

# Facility Deactivation & Decommissioning (D&D) Executive Overview

2011 Edition



K-25, Oak Ridge (844,000 ft<sup>2</sup> demolished)



K Cooling Tower, Savannah River



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**This document presents an overview of DOE's Complex-wide facility D&D project locations, scope, cost and challenges:**

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# Data Sources and Programmatic Assumptions

**Data presented in this D&D reference guide was obtained from the following sources:**

- Analytical Building Blocks (ABBs) (Current Planning Data as of Spring 2010)
- FY 2011 DOE Congressional Budget Request Document
- Facility Information Management System (FIMS)
- Integrated Planning, Accountability, and Budgeting Summary (IPABS)
- Integrated Priority List (IPL) (FY 2013 Budget Formulation)
- Site field reports and internet web pages

The ABBs are the primary source of information related to D&D projects presented in this document. In some cases, data from multiple sources may not be in exact agreement. In these cases, the hierarchal order was used as the default.

Project completion data were taken from the Corporate Measures Totals presented in the FY 2011 DOE Congressional Budget Request Document, which are only reported through FY 2009.

This D&D compendium was prepared prior to the April 2011 Congressional Budget Decisions (HR 1473) and does not reflect site, and thus project, allocations necessitated by these decisions.



# Data Sources and Programmatic Assumptions (continued)

- D&D costs presented herein are budgetary estimates extracted from the updated ABB data submitted for the development of the FY 2012 Business Case. ABBs were created at a work breakdown level just below the Project Baseline Summary (PBS) to provide additional flexibility in analyzing funding alternative scenarios. The projects' costs, used here to define and sort project size, reflect only the "progress" dollars for the D&D activities. Both progress and maintenance costs are, however, shown in the graphic cost profiles. Maintenance costs include surveillance-maintenance, project management, and contingency/management reserve costs.
- The costs will not necessarily match PBS costs, as there are soil or waste site remediation ABBs, infrastructure maintenance ABBs, and oversight management ABBs that are, at times, consolidated at the PBS level, and that have been, by design, excluded from the D&D project costs for sorting purposes. *(Some costs appear to be inaccurately categorized, causing distortion in "progress" dollars at sites such as Portsmouth. EM-Headquarters continues to refine the ABB process to eventually alleviate such inconsistencies.)*
- 296 excess contaminated facilities were accepted for transfer from the DOE Office of Science, Office of Nuclear Energy, and the National Nuclear Security Administration in 2009\*. The largest numbers of facilities accepted are at the Oak Ridge Reservation (under the Integrated Facilities Disposition Project) and the Idaho National Laboratory (see pages 26& 27 for additional details). ARRA funding has resulted in the accelerated demolition of 61 facilities. The schedule for the transfer of the remaining facilities is still evolving and therefore the effect on the EM budget profile is not fully known at this time, however, no transfers are expected to occur before 2017.
- ARRA funding has had a positive impact on the EM baseline by accelerating the D&D of several facilities, and as mentioned above, accelerating the deactivation/stabilization/deinventorying and in some cases the complete demolition of excess facilities identified for transfer from other PSOs and NNSA. The remaining ARRA D&D scope will be completed by the end of 2011 as originally planned.

\*296 facilities were originally accepted by EM. ARRA funding accelerated the D&D of 61 transfer facilities, leaving 235 remaining for D&D.



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# FY 2010 D&D Accomplishments

## Buildings Demolished

Site	Facility Completions	Total GSF	\$ (K)*	ARRA or Base Program
Idaho National Laboratory	41	121,314	\$77,778	ARRA
Los Alamos National Laboratory	19	94,013	\$12,822	ARRA
Los Alamos National Laboratory	2	-	\$1,457	Base
Oak Ridge - ETPP	40	-	\$223,985	Base
Oak Ridge – Y-12	1	67,404	\$141,594	ARRA
Paducah	1	23,698	\$42,507	ARRA
Portsmouth	11	109,089	\$81,380	ARRA
Richland	39	105,581	\$219,693	ARRA
Richland	20	-	\$103,733	Base
Savannah River	8	109,113	\$162,088	ARRA
<b>TOTAL</b>	<b>182</b>	<b>630,212</b>	<b>\$1,067,037</b>	

Note: Only ARRA projects are currently reporting the square footage metrics.

\* Reported costs represent total D&D spending in FY 2010 at each site, as recorded in IPABS. The level of detail of the data does not differentiate what costs were directly attributed to the facility completions listed versus other D&D work (not resulting in 'completion') conducted during this period. For example, the \$162 Million at Savannah River includes costs associated with the partial entombment of P and R Reactors, but since these projects have not been completed, the facility completion count and associated GSF are not included. Similarly, because the demolition of the K-25 West Wing at ETPP represents only a partial completion, the associated footprint reduction of 844,000 GSF is not included on this page.

The following pages provide a snap shot of D&D Activities in FY 2010.



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# FY 2010 D&D Accomplishments (cont')

## Idaho National Laboratory -- Materials Test Reactor Demolition

Demolition of Reactor Bioshield



Removal of inner shielding



Removal of Reactor Vessel



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# FY 2010 D&D Accomplishments (cont')

## Idaho National Laboratory – Materials and Fuels Complex (MFC)

Removed approximately 425,000 lbs of lead to date



Lead removal within the RSCL Cell



Lead removal within MFC -767

1.3 miles of asbestos (facility-wide) removed



Before



After

MFC 795 – Cover Gas Cleanup System  
(above-ground) Demolished



Before



After

Super-heated steam treatment in MFC-766 Secondary Sodium Drain



Secondary Sodium Drain Tank in MFC-766 prior to treatment



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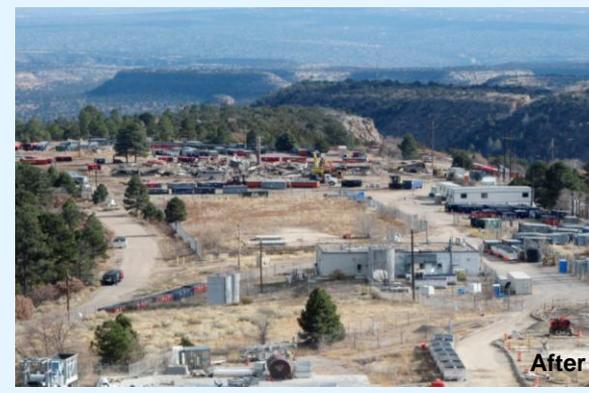
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# FY 2010 D&D Accomplishments (cont')

## Los Alamos National Laboratory



TA-21 D&D

DP East

DP West



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# FY 2010 D&D Accomplishments (cont')

## Oak Ridge Operations – ETTP K-25 Gaseous Diffusion Plant Demolition

- The west wing (844,000 ft<sup>2</sup>) of the K-25 building was demolished
- The east wing was prepared (deactivated) for demolition
- K-601 Demolished



Demolition of K-25 west wing



Removing motor assembly in east wing of K-25  
in preparation for demolition



Demolition of K-601



# FY 2010 D&D Accomplishments (cont')

## Oak Ridge Operations - Y-12 Biology Complex Building 9211 Demolition



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# FY 2010 D&D Accomplishments (cont')

## Richland Operations River Corridor D&D - Hanford N Reactor



The highly radioactive portions of the facility are being placed in Interim Safe Storage or "cocooned"



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# FY 2010 D&D Accomplishments (cont')

## Richland Operations River Corridor D&D - Hanford 300 Area

### Building 337 D&D



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# FY 2010 D&D Accomplishments (cont')

## Richland Operations Central Plateau D&D – Hanford U Plant Ancillary Facilities



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# FY 2010 D&D Accomplishments (cont')

## Richland Operations Central Plateau D&D – Hanford Fitzner/Eberhardt Arid Lands Reserve

### Lower Arid Lands Ecology Reserve



### Upper Arid Lands Ecology Reserve



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# FY 2010 D&D Accomplishments (cont')

## Richland Operations Central Plateau D&D – Hanford Plutonium Finishing Plant Demolition Preparation

- Removed five access control facilities and 15 fuel storage vaults
- Completed site's first Key Performance Parameter (KPP) for the ARRA funded work with the disposition/demolition of 22 facilities
- Removed 126 gloveboxes
- Shipped 110 gloveboxes
- Removed 346 feet of process transfer line
- Removed 572 feet of process vacuum pipe
- Started operations in the 'Chop Shop' size reduction vault in Room 172
- Completed initial cleanup of the PRF canyon floor



A glovebox being removed from the former process lines at PFP



The vehicle inspection tent and K-9 Unit guard house being demolished.



# FY 2010 D&D Accomplishments (cont')

## Savannah River Site

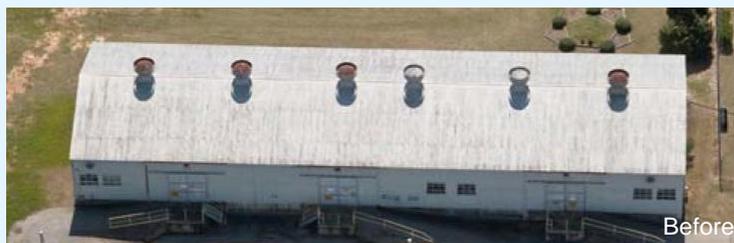
### 661G Small Arms Training Demolition



### 1853K Cooling Tower Demolition



### 710B Hazard Waste Storage Facility and Guardhouse Demolition



# FY 2010 D&D Accomplishments (cont')

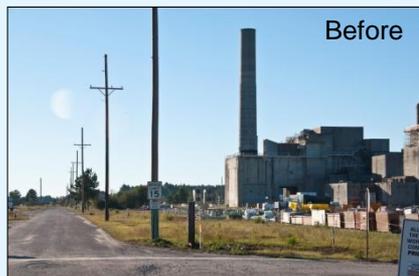
## Savannah River Site (cont')



R Reactor Disassembly Basin before Grouting



R Reactor Disassembly Basin after Grouting



Removal of two 145-foot tall, 700-ton exhaust stacks from the Site's P & R reactors.



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# Other Significant Accomplishments

## Argonne National Laboratory –

- Thirty-six 55-gallon drums of irradiated test material were removed from Building 205 making it possible to reclassify the building from a “Nuclear Hazard Category 2” facility to a “Radiological Facility”.
- Demolition was started on Building 330, the former Chicago Pile-5 (CP-5) heavy water reactor; when complete, 52,743 GSF will be removed.



CP-5 Demolition

## Brookhaven National Laboratory –

- Removed and disposed of Brookhaven Graphite Research Reactor’s (BGRR) graphite pile consisting of over 60,000 graphite blocks at a total volume of 15,625 cubic feet.
- Removed BGRR’s Bioshield and disposed the resulting Low Level Radioactive Waste consisting of nearly 500 cubic yards of metal, metal plate, concrete and secondary wastes.



Removal of graphite pile



# Other Significant Accomplishments (cont')

## Hanford –

- All ten hot cells, each weighing close to 500,000 pounds, were removed from Building 327. Each hot cell was filled with grout and disposed of at Hanford's Environmental Restoration Disposal Facility.
- Retrieved 3.5 cubic meters of radioactive material from ten 16-foot-long settler tubes located underwater in the K West Basin.
- Completed construction of super cells 9 and 10 at the Environmental Restoration Disposal Facility (ERDF). The super cells will increase ERDF's capacity to 16.4 million tons of waste material. The facility is equivalent in size to 52 football fields.

## Los Alamos National Laboratory –

- Waste from the former Tritium Systems Test Assembly (TSTA) was shipped to a disposal facility in Clive, Utah in 246 waste containers.

## Nevada Test Site –

- 25,000 gross square feet demolished.

## Paducah –

- The remaining legacy waste was removed from the Gaseous Diffusion Plant, reducing the cost of long-term storage, surveillance and maintenance of waste materials.

## ORNL

- Over 9,000 gross square feet demolished



# FY 2011 Base D&D Projects

Site	Project (ABB) Name	2011 Appropriations (\$K)*
Hanford	Balance of Nuclear Facility D&D – River Closure Project	\$202,116
Hanford	Fast Flux Test Facility (FFTF) D4	\$2,983
Oak Ridge	ETTP Main Plant D&D	\$2,800
Oak Ridge	ETTP Balance of Site D&D	\$86,222
Oak Ridge	K-25 Building D&D	\$116,764
Paducah	Inactive Facility D&D	\$22,139
Portsmouth	Facility Surveillance & Maintenance	\$177,590
SPRU	Nuclear Facility D&D – Separations Process Research Unit	\$50,895
West Valley	Nuclear Facility D&D – West Valley	\$37,737
<b>Total</b>		<b>\$699,246</b>

\* The 2011 appropriations above are from the FY 2013 Integrated Priority List (IPL). This represents more current information than the 2011 total on page 35 which uses the ABB current planning data from spring 2010. Because more current data are not available for outgoing years, the 2010 data were used on page 35 to maintain consistency within that table.



# FY 2011 ARRA D&D Projects

Site	Project (ABB) Name	FY 2011 Appropriations (\$K)
Argonne	Building 310 D&D	\$5,819
Argonne	Building 330 D&D	\$11,278
Argonne	AGHCF Waste & Materials Cleanup	\$5,146
Brookhaven	Nuclear Facility D&D – Brookhaven Graphite Research Reactor	\$15,403
Brookhaven	HFBR Record of Decision Compliance Phase Two	\$8,660
Hanford – RL	PFP D&D	\$154,887
Hanford – RL	U Plant/Other D&D	\$96,888
Hanford – RL	Outer Zone D&D	\$65,696
Hanford – RL	Central Plateau D&D Operations	\$9,214
Idaho	Facility D&D	\$35,377
Idaho	NTB D&D	\$6,524
Idaho	Material and Fuels Complex D&D	\$40,169
LANL	D&D TA-21	\$31,028
Nevada	NNSS Recovery Act Project – Soil & Water Remediation	\$10,682
Oak Ridge	K27 Demolition Preparation	\$1,044
Oak Ridge	K33 Demolition	\$43,900
Oak Ridge	Y12 Legacy Material Disposition	\$50,119
Oak Ridge	Y12 9206 Filter House D&D	\$5,185
Oak Ridge	Y12 Biology Complex	\$14,954
Oak Ridge	ORNL Defense Legacy Material Removal	\$6,530
Oak Ridge	Facility Demolition Small Facilities	\$4,878
Oak Ridge	Facility Demolition Hot Cells	\$5,421
Oak Ridge	ORNL Non-Defense Legacy Material Removal	\$8,026
Oak Ridge	ORNL Non-Defense Misc Facilities Demolition	\$7,369
Oak Ridge	ORNL Non-Defense Facility Demolition – 2000 Complex	\$862



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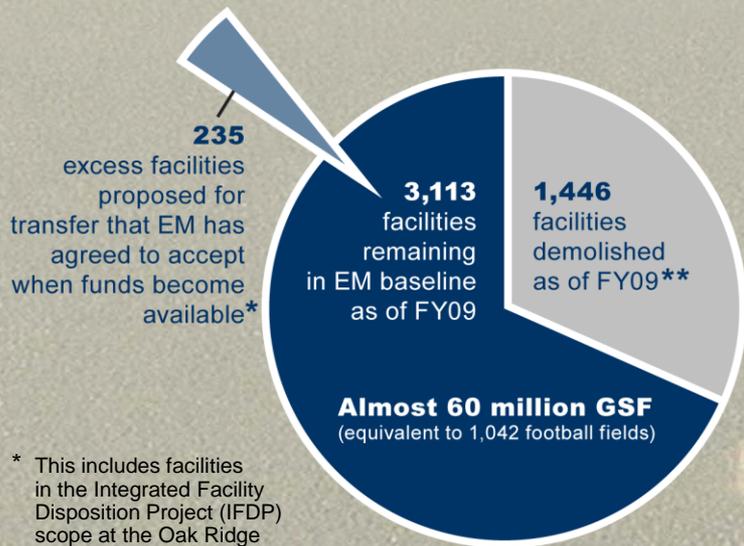
# FY 2011 ARRA D&D Projects

Site	Project (ABB) Name	FY 2011 Appropriations (\$K)
Paducah	Inactive Facility D&D Recovery Act	\$18,866
Portsmouth	Facility D&D	\$7,266
Savannah River	ARRA P and R Area Completion GPP and Operations	\$51,294
Savannah River	ARRA P Reactor Decommissioning Project	\$72,245
Savannah River	ARRA R Reactor Decommissioning Project	\$70,962
Savannah River	ARRA Site Wide Completion GPP and Operations	\$77,795
Savannah River	ARRA Heavy Water Components Test Reactor Decommissioning Project	\$8,531
West Valley	Nuclear Facility – Main Plant D&D	\$10,321
<b>Total</b>		<b>\$962,339</b>



# The EM D&D Program is Focused on Footprint Reduction

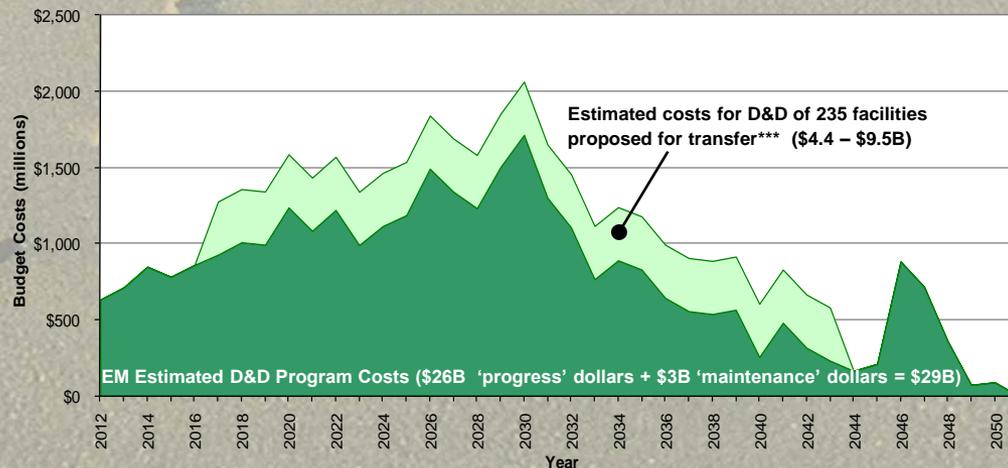
The EM footprint reduction (FPR) goal is aimed at reducing the overall size of a site, or a major area within a site, as well as removing the contamination located therein. Footprint reduction is achieved through demolition of structures, waste disposition, and remediation of soil and groundwater contamination. Building demolitions, which reduce EM's physical footprint (reported in gross square feet), enables and greatly contributes to EM's overall footprint reduction goal.



\* This includes facilities in the Integrated Facility Disposition Project (IFDP) scope at the Oak Ridge Reservation that are currently owned by the Offices of Science and Nuclear Energy and the National Nuclear Security Administration.

\*\* Project completion data taken from FY 2011 DOE Congressional Budget Request Document which reports through FY 2009. Progress does not include all of the ARRA D&D scope which will demolish up to 183 additional facilities from the current EM baseline and an additional 60 proposed transfer facilities by the end of FY11.

EM D&D Program Estimated Cost Profile



\*\*\* The schedule for facility transfers has not been finalized; no transfers are anticipated to occur before 2017. To graphically depict the magnitude of the effect, the total estimated cost of the transfers was levelized over the period of 2017 through 2043 and added to the base program.



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# FPR Supports EM's Focus on Risk and Cost/Schedule Reduction

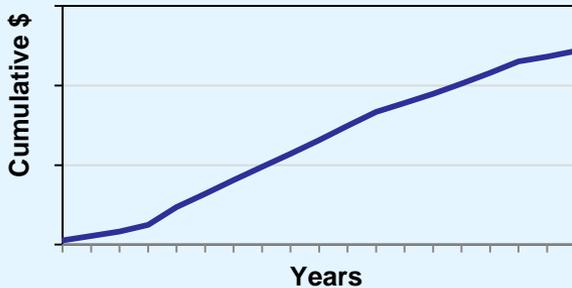


D&D

### Delaying D&D:

- Impedes schedule
- Increases cost (lingering S&M and escalation)
- Increases risk to workers and the environment (increased likelihood of contaminant release)

### Incremental Cost of Delaying D&D



### Timely D&D provides:

- Physical footprint reduction
- Elimination of S&M cost
- Schedule efficiency
- Reduction in curies (Ci)
- Reduction in risk

Demolition & Waste Disposition



Soil & Groundwater Remediation



### EM's Goals:

- Provide overall footprint reduction
- Ci reduction



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# EM ARRA D&D Summary

**EM received \$6 Billion in funding from the American Recovery and Reinvestment Act of 2009 (ARRA). \$3.32 Billion has been allocated for D&D projects across the complex. The remainder of the funding has been allocated to environmental restoration and waste disposition projects.**

- The majority of the D&D projects were selected because they can be completed by 2011 with the ARRA funding and provide significant footprint reduction.
- ARRA funding accelerated the EM Baseline with selected projects being completed 2 to 13 years earlier than originally planned.
- ARRA funding also provided for the accelerated D&D of excess facilities from other PSOs and NNSA.
- ARRA funds are being used to demolish 251 facilities, including the complete In-Situ Decommissioning (ISD) of the P and R production reactors at SRS and a Spent Fuel Processing Facility (CPP 601 & 640) at INL. ARRA funds are also being used to initiate ISD closure of the U-Plant Separation Facility at RL, as well as the deactivation/clean-out of approximately 29 facilities across the Complex.
- The overall ARRA goal is to have more than 6,000,000 square feet of facilities demolished by September 30, 2011. As of November 30, 2010, 1,335,850 square feet of facilities (22% of goal) has been demolished.



# Planned EM ARRA Scope

Site	Building Demolition				Facility Clean-out / Deactivation		
	# Facilities			GSF (1,000's)	# Facilities		
	Base Program	Transfer	Total		Base Program	Transfer	Total
Argonne National Lab	0	2	2	94	0	5	5
Brookhaven National Lab	2	2	4	11	2	0	2
Hanford	53	0	53	1,079	2	0	2
Idaho National Lab	70***	20*	90	827	0	0	0
Los Alamos National Lab	22	0	22	158	2	0	2
Nevada Test Site	5	0	5	202	0	0	0
Oak Ridge Operations	14	37**	51	3,180	2	5	7
Paducah	3	0	3	23	8	0	8
Portsmouth	12	0	12	278	1	0	1
Savannah River Site	9***	0	9	877	1	0	1
Separations Process Research Unit	2	0	2	60	0	0	0
West Valley	0	0	0	0	1	0	1
<b>Total</b>	<b>192</b>	<b>61</b>	<b>253</b>	<b>6,789</b>	<b>17</b>	<b>10</b>	<b>27</b>

Numbers reflect proposed scope as presented in the revised Project Operating Plans submitted to Headquarters; final facility count may vary due to scope adjustments and revisions.

\* An additional facility at INL (TRA-636, which is owned by NE) is being demolished with ARRA funding. The site considers this as "transfer scope"; however, it was not officially proposed for transfer to EM and EM has not agreed to accept it.

\*\* ARRA funding was also used to demolish the Filter House attached to B-9206 at Y-12; the Filter House represents negligible GSF and therefore the bulk of B-9206 remains for transfer under IFDP.

\*\*\* Includes in-situ decommissioning (ISD) of fuel processing facility (CPP-601 & CPP-640) at INL and P-Area (105-P) and R-Area (105-R) production reactors at SRS. ISD is the permanent entombment of a facility, containing residual radiological contamination, in its existing location.



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# Excess Facilities Planned for Transfer to EM

In an August 2006 US DOE Program Decision Memorandum (“Unfunded Environmental Liabilities,” IPL #103-107), then Deputy Secretary Clay Sell issued direction for EM to resume the responsibility for D&D and disposition of DOE’s unfunded environmental liabilities.

In December 2007, in response to this direction, the Assistant Secretary for Environmental Management (EM-1) invited the DOE Program Secretarial Offices (PSOs) of Nuclear Energy (NE), Science (SC), and the National Nuclear Security Administration (NNSA) to propose facilities and legacy waste for transfer to EM for final disposition or D&D.

In parallel with the EM-1 initiative, the Oak Ridge Reservation has proposed a large, highly complex project — the Integrated Facility Disposition Project (IFDP) — to complete cleanup of the Oak Ridge site by FY 2037. In addition to cleanup already owned by EM, IFDP incorporates cleanup scope currently owned by NNSA, SC, and NE and proposes to transfer this scope to EM for completion.

The table on the next page summarizes, by site, the number of facilities that EM has agreed to accept and reflects the current status incorporating ARRA progress.



ORNL Building 3026



INL TRA-632 Hot Cell #1



ANL Building 331



Y-12 Building 9204-1 (showing underground springs)



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# Excess Facilities Planned for Transfer to EM (cont.)

