier II	LBNL	SC	005	Laboratories & Research Offices	7.3	2016	0.1	0.1
60	Tier II	LBNL	SC	016A	Storage	0.3	2016	0.01	0.01
61	Tier II	LBNL	SC[14]	007	Assembly, Offices & Labs (ALS Support)	21.4	2018	0.6	1.7
62	Tier II	LBNL	SC	073A	Utility Equipment Bldg. (red-tagged)	0.1	TBD	0.01	0.1

[13] The ROM cost estimate for the Kansas City Plant includes the cost of all facilities included in the project to transfer the Bannister Road Complex to the private sector for redevelopment.

[14] While SC is identified as the responsible HQ Program Office for building B007 and B007C, EM is funding the D&D of Old Town.

Higher Risk Contaminated Excess Facilities									
List #	Priority Tier	Site Name	PSO	Property ID	Property Name	ROM Costs ($M)	Estimated Disposition Year	Avoided MSRO Costs ($M)	
								Annual MSRO Costs	Lifecycle MSRO Costs[11]
63	Tier II	LBNL	SC	073	Previously Labs/Shops/Office (red-tagged)	1.3	TBD	0.1	1.4
64	Tier II	LLNL	NNSA	221	Chemistry Facility	9	TBD	0.004	0.1
65	Tier II	LLNL	NNSA	326	Material Science Testing Facility	1	TBD	0.01	0.2
66	Tier II	LLNL	NNSA	343	Explosives and High Pressure Testing Facility	6	TBD	0.05	1.1
67	Tier II	LLNL	NNSA	OS212	Accelerator Facility	22	TBD	0	0
68	Tier II	ORNL (X-10)	EM	4507	High Level Chemical Dev Lab		2033	0.2	3.9
69	Tier II	ORNL (X-10)	EM	7503	MSRE Building		2043	0.4	10.8
70	Tier II	ORNL (X-10)	EM	7511	Filter Pit (For MSRE 7503)		2043	0.02	0.4
71	Tier II	ORNL (X-10)	EM	7514	Filter House For 7503		2043	0.01	0.1
72	Tier II	ORNL (X-10)	EM	3002	Filter House for Graphite Reactor - 3001		2033	0.3	7.7
73	Tier II	ORNL (X-10)	EM	3005	Low-Intensity Test Reactor Facility		2033	0.04	1
74	Tier II	ORNL (X-10)	EM	3010	Bulk Shielding Reactor		2033	0.04	1
75	Tier II	ORNL (X-10)	EM	3029	Radioisotope Production Lab-B		2030	0.1	1.5
76	Tier II	ORNL (X-10)	EM	3042	Oak Ridge Research Reactor (ORRR)		2033	0.3	6.7

Higher Risk Contaminated Excess Facilities									
List #	Priority Tier	Site Name	PSO	Property ID	Property Name	ROM Costs ($M)	Estimated Disposition Year	Avoided MSRO Costs ($M)	
								Annual MSRO Costs	Lifecycle MSRO Costs[11]
77	Tier II	ORNL (X-10)	EM	3107	25 Meter Target House		2033	0.003	0.1
78	Tier II	ORNL (X-10)	EM	3126	Charcoal Filt (Nog) Orr		2030	0.002	0.1
79	Tier II	ORNL (X-10)	EM	3139	Cell Ventilation Filters-ORR		2030	0.02	0.4
80	Tier II	ORNL (X-10)	EM	3515	Fission Product Lab No 1		2032	0.02	0.5
81	Tier II	ORNL (X-10)	EM	3517	Fission Products Development Laboratory		2032	0.5	13.5
82	Tier II	ORNL (X-10)	EM	3005-R	3005 Low Intensity Test Reactor (X900005)		2042	0.3	8
83	Tier II	ORNL (X-10)	EM	3010-RP	3010 Swim'G Pool Reactor (X900004)		2042	0.3	6.9
84	Tier II	ORNL (X-10)	EM	3010-RS	3010 Bulk Shield'G Reactor (X900007)		2042	0.1	1.8
85	Tier II	ORNL (X-10)	EM	3019B	High Level Radiation Analytical Lab		2033	4.9	122.7
86	Tier II	ORNL (X-10)	EM	3026D	Dismantling & Examination Hot Cells		2030	0.7	18.1
87	Tier II	ORNL (X-10)	EM	3042-R	Oak Ridge Research Reactor (X900042)		2035	2.8	70.4
88	Tier II	ORP	EM	216A	Valve Control Facility		2028	0	0
89	Tier II	ORP	EM	291AR	Exhaust Air Filter Stack Building		2044	0.005	0.1
90	Tier II	ORP	EM	242A702	Turbine Building		TBD	0.01	0.2