Site	PSO	# Facilities to be Demolished			Remaining Facilities	
		Originally Accepted by EM	Completed by ARRA	Remaining After ARRA	GSF	D&D ROM Cost Range (\$1,000,000)
Argonne National Lab	SC	9	2	7	1,275,200	\$209.9 – \$839.4 <sup>1,2</sup>
Brookhaven National Lab	SC	8	2	6	95,000	\$27.2 – \$108.8
Idaho National Lab	NE	35	20*	15	78,600	\$50.9 – \$203.4 <sup>1,3</sup>
Los Alamos National Lab	NNSA	1	0	1	56,300	\$5.4 – \$21.6
Lawrence Livermore National Lab	NNSA	4	0	4	149,000	\$31.3 – \$125
Oak Ridge National Lab	SC	131	32	99	621,000	Included with Y-12
Oak Ridge National Lab	NE	1	0	1	25,000	
Nevada Test Site	NNSA	6	0	6	19,300	\$3.2 – \$12.8
Stanford Linear Accelerator Center	SC	1	0	1	100,000	\$18 – \$72
Savannah River Site	NNSA	2	0	2	72,000	\$29 – \$116
Y-12 National Security Complex	NE	2	0	2	256,000	\$4,000 – \$8,000 <sup>4</sup>
Y-12 National Security Complex	SC	18	3	15	887,000	
Y-12 National Security Complex	NNSA	78	2**	76	1,924,000	
<b>Total</b>		<b>296</b>	<b>61</b>	<b>235</b>	<b>5,558,400</b>	<b>\$4,375 – \$9,499</b>

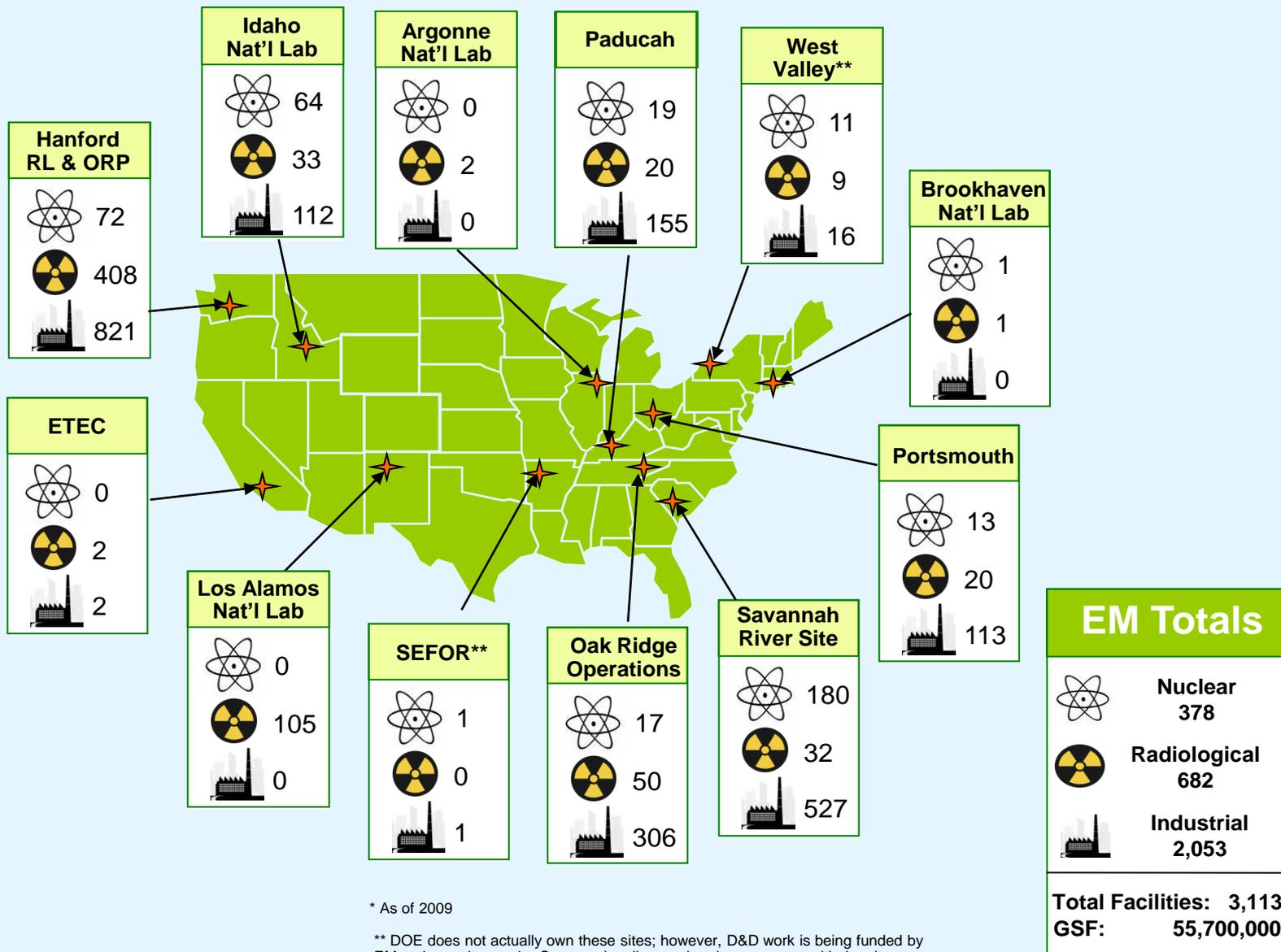
1. Does not include facilities added by PSO after EM's 2008 evaluations.
2. Does not include waste cleanout project not directly supporting D&D.
3. Does not include programmatic transfers.
4. Total CD-1 cost range for the Integrated Facilities Disposition Project (IFDP) at ORNL & Y-12 is estimated between \$4 – \$8 billion.

\* An additional facility at INL (TRA-636, which is owned by NE) is being demolished with ARRA funding. The site considers this as "transfer scope"; however, it was not officially proposed for transfer to EM and EM has not agreed to accept it.

\*\* ARRA funding was also used to demolish the Filter House attached to B-9206 at Y-12; the Filter House represents negligible GSF and therefore the bulk of B-9206 remains for transfer under IFDP.



# Remaining\* Facilities Planned for D&D in Current EM Baseline



\* As of 2009

\*\* DOE does not actually own these sites; however, D&D work is being funded by EM at these sites under Congressionally-mandated agreements with the site owner.



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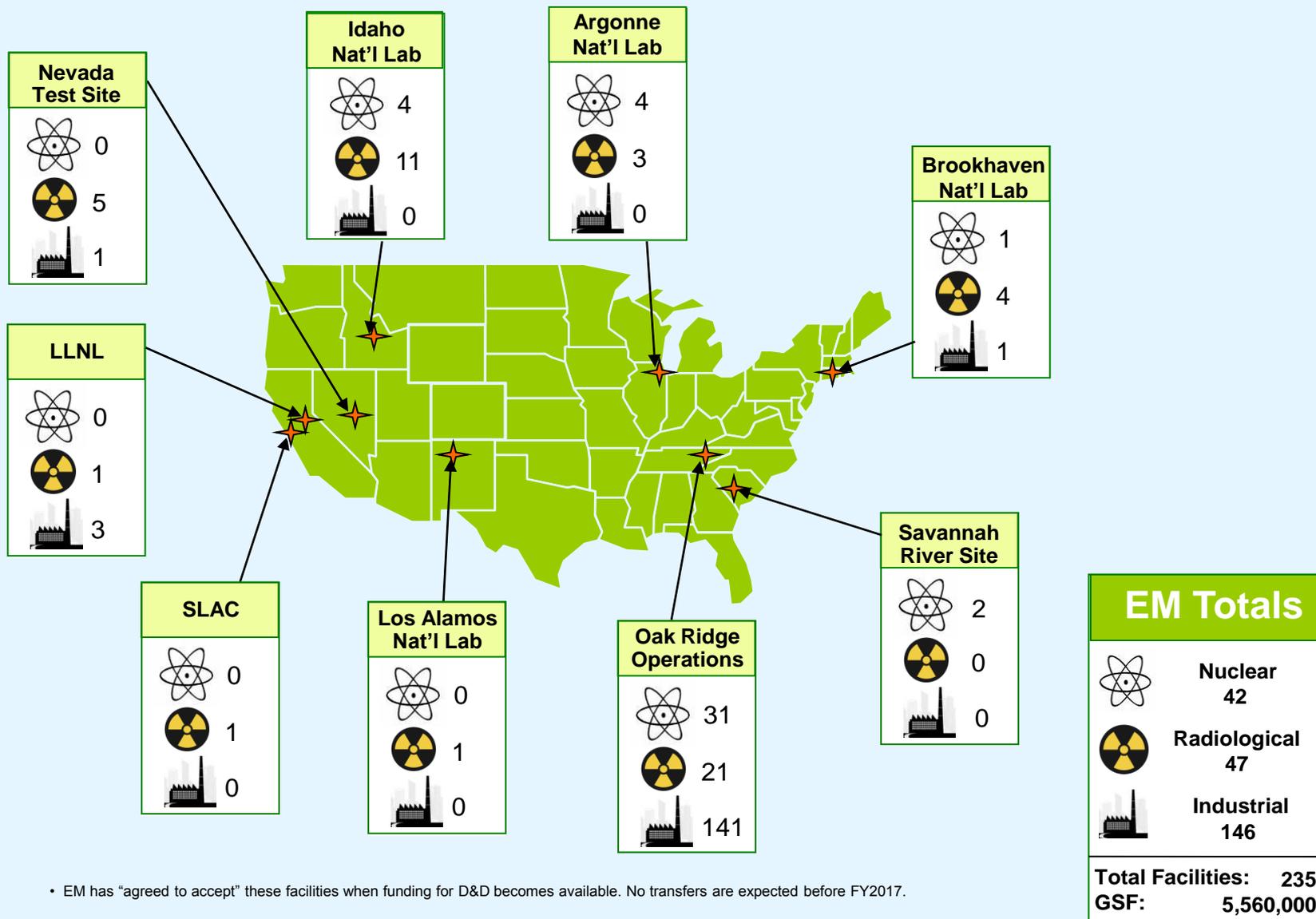
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# Facilities Planned for Transfer to EM for D&D



• EM has "agreed to accept" these facilities when funding for D&D becomes available. No transfers are expected before FY2017.



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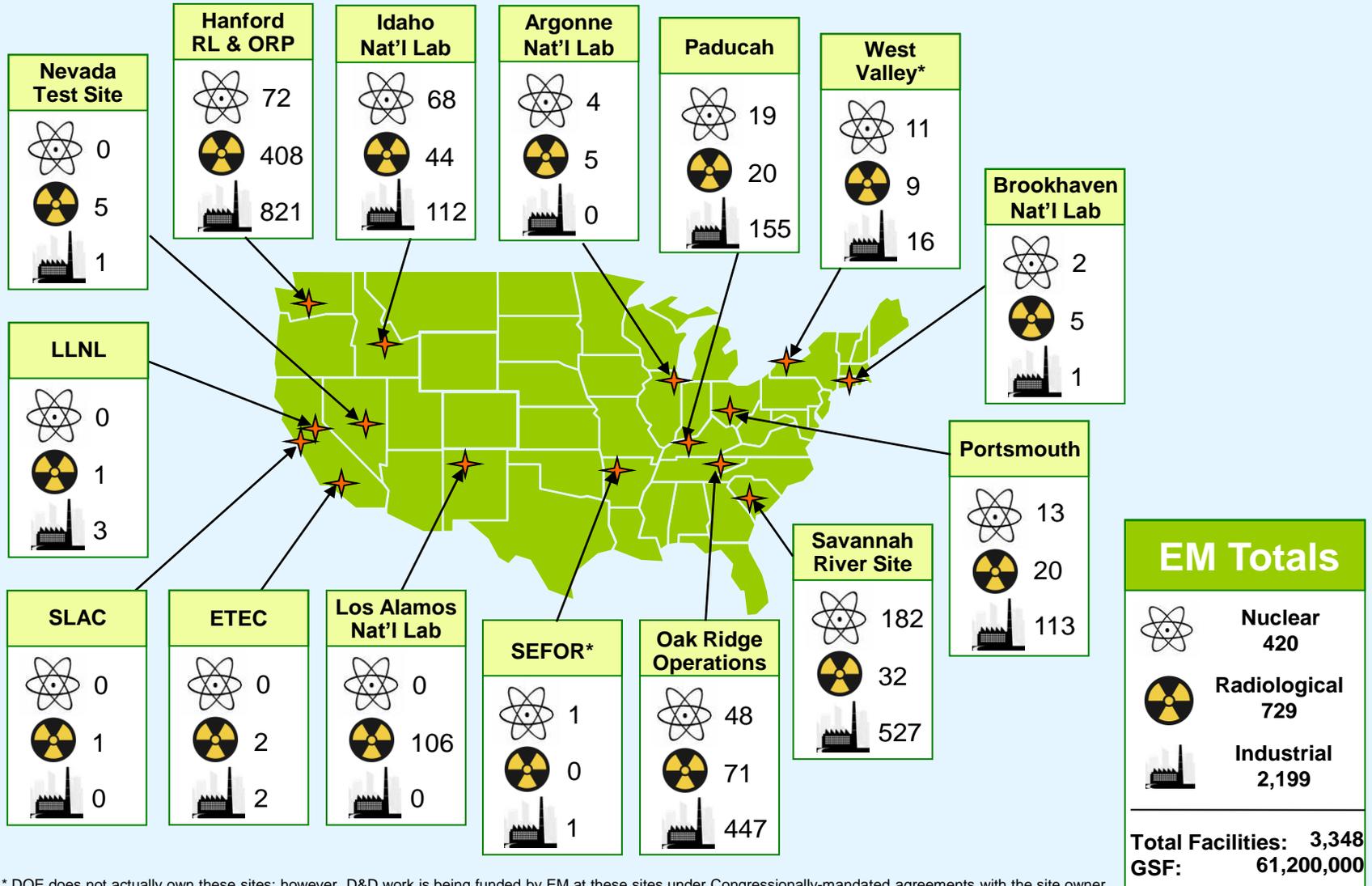
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# Effect of Planned Transfers on Current EM Baseline



\* DOE does not actually own these sites; however, D&D work is being funded by EM at these sites under Congressionally-mandated agreements with the site owner.

• A breakout of baseline facilities and planned transfers is presented on the following pages.

• EM will only accept ownership of transfer facilities when funding for D&D becomes available; No transfers are expected before FY2017.



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# Breakdown of Facilities in EM D&D Projects by Site

EM Site	Current Baseline				Gross Square Feet (1000's)	Planned Transfers		Totals	
	Type	Lifecycle	Completed as of FY 09	Remaining		Facility Transfers	Gross Square Feet (1000's)	Facilities	Gross Square Feet (1000's)
Argonne National Laboratory	Nuclear	0	0	0	4,500	4	1,275	9	5,775
	Radiological	80	78	2		3			
	Industrial	0	0	0		0			
	<b>Site Total</b>	<b>80</b>	<b>78</b>	<b>2</b>		<b>7</b>			
Brookhaven National Laboratory	Nuclear	1	0	1	50	1	95	8	145
	Radiological	11	10	1		4			
	Industrial	0	0	0		1			
	<b>Site Total</b>	<b>12</b>	<b>10</b>	<b>2</b>		<b>6</b>			
Energy Technology Engineering Center	Nuclear	0	0	0	70	0	0	4	70
	Radiological	6	4	2		0			
	Industrial	26	24	2		0			
	<b>Site Total</b>	<b>32</b>	<b>28</b>	<b>4</b>		<b>0</b>			
Hanford (RL+ORP)	Nuclear	100	28	72	16,000	0	0	1,301	16,000
	Radiological	460	52	408		0			
	Industrial	1197	376	821		0			
	<b>Site Total</b>	<b>1,757</b>	<b>456</b>	<b>1,301</b>		<b>0</b>			
Idaho	Nuclear	92	28	64	3,000	4	79	224	3,079
	Radiological	68	35	33		11			
	Industrial	255	143	112		0			
	<b>Site Total</b>	<b>415</b>	<b>206</b>	<b>209</b>		<b>15</b>			
Lawrence Livermore National Laboratory	Nuclear	0	0	0	0	0	150	4	150
	Radiological	0	0	0		1			
	Industrial	0	0	0		3			
	<b>Site Total</b>	<b>0</b>	<b>0</b>	<b>0</b>		<b>4</b>			



# Breakdown of Facilities in EM D&D Projects by Site

Current Baseline					Planned Transfers		Totals		
EM Site	Type	Lifecycle	Completed as of FY 09	Remaining	Gross Square Feet (1000's)	Facility Transfers	Gross Square Feet (1000's)	Facilities	Gross Square Feet (1000's)
Los Alamos National Laboratory	Nuclear	0	0	0	300	0	56	106	356
	Radiological	105	0	105		1			
	Industrial	0	0	0		0			
	<b>Site Total</b>	<b>105</b>	<b>0</b>	<b>105</b>		<b>1</b>			
Nevada Test Site	Nuclear	0	0	0	0	0	19	6	19
	Radiological	0	0	0		5			
	Industrial	0	0	0		1			
	<b>Site Total</b>	<b>0</b>	<b>0</b>	<b>0</b>		<b>6</b>			
Oak Ridge	Nuclear	25	8	17	8,000	31	3,713	566	11,713
	Radiological	76	26	50		21			
	Industrial	635	329	306		141			
	<b>Site Total</b>	<b>736</b>	<b>363</b>	<b>373</b>		<b>193</b>			
Paducah	Nuclear	19	0	19	3,400	0	0	194	3,400
	Radiological	22	2	20		0			
	Industrial	172	17	155		0			
	<b>Site Total</b>	<b>213</b>	<b>19</b>	<b>194</b>		<b>0</b>			
Portsmouth	Nuclear	13	0	13	12,000	0	0	146	12,000
	Radiological	27	7	20		0			
	Industrial	121	8	113		0			
	<b>Site Total</b>	<b>161</b>	<b>15</b>	<b>146</b>		<b>0</b>			
Savannah River	Nuclear	191	11	180	7,000	2	72	741	7,072
	Radiological	40	8	32		0			
	Industrial	759	232	527		0			
	<b>Site Total</b>	<b>990</b>	<b>251</b>	<b>739</b>		<b>2</b>			



# Breakdown of Facilities in EM D&D Projects by Site

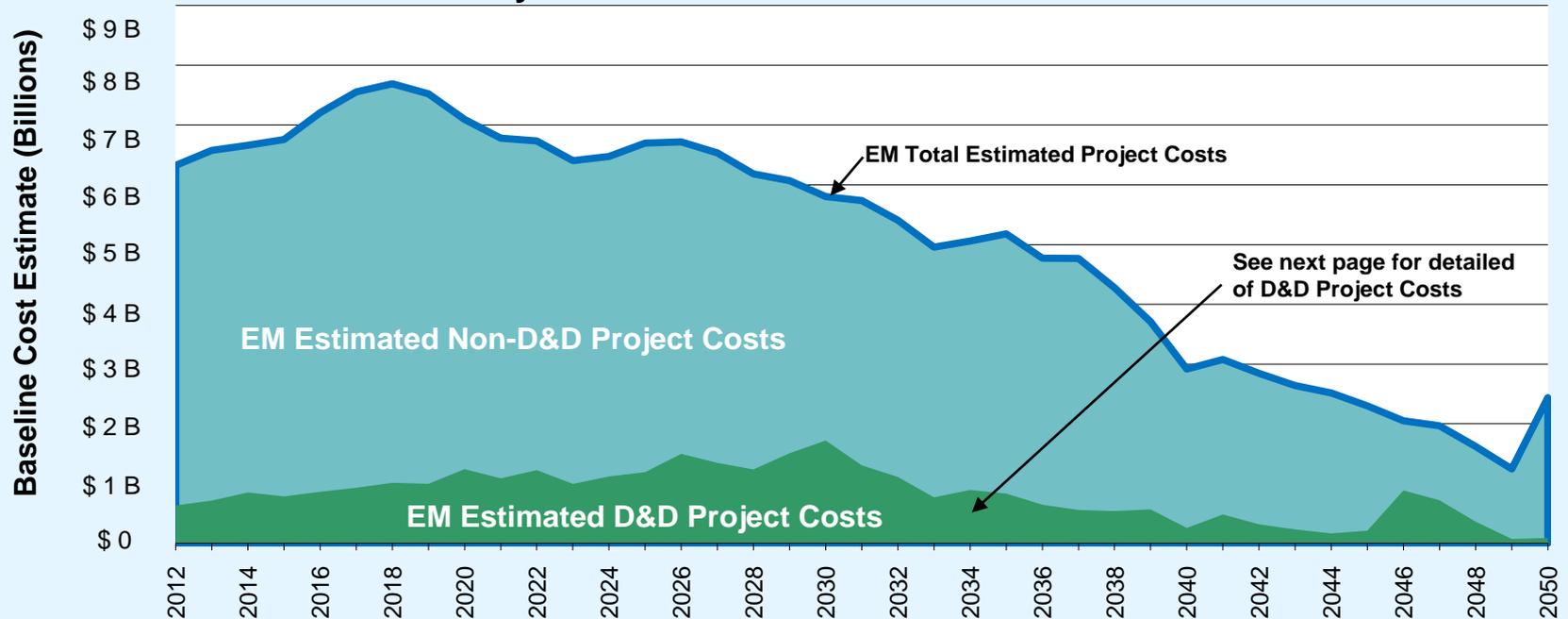
Current Baseline						Planned Transfers		Totals	
EM Site	Type	Lifecycle	Completed as of FY 09	Remaining	Gross Square Feet (1000's)	Facility Transfers	Gross Square Feet (1000's)	Facilities	Gross Square Feet (1000's)
Southwest Experimental Fast Oxide Reactor	Nuclear	1	0	1	1,000	0	0	2	1,000
	Radiological	0	0	0		0			
	Industrial	1	0	1		0			
	<b>Site Total</b>	<b>2</b>	<b>0</b>	<b>2</b>		<b>0</b>			
Stanford Linear Accelerator Center	Nuclear	0	0	0	0	0	100	1	100
	Radiological	0	0	0		1			
	Industrial	0	0	0		0			
	<b>Site Total</b>	<b>0</b>	<b>0</b>	<b>0</b>		<b>1</b>			
West Valley	Nuclear	14	3	11	400	0	0	36	400
	Radiological	13	4	9		0			
	Industrial	29	13	16		0			
	<b>Site Total</b>	<b>56</b>	<b>20</b>	<b>36</b>		<b>0</b>			
EM Totals	Nuclear	456	78	378	55,720	42	5,559	3,348	61,279
	Radiological	908	226	682		47			
	Industrial	3,195	1,142	2,053		146			
	<b>TOTALS</b>	<b>4,559</b>	<b>1,446</b>	<b>3,113</b>		<b>235</b>			



# EM D&D Cost Profile Comparisons

	Overall Cost (\$ M) EM and EM D&D*					
	2011	2012	2013	2014	2015	2016
<b>EM Total Project Costs</b>	\$6,481	\$6,326	\$6,577	\$6,661	\$6,758	\$6,342
EM D&D Progress Cost	\$381	\$439	\$510	\$592	\$473	\$503
EM D&D Maintenance Cost**	\$211	\$170	\$159	\$161	\$160	\$167
<b>EM D&amp;D Project Cost (% of EM Total Project Cost)</b>	\$592 (9.1%)	\$609 (9.6%)	\$669 (10.2%)	\$753 (11.3%)	\$633 (9.4%)	\$670 (10.6%)

## Lifecycle Cost Profile – EM D&D vs EM Total



\* This profile only depicts the current EM baseline and does not include facilities earmarked for transfer from SC, NE, and NNSA. The transfer facilities represent an additional \$4.4 to \$9.5 Billion; no transfers are expected before 2017.

\*\* Maintenance costs include surveillance-maintenance, project management, and contingency/management reserve costs.



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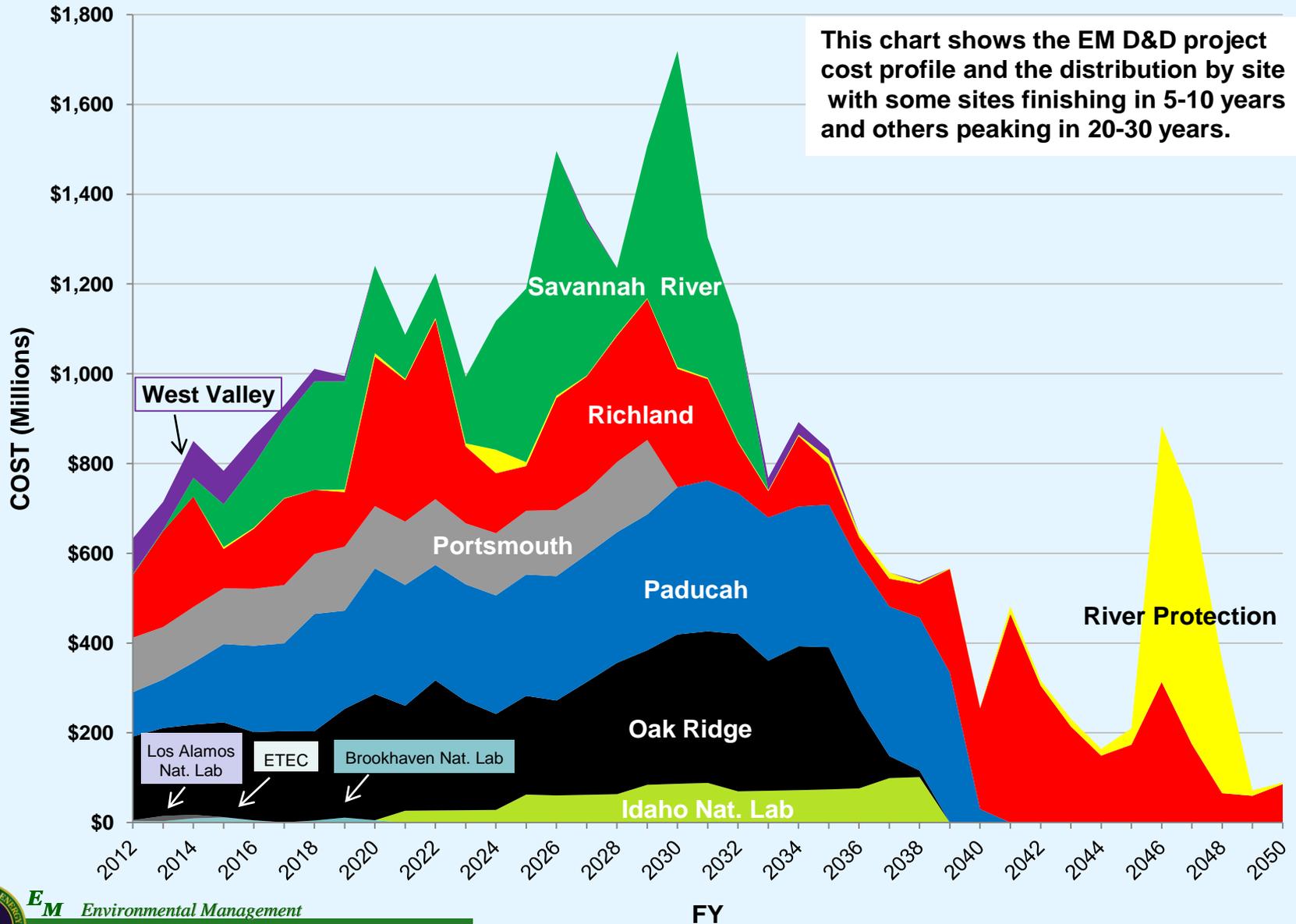
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# DOE EM Facility D&D Estimated Cost Profile By Site – FY 2012-2050



# Major EM Sites by Total D&D Cost

EM Project Sites	Current Baseline Facility D&D Scope				Excess Facility (Unfunded liability) Transfers to EM			Combined Post-Transition Total	
	D&D Facilities Progress <sup>(1)</sup>	Years until >90% Complete	D&D Facilities Remaining	Remaining Lifecycle D&D Cost (ABB "Progress" Costs) <sup>(2)</sup>	Significant Number Change to Present Scope	Number of Facilities	\$	Number of Facilities	\$
Hanford – RL+ORP, WA	26%		1301	\$7.4 Billion		0		1301	\$ 7.4 Billion
Paducah, KY	9%		194	\$6.3 Billion		0		194	\$6.3 Billion
Oak Ridge, TN	49%		373	\$5.9 Billion		193	\$8 Billion	566	\$13.9 Billion
Savannah River, SC	25%		739	\$3.8 Billion		2	\$60 Million	741	\$3.86 Billion
Portsmouth, OH	9%		146	\$2.2 Billion		0		146	\$2.2 Billion
Idaho National Energy Laboratory, ID	50%		209	\$276 Million		15	\$100 Million	224	\$376 Million
West Valley, NY <sup>(3)</sup>	36%		36	\$343 Million		0		36	\$343 Million
Energy Technology Engineering Center (ETEC) – CA	88%		4	\$29 Million		0		4	\$29 Million
Brookhaven National Laboratory – NY	83%		2	\$12 Million		6	\$62 Million	8	\$74 Million
Los Alamos National Laboratory – NM	0%		105	\$22 Million		1	\$20 Million	106	\$42 Million
Southwest Experimental Fast Oxide Reactor (SEFOR) – AR <sup>(3)</sup>	0%		2	\$0		0		2	\$0
Argonne National Laboratory – IL <sup>(4)</sup>	-	-	2	\$0		7	\$377 Million	9	\$377 Million
Lawrence Livermore National Laboratory - CA <sup>(4)</sup>	-	-	-	-		4	\$120 Million	4	\$120 Million
Stanford Linear Accelerator Center - CA <sup>(4)</sup>	-	-	-	-		1	\$70 Million	1	\$70 Million
Nevada Test Site - NV <sup>(4)</sup>	-	-	-	-		6	\$11 Million	6	\$11 Million

## Probability of Near Term Completion

- = >90% complete in 5 years
- = >90% complete in 10 years
- = >90% complete beyond 10 years

## Significant Number Change to Present Scope

- = <10% of Original Remaining Facilities
- = 10-25% of Original Remaining Facilities
- = >25% of Original Remaining Facilities

(1) ARRA funded completions are not reflected in D&D progress since ARRA funding is tracked separately from baseline expenditures.

(2) In isolating facility D&D costs using the ABB data it appears that some D&D "progress" costs have been mis-categorized as S&M or infrastructure support costs. For example, the Portsmouth D&D costs are less than half the Paducah D&D costs. Due to the scope definition of some projects, facility D&D could not be fully isolated. Some waste site remediation, surveillance and maintenance, material disposition is included in these costs.

(3) DOE does not actually own these sites; however, D&D work is being funded by EM under a Congressionally-mandated agreement with the site owners.

(4) ANL, LLNL, SLAC, and NTS do not have a significant EM presence at this time; these sites have facilities to be transferred to EM when funding becomes available.



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# Facility D&D Challenges and Cost Drivers



**Robust Structures:** Reactors, canyons, other processing facilities, and laboratories/hot cells were constructed with massive concrete shielding 3 to 10 feet thick, congested piping galleries, and heavy steel containment vessels or domes. The uranium gaseous diffusion plants are built of steel and asbestos transite panels with up to 100 acres under roof.



**Highly Contaminated:** Contain significant amounts of contamination, contaminated piping and equipment, and residual nuclear material holdup, often requiring remote handling and shielded transport packaging. Containment systems must be maintained until final stage demolition. Criticality potential must be characterized and monitored.



**Legacy Waste and D&D Waste Disposition:** Older facilities used to store legacy waste or debris, require waste disposition step. Quantity and variety of waste types in storage and generated by the D&D and remediation processes require multiple disposition paths.



**Unknown Conditions:** Many older, often under-funded or abandoned facilities have inadequate records or drawings and unknown legacy conditions, requiring extensive investigating, sampling, and characterization of conditions. Conservative safety planning and increased contingencies are necessary for the unknown risks.



**Degraded Conditions:** Many facilities have been utilized far beyond normal design-life with less than optimal maintenance for many years. This has created conditions requiring either upgrades to safety systems and structures to maintain a safe work environment for D&D personnel or a need for expensive remote (robotic) D&D operations.



**Unique / One-of-Kind Facilities:** Facilities were built or modified for first-of-kind research or prototype programs with unique hazards or challenges. This drives extra hazard characterization, mitigation research, planning, and training preparation. Little to no experience or information exists to help benchmark the planning for these projects.



**Technology:** Adequate and appropriate technologies need to be developed to enhance worker safety and to facilitate efficient and cost effective characterization, equipment removal and size reduction, and final D&D.



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# Typical Phases of D&D

The following comprise typical phases of D&D work and are not necessarily sequential. Some phases may be combined or skipped depending on the conditions encountered and the D&D strategy implemented.



**Facility Stabilization / Transition:** Primarily defines the last steps of an operational facility or one in stand-by mode with the objective to remove nuclear materials, spent fuels, containerized wastes, and classified documents and equipment, allowing the security levels and security systems to be reduced. Operational procedures and standards are reduced to minimum standards. The radiological hazard classification level may be reduced. Most effectively implemented by operational skill of craft. (DOE G 430.1-5 Transition Implementation Guide)



**Facility Deactivation:** A facility maintains active safety and contamination confinement systems for personnel safety and environmental control. Deactivation may involve removing or fixing contamination; removing hazards; and removing occupants in order to permit the shut down or removal of active systems. The radiological hazard classification level may be reduced. This is typically a minimum surveillance and maintenance holding condition for future decommissioning funding priority and is determined by the EM-developed End-Point Process. Characterization of unknown conditions, materials, wastes, and hazards help to mitigate surprises during planning and execution of work. (DOE G 430.1-3 Deactivation Implementation Guide)



**Facility Decommissioning:** While decommissioning can include elements of the prior steps, the most frequent result is dismantlement or demolition. However, alternative disposition end-states are possible such as entombment (in situ decommissioning) or re-utilization. Complexity and costs depend on the hazards, unknown conditions, levels of contamination, and the variety of waste types generated. Additional characterization of unknown conditions, materials, wastes, and hazards help to mitigate surprises during planning and execution of work. (DOE G 430.1-4 Decommissioning Implementation Guide)



# What are the currently planned D&D projects?

Presently there are approximately 60 planned major D&D projects (as defined by ABBs) over the next 40+ years. Three different lists have been generated:

## 1. EM D&D Projects Scheduled for FY 2012–2016 (page 40)

This is a ranking of D&D projects that are planned to be funded in the next 5 years.

## 2. EM D&D Projects Scheduled for FY 2012-2016 Sorted by Site (page 41)

This table presents the 2012-2016 D&D projects, from above, sorted and ranked by site.

## 3. EM D&D Projects Budgeted for FY 2012–2050 (pages 42-44)

This is a ranking of D&D projects presently planned over the lifecycle of the EM program.

Projects with estimated costs in the next five years are captured in the first list. These are ranked based only on the estimated costs reported for the five year period. Project profiles are provided in Appendix B1 for these projects.

All of the D&D projects that are presently planned for the lifecycle of the EM program are captured in the third list. These are ranked based on the estimated total lifecycle costs reported for the project. Those projects that are also captured in the five year planning window (i.e., have estimated costs budgeted in the 2012 – 2016 timeframe, and hence have project profiles presented in Appendix B1) are highlighted in pale blue. The remaining projects do not have any estimated costs occurring before 2017. A project summary fact sheet is provided in Appendix B2 for these projects.

D&D cost estimates shown in this document are taken from updated ABB data submitted for the development of the FY 2012 Business Case. The projects' costs, used here to define and sort project size, reflect only the “progress” dollars for the D&D activities. Surveillance and maintenance costs and progress costs are however shown in the graphic cost profiles; surveillance and maintenance costs that are not visible on the ABB Budget and Schedule Profiles are either too low for the scale of the graph or are reported as zero.



# The EM D&D Projects Scheduled for FY 2012–2016

Note: Durations are based on the number of years with “progress” dollars budgeted. Several D&D projects with current activity (e.g., SRS C-Area) have several years with no D&D activities before resuming D&D later. In these cases the durations will not be equal to the interval between the Start Year and the End Year.

Site	ABB ID	Project (ABB) Name	D&D Project				
			Progress Cost* from 2012-2016 (\$ K)	% of LCC represented by 2012-2016 cost	Duration (yrs)	Start Year	End Year
Richland Operations Office	331	Plutonium Finishing Plant (PFP) Disposition (D4)	\$536,855	81%	7	2010	2016
Oak Ridge Reservation	274Ex	K-25 Building	\$475,500	81%	5	2011	2015
Portsmouth Project Office	166	D&D Balance of Plant (A1 & A2)	\$416,271	24%	20	2010	2029
West Valley Demonstration Project	319	Nuclear Facility D&D	\$283,224	72%	17	2008	2038
Savannah River Site	60	F-Area D&D: Non-Area Completion	\$150,521	16%	16	2012	2032
Oak Ridge Reservation	269Ex	ETTP Balance of Site D&D	\$147,586	52%	8	2011	2018
Portsmouth Project Office	167	Process Buildings	\$133,360	23%	18	2012	2029
Paducah Project Office	199	Gaseous Diffusion Plant	\$89,520	1%	29	2012	2040
Paducah Project Office	200	Inactive Facility D&D	\$43,615	38%	10	2008	2017
Richland Operations Office	408	Zone 18 (U Plant Zone)	\$41,977	21%	12	2010	2022
Richland Operations Office	336	K West Basin D&D	\$40,273	65%	4	2015	2018
Oak Ridge Reservation	273Ex	ETTP Main Plant D&D	\$31,800	28%	4	2011	2018
Energy Technology Engineering Center	307	Facility D&D	\$29,594	96%	7	2011	2017
Los Alamos National Laboratory	486	TA-54	\$21,867	34%	6	2010	2015
Richland Operations Office	417	FFTF D4	\$21,439	6%	21	2010	2030
Savannah River Site	62	H-Area D&D: Non-Area Completion	\$19,251	1%	18	2014	2032
Richland Operations Office	418	Sodium Disposition	\$13,956	5%	15	2015	2029
Savannah River Site	57	C-Area D&D: Non-Area Completion	\$8,058	6%	9	2015	2030
Office of River Protection	147	Tank Farm	\$6,455	1%	36	2014	2050
Richland Operations Office	403	Zone 11 (PUREX Zone)	\$1,727	0.2%	9	2015	2024
Savannah River Site	61	G-Area D&D: Non-Area Completion	\$1,518	7%	10	2014	2031
Richland Operations Office	411	Zone 5 (B Plant Zone)	\$1,108	0.2%	13	2015	2041
Richland Operations Office	406	Zone 12 (REDOX Zone)	\$1,108	0.1%	16	2015	2047
Richland Operations Office	402	Zone 1 (200-E Admin Zone)	\$220	0.05%	11	2016	2048
<b>TOTAL</b>			<b>\$2,516,803</b>				
<b>TOTAL LIFE CYCLE</b>			<b>\$16,982,775</b>				

= Projects planned to be completed within the 5 year planning window

See Appendix B1 for more information on these D&D projects.

\* The projects' costs, used here to define and sort project size, reflect only the “progress” dollars for the D&D activities. Both progress and maintenance costs are, however, shown in the graphic cost profiles (see page B1-10 for an example). Maintenance costs include surveillance-maintenance, project management, and contingency/management reserve costs.



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# The EM D&D Projects Scheduled for FY 2012–2016 Sorted by Site

Site	ABB ID	Project (ABB) Name	D&D Project
			Progress Cost* from 2012-2016 (\$ K)
Richland Operations Office	331	Plutonium Finishing Plant (PFP) Disposition (D4)	\$536,855
Richland Operations Office	408	Zone 18 (U Plant Zone)	\$41,977
Richland Operations Office	336	K West Basin D&D	\$40,273
Richland Operations Office	417	FFTF D4	\$21,439
Richland Operations Office	418	Sodium Disposition	\$13,956
Richland Operations Office	403	Zone 11 (PUREX Zone)	\$1,727
Richland Operations Office	406	Zone 12 (REDOX Zone)	\$1,108
Richland Operations Office	411	Zone 5 (B Plant Zone)	\$1,108
Richland Operations Office	402	Zone 1 (200-E Admin Zone)	\$220
Office of River Protection	147	Tank Farm	\$6,455
<b>Richland + ORP Total</b>			<b>\$665,118</b>
Oak Ridge Reservation	274Ex	K-25 Building	\$475,500
Oak Ridge Reservation	269Ex	ETTP Balance of Site D&D	\$147,586
Oak Ridge Reservation	273Ex	ETTP Main Plant D&D	\$31,800
<b>Oak Ridge Total</b>			<b>\$654,886</b>
Portsmouth Project Office	166	D&D Balance of Plant (A1 & A2)	\$416,271
Portsmouth Project Office	167	Process Buildings	\$133,360
<b>Portsmouth Total</b>			<b>\$549,631</b>
West Valley Demonstration Office	319	Nuclear Facility D&D	\$283,224
Savannah River Site	60	F-Area D&D: Non-Area Completion	\$150,521
Savannah River Site	62	H-Area D&D: Non-Area Completion	\$19,251
Savannah River Site	57	C-Area D&D: Non-Area Completion	\$8,058
Savannah River Site	61	G-Area D&D: Non-Area Completion	\$1,518
<b>Savannah River Total</b>			<b>\$179,348</b>
Paducah Project Office	199	Gaseous Diffusion Plant	\$89,520
Paducah Project Office	200	Inactive Facility D&D	\$43,615
<b>Paducah Total</b>			<b>\$133,135</b>
Energy Technology Engineering Center	307	Facility D&D	\$29,594
Los Alamos National Laboratory	486	TA-54	\$21,867
<b>TOTAL</b>			<b>\$2,516,803</b>

\* The projects' costs, used here to define and sort project size, reflect only the "progress" dollars for the D&D activities. The "maintenance" dollars for FY 2012-16 are \$1.1 billion.



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# The EM D&D Projects Budgeted for FY 2012–2050

Note: Durations are based on the number of years with “progress” dollars budgeted. Several projects with current D&D activity (e.g., SRS C-Area) have several years with no D&D activities before resuming D&D later. In these cases the durations will not be equal to the interval between the Start Year and the End Year.

Site	ABB ID	Project (ABB) Name	D&D Project			
			Progress Cost* from 2012-2050 (\$ Million)	Duration (years)	Start Year	End Year
Paducah	199	<b>Gaseous Diffusion Plant (GDP)</b>	\$6,242	29	2012	2040
Portsmouth	166	<b>D&amp;D Balance of Plant (A1&amp;A2)</b>	\$1,632	21	2009	2029
Savannah River Site	62	<b>H-Area D&amp;D: Non-Area Completion</b>	\$1,541	18	2014	2032
Office of River Protection	154	<b>Waste Immobilization and Treatment Plant (WTP)</b>	\$1,233	3	2046	2048
Oak Ridge Reservation	280ANew	<b>Alpha Buildings D&amp;D</b>	\$1,051	15	2018	2034
Richland Operations Office	411	<b>Zone 5 (B Plant Zone)</b>	\$984	13	2015	2041
Savannah River Site	60	<b>F-Area D&amp;D: Non-Area Completion</b>	\$970	16	2012	2032
Oak Ridge Reservation	284A New	<b>Central Campus Area and other BV Facilities</b>	\$908	20	2018	2037
Oak Ridge Reservation	280D New	<b>Process Facilities D&amp;D</b>	\$878	15	2019	2035
Richland Operations Office	407	<b>Zone 17 (T Plant Zone)</b>	\$860	11	2018	2044
Richland Operations Office	403	<b>Zone 11 (PUREX Zone)</b>	\$738	9	2015	2024
Oak Ridge Reservation	280B New	<b>Beta Buildings D&amp;D</b>	\$637	16	2018	2037
Portsmouth	167	<b>Process Buildings</b>	\$568	18	2012	2029
Richland Operations Office	331	<b>PFP Disposition (D4)</b>	\$537	7	2010	2016
Richland Operations Office	406	<b>Zone 12 (REDOX Zone)</b>	\$529	16	2015	2047
Oak Ridge Reservation	274 Existing	<b>K-25 Building D&amp;D</b>	\$476	5	2011	2015
Office of River Protection	147	<b>Tank Farm D&amp;D</b>	\$450	36	2014	2050
Richland Operations Office	402	<b>Zone 1 (200-E Admin Zone)</b>	\$408	11	2016	2048
Oak Ridge Reservation	284D New	<b>3019 Complex D&amp;D</b>	\$386	10	2025	2034
Richland Operations Office	417	<b>FFTF D4</b>	\$353	21	2010	2030
West Valley	319	<b>Nuclear Facility D&amp;D –West Valley</b>	\$343	17	2008	2038
Richland Operations Office	418	<b>Sodium Disposition</b>	\$307	15	2015	2029
Savannah River Site	70	<b>S-Area D&amp;D: Non-Area Completion</b>	\$277	6	2027	2032
Oak Ridge Reservation	269 Existing	<b>ETTP Balance of Site D&amp;D</b>	\$269	8	2011	2018

= Project also on FY 2012-2016 Project List (Page 38)

\* The projects' costs, used here to define and sort project size, reflect only the “progress” dollars for the D&D activities. The “maintenance” dollars are \$2.8 billion



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D&D Program Map — Executive Overview

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# The EM D&D Projects Budgeted for FY 2012–2050 (cont’)

Note: Durations are based on the number of years with “progress” dollars budgeted. Several projects with current D&D activity (e.g., SRS C-Area) have several years with no D&D activities before resuming D&D later. In these cases the durations will not be equal to the interval between the Start Year and the End Year.

Site	ABB ID	Project (ABB) Name	D&D Project			
			Progress Cost* from 2012-2050 (\$ Million)	Duration (years)	Start Year	End Year
Oak Ridge Reservation	284A Existing	Central Campus Area and Other BV Facilities D&D	\$264	14	2018	2031
Oak Ridge Reservation	284B Existing	Melton Valley and MV Reactors D&D	\$258	17	2020	2036
Savannah River Site	64	K-Area D&D: Non-Area Completion	\$218	9	2020	2030
Richland Operations Office	408	Zone 18 (U Plant Zone)	\$212	12	2010	2022
Savannah River Site	63	J-Area D&D: Non-Area Completion	\$204	6	2027	2032
Oak Ridge Reservation	284B New	Melton Valley and MV Reactors D&D	\$204	11	2022	2038
Idaho National Laboratory	106	INTEC D&D	\$169	14	2025	2038
Savannah River Site	65	L-Area D&D: Non-Area Completion	\$154	9	2024	2032
Oak Ridge Reservation	284C New	Waste Treatment Facilities D&D	\$146	15	2020	2034
Richland Operations Office	410	Zone 26 (400 Area)	\$145	6	2018	2036
Oak Ridge Reservation	280A Existing	Alpha Buildings D&D	\$145	6	2018	2023
Savannah River Site	57	C-Area D&D: Non-Area Completion	\$137	9	2015	2030
Richland Operations Office	412	Zone 7 (CSB Zone)	\$121	6	2017	2033
Oak Ridge Reservation	280C New	Biology & Lab Complex D&D	\$110	5	2026	2030
Oak Ridge Reservation	273 Existing	ETTP Main Plant D&D	\$108	4	2011	2018
Idaho National Laboratory	2014	AMWTP D&D	\$82	4	2021	2024
Savannah River Site	55	A-Area D&D: Non-Area Completion	\$79	6	2021	2031
Savannah River Site	67	N-Area D&D: Non-Area Completion	\$75	8	2022	2031
Savannah River Site	56	B-Area D&D: Non-Area Completion	\$68	4	2028	2031
Richland Operations Office	336	K West Basin D&D	\$62	4	2015	2018
Savannah River Site	73	Z-Area D&D: Non-Area Completion	\$44	4	2029	2032
Paducah	200	Inactive Facility D&D	\$44	10	2008	2017
ETEC	307	Facility D&D	\$30	7	2011	2017
Richland Operations Office	409	Zone 23 (100 Area)	\$26	2	2024	2025

= Project also on FY 2012-2016 Project List (Page 38)

\* The projects' costs, used here to define and sort project size, reflect only the “progress” dollars for the D&D activities. The “maintenance” dollars are \$2.8 billion



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D&D Program Map — Executive Overview

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# The EM D&D Projects Budgeted for FY 2012–2050 (cont’)

Note: Durations are based on the number of years with “progress” dollars budgeted. Several projects with current D&D activity (e.g., SRS C-Area) have several years with no D&D activities before resuming D&D later. In these cases the durations will not be equal to the interval between the Start Year and the End Year.

Site	ABB ID	Project (ABB) Name	D&D Project			
			Progress Cost* from 2012-2050 (\$ Million)	Duration (years)	Start Year	End Year
Oak Ridge Reservation	280D Existing	<b>Process Facilities D&amp;D</b>	\$24	6	2024	2029
Los Alamos National Laboratory	486	<b>TA-54 D&amp;D</b>	\$22	6	2010	2015
Savannah River Site	61	<b>G-Area D&amp;D: Non-Area Completion</b>	\$22	10	2014	2031
Savannah River Site	59	<b>E-Area D&amp;D: Non-Area Completion</b>	\$21	5	2027	2031
Idaho National Laboratory	2016	<b>Misc. Facilities</b>	\$15	5	2021	2025
Richland Operations Office	413	<b>Zone 9 (ETF Zone)</b>	\$12	4	2017	2020
Oak Ridge Reservation	275 Existing	<b>K-27 Building D&amp;D</b>	\$10	3	2010	2018
Savannah River Site	72	<b>U-Area D&amp;D: Non-Area Completion</b>	\$0.9	4	2021	2024
Brookhaven	504B	<b>HFBR Phase Two</b>	\$0.7	3	2018	2020
Idaho National Laboratory	2015	<b>MFC D&amp;D</b>	\$0.7	4	2021	2024
Brookhaven	504A	<b>HFBR Record of Decision Compliance Phase One</b>	\$0.4	3	2018	2020
Idaho National Laboratory	110	<b>RWMC D&amp;D</b>	\$0.2	4	2021	2024
<b>TOTAL</b>			<b>\$25,810</b>			

= Project also on FY 2012-2016 Project List (Page 38)

\* The projects’ costs, used here to define and sort project size, reflect only the “progress” dollars for the D&D activities. The “maintenance” dollars are \$2.8 Billion

- The ‘existing’ designation refers to Oak Ridge’s Integrated Facilities Disposition Project (IFDP) scope that is already part of the EM Program.
- The ‘new’ designation refers to Oak Ridge’s IFDP scope that EM has agreed to accept from the offices of Science (SC), Nuclear Energy (NE) and the National Nuclear Security Administration (NNSA) but is not yet part of the EM Baseline.