Higher Risk Contaminated Excess Facilities									
List #	Priority Tier	Site Name	PSO	Property ID	Property Name	ROM Costs ($M)	Estimated Disposition Year	Avoided MSRO Costs ($M)	
								Annual MSRO Costs	Lifecycle MSRO Costs[11]
91	Tier II	ORP	EM	2713S	Lab Office Building		TBD	0.2	4.4
92	Tier II	ORP	EM	6241V	Vent Station and Support Building		2044	0.2	7.2
93	Tier II	PAD	EM	C-310	Purge and Product Building		2040	0.6	15
94	Tier II	PAD	EM	C-310-A	Product Withdrawal Building		2040	0.02	0.4
95	Tier II	PAD	EM	C-315	Surge and Waste Building		2040	0.1	2.1
96	Tier II	PAD	EM	C-331	Process Building		2040	12.4	310
97	Tier II	PAD	EM	C-333	Process Building		2040	11.4	284.3
98	Tier II	PAD	EM	C-333-A	Feed Vaporization Facility		2040	0.04	1.1
99	Tier II	PAD	EM	C-335	Process Building		2040	5.5	137.3
100	Tier II	PAD	EM	C-337	Process Building		2040	11.4	284.3
101	Tier II	PAD	EM	C-337-A	Feed Vaporization Facility		2040	0.05	1.1
102	Tier II	PAD	EM	C-400	Cleaning Building		2040	0.5	12.5
103	Tier II	PAD	EM	C-409	Stabilization Building		2040	0.1	2.5
104	Tier II	PORTS	EM	X-326	GDP Process Building		2029	11.8	165
105	Tier II	PORTS	EM	X-330	GDP Process Building		2029	9.6	134
106	Tier II	PORTS	EM	X-333	GDP Process Building		2029	9.3	130

Higher Risk Contaminated Excess Facilities									
List #	Priority Tier	Site Name	PSO	Property ID	Property Name	ROM Costs ($M)	Estimated Disposition Year	Avoided MSRO Costs ($M)	
								Annual MSRO Costs	Lifecycle MSRO Costs[11]
107	Tier II	PORTS	EM	X-342A	Feed, Vaporization and Sampling Facility		2029	0.2	2.8
108	Tier II	PORTS	EM	X-343	Feed, Vaporization and Sampling Facility		2029	0.2	2.8
109	Tier II	PORTS	EM	X-344A	UF6 Sampling Facility		2029	1	14
110	Tier II	PORTS	EM	X-345	SNM Storage Building		2029	0.1	1.4
111	Tier II	PORTS	EM	X-710	Technical Services Building		2029	1.4	19.6
112	Tier II	PORTS	EM	X-744G	Bulk Storage Building		2029	0.3	4.2
113	Tier II	PORTS	EM	X-232C-2	Tie Line No. 2, X-330 to X-326		2029	0	0
114	Tier II	PORTS	EM	X-232C-4	Tie Line No. 2, X-326 to X-330		2029	0	0
115	Tier II	RL	EM	2711S	Stack Gas Monitoring Station		2016	0.0003	0.01
116	Tier II	RL	EM	2718S	Equipment/Lead Shielding Storage Shed		2016	0.0003	0.01
117	Tier II	RL	EM	234-5Z	PFP and Storage		2017	0	0
118	Tier II	RL	EM	105C	Cocooned Reactor Building		2050	0.01	0.4
119	Tier II	RL	EM	105DR	Cocooned Reactor Building		2050	0.01	0.3
120	Tier II	RL	EM	105F	Cocooned Reactor Building		2050	0.01	0.4
121	Tier II	RL	EM	105H	Cocooned Reactor Building		2050	0.02	0.5

Higher Risk Contaminated Excess Facilities									
List #	Priority Tier	Site Name	PSO	Property ID	Property Name	ROM Costs ($M)	Estimated Disposition Year	Avoided MSRO Costs ($M)	
								Annual MSRO Costs	Lifecycle MSRO Costs[11]
122	Tier II	RL	EM	105KW	Reactor Building		2050	0.1	2.1
123	Tier II	RL	EM	105KE	Reactor Building		2050	0.1	2.1
124	Tier II	RL	EM	105N	Cocooned Reactor		2050	0.1	2.8
125	Tier II	RL	EM	213A	Fission Product Load-in Station		2027	0.001	0.01
126	Tier II	RL	EM	218 E14 & E15	PUREX Plant Storage Tunnels 1 and 2		TBD	0.001	0.03
127	Tier II	RL	EM	276C	Solvent Handling Building		2023	0.005	0.04
128	Tier II	RL	EM	291AB	Exhaust Air Sampler House 1		2027	0.003	0.04
129	Tier II	RL	EM	203A	Acid Pump House		2026	0.002	0.02
130	Tier II	RL	EM	206A	Vacuum Acid Fractionator Building		2030	0.003	0.1
131	Tier II	RL	EM	212A	Fission Product Load-out Station		2030	0.001	0.02
132	Tier II	RL	EM	212B	Fission Products Load Out Station		2024	0.01	0.1
133	Tier II	RL	EM	291AC	Exhaust Air Sampler House 2		2027	0.0001	0.001
134	Tier II	RL	EM	293A	Off-Gas Treatment Facility		2027	0.004	0.1
135	Tier II	RL	EM	294A	Off Gas Treatment and Monitoring Station		2027	0.001	0.02
136	Tier II	RL	EM	221BB	Process Steam and Condensate Building		2023	0.001	0.01