# Completed D&D Project Sites

- Ashtabula Uranium Plant Closure Project
- Columbus Nuclear Research Facility Closure Project
- Fernald Uranium Plant Closure Project
- Mound Radioisotopic Plant - Miamisburg Closure Project
- Rocky Flats Plutonium Plant Closure Project



# Completed Major D&D Projects

- Hanford
  - 300 Area
  - 100 Area
  - 200 N Area
- Idaho National Laboratory
  - Loss of Fluid Test Reactor
  - Test Area North
  - Engineering Test Reactor
- Los Alamos
  - Tritium Systems Test Assembly Facility
- Savannah River
  - M-Area Closure
  - T-Area Closure



# Appendices

- A.** D&D Project Site Profiles
  
- B1.** D&D Project Profiles (FY 2012 – 2016)
  
- B2.** D&D Project Summaries (for additional projects in program Life Cycle)
  
- C.** Summary of Completed Major D&D Projects
  
- D.** Basic Information on D&D



# Facility Deactivation & Decommissioning Appendix A — Major D&D Project Site Profiles

2011 Edition

This document presents an overview of the major sites  
and their list of projects yet to be accomplished.



Portsmouth - Gaseous Diffusion Plant



Oak Ridge Y-12

# Major D&D Project Sites

- **Brookhaven National Laboratory, Long Island, New York**
- **Energy Technology Engineering Center, Eastern Ventura County, California**
- **Hanford (Richland & River Protection) Site, Richland, Washington**
- **Idaho National Laboratory, Idaho Falls, Idaho**
- **Los Alamos National Laboratory, Los Alamos, New Mexico**
- **Oak Ridge Reservation, Oak Ridge, Tennessee**
- **Paducah Site, Paducah, Kentucky**
- **Portsmouth Site, Piketon, Ohio**
- **Savannah River Site, Aiken, South Carolina**
- **West Valley Site, West Valley, New York**

D&D costs presented herein are budgetary estimates extracted from the updated ABB data submitted for the development of the FY 2012 Business Case. The projects' costs, used here to define and sort project size, reflect only the "progress" dollars for the D&D activities. Surveillance and maintenance costs and progress costs are shown in the graphic cost profiles. Project close out costs may extend beyond the D&D End Year.



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# Brookhaven National Laboratory, Long Island, NY

One of 10 national laboratories overseen and primarily funded by the Office of Science of the U.S. Department of Energy (DOE), Brookhaven National Laboratory is located in the town of Brookhaven, approximately 60 miles east of New York City. Formerly Camp Upton, a U.S. Army installation site, the BNL site occupies about 5,300 mostly-wooded acres in Suffolk County. Many of the Lab's facilities are near the center of the site, in a developed portion that covers about 1,700 acres.

The Brookhaven National Laboratory (BNL) was established in 1947 by the Atomic Energy Commission (AEC) (predecessor to U.S. Department of Energy [DOE]). Historically, BNL was involved in the construction of accelerators and research reactors such as the Cosmotron, the High Flux Beam Reactor (HFBR) and the Brookhaven Graphite Research Reactor (BGRR). These accelerators and reactors lead the way in high-energy physics experiments and subsequent discoveries.



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# Brookhaven National Laboratory

Facility Type	Completed as of FY 09	Remaining (Life-cycle)
Nuclear	0	1
Radiological	10	1
Industrial	0	0

The EM BNL project addresses the cleanup of the BNL Superfund site as well as the deactivation and decommissioning of two former research reactors: the High Flux Beam Reactor and Brookhaven Graphite Research Reactor. Cleanup is required by a 1992 Interagency Agreement among DOE, the U.S. Environmental Protection Agency and the New York State Department of Environmental Conservation.

Site	ABB ID	Project (ABB) Name	D&D Project			
			Total Cost (\$ Thousands)	Duration (years)	Start Year	End Year
Brookhaven	504B	HFBR Phase Two	\$7,467	3	2018	2020
Brookhaven	504A	HFBR Record of Decision Compliance Phase One	\$4,487	3	2018	2020



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# Brookhaven National Laboratory

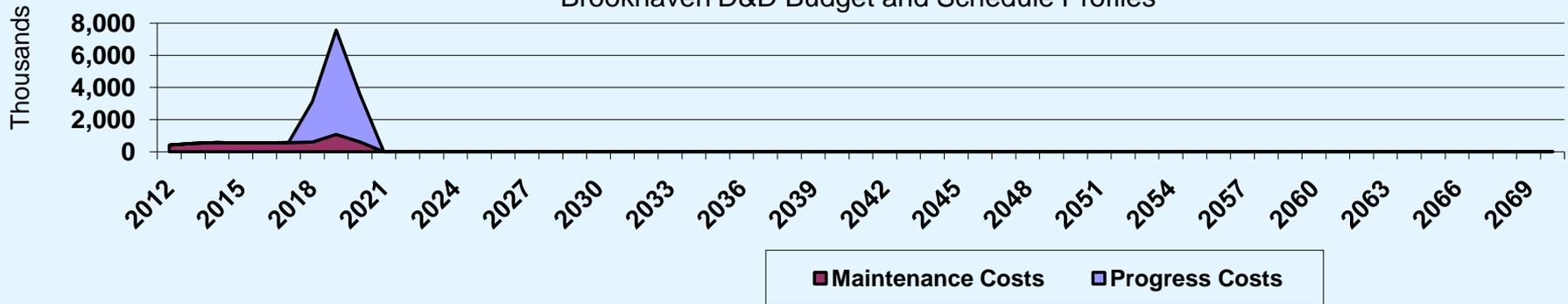
Structures that have been addressed as part of the BGRR decommissioning project include the graphite pile and biological shield which are located inside of the reactor building. After the removal of the pile and biological shield in FY 2011, an engineered cap will be installed around the reactor building to prevent water infiltration and the migration of residual contamination remaining in subsurface soil and underground concrete structures.

The HFBR was successfully placed into long-term Surveillance and Maintenance in 2010 with the removal of the control rod blades and associated reduction in the curries of the reactor vessel.



A photo of the interior of the HFBR taken in July 2010, just before the doors were closed and locked and the facility was put in a stable state for its long hibernation.

Brookhaven D&D Budget and Schedule Profiles

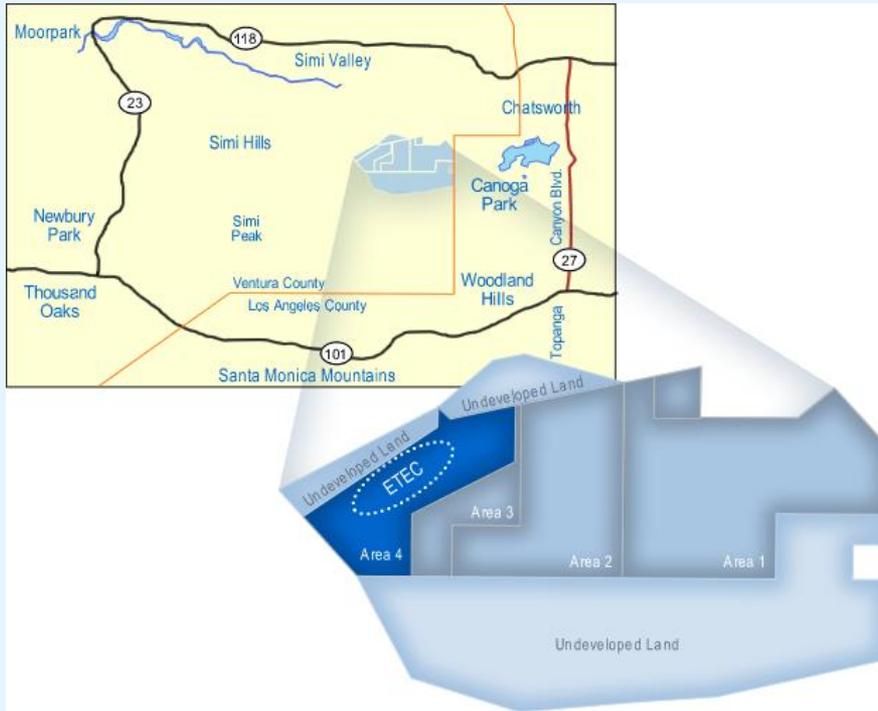


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# Energy Technology Engineering Center, Eastern Ventura County, CA



The ETEC's historic mission involved nuclear research and development for the U.S. Atomic Energy Commission, a predecessor to DOE. In the mid-1950s, a part of Area IV was set aside for nuclear reactor development and testing – primarily related to the development of nuclear power plants and space power systems, using sodium and potassium as coolants.

In the mid-1960s, the ETEC was established as a DOE laboratory for the development of liquid metal heat transfer systems to support the Office of Nuclear Energy Liquid Metal Fast Breeder Reactor program. Other operations focused on applied engineering and the development of emerging energy technologies. These operations included the development of solar and fossil energy, as well as the development of an energy conservation methodology.

The Energy Technology Engineering Center (ETEC) is located within Area IV of the Santa Susana Field Laboratory. The ETEC occupies 90-acres within the 290 acre site. The Santa Susana Field Laboratory, owned by the Boeing Company is located 30 miles north of Los Angeles, California. Area IV was primarily used for the U.S. Department of Energy (DOE) research and development activities.



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# Energy Technology Engineering Center (ETEC)

Facility Type	Completed as of FY 09	Remaining (Life-cycle)
Nuclear	0	0
Radiological	4	2
Industrial	24	2

In 1998, DOE decided to close the remaining ETEC operations. With the closing of DOE operations, the focus turned towards the disposition of government property, cleanup of facilities, the investigation and remediation of soil and groundwater, and demolition of facilities and site restoration. The Closure Project includes remediation of facilities involved in nuclear energy research.

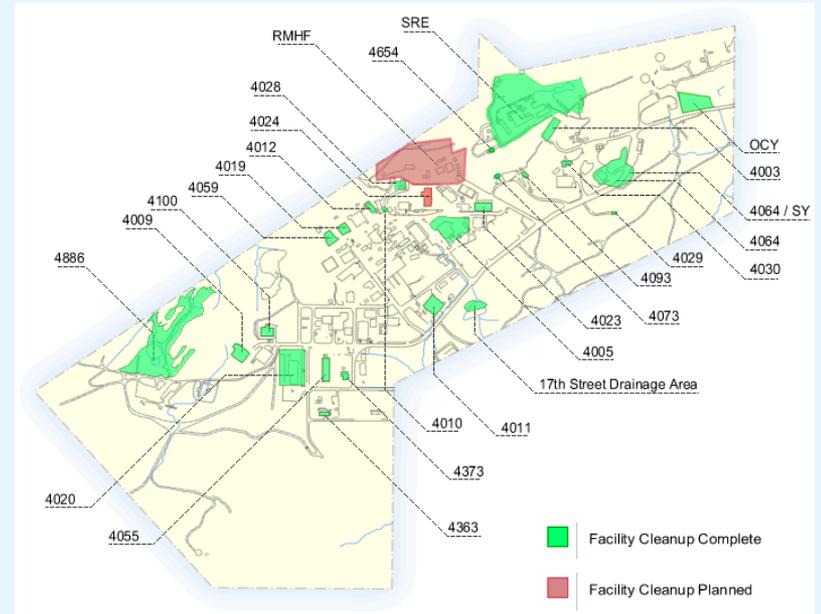
Site	ABB ID	Project (ABB) Name	D&D Project			
			Total Cost (\$ Thousands)	Duration (years)	Start Year	End Year
ETEC	307	Facility D&D	\$29,672	7	2011	2017

# Energy Technology Engineering Center (ETEC)

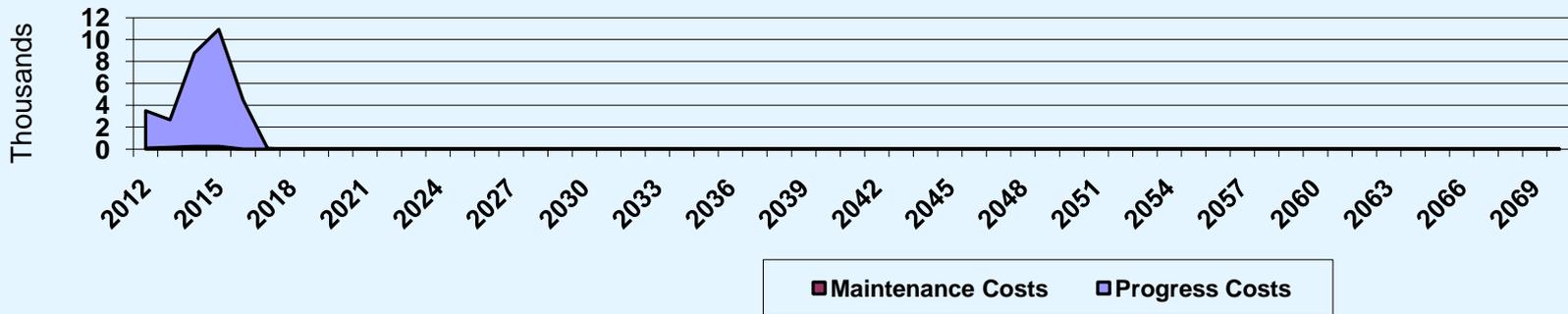
The Sodium Reactor Experiment (SRE) is a complex of buildings that were used to support the earliest nuclear research in commercialized nuclear power in Area IV. Many of the buildings in the SRE complex have since been D&D.

The RMHF is a group of buildings constructed to safely handle new and irradiated nuclear fuel and for the temporary storage and management of radioactive waste. The RMHF will be the last radiological facility to be decommissioned and released for unrestricted use.

The DOE has proposed to remove all the buildings at RMHF as part of the ongoing deactivation & decommissioning of ETEC. The D&D involves the complete removal and off-site disposal of all above and below ground structural components and any radiologically impacted soil that may exist within the facility's footprint and surrounding area.



ETEC D&D Budget and Schedule Profiles



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# Hanford Site, Richland, WA

The Hanford DOE Site is managed by:

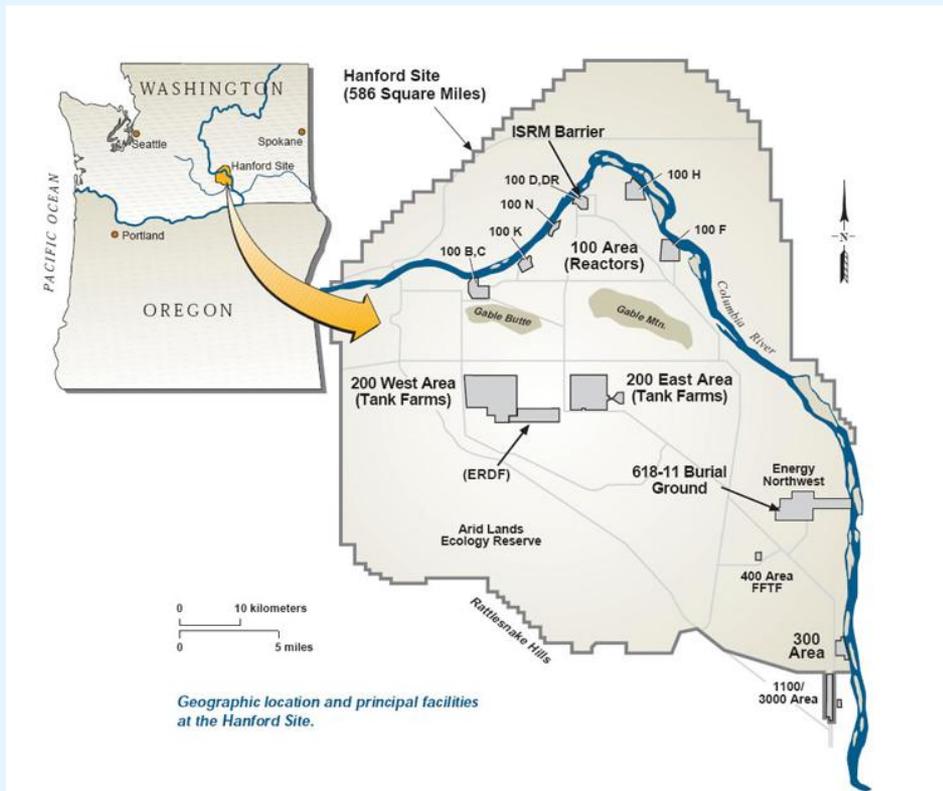
- EM's Richland Field Office
- EM's Office of River Protection and
- Office of Science's (SC) Pacific Northwest National Labs (PNNL)

**Richland Field Office has two major cleanup programs and three major contractors:**

- River Corridor Closure D&D and Remediation Project, contracted to the Washington Closure Hanford Corporation (WCH)
- Central Plateau D&D and Remediation Project, contracted to the CH2MHill Plateau Remediation Corporation (CPRC)
- Hanford Site-wide Infrastructure Support Services, contracted to Fluor Hanford Inc (FHI)

**Office of River Protection has one major cleanup program and one construction project:**

- Tank Waste Farms D&D and Remediation Project, contracted to Washington River Protection Solutions (WRPS)
- Waste Immobilization and Treatment Plant (WTP) construction project, contracted to Bechtel National-River Protection (BNRP)



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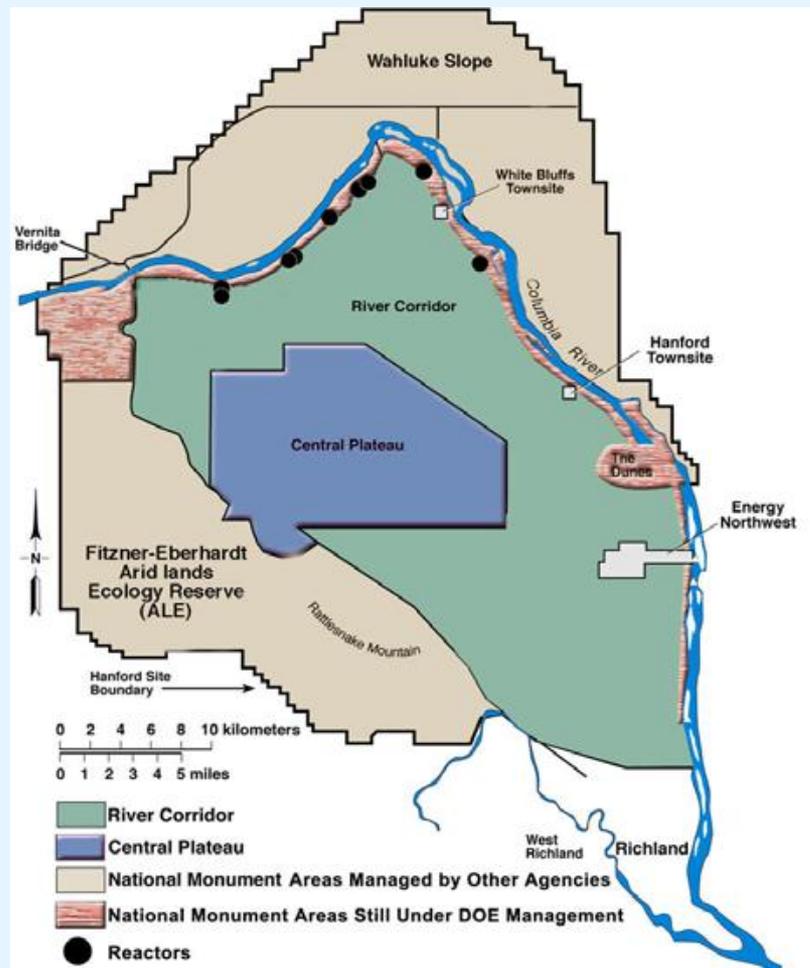
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## D&D Projects

Hanford-Richland Field Office		
Facility Type	Completed as of FY 09	Remaining (Life-cycle)
Nuclear	28	82
Radiological	52	346
Industrial	376	1,069

Hanford-Office of River Protection		
Facility Type	Completed as of FY 09	Remaining (Life-cycle)
Nuclear	0	18
Radiological	0	114
Industrial	0	128



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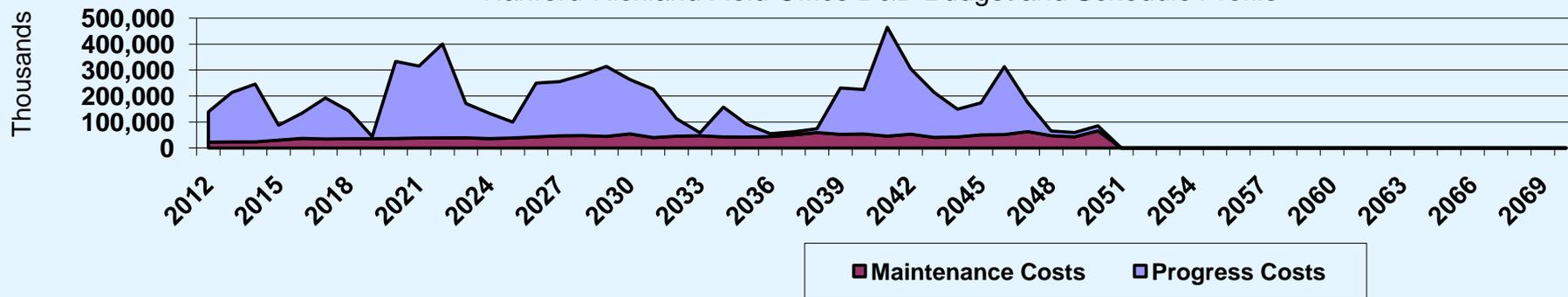
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# Hanford-Richland Field Office

Site	ABB ID	Project (ABB) Name	D&D Project			
			Total Cost (\$ Thousands)	Duration (years)	Start Year	End Year
Richland Field Office	411	Zone 5 (B Plant Zone)	\$983,931	13	2015	2041
Richland Field Office	407	Zone 17 (T plant Zone)	\$860,331	11	2018	2044
Richland Field Office	403	Zone 11 (PUREX Zone)	\$737,734	9	2015	2024
Richland Field Office	331	PFP Disposition (D4)	\$536,855	7	2010	2016
Richland Field Office	406	Zone 12 (REDOX Zone)	\$528,723	16	2015	2047
Richland Field Office	402	Zone 1 (200-E Admin Zone)	\$407,639	11	2016	2048
Richland Field Office	417	FFTF D4	\$353,052	21	2010	2030
Richland Field Office	418	Sodium Disposition	\$307,206	15	2015	2029
Richland Field Office	408	Zone 18 (U Plant Zone)	\$211,862	12	2010	2022
Richland Field Office	410	Zone 26 (400 Area)	\$145,084	6	2018	2036
Richland Field Office	412	Zone 7 (CSB Zone)	\$121,384	6	2017	2033
Richland Field Office	336	K West Basin D&D	\$61,563	4	2015	2018
Richland Field Office	409	Zone 23 (100 Area)	\$25,905	2	2024	2025
Richland Field Office	413	Zone 9 (ETF Zone)	\$12,400	4	2017	2020

Hanford-Richland Field Office D&D Budget and Schedule Profile



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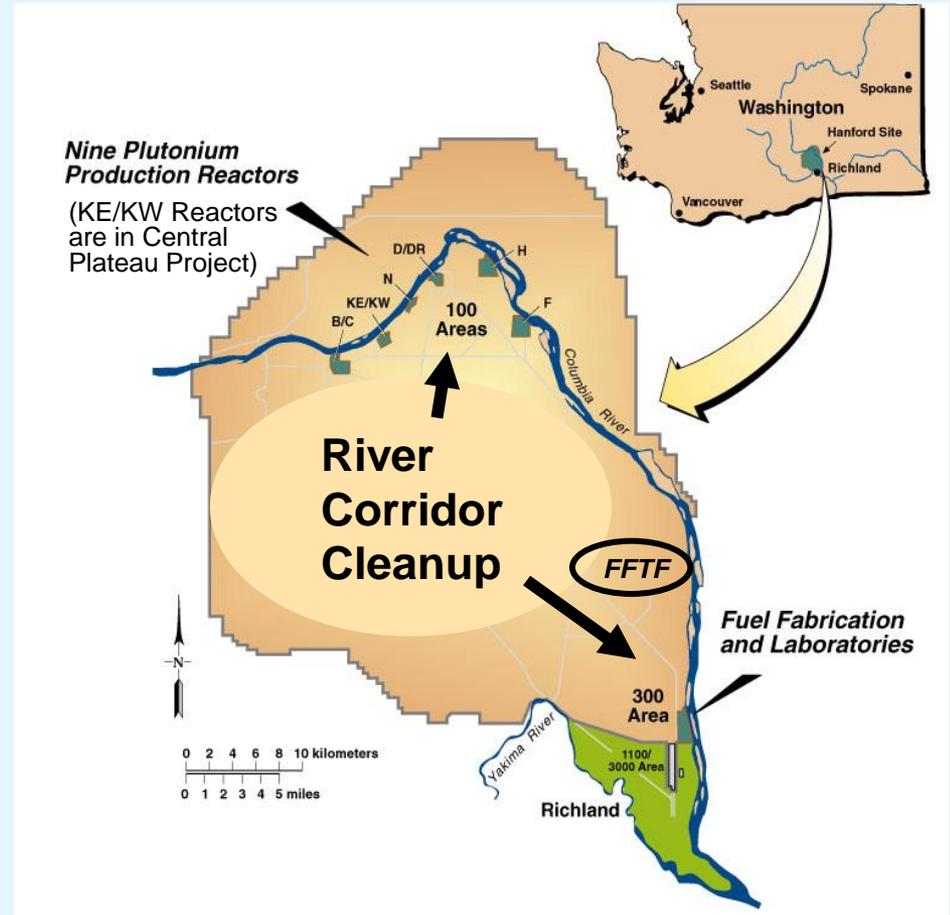
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# Hanford-Richland Field Office - River Corridor

## River Corridor Closure D&D and Remediation Project

- 100 Area Reactors (B,C,D,DR,F,H,N)
  - Reactors Cocooning Completed:
    - Reactor C - 1998
    - Reactor DR - 2002
    - Reactor F – 2003
    - Reactor D – 2004
    - Reactor H – 2005
- 300 Area Uranium Fuel Processing & Testing Facility
- 400 Area Facility
  - Fast Flux Test Facility (FFTF) Reactor and Sodium disposition



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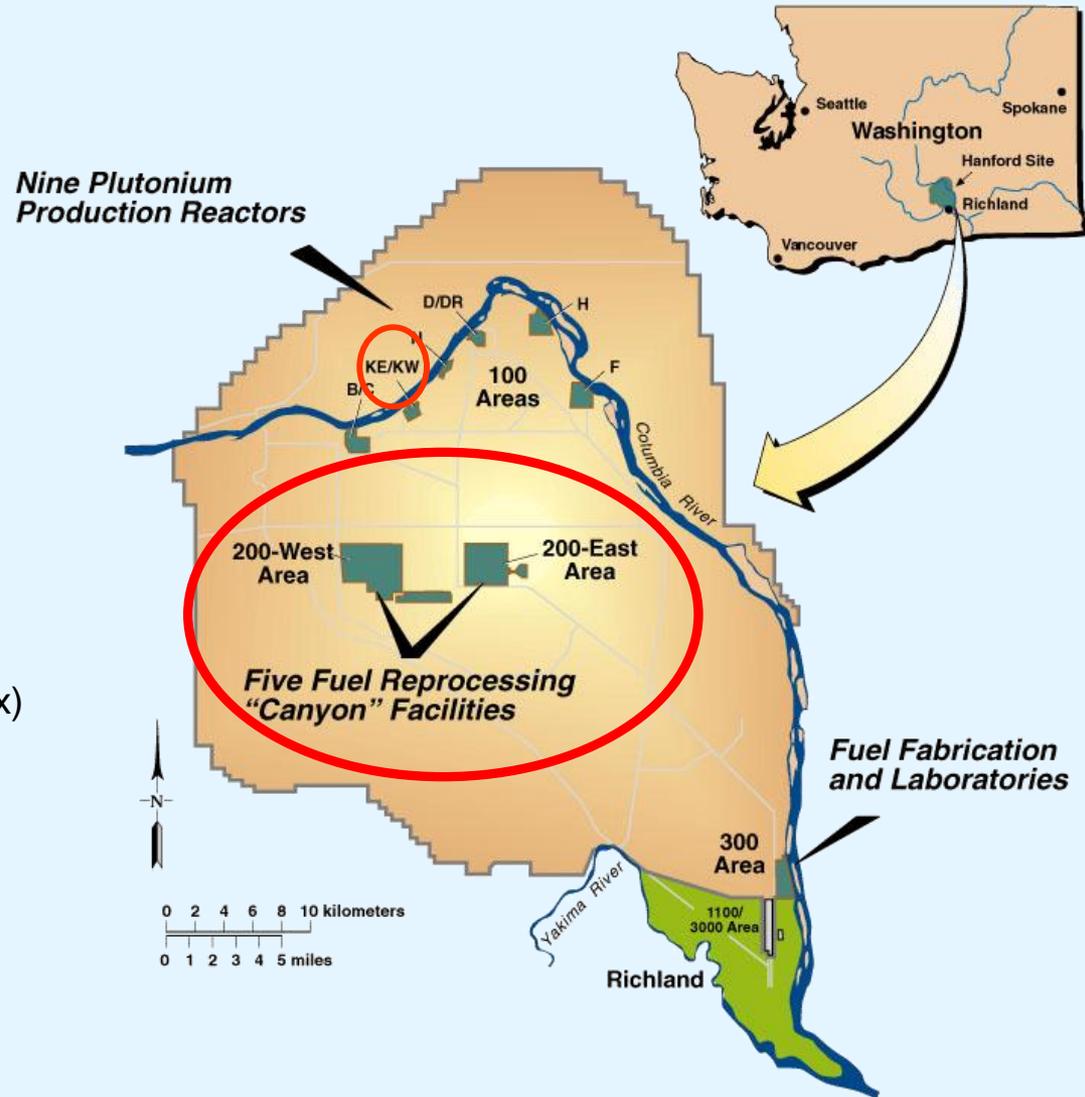
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# Hanford-Richland Field Office – Central Plateau

## Central Plateau Isotope Separations Processing & Waste Facilities

- 200 East
  - B Plant/ Waste Encapsulation & Storage Facility (WESF)
  - Plutonium/Uranium Extraction Plant (PUREX)
  - C Plant
- 200 West
  - Plutonium Finishing Plant (PFP)
  - U Plant
  - T Plant
  - Uranium Oxide Plant
  - Reduction Oxidation (S) Plant (Redox)
    - 100 Area; K East, K West



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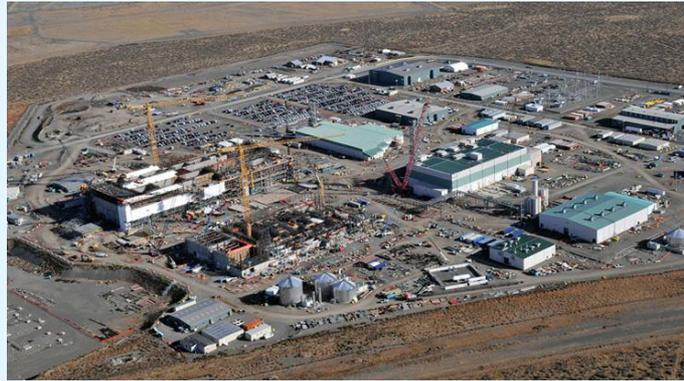
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Appendix A — D&D Sites and Projects

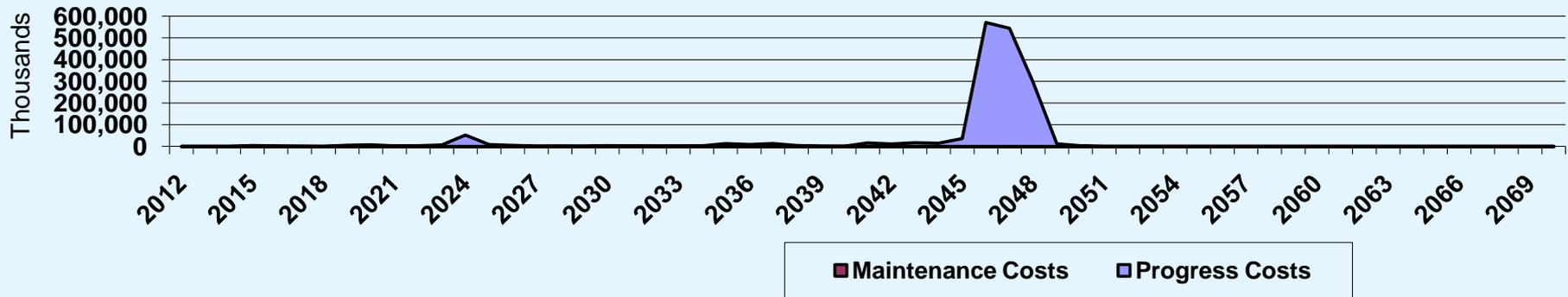
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# Hanford-Office of River Protection



Site	ABB ID	Project (ABB) Name	D&D Project			
			Total Cost (\$ Thousands)	Duration (years)	Start Year	End Year
Office of River Protection	154	WTP D&D	\$1,233,299	3	2046	2048
Office of River Protection	147	Tank Farm D&D	\$449,776	36	2014	2050

Hanford - River Protection Site D&D Budget and Schedule Profile

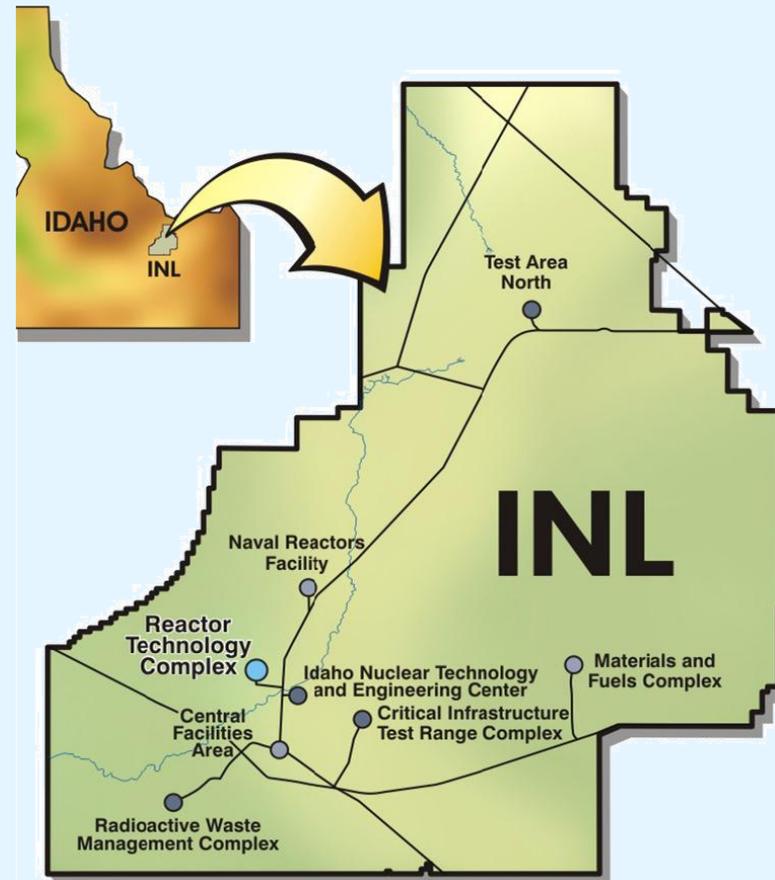


# Idaho National Laboratory, Idaho Falls, ID

DOE - Idaho Operations are managed under the Office of Nuclear Energy (NE), and is contracted to the Battelle Energy Alliance. Idaho cleanup projects are managed under the Office of Environmental Management (EM). In addition to decommissioning hundreds of facilities, EM manages and disposes radioactive and hazardous wastes and spent nuclear fuel (SNF) that originated from Cold War activities at the Idaho National Laboratory (INL) site. The Advanced Mixed Waste Treatment Project is contracted to Bechtel-B&W Idaho (BBWI). The rest of the Idaho site cleanup is contracted to CH2MHill-Washington (now URS) Group Idaho (CWI).

Environmental remediation/D&D activities are underway or have been completed at ten Waste Area Groups encompassing about one hundred operable units, including the Naval Reactors Facility (NRF) and the Materials and Fuels Complex (MFC), formerly known as Argonne National Laboratory-West.

(The INL Site Environmental Management Program is not responsible for activities at the NRF or the MFC.)



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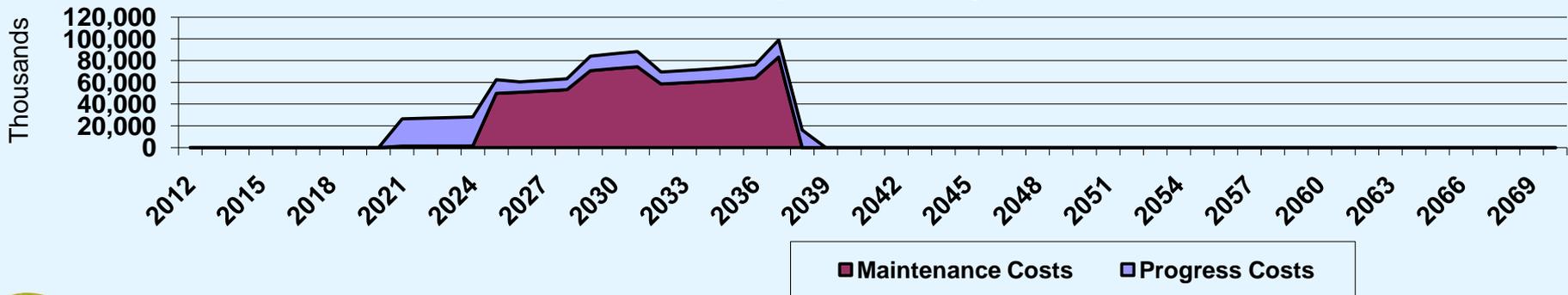
Office of Technical and Regulatory Support, EM-44  
Office of D&D and Facility Engineering

# Idaho National Laboratory (INL)

The Idaho Cleanup Project spans 890 square miles and includes five geographic areas: Idaho Nuclear Technology and Engineering Center (INTEC), Radioactive Waste Management Complex (RWMC), Test Area North (TAN), Reactors Technology Complex (RTC, formerly Test Reactor Area), and the Power Burst Facility. The project also includes several laboratories 50 miles east of Idaho Falls.

Site	ABB ID	Project (ABB) Name	D&D Project			
			Total Cost (\$ Thousands)	Duration (years)	Start Year	End Year
Idaho National Laboratory	106	INTEC D&D	\$169,472	14	2025	2038
Idaho National Laboratory	2014	AMWTP D&D	\$82,185	4	2021	2024
Idaho National Laboratory	2016	Misc. Facilities	\$15,293	5	2021	2025
Idaho National Laboratory	2015	MFC D&D	\$7,148	4	2021	2024
Idaho National Laboratory	110	RWMC D&D	\$2,249	4	2021	2024

Idaho National Laboratory Site D&D Budget and Schedule Profile



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# Idaho National Laboratory (INL)



**Test Area North (TAN) Technical Support Facility (TSF) Complex before demolition**



**Test Area North (TAN) Technical Support Facility (TSF) Complex after demolition (May 2008)**

Facility Type	Completed as of FY 09	Remaining (Life-cycle)
Nuclear	28	64
Radiological	35	33
Industrial	143	112



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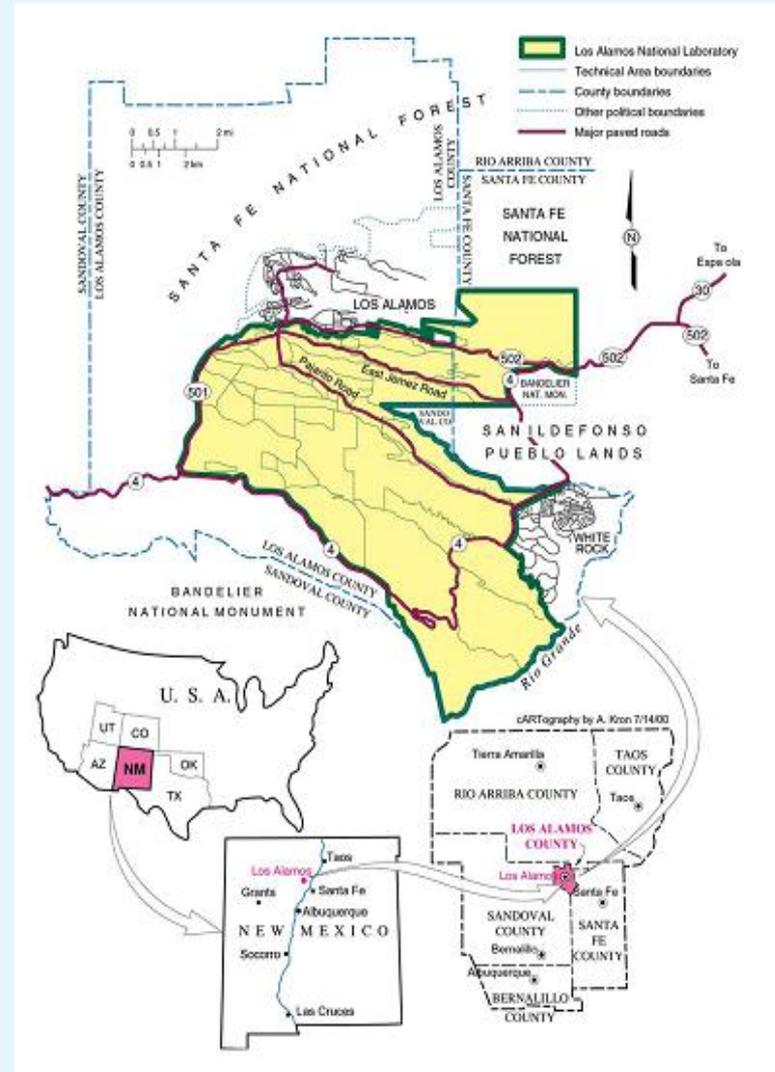
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Office of D&D and Facility Engineering

# Los Alamos National Laboratory, Los Alamos, NM

The Los Alamos National Laboratory (LANL) is located on 28,000 acres in Los Alamos and Santa Fe counties of north-central New Mexico, approximately 60 miles northeast of Albuquerque, New Mexico, and 25 miles northwest of Santa Fe, New Mexico. LANL is a multi-program national laboratory with research and development programs in a broad range of scientific and technical fields.

Los Alamos National Laboratory site operations are managed by the Office of National Nuclear Security Administration (NNSA). Site operations are contracted to Los Alamos National Security (LANS), a joint venture between the University of California and four major corporations.

LANL D&D and remediation work is funded through the Office of Environmental Management (EM) and contracted through LANS to subcontractors.



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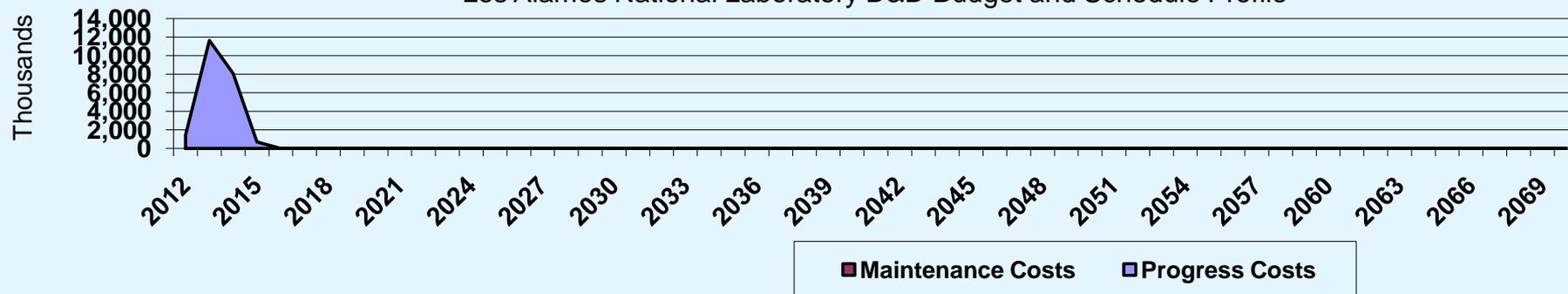
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Office of D&D and Facility Engineering

# Los Alamos National Laboratory

Site	ABB ID	Project (ABB) Name	D&D Project			
			Total Cost (\$ Thousands)	Duration (years)	Start Year	End Year
Los Alamos National Laboratory	486	TA-54 D&D	\$21,867	6	2010	2015

Facility Type	Completed as of FY 09	Remaining (Life-cycle)
Nuclear	0	0
Radiological	0	105
Industrial	0	0

Los Alamos National Laboratory D&D Budget and Schedule Profile



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# Oak Ridge Reservation, Oak Ridge, TN



The U.S. Department of Energy (DOE) Oak Ridge Reservation is located on 37,000 acres in east Tennessee. The Oak Ridge facilities include the Oak Ridge National Laboratory, the Y-12 National Security Complex, and the East Tennessee Technology Park.

The Oak Ridge – East Tennessee Technology Park was originally built as a uranium enrichment facility for defense programs. The majority of the building sites have been inactive since uranium enrichment production ceased in 1985.

The Oak Ridge National Laboratory supported both defense production operations and civilian energy research efforts. Currently, the Oak Ridge National Laboratory conducts applied and basic research in energy technologies and the physical and life sciences. Cleanup includes environmental remediation, deactivation and decommissioning of radioactively-contaminated facilities, and disposition of legacy low, mixed low-level, and transuranic waste.

The Oak Ridge Y-12 site originally was a uranium processing facility. This site is now used for the dismantling of nuclear weapons components, while also serving as one of the nation's storehouses for special nuclear materials. Major cleanup scope is envisioned under the IFDP.



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# Oak Ridge Reservation



ETPP D&D scope includes decommissioning of approximately 500 facilities, including 125 major buildings. The highest priority at the site is the deactivation and decommissioning of the K-25 and K-27 gaseous diffusion process buildings due to the deteriorating condition of the buildings.

D&D at ORNL and Y-12 is being managed through the Integrated Facilities Disposition Project (IFDP). The full IFDP scope includes the demolition of more than 200 old nuclear facilities and 5 million square feet of space at the Oak Ridge National Laboratory (ORNL) and the Y-12 nuclear weapons plant, including facilities already within the EM program (e.g., Alpha 4 at Y-12).



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# Oak Ridge Reservation

Site	ABB ID	Project (ABB) Name	D&D Project			
			Total Cost (\$ Thousands)	Duration (years)	Start Year	End Year
Oak Ridge Reservation	280A New	Alpha Buildings D&D	\$1,050,823	15	2018	2034
Oak Ridge Reservation	284A New	Central Campus Area and Other BV Facilities D&D	\$907,726	20	2018	2037
Oak Ridge Reservation	280D New	Process Facilities	\$877,720	15	2019	2035
Oak Ridge Reservation	280B New	Beta Buildings D&D	\$637,338	16	2018	2037
Oak Ridge Reservation	274 Existing	K-25 Building D&D	\$475,500	5	2011	2015
Oak Ridge Reservation	284D New	3019 Complex D&D	\$385,767	10	2025	2034
Oak Ridge Reservation	269 Existing	ETTP Balance of Site D&D	\$268,969	8	2011	2018
Oak Ridge Reservation	284A Existing	Central Campus Area and Other BV Facilities D&D	\$263,768	14	2018	2031
Oak Ridge Reservation	284B Existing	Melton Valley and MV Reactors D&D	\$258,246	17	2020	2036
Oak Ridge Reservation	284B New	Melton Valley and MV Reactors D&D	\$203,547	11	2022	2038
Oak Ridge Reservation	284C New	Waste Treatment Facilities D&D	\$145,943	15	2020	2034
Oak Ridge Reservation	280A Existing	Alpha Buildings D&D	\$144,984	6	2018	2023
Oak Ridge Reservation	280C New	Biology & Lab Complex	\$109,523	5	2026	2030
Oak Ridge Reservation	273 Existing	ETTP Main Plant D&D	\$108,300	4	2011	2018
Oak Ridge Reservation	280D Existing	Process Facilities D&D	\$24,480	6	2024	2029
Oak Ridge Reservation	275 Existing	K-27 Building D&D	\$10,000	3	2010	2018



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Appendix A — D&D Sites and Projects

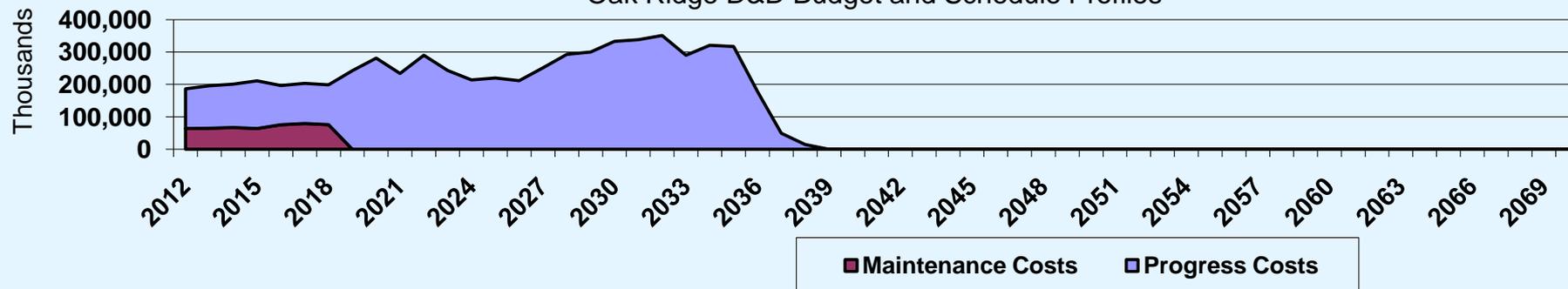
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# Oak Ridge Reservation

Facility Type	Completed as of FY 09	Remaining (Life-cycle)
Nuclear	8	17
Radiological	26	50
Industrial	329	306



Oak Ridge D&D Budget and Schedule Profiles



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# Paducah Site, Paducah, KY



The Paducah site is located on 3,400-acres owned by the Department of Energy. It is located in rural western Kentucky, 15 miles west of Paducah, Kentucky near the Ohio and Mississippi rivers.