Higher Risk Contaminated Excess Facilities									
List #	Priority Tier	Site Name	PSO	Property ID	Property Name	ROM Costs ($M)	Estimated Disposition Year	Avoided MSRO Costs ($M)	
								Annual MSRO Costs	Lifecycle MSRO Costs[11]
137	Tier II	RL	EM	221BC	SWP Change House		2022	0.001	0.01
138	Tier II	RL	EM	221BD	Laundry Storage Building		2022	0.001	0.01
139	Tier II	RL	EM	221BF	Condensate Effluent Discharge Facility		2023	0.004	0.03
140	Tier II	RL	EM	222B	Office Building		2023	0.01	0.1
141	Tier II	RL	EM	271B	B Plant Support Building		2024	0.1	0.5
142	Tier II	RL	EM	2716B	Radiation Monitoring Checkout Station		2025	0.0004	0.004
143	Tier II	RL	EM	291AD	Ammonia Off-Gas Building		2027	0.001	0.01
144	Tier II	RL	EM	291B	Exhaust Air Control House, Sand Filter		2024	0.01	0.1
145	Tier II	RL	EM	291BB	Instrument Building		2023	0.0003	0.002
146	Tier II	RL	EM	291BD	Instrument Building and Filter Vault		2026	0.004	0.04
147	Tier II	RL	EM	291BF	Instrument Building and Filter Vault		2025	0.003	0.03
148	Tier II	RL	EM	292AA	Plutonium Recovery Stack Sample House		2041	0.0002	0.01
149	Tier II	RL	EM	291BA	Exhaust Air Sample House		2022	0.0001	0.001
150	Tier II	RL	EM	295AA	SCD Sample and Pumpout Station		2041	0.0002	0.004
151	Tier II	RL	EM	2711A	Air Compressor Building		2026	0.001	0.01

Higher Risk Contaminated Excess Facilities									
List #	Priority Tier	Site Name	PSO	Property ID	Property Name	ROM Costs ($M)	Estimated Disposition Year	Avoided MSRO Costs ($M)	
								Annual MSRO Costs	Lifecycle MSRO Costs[11]
152	Tier II	RL	EM	292B	Stack Monitor Station		2023	0.001	0.005
153	Tier II	RL	EM	295A	Ammonia Scrubber/Discharge Sample		2027	0.0002	0.002
154	Tier II	RL	EM	295AD	SWL Sample Station		2041	0.0003	0.01
155	Tier II	RL	EM	295AB	PDD Sample Station		2026	0.001	0.01
156	Tier II	RL	EM	291BK	Instrument Building		2024	0.0002	0.002
157	Tier II	RL	EM	291U	Exhaust Fan Control House, Sand Filter		2023	0.01	0.1
158	Tier II	RL	EM	292T	Fission Products Release Laboratory		2044	0.02	0.6
159	Tier II	RL	EM	292U	Stack Monitoring Station		2023	0.001	0.002
160	Tier II	RL	EM	292S	Jet Pit House		2046	0.001	0.03
161	Tier II	RL	EM	293S	Acid Recovery and Off Gas Treatment Bldg		2046	0.003	0.1
162	Tier II	RL	EM	405	FFTF Reactor Containment Building		2031	0.1	1.1
163	Tier II	RL	EM	4717	Reactor Service Building		2032	0.1	1.6
164	Tier II	RL	EM	491S	HTS Service Building, South		2028	0.02	0.3
165	Tier II	RL	EM	291AJ	Sample Station 3		2027	0.0001	0.002
166	Tier II	RL	EM	291BG	Instrument Building and Filter Vault		2023	0.003	0.02