For approximately 50 years, the Paducah Gaseous Diffusion Plant (and the Portsmouth Gaseous Diffusion Plant in Portsmouth, Ohio) supported Federal Government and commercial nuclear power missions. These operations produced contaminated areas both onsite and beyond site boundaries.

Presently, the sites are transitioning from primarily enrichment operations to shared missions with environmental cleanup, waste management, depleted uranium conversion, deactivation and decommissioning, re-industrialization, and long-term stewardship.

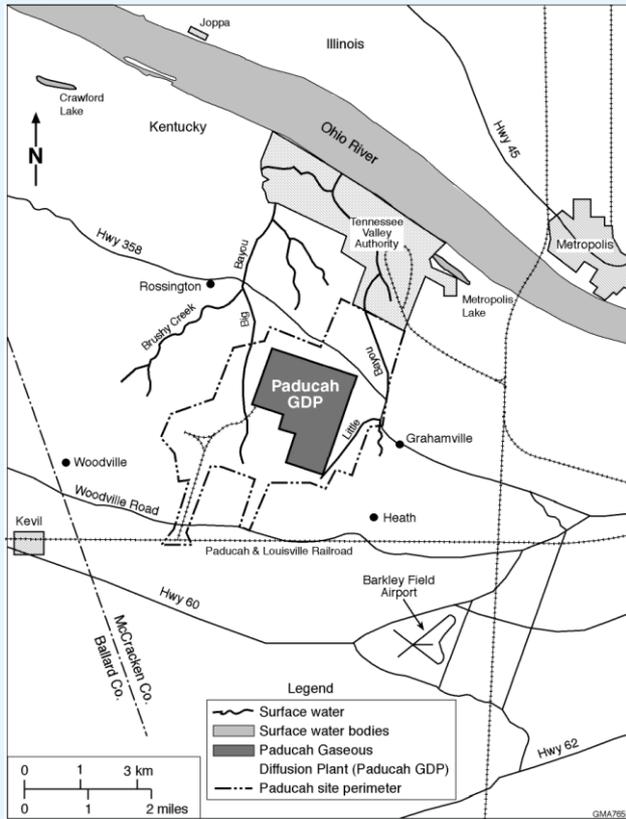


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# Paducah Site



Paducah Site Infrastructure Support, D&D and Remediation are managed by the Portsmouth-Paducah Project Office (PPPO), in Lexington, Kentucky:

- Site remediation and D&D is contracted to Paducah Remediation Services (PRS).
- Site Infrastructure Support service is contracted to Swift & Staley Team (SST).
- DUF6 Treatment Plant is being built and started up by Uranium Disposition Services (UDS).

Site	ABB ID	Project (ABB) Name	D&D Project			
			Total Cost (\$ Thousands)	Duration (years)	Start Year	End Year
Paducah	199	D&D of the Gaseous Diffusion Plant (GDP)	\$6,242,476	29	2012	2040
Paducah	200	Inactive Facility D&D	\$43,992	8	2010	2017

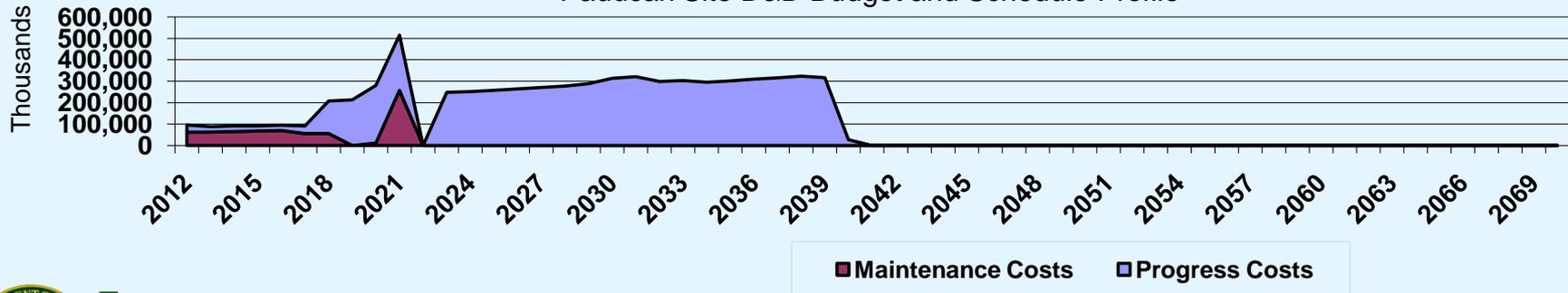
# Paducah Site

The plant was opened in 1952 as part of a U.S. government program to produce highly enriched uranium to fuel military reactors and produce nuclear weapons. Enrichment at Paducah originally was limited to low levels, and the plant served as a "feed facility" for other defense plants in Oak Ridge, TN, and Piketon, OH, where the enriched uranium was processed. That mission changed in the 1960s, when Paducah, along with its sister plant in Piketon, began to enrich uranium for use in commercial nuclear reactors to generate electricity.

Facility Type	Completed as of FY 09	Remaining (Life-cycle)
Nuclear	0	19
Radiological	2	20
Industrial	17	155

The former gaseous diffusion plant buildings are in the process of being transitioned to D&D by the existing site remediation contractor. D&D will first require the removal and disposition of hundreds of large centrifuges.

Paducah Site D&D Budget and Schedule Profile



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# Portsmouth Site, Piketon, OH



The Portsmouth Site Uranium Operations are managed by United States Enrichment Corporation (USEC), a private corporation.

Portsmouth Site Infrastructure Support, D&D and Remediation are managed by the Portsmouth-Paducah Project Office (PPPO), in Lexington, Kentucky:

- Site remediation and D&D is contracted to LATA Parallax Portsmouth (LPP).
- Site Infrastructure Support service is contracted to Theta Pro2Serve Mgmt (TPM).
- DUF6 Treatment Plant is being built and started up by Uranium Disposition Services (UDS).



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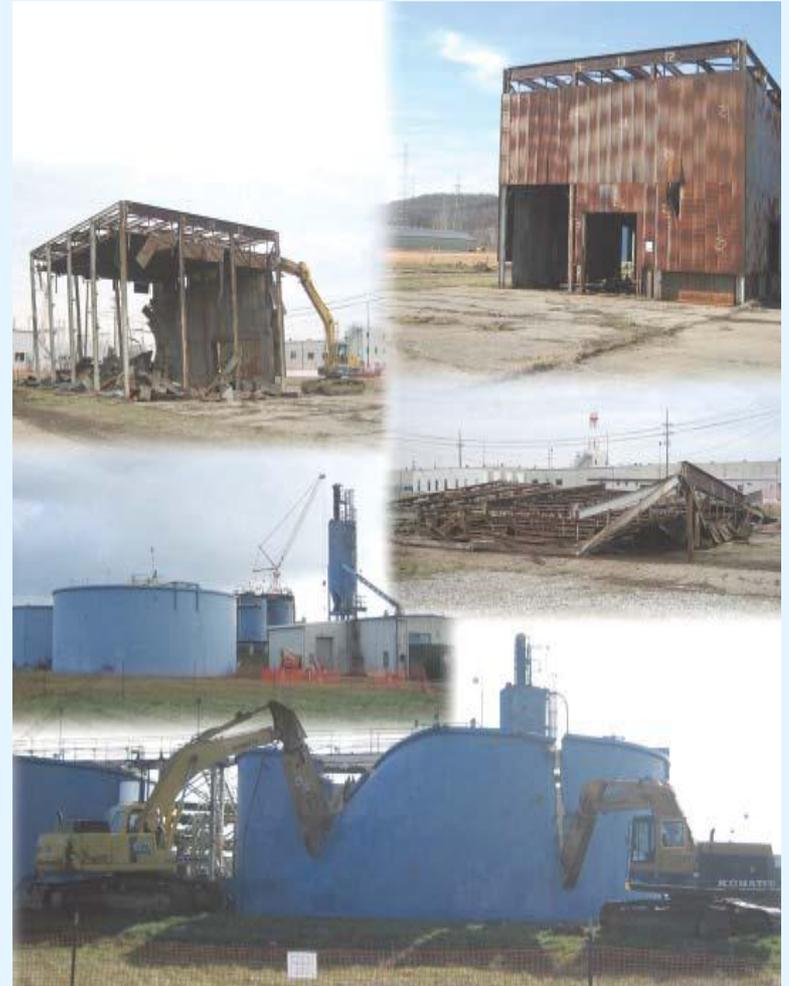
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# Portsmouth Site

The Energy Policy Act of 1992 (EPAct) created the United States Enrichment Corporation (USEC), a wholly owned Government corporation, to initiate the transfer of the uranium enrichment operation to the private sector. The act transferred the DOE uranium enrichment enterprise, primarily the Paducah and Portsmouth Gaseous Diffusion Plant (GDP) sites to USEC. In 2000, USEC ceased enrichment operations at the Portsmouth GDP site. As a matter of energy security policy, the Department in 2001 placed a portion of the Portsmouth GDP site on cold standby.

Deactivation and cold shutdown were completed in 2008 and a draft Request for Proposal was issued the same year. Uranium was enriched in a sequence, starting in X-333, then X-330, and finally, X-326. D&D will be performed in the same sequence, based on the enrichment process, from lower radiological levels in X-333 to the highest in X-326, where 90% HEU was produced.



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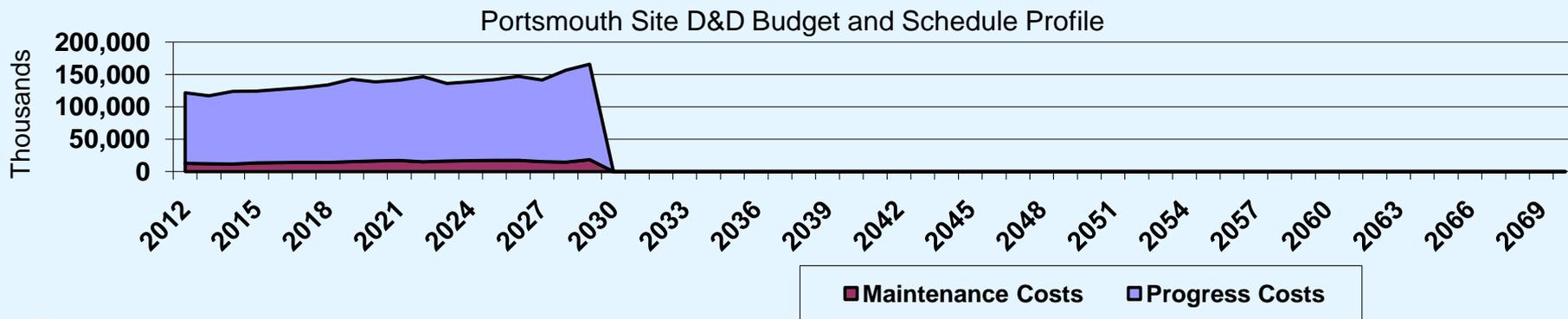
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# Portsmouth Site

Facility Type	Completed as of FY 09	Remaining (Life-cycle)
Nuclear	0	13
Radiological	7	20
Industrial	8	113



Site	ABB ID	Project (ABB) Name	D&D Project			
			Total Cost (\$ Thousands)	Duration (years)	Start Year	End Year
Portsmouth	166	D&D Balance of Plant	\$1,631,838	20	2010	2029
Portsmouth	167	D&D of the Process Buildings	\$568,492	18	2012	2029



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Appendix A — D&D Sites and Projects

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# Savannah River, Aiken, SC

Savannah River Operation Office includes two major cleanup programs:

- General site facility D&D and remediation, contracted to Savannah River Nuclear Solutions (SRNS).
- Liquid waste tank dispositions contracted to Washington Savannah River Corp (WSRC).

SRS encompasses over 300 square miles with more than 1,000 facilities concentrated within only 10 percent of the total land area. As cleanup activities are completed, operations will be concentrated to the site central core area. The land surrounding the central core provides a protective buffer. Savannah River is employing an Area Completion Strategy for which facility decommissioning is performed concurrently with soil remediation in each of the 14 large industrial areas.



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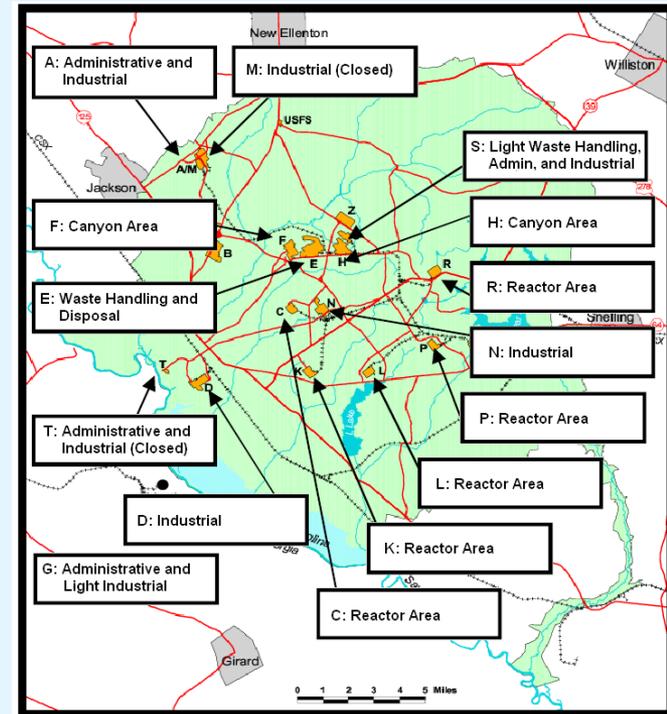
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# Savannah River

Facility Type	Completed as of FY 09	Remaining (Life-cycle)
Nuclear	11	180
Radiological	8	32
Industrial	232	527

Reactor Name	Start-up Date	Shutdown Date	D&D Start Date
R-reactor	1953	1964	2014
P-reactor	1954	1988	2014
K-reactor	1954	Standby 1992	2020
L-reactor	1954	1988	2024
C-reactor	1955	1985	2015



There are two large canyon facilities at Savannah River. H Canyon is operational. F Canyon has been deactivated, however, with ARRA funding, the remediation of 800 to 1,000 drums of transuranic (TRU) waste restarted at the Department of Energy's F Canyon, a deactivated chemical separations facilities at the Savannah River Site. The process calls for hand sorting of the contents of 55-gallon drums that X-ray technology has identified as containing items, such as aerosol cans or liquids, which are not allowed for disposal at the Waste Isolation Pilot Plant (WIPP) near Carlsbad, N.M.

The drum remediation project was a key part of SRS being able to disposition 30,000 drums of legacy TRU waste. The first phase of the project was completed in October 2008, after two years of safely remediating 3,000 drums. The work is expected to continue into 2012 to complete the project.



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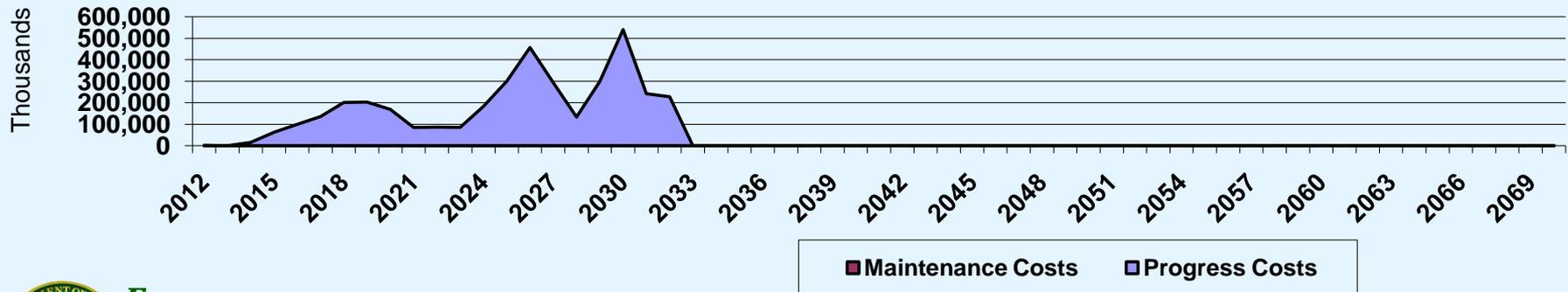
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# Savannah River

Site	ABB ID	Project (ABB) Name	D&D Project			
			Total Cost (\$ Thousands)	Duration (years)	Start Year	End Year
Savannah River	62	H-Area D&D: Non-Area Completion	\$1,540,834	18	2014	2032
Savannah River	60	F-Area D&D: Non-Area Completion	\$970,392	16	2012	2032
Savannah River	70	S-Area D&D: Non-Area Completion	\$276,656	6	2027	2032
Savannah River	64	K-Area D&D: Non-Area Completion	\$217,759	9	2020	2030
Savannah River	63	J-Area D&D: Non-Area Completion	\$204,378	6	2027	2032
Savannah River	65	L-Area D&D: Non-Area Completion	\$154,410	9	2024	2032
Savannah River	57	C-Area D&D: Non-Area Completion	\$136,857	9	2015	2030
Savannah River	55	A-Area D&D: Non-Area Completion	\$79,351	6	2021	2031
Savannah River	67	N-Area D&D: Non-Area Completion	\$74,850	8	2022	2031
Savannah River	56	B-Area D&D: Non-Area Completion	\$67,811	4	2028	2031
Savannah River	73	Z-Area D&D: Non-Area Completion	\$43,993	4	2029	2032
Savannah River	61	G-Area D&D: Non-Area Completion	\$21,852	10	2014	2031
Savannah River	59	E-Area D&D: Non-Area Completion	\$21,315	5	2027	2031
Savannah River	72	U-Area D&D: Non-Area Completion	\$9,262	4	2021	2024

Savannah River Site D&D Budget and Schedule Profile



# West Valley Demonstration Project, West Valley, NY

The West Valley Demonstration Project is located on 3,345 acres of land called the Western New York Nuclear Service Center, and owned by the state of New York. The site is located approximately 40 miles south of Buffalo, New York. The U.S. Department of Energy (DOE) has operational responsibility for approximately 165 acres near the center of the larger 3,345 acres.

From 1966 to 1972, the West Valley site reprocessed 640 metric tons of commercial and U. S. Atomic Energy Commission (AEC) spent nuclear fuel to recover uranium and plutonium. The reprocessing efforts were conducted by Nuclear Fuel Services, under contract to the State of New York, and under license by the AEC (a predecessor agency to the DOE) and the U.S. Nuclear Regulatory Commission. The facility also accepted low-level radioactive wastes from other sites for storage until 1975.



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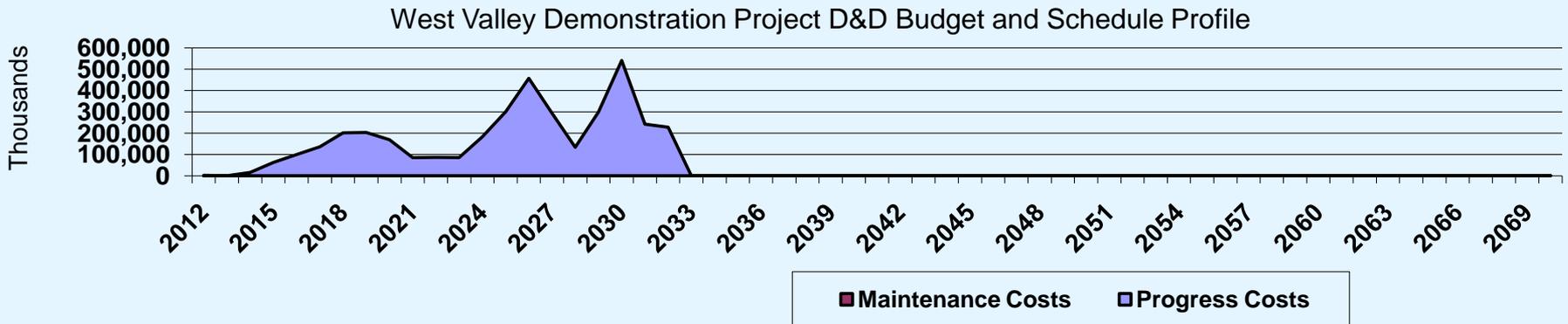
Appendix A — D&D Sites and Projects

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# West Valley Demonstration Project

Site	ABB ID	Project (ABB) Name	D&D Project			
			Total Cost (\$ Thousands)	Duration (years)	Start Year	End Year
West Valley	319	Nuclear Facility D&D-West Valley	\$343,394	15	2010	2038

Facility Type	Completed as of FY 09	Remaining (Life-cycle)
Nuclear	3	11
Radiological	4	9
Industrial	13	16



# Facility Deactivation & Decommissioning Appendix B1 — EM D&D Project Profiles (FY 2012-2016)

2011 Edition



Hanford – U Plant



Savannah River Site – Maneuvering  
Spent Fuel Cask



Hanford – K East Basin Removal

# Introduction to EM D&D Projects

- D&D costs presented herein are budgetary estimates extracted from the updated ABB data submitted for the development of the FY 2012 Business Case. The projects' costs, used here to define and sort project size, reflect only the “progress” dollars for the D&D activities. Surveillance and maintenance costs and progress costs are shown in the graphic cost profiles. D&D projects shown are those with “progress” costs budgeted in FY2012-2016 or before.
- Surveillance and maintenance costs are not visible on some ABB Budget and Schedule Profiles because they are either too low for the scale of the graph or are reported as zero.
- Durations are based on the number of years with “progress” dollars budgeted. Some projects with current D&D activity (e.g., SRS C-Area) have several years with no D&D activities before resuming D&D later. In these cases the durations will not be equal to the interval between the Start Year and the End Year.
- The level of detail provided for individual “Project Descriptions” pages vary greatly and is consistent with the level of planning accomplished to date. Projects in the out years typically have only general or conceptual levels of available detail that will evolve as additional planning is accomplished.



# Five Year Outlook (FY 2012–2016)

Site	ABB ID	Project (ABB) Name	D&D Project			
			Progress Cost* from 2012-2016 (\$ K)	Duration (yrs)	Start Year	End year
Richland Operations Office	331	Plutonium Finishing Plant (PFP) Disposition (D4)	\$536,855	7	2010	2016
Oak Ridge Reservation	274 Existing	K-25 Building D&D	\$475,500	5	2011	2015
Portsmouth	166	D&D Balance of Plant (A1 & A2)	\$416,271	20	2010	2029
West Valley Demonstration Project	319	Nuclear Facility D&D-West Valley	\$283,224	17	2008	2038
Savannah River Site	60	F-Area D&D: Non-Area Completion	\$150,521	16	2012	2032
Oak Ridge Reservation	269 Existing	ETTP Balance of Site D&D	\$147,586	8	2011	2018
Portsmouth	167	D&D of the Process Building	\$133,360	18	2012	2029
Paducah	199	D&D of the Gaseous Diffusion Plant (GDP)	\$89,520	29	2012	2040
Paducah	200	Inactive Facility D&D	\$43,615	10	2008	2017
Richland Operations Office	408	Zone 18 (U Plant Zone)	\$41,977	12	2010	2022
Richland Operations Office	336	K West Basin D&D	\$40,273	4	2015	2018
Oak Ridge Reservation	273 Existing	ETTP Main Plant D&D	\$31,800	4	2011	2018
ETEC	307	Facility D&D	\$29,594	7	2011	2017
Los Alamos National Laboratory	486	TA-54 D&D	\$21,867	6	2010	2015
Richland Operations Office	417	FFTF D4	\$21,439	21	2010	2030
Savannah River Site	62	H-Area D&D: Non-Area Completion	\$19,251	18	2014	2032
Richland Operations Office	418	Sodium Disposition	\$13,956	15	2015	2029
Savannah River Site	57	C-Area D&D: Non-Area Completion	\$8,058	9	2015	2030
Office Of River Protection	147	Tank Farm D&D	\$6,455	36	2014	2050
Richland Operations Office	403	Zone 11 (PUREX Zone)	\$1,727	9	2015	2024
Savannah River Site	61	G-Area D&D: Non-Area Completion	\$1,518	10	2014	2031
Richland Operations Office	411	Zone 5 (B Plant Zone)	\$1,108	13	2015	2041
Richland Operations Office	406	Zone 12 (REDOX Zone)	\$1,108	16	2015	2047
Richland Operations Office	402	Zone 1 (200-E Admin Zone)	\$220	11	2016	2048
<b>SUBTOTAL 2012-2016</b>			<b>\$2,516,803</b>			
<b>SUBTOTAL BEYOND 2016</b>			<b>\$14,465,972</b>			
<b>TOTAL LIFECYCLE</b>			<b>\$16,982,775</b>			

\* The projects' costs, used here to define and sort project size, reflect only the "progress" dollars for the D&D activities. The "maintenance" dollars for FY 2012-16 are \$1.1 billion.



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# Plutonium Finishing Plant Disposition (D4)

## Project Summary Table

Location Description			
Site/Area Description	Hanford; Central Plateau; 200 West Area		
EM Field Office	Richland Operations Office		
Facility Description			
Major Facility Type	Nuclear		
No. Buildings	A complex of more than sixty buildings, major building is PFP-234-5Z		
Gross Total Building Square Feet	Nearly 400,000		
Construction	Steel frame and siding with concrete cell walls for building PFP-234-5Z		
Current Facility State	Decontamination work continues; remaining SNM transferred to SRS in December 2009. The scope, schedule, and cost for this ABB has been revised as a result of the ARRA. The changes will be recorded in the next revision of the D&D Maps.		
Source Term	Plutonium		
Project Description			
Estimated Cost 2012-2016	\$536,855,000	Remaining Lifecycle Cost*	\$536,855,000
Projected End-State	Slab-on-grade		
Project Start and End Dates	2010-2016		
Contractor	CH2M-Hill Plateau Remediation Company		
Identifiers	ABB: 331; PBS: RL-0011		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# Plutonium Finishing Plant Disposition (D4)

## Facility Background

From 1949 to 1989, the Plutonium Finishing Plant (PFP) processed plutonium nitrate solutions into a solid form for shipment to the nation's weapons production facilities. PFP produced more plutonium metal buttons than any other American facility.

Many of the defense nuclear material production lines were shut down with material still in various stages of the production process. This left Hanford with a sizeable inventory of plutonium materials in various forms.

In June 1993, a dilute solution of hydroxylamine nitrate and nitric acid was prepared in a tank at the Plutonium Reclamation Facility (PRF) within the PFP. However, plans to restart PRF were cancelled in December, 1993. Over the next four years the concentration of the HAN/nitric acid solution within the tank increased due to evaporation. This led to an explosion that destroyed the tank and damaged the surrounding structure. Subsequently, a two year investigation, cleanup, and recovery period was required.



There are more than 60 major buildings and ancillary facilities in the PFP complex. The major process facilities include the 234-5Z Processing Facility, the 236-Z Plutonium Reclamation Facility, and the 242-Z Americium Recovery Facility.



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# Plutonium Finishing Plant Disposition (D4)

## Project Discussion

The main production areas of PFP have been undergoing stabilization and deactivation activities. Ancillary buildings and structures no longer critical to present activities are undergoing D&D.

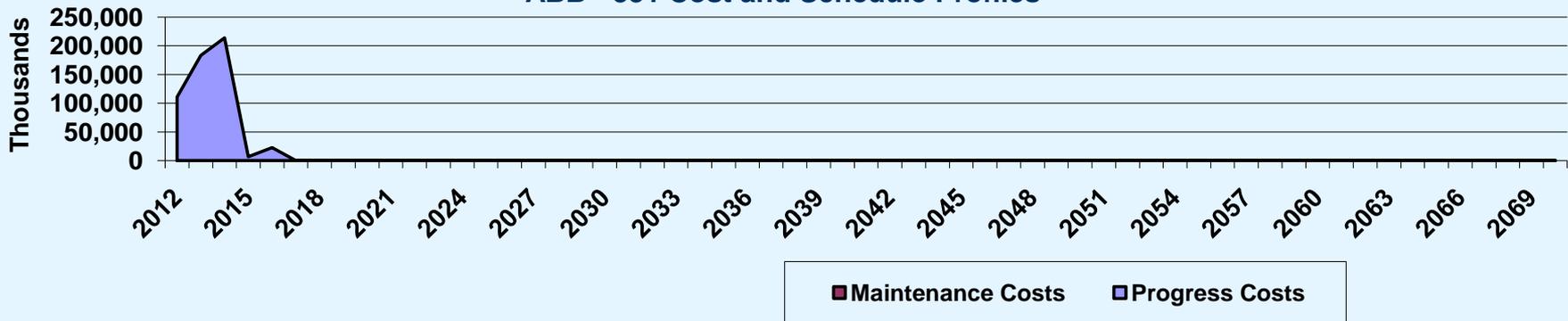
Several buildings that existed in the PFP Complex have been cleaned out and demolished including removal of the 241-Z Waste Treatment/Storage Tank Facility and the 232-Z Waste Incinerator Building. Nearly 100 gloveboxes have been decontaminated and removed.

The waste inventory at the Hanford Site is large since it was the largest and oldest plutonium production site. The total plutonium waste inventory is approximately 1,522 kilograms and consists of 455 kilograms in tanks, 192 kilograms in ditches and cribs, and 875 kilograms in solid wastes. In December 2009 it was announced that all of the remaining plutonium that had been stored at Hanford had been successfully stabilized, packaged, and shipped to the Savannah River Site. The facility's armed security presence which had been associated with PFP for many years was no longer needed.

The project costs shown are for the D&D portion of the work only.



### ABB - 331 Cost and Schedule Profiles



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# K-25 Building D&D

## Project Summary Table

Location Description			
Site/Area Description	Oak Ridge; East Tennessee Technology Park		
EM Field Office	Oak Ridge Operations Office		
Facility Description			
Major Facility Type	Nuclear		
No. Buildings	1		
Gross Total Building Square Feet	1.64 Million		
Construction	Steel framed concrete, asbestos transite siding		
Current Facility State	Demolition of west wing competed in Jan. 2010, pre-demolition activities continue in the north and east wings.		
Source Term	Uranium, Technetium-99, and other fission products waste		
Project Description			
Estimated Cost 2012-2016	\$475,500,000	Remaining Lifecycle Cost*	\$475,500,000
Projected End-State	Demolition; brown field industrial reuse		
Project Start and End Dates	2011-2015		
Contractor	URS-CH2M Oak Ridge, LLC		
Identifiers	ABB: 274 Existing; PBS: OR-0040		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# K-25 Building D&D

## Facility Background



ETTP, formerly known as the K-25 Gaseous Diffusion Plant, was a uranium enrichment production facility built between 1943 and 1945. The facility covers 45 acres on the 5,000 acre site. When it was built, the K-25 building was the largest industrial structure in the world.

The three-story, U shaped building, built during the Manhattan Project, covers 1.64 million square feet and contains 3,018 stages of gaseous diffusion process equipment and associated auxiliary systems. Each stage consists of a converter, two compressors, two compressor motors, and associated piping. Some operations have been shut down for nearly 3 decades, and the entire production mission ended more than 15 years ago.

The K-25 Building is a Nuclear Category 2 facility. In addition to uranium, bio-contamination requires the use of respiratory protection, and constant S&M is required to reduce entry of water, which increases the potential for criticality if it encounters the highly enriched uranium present in process equipment.



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# K-25 Building D&D

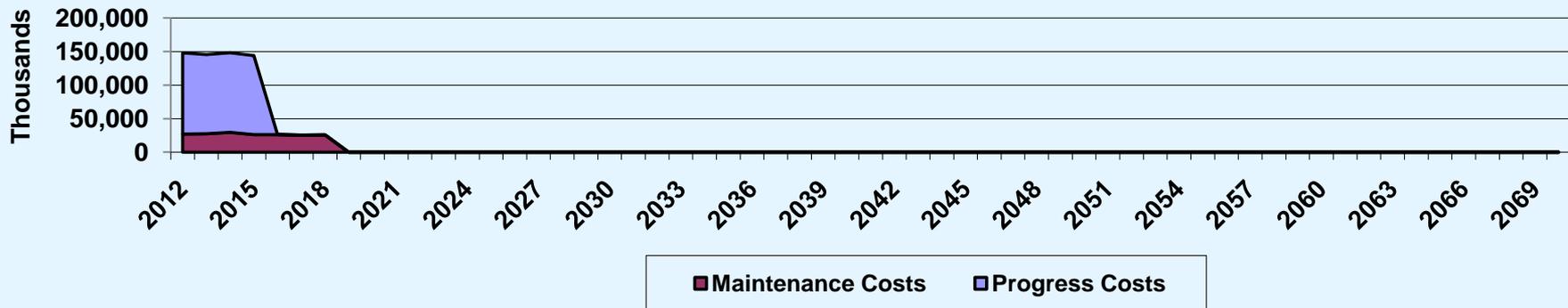
## Project Discussion

Activities to date within the K-25 Building include cleanout and disposal of a large quantity of loose stored material and equipment, installation of a temporary power system, installation of a reconfigured Radiation Criticality Accident Alarm System, demolition of the northwest bridge connecting the west wing to the north tower, and other preparations for removal of the process system and equipment. Demolition of the west wing was completed in January 2010, and is expected to be disposed of by the current contractor.



K-25 West Wing Demolition

### ABB – 274 Existing Cost and Schedule Profiles



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# D&D Balance of Plant (A1 and A2)

## Project Summary Table

Location Description			
Site/Area Description	Portsmouth		
EM Field Office	Portsmouth/Paducah Project Office		
Facility Description			
Major Facility Type	Nuclear & Industrial		
No. Buildings	130		
Gross Total Building Square Feet	3,700,000+		
Construction	Various		
Current Facility State	Cold shutdown. The scope, schedule, and cost for this ABB has been revised as a result of the ARRA. The changes will be recorded in the next revision of the D&D Maps.		
Source Term	Uranium, Tantalum, Radium		
Project Description			
Estimated Cost 2012-2016	\$416,271,000	Remaining Lifecycle Cost*	\$1,631,000,000
Projected End-State	D&D of all GDP facilities, process equipment, related process buildings, and other ancillary GDP facilities.		
Project Start and End Dates	2009-2029		
Contractor	Fluor-B&W Portsmouth LLC		
Identifiers	ABB: 166; PBS: PO-0040		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# D&D Balance of Plant (A1 and A2)

## Facility Background



The Portsmouth Gaseous Diffusion Plant in Piketon, Ohio, was operated by the United States Enrichment Corporation, a subsidiary of USEC Inc. The plant had a long history of enriching uranium for defense and commercial nuclear power needs.

Uranium enrichment began in the early 1940s as a U.S. defense initiative to produce fissionable material for the atomic bomb, initially at the nation's first gaseous diffusion plant, K-25, at Oak Ridge, Tennessee. In 1952, the Atomic Energy Commission selected a tract of land in the Ohio Valley along the Scioto River in Pike County for the site of the Portsmouth Gaseous Diffusion Plant. In March 1956, the plant was completed at a cost of \$750 million. More than 1,200 acres were cleared and more than 4.5 million cubic yards of earth were moved. The current 3,800 acre plant site encompasses 415 facilities including buildings, utilities, systems, ponds and infrastructure units.

In the 1960s, the Portsmouth plant's mission changed from enriching uranium for nuclear weapons to producing fuel for commercial nuclear power plants. Until 2001, Portsmouth and its sister plant in Paducah, Kentucky, worked in tandem to enrich uranium for use in nuclear power plants.



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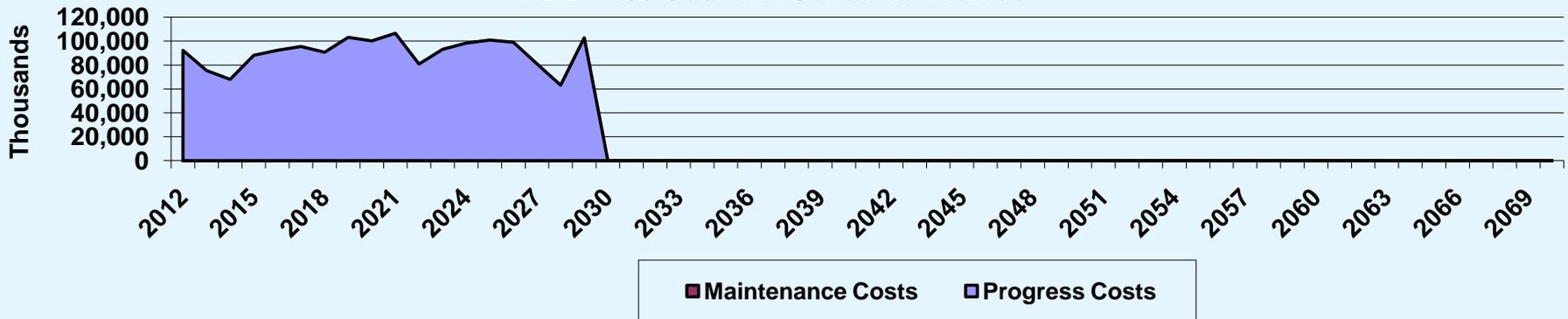
# D&D Balance of Plant (A1 and A2)

## Project Discussion

A total of 415 facilities (including buildings, utilities, systems, ponds, and infrastructure units) are currently identified on the Portsmouth site. Of those facilities, approximately 315 are included in the Portsmouth D&D project. The 315 facilities include 130 buildings. The scope of this ABB is those facilities which supported the three process buildings (X-326, X-330, X-333). Those support facilities include a steam plant, electrical switchyards, cooling towers, cleaning and decontamination facilities, water and wastewater treatment plants, maintenance and laboratory facilities, and office buildings.



ABB - 166 Cost and Schedule Profiles



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# Nuclear Facility D&D – West Valley

## Project Summary Table

Location Description			
Site/Area Description	West Valley Demonstration Project		
EM Field Office	Ohio Field Office		
Facility Description			
Major Facility Type	Nuclear		
No. Buildings	42		
Gross Total Building Square Feet	400,000		
Construction	Reinforced concrete/steel framed		
Current Facility State	Obsolete & vacant nuclear processing facility. D&D in progress.		
Source Term	Cesium-137, Strontium-90, Tritium, Radium-226, and Plutonium-238		
Project Description			
Estimated Cost 2012-2016	\$283,224,000	Remaining Lifecycle Cost*	\$343,394,000
Projected End-State	Demolish, Brownfield		
Project Start and End Dates	2008 – 2038		
Contractor	West Valley Environmental Services LLC		
Identifiers	ABB: 319; PBS: OH-WV-0040		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# Nuclear Facility D&D – West Valley

## Facility Background

Located about 40 miles south of Buffalo, NY, the West Valley Demonstration Project (WVDP) occupies the site of the only commercial nuclear fuel reprocessing facility to have operated in the United States. During commercial operations of the site in the late sixties and early seventies, approximately 640 metric tons of spent nuclear fuel was reprocessed. Reprocessing operations were halted between 1972 and 1976 to support facility modifications, but operations never resumed. When DOE became responsible for the site in 1980, approximately 600,000 gallons of liquid high level waste (HLW) were stored in two single shelled, carbon steel underground tanks. Since then, DOE has performed waste decontamination, deactivation, and disposition of facilities, and infrastructure/landlord activities. To date, the site has solidified over 600,000 gallons of HLW into 275 canisters and shipped over 1,000,000 cubic feet of low level waste (LLW).

The WVDP is a unique operation within the Department of Energy. It came into being through the West Valley Demonstration Project Act of 1980. The Act requires that the Department be responsible for solidifying the high-level waste, disposing of waste created by the solidification, and decommissioning the facilities used in the process. The land and facilities are not owned by the Department. Rather, the project premises are the property of the New York State Energy Research and Development Authority (NYSERDA) and represents only 200 acres of the larger Western New York Service Center, which is approximately 3,300 acres, also owned by NYSERDA. After DOE's responsibilities under the Act are complete, the Act requires that the premises be returned to New York state. Until that time, the Act requires New York state to pay 10 percent of the Project costs, and the Department pays the remaining 90 percent.



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# Nuclear Facility D&D – West Valley

## Project Discussion

### Main Plant Process Building

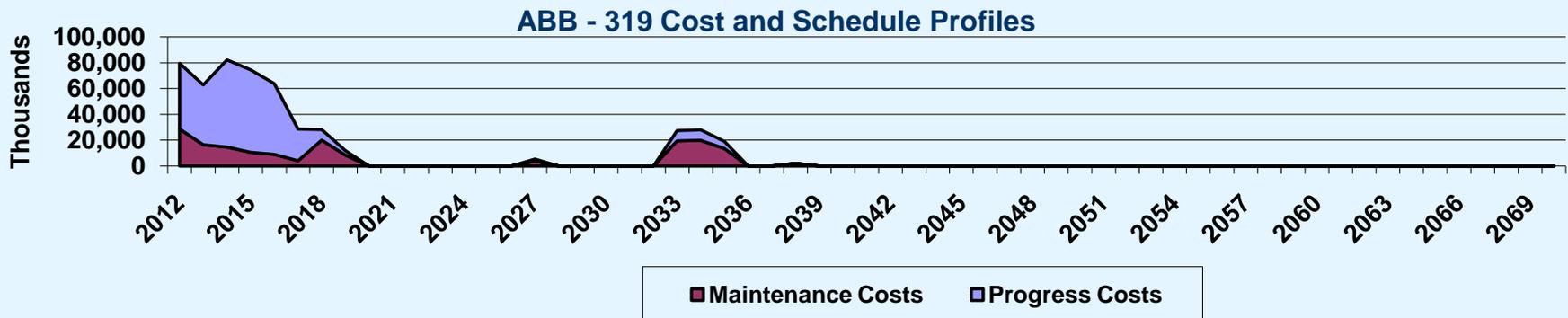
Once used to reprocess spent (used) nuclear fuel, the Main Plant Process Building at the West Valley Site is a five-story, heavily-shielded reinforced concrete structure. Some areas of the Main Plant contain residual radioactive contamination from past reprocessing activities. Removing equipment and debris and preparing the facility for demolition is a major focus of the present work scope. Specifically the contractor will:

- Process and ship stored legacy low-level radioactive waste and highly-contaminated equipment and debris,
- Package and dispose of newly-generated waste resulting from decontamination and dismantlement work, and
- Continue onsite safe storage of waste with no current pathway for disposal, including 275 canisters of solidified high-level radioactive waste.

### Infrastructure Reduction

As the WVDP moves toward site closure, large-scale infrastructure reduction activities have significantly reduced the number of structures on the site. An additional 60 structures are expected to be removed, further preparing the site for future long-term management and eventual closure. Major facilities to be removed during this period include:

- Storage facilities, including areas used for the storage of waste and materials associated with operation of the facility,
- Wastewater treatment facilities, and
- Waste transfer piping that connects the Main Plant to the Waste Tank Farm.



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# F-Area D&D: Non-Area Completion

## Project Summary Table

Location Description			
Site/Area Description	Savannah River Site; F-Area		
EM Field Office	Savannah River Operations Office		
Facility Description			
Major Facility Type	Nuclear & Industrial		
No. Buildings	More than 65 facilities include the F-Canyon Building		
Gross Total Building Square Feet	712,000		
Construction	F-Canyon = reinforced concrete, other structures = various		
Current Facility State	Canyon operations have been shutdown. Facility is being used for repackaging TRU waste.		
Source Term	Various		
Project Description			
Estimated Cost 2012-2016	\$150,521,000	Remaining Lifecycle Cost*	\$970,392,000
Projected End-State	Demolition and In Situ Decommissioning (entombment) candidate		
Project Start and End Dates	2012-2032		
Contractor	Savannah River Nuclear Solutions LLC		
Identifiers	ABB: 60; PBS: SR-0040		

\* Remaining Life-cycle cost is from 2012 to project completion.



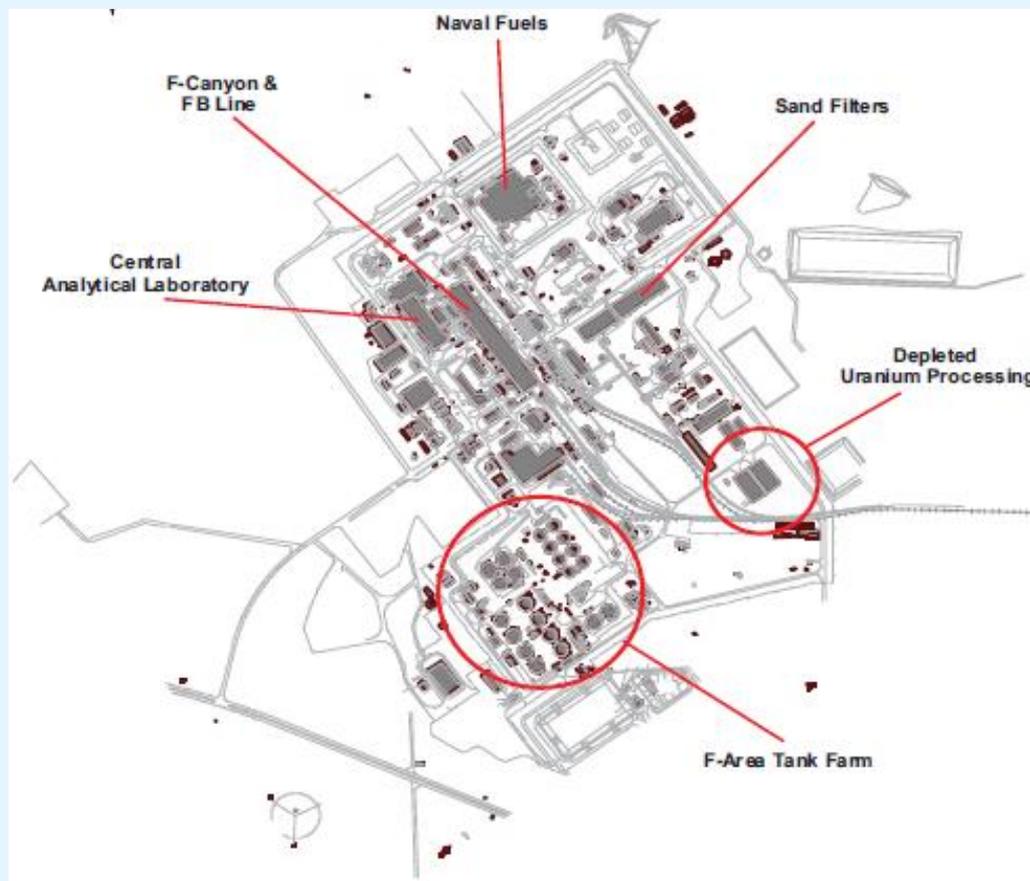
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# F-Area D&D: Non-Area Completion

## Facility Background



F-Area is located in the center of the site and is 6.6 miles from A-Area. F-Area waste units are located in the Fourmile Branch and Upper Three Runs Watersheds. The area primarily comprises heavy nuclear, industrial, warehouse and administrative facilities. The current land use for F-Area is site industrial.

F-Area facilities include the F-Canyon Building, Depleted Uranium (DU) Processing Facility, FB-Line Facility, Metallurgical Facilities, Naval Fuels Building (now demolished), Central Analytical Laboratory, the Mockup/Fabrication Facility, and the F-Area Tank Farm. F-Area is one of the two areas located near the center of SRS where nuclear chemical separations and waste management operations are performed. The primary function of these facilities was to stabilize special nuclear material (SNM) from spent fuels, irradiated targets, and other legacy nuclear materials and to evaporate and store the liquid radioactive waste generated by these operations.



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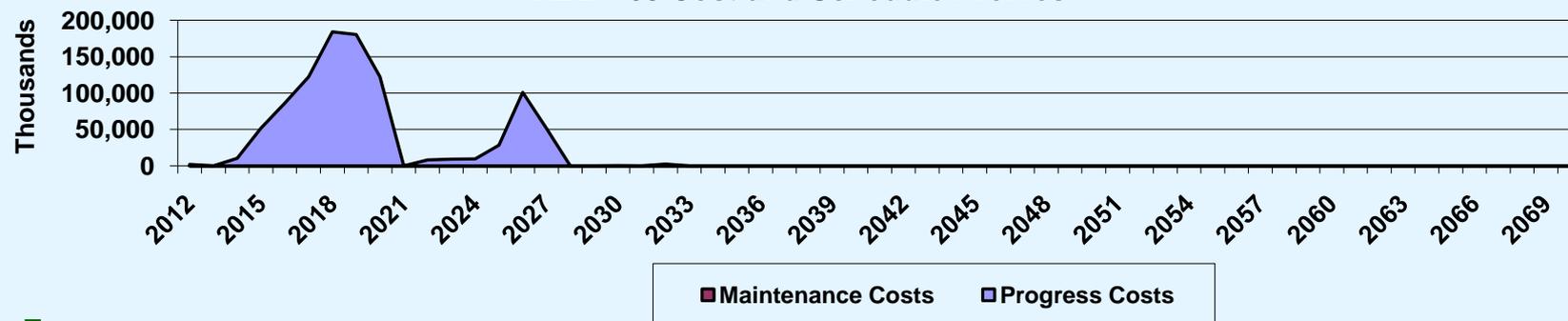
# F-Area D&D: Non-Area Completion

## Project Discussion

FB Line is completely deactivated and requires periodic entries for surveillance. A portion of F-Canyon is being maintained for possible future missions. All liquid radioactive waste tanks in the tank farms will be closed (emptied and filled with grout). In addition, the 1F and 2F Evaporators and contaminated waste transfer systems will be closed by isolating utilities and filling with grout. All above-ground buildings or structures will be demolished, and a perimeter fence will secure any remaining F-Area facilities.