Higher Risk Contaminated Excess Facilities									
List #	Priority Tier	Site Name	PSO	Property ID	Property Name	ROM Costs ($M)	Estimated Disposition Year	Avoided MSRO Costs ($M)	
								Annual MSRO Costs	Lifecycle MSRO Costs[11]
167	Tier II	RL	EM	292AB	Purex Gas Effluent Monitoring Building		2041	0.003	0.07
168	Tier II	RL	EM	295AC	Chemical Sewer Line Sample Station		2026	0.0002	0.002
169	Tier II	RL	EM	291AH	Ammonia Off Gas Sample Station		2027	0.0001	0.001
170	Tier II	RL	EM	291AK	Tunnel Spray Enclosure and Caissons		2032	0.0004	0.01
171	Tier II	RL	EM	276A	Cold Solvent Storage Building, R Cell		2030	0.03	0.5
172	Tier II	RL	EM	242BL	Cask Loading Building		2046	0.001	0.03
173	Tier II	RL	EM	291A	PUREX Main Exhaust System		2041	0.02	0.4
174	Tier II	RL	EM	291BC	Access Control Building, Filter Vaults		2026	0.01	0.1
175	Tier II	RL	EM	291BJ	Instrument Building and 6th Filter Vault		2023	0.01	0.1
176	Tier II	RL	EM	241CX40	Grout Removal Building		2023	0.001	0.01
177	Tier II	RL	EM	291U001	221 U Main Stack		2019	0.003	0.01
178	Tier II	RL	EM	202A	PUREX Canyon and Service Facility		2032	0.6	9.4
179	Tier II	RL	EM	202S	Redox Canyon And Service Facility		2048	0.7	21.5
180	Tier II	RL	EM	221B	B Plant Canyon		2027	0.8	9.6

Higher Risk Contaminated Excess Facilities									
List #	Priority Tier	Site Name	PSO	Property ID	Property Name	ROM Costs ($M)	Estimated Disposition Year	Avoided MSRO Costs ($M)	
								Annual MSRO Costs	Lifecycle MSRO Costs[11]
181	Tier II	RL	EM	224T	Transuranic Storage and Assay Facility		2043	0.3	8.4
182	Tier II	RL	EM	231Z	Materials Engineering Laboratory		2019	0.5	2
183	Tier II	RL	EM	276S	Cold Solvent Storage and Makeup Building		2046	0.01	0.2
184	Tier II	SRS	EM	221001	F-Canyon A Line		2035	0.6	11.1
185	Tier II	SRS	EM	292001	Vessel Vent Fan House		2034	0.001	0.03
186	Tier II	SRS	NNSA	232000	Manufacturing Building	31.7	TBD	0.1	2.5
187	Tier II	SRS	NNSA	232001	Shop & Storage Building	4	TBD	0.01	0.3
188	Tier II	WVDP	EM	NA	Main Plant Process Building		2020	2	8
189	Tier II	WVDP	EM	NA	Vitrification Facility		2020	2	8
190	Tier II	WVDP	EM	NA	Low-Level Radiological Wastewater Treatment Facility		2018	0.6	1.8
191	Tier II	WVDP	EM	NA	Chemical Process Cell- Waste Storage Facility		2019	0.6	2.4
192	Tier II	WVDP	EM	NA	Vitrification Vault (Corral)		2019	0.6	2.4
193	Tier II	WVDP	EM	NA	High Level Waste Tank Pumps Storage Vaults		2019	0.6	2.4
194	Tier II	WVDP	EM	NA	Administrative Building		2018	0.6	2.4
195	Tier II	WVDP	EM	NA	Radwaste Treatment System Drum Cell		TBD	0.1	2.5

Higher Risk Contaminated Excess Facilities									
List #	Priority Tier	Site Name	PSO	Property ID	Property Name	ROM Costs ($M)	Estimated Disposition Year	Avoided MSRO Costs ($M)	
								Annual MSRO Costs	Lifecycle MSRO Costs[11]
196	Tier II	WVDP	EM	NA	Equipment Shelter and Condensers		2018	0.1	0.3
197	Tier II	WVDP	EM	NA	Warehouse Bulk Oil Storage Unit		2019	0.6	2.4
198	Tier II	WVDP	EM	NA	Liquid Pretreatment System Building		2019	0.6	2.4
199	Tier II	Y-12	NNSA	9720-17	Warehouse/Industrial	1	TBD	0.1	1.3
200	Tier II	Y-12	NNSA	9720-22	Storage	3.3	TBD	0.1	1.3
201	Tier II	Y-12	NNSA	9720-24	Classified Tool Storage	0.8	TBD	0.01	0.1
202	Tier II	Y-12	SC	9767-06	Utilities	0.2	TBD	0.01	0.25
203	Tier II	Y-12	SC	9767-07	Utilities	0.2	TBD	0.01	0.25