ABB - 60 Cost and Schedule Profiles



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# ETTP Balance of Site D&D

## Project Summary Table

Location Description			
Site/Area Description	Oak Ridge; East Tennessee Technology Park		
EM Field Office	Oak Ridge Operations Office		
Facility Description			
Major Facility Type	Industrial & Radiological		
No. Buildings	166		
Gross Total Building Square Feet	173,000		
Construction	Steel framed, asbestos transite siding		
Current Facility State	Shut down/most are cold and dark		
Source Term	Uranium, Technetium-99, and other fission products waste		
Project Description			
Estimated Cost 2012-2016	\$147,586,000	Remaining Lifecycle Cost*	\$268,969,000
Projected End-State	Slab-on-grade		
Project Start and End Dates	2011-2018		
Contractor	Bechtel Jacobs Company LLC		
Identifiers	ABB: 269 Existing; PBS: OR-0040		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# ETTP Balance of Site D&D

## Facility Background



The DOE's East Tennessee Technology Park (ETTP), originally the Oak Ridge Gaseous Diffusion Plant, was established in 1943 as part of the Manhattan Project. The ETTP site covers about 4,845 acres (7.6 square miles), or 14 percent of the Oak Ridge Reservation, approximately 13 miles from the city of Oak Ridge, Tennessee. It was designed to produce enriched uranium for nuclear weapons operations. Following World War II, the plant was renamed the Oak Ridge K-25 Site. It continued to produce enriched uranium, but for commercial nuclear power, from 1945 to 1985. In 1987, DOE permanently shut down the plant.

After the shutdown of diffusion operations, K-25 was declared a DOE Environmental Management (EM) site. In 1997, the site was renamed the East Tennessee Technology Park (ETTP), after a project of environmental restoration, decontamination and decommissioning, and reindustrialization went into effect the year before.



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# ETTP Balance of Site D&D

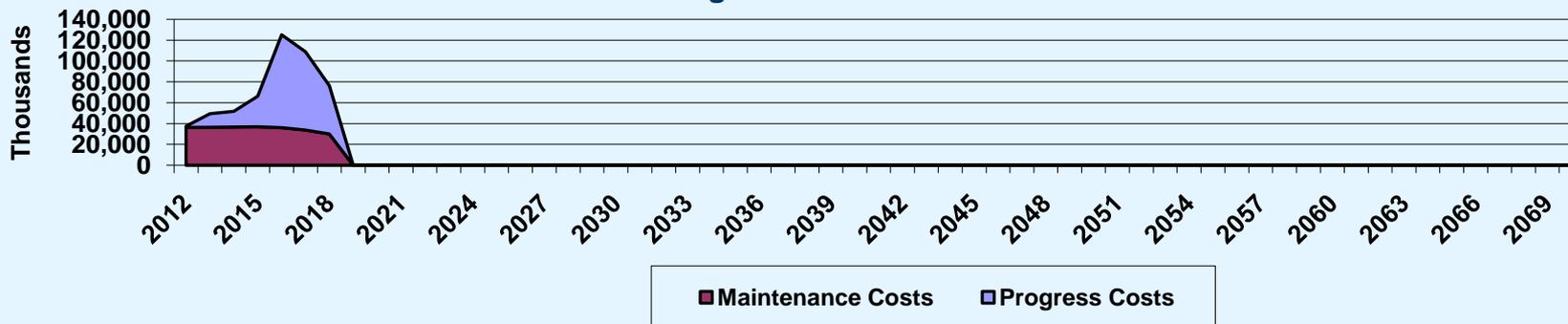
## Project Discussion



Workers completed demolition of the K-1035 Building, a former maintenance and instrument shop, in the summer of 2009.

Approximately 166 above-ground facilities are being demolished by groupings. These facilities include buildings, tanks, sheds, and other structures. Most of these facilities have actual or potential elevated concentrations of radiological and/or other hazardous substances. Demolition will include characterization, decontamination (if required), and segregation of demolition waste streams and disposal in appropriate Oak Ridge Reservation or other disposal facilities, as required. Recent demolition activities largely focused on the Balance of Site laboratory and K-1008/K-1020 areas, the K-1417 yards, and demolition preparation in K-1401 and K-1420.

### ABB – 269 Existing Cost and Schedule Profiles



# D&D of the Process Buildings

## Project Summary Table

Location Description			
Site/Area Description	Portsmouth		
EM Field Office	Portsmouth/Paducah Project Office		
Facility Description			
Major Facility Type	Nuclear		
No. Buildings	3		
Gross Total Building Square Feet	8,214,000		
Construction	Steel framed with asbestos siding		
Current Facility State	Cold Shutdown		
Source Term	Uranium, Technetium-99, Radium		
Project Description			
Estimated Cost 2012-201	\$133,360,000	Remaining Lifecycle Cost*	\$568,492,000
Projected End-State	Demolition; DOE controlled brownfield; Onsite disposal facility		
Project Start and End Dates	2012 – 2029		
Contractor	Fluor-B&W Portsmouth LLC		
Identifiers	ABB – 167; PBS PO-0040		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# D&D of the Process Buildings

## Facility Background



The Portsmouth Gaseous Diffusion Plant in Piketon, Ohio was operated by the United States Enrichment Corporation, a subsidiary of USEC Inc. The plant had a long history of enriching uranium for defense and commercial nuclear power needs.

The current 3,800 acre plant site encompasses 415 facilities including buildings, utilities systems, ponds, and infrastructure units. Three of the buildings are large process buildings about a mile in length.



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# D&D of the Process Buildings

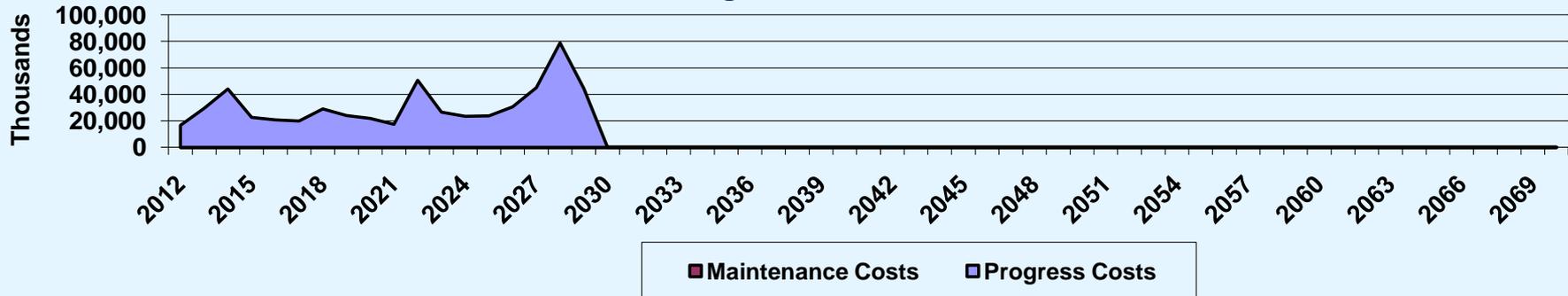
## Project Discussion

By 2006, the initial D&D at Portsmouth had completed 16 support buildings and cleaned out the contents of the Gas Centrifuge Enrichment Plant buildings. It included cleanout of waste and centrifuge equipment in two process buildings, relocation of office space for waste management operations, maintenance, storage and training, and project management. 1,383 old centrifuge casings were removed from the facilities.

The scope of this ABB is the three process buildings; the X-333 Process Building is comprised of 8 operating units, the X-330 Process Building is comprised of 11 operating units, and the X-326 Process Building is comprised of 9 ½ operating units and an additional ½ unit containing 60 purge cascade stages.



**ABB - 167 Budget and Schedule Profiles**



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# D&D of the GDP

## Project Summary Table

Location Description			
Site/Area Description	Paducah; Gaseous Diffusion Plant Buildings		
EM Field Office	Portsmouth/Paducah Project Office		
Facility Description			
Major Facility Type	Nuclear		
No. Buildings	Four major		
Gross Total Building Square Feet	Over 3.2 million		
Construction	Steel framed with asbestos siding		
Current Facility State	Active uranium enrichment plant, GDP planning underway.		
Source Term	Uranium, Technetium-99, Radium		
Project Description			
Estimated Cost 2012-2016	\$89,520,000	Remaining Lifecycle Cost*	\$6,242,476,000
Projected End-State	Demolition, brownfield for industrial reuse		
Project Start and End Dates	2012 – 2040		
Contractor	Fluor-B&W Portsmouth LLC		
Identifiers	ABB – 199; PBS PA-0040		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# D&D of the GDP

## Facility Background

The plant was built from 1951-1954 and has been in continuous operation since startup. The current 3,500 acre plant site encompasses 419 facilities, of which four are large process buildings that cover approximately 72.5 acres, the largest of the three DOE gaseous diffusion plants (Portsmouth and K-25).

The four major process buildings contain 1,760 process stages, along with common feed and product withdrawal facilities. As intended, the plant operated mainly as a stripper plant for the Portsmouth and Oak Ridge gaseous diffusion plants, whereby Paducah shipped products to Portsmouth or Oak Ridge for further enrichment. In the 1960s, the Paducah plant's mission changed from enriching uranium for nuclear weapons to one focused on producing fuel for commercial nuclear power plants. Until recently, Paducah and its sister plant located near Portsmouth, Ohio, worked together to enrich uranium for use in nuclear power plants. In May 2001, USEC consolidated its enrichment operations at Paducah. The following year, transfer and shipping operations were also consolidated at Paducah.



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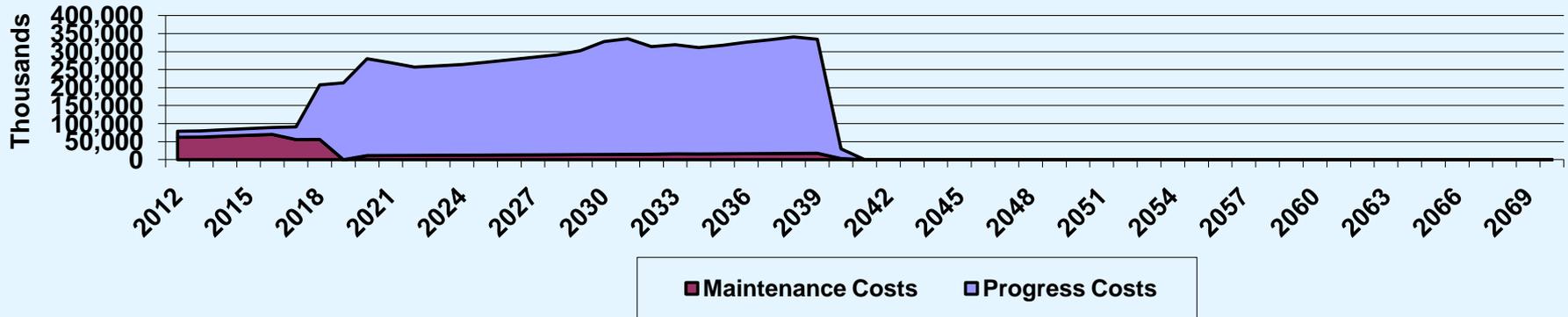
# D&D of the GDP



## Project Discussion

The three groups of facilities to be dispositioned are: the C-410/420 Complex; Inactive Facilities; and the C-340 Complex

### ABB - 199 Cost and Schedule Profiles



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# Paducah Inactive Facilities

## Project Summary Table

Location Description			
Site/Area Description	Paducah		
EM Field Office	Portsmouth/Paducah Project Office		
Facility Description			
Major Facility Type	Radiological and Industrial		
No. Buildings	Approximately 9		
Gross Total Building Square Feet	143,000		
Construction	Concrete, Steel & asbestos transite		
Current Facility State	The scope, schedule, and cost for this ABB has been revised as a result of the ARRA. The change will be recorded in the next revision of the D&D Maps.		
Source Term	Uranium		
Project Description			
Estimated Cost 2012-2016	\$43,615,000	Remaining Lifecycle Cost*	\$43,992,000
Projected End-State	Demolition; brownfield industrial reuse		
Project Start and End Dates	2008 – 2017		
Contractor	Fluor-B&W Portsmouth LLC		
Identifiers	ABB – 200; PBS PA-0040		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# Paducah Inactive Facilities

## Facility Background

The facilities in this group were used for hazardous materials storage, general storage, shops for maintenance and industrial cleaning, chemical conversion processes, and other general purpose industrial activities.



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# Paducah Inactive Facilities

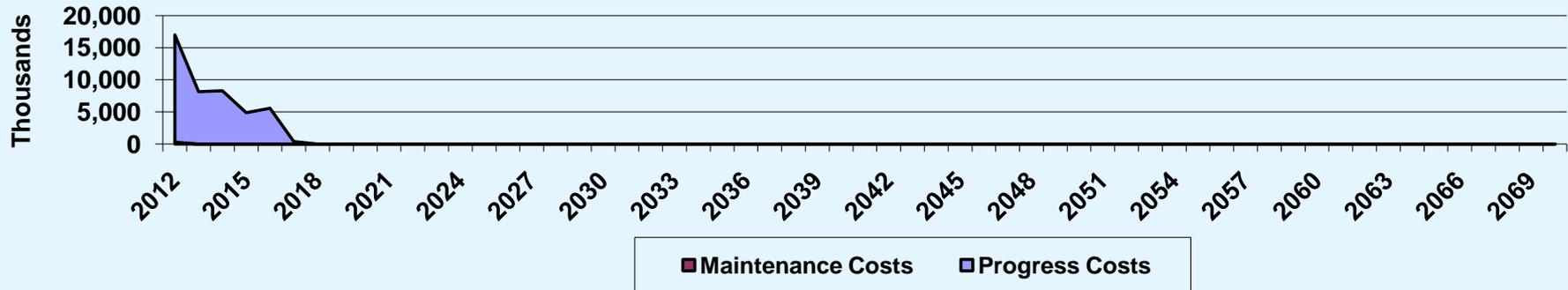


## Project Discussion

The facilities have been maintained to a minimal level to ensure integrity of the structure safety envelope. The facilities exist in various states of repair; asbestos, uranium, heavy metals, and PCBs are the hazards of most concern.

The scope, schedule, and cost for this ABB has been revised as a result of the ARRA. The changes will be recorded in the next revision of the D&D Maps.

ABB - 200 Cost and Schedule Profiles



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Office of D&D and Facility Engineering

# Zone 18 (U Plant Zone)

## Project Summary Table

Location Description			
Site/Area Description	Hanford; Central Plateau; 200 West Area		
EM Field Office	Richland Operations Office		
Facility Description			
Major Facility Type	Nuclear		
No. Buildings	Approximately 37 structures		
Gross Total Building Square Feet	252,000		
Construction	U Canyon = reinforced concrete, others = various		
Current Facility State	Deactivation; D&D in progress		
Source Term	Low level radioactive and mixed waste		
Project Description			
Estimated Cost 2012-2016	\$41,977,000	Remaining Lifecycle Cost*	\$211,862,000
Projected End-State	In-Situ Decommissioning for canyon, slab-on-grade for ancillary facilities		
Project Start and End Dates	2010-2022		
Contractor	CH2MHill Plateau Remediation Company		
Identifiers	ABB – 408; PBS RL-0040		

\* Remaining Life-cycle cost is from 2012 to project completion.



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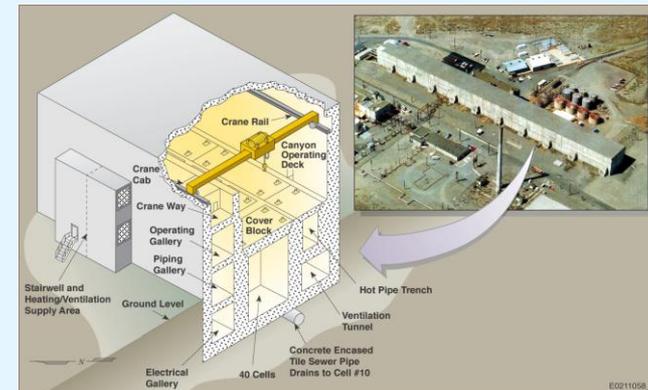
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# Zone 18 (U Plant Zone)

## Facility Background

The U-Plant in Hanford's 200 West Area converted uranium nitrate liquid from the Plutonium Uranium Extraction (PUREX) Plant into uranium oxide powder, which was then processed into reactor fuel. The liquid was concentrated and converted to a powder in the 224-U Building.

The 224-U Building was completed in 1944 for fuel reprocessing as part of the U-Plant complex. This facility was never used for its original planned purpose, the building was a training facility from 1944 to 1950. In 1952, 224-U was converted to a Uranium Reduction Facility, and in 1955 to the current UO<sub>3</sub> Plant. The 224-UA Building was added in 1957. This plant was shutdown in 1972 while various environmental control and monitoring upgrades and equipment modifications were made. Operation resumed in 1984. DOE issued the final deactivation orders in December 1992.



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# Zone 18 (U Plant Zone)

## Project Discussion



Demolition at the 224-U UO3 Plant Concentration Building

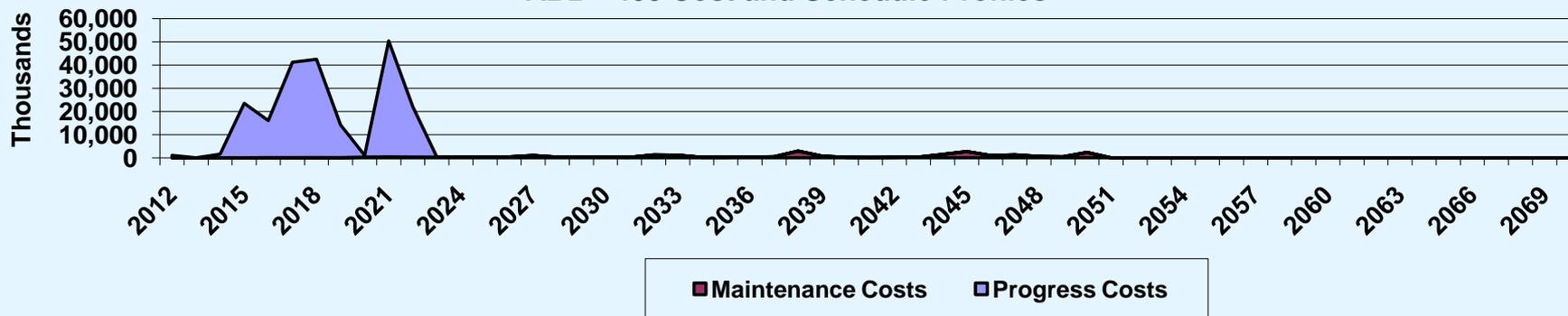
U-Plant decommissioning will serve as a pilot project under the Canyon Disposition Initiative (CDI) for the other four canyon buildings, B Plant, T Plant, PUREX, and REDOX.

Remedial investigation and characterization activities in support of the 221-U Facility feasibility study indicate that the 221-U Facility contains various levels of radiologically contaminated equipment, fission products, contaminated building materials, and/or miscellaneous debris from the fuels reprocessing. Soils around the facility are also contaminated.

A feasibility study was conducted to review 6 alternatives for remedial action.

Close-in-place, partially-demolished structure (In-Situ Decommissioning) was the chosen preferred alternative, as described in the CDI Proposed Plan and the DOE/EPA approved Record of Decision (ROD).

### ABB - 408 Cost and Schedule Profiles



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Office of D&D and Facility Engineering

# K West Basin D&D

## Project Summary Table

Location Description			
Site/Area Description	Hanford; River Corridor; 100 Area		
EM Field Office	Richland Operations Office		
Facility Description			
Major Facility Type	Radiological		
No. Buildings	9 Major		
Gross Total Building Square Feet	183,000		
Construction	Concrete shear wall		
Current Facility State	Awaiting removal and processing of sludge		
Source Term	Sludge containing Uranium/fuel particulate matter		
Project Description			
Estimated Cost 2012-2016	\$40,273,000	Remaining Lifecycle Cost*	\$61,563,000
Projected End-State	D&D of facilities; will require subsequent remediation of soil		
Project Start and End Dates	2015-2018		
Contractor	Washington Closure LLC		
Identifiers	ABB: 336; PBS: RL-0012		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# K West Basin D&D

## Facility Background



The K-Basins were built in the 1950's, and at that time, they were built for a 20-year mission. The basins were already beyond their anticipated service life when fuel assemblies were placed in them, and the basins were not built to store spent nuclear fuel for decades as they had to. By the 1990's, it was discovered that the K-East Basin had started to leak contaminated water into the ground. Additionally, the fuel rods in both basins had started to deteriorate, resulting in the formation of a material called "sludge".



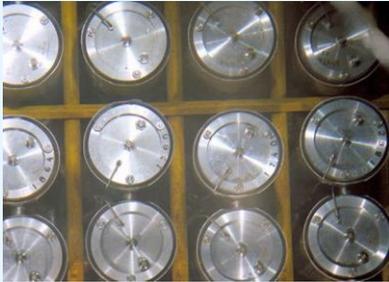
**EM** Environmental Management

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# K West Basin D&D

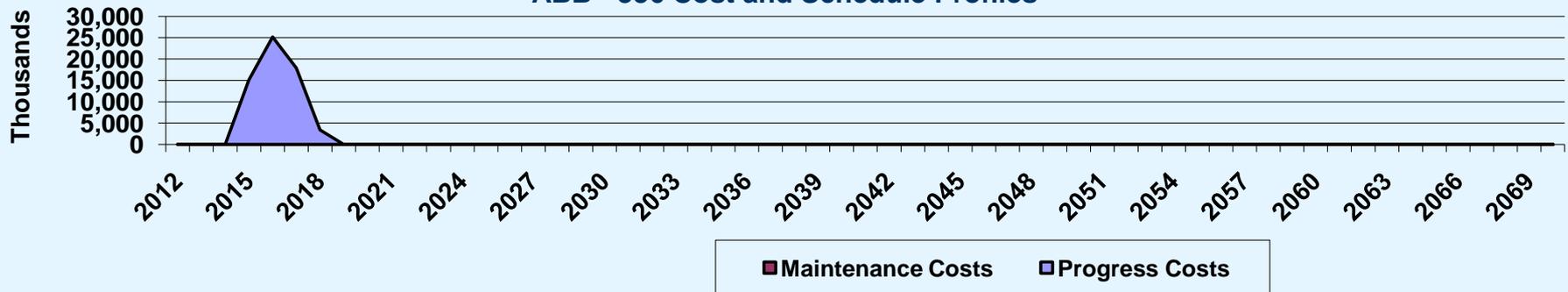
## Project Discussion



Demolition of the K-East Basin was complete in FY 2009, however 29 cubic meters of radioactive sludge remain in K-West Basin that must be removed and treated.

The K-West Basin has never shown any evidence of leaking and remains filled with water to store the sludge that had accumulated in the K-East and K-West Basins. Hanford workers are now in the process of removing the sludge from the K-West Basin so that it can be drained of water and demolished. The K-West Basin debris will be taken to ERDF for final burial.

ABB - 336 Cost and Schedule Profiles



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# ETTP Main Plant D&D

## Project Summary Table

Location Description			
Site/Area Description	Oak Ridge; East Tennessee Technology Park		
EM Field Office	Oak Ridge Operations Office		
Facility Description			
Major Facility Type	Industrial		
No. Buildings	47		
Gross Total Building Square Feet	138,000		
Construction	Steel, concrete, cement block, asbestos transite siding		
Current Facility State	Defunct uranium enrichment plant support facilities; D&D in progress.		
Source Term	Uranium, Technetium-99, and other fission products waste		
Project Description			
Estimated Cost 2012-2016	\$31,800,000	Remaining Lifecycle Cost*	\$108,300,000
Projected End-State	Demolition; brown field industrial reuse		
Project Start and End Dates	2011-2018		
Contractor	Bechtel Jacobs Company LLC		
Identifiers	ABB – 273; PBS OR-0040		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# ETTP Main Plant D&D



## Facility Background

The East Tennessee Technology Park site occupies approximately 5,000 administrative acres adjacent to the Clinch River and is located approximately 13 miles west of Oak Ridge, Tennessee. ETTP was originally built as a uranium enrichment facility for defense programs. The majority of the 125 major buildings on the site have been inactive since uranium enrichment production ceased in 1985.

There are approximately 35 facilities remaining, many of which have radioactive contamination. These facilities contribute to the technetium-99 and VOC plumes.



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# ETTP Main Plant D&D

## Project Discussion

More than 150 facilities, including the former administration building, cafeteria, and medical facility, have already been demolished. Other buildings, including K-1225, K-1330, K-1007, K-1580, K-1036, and K-1400 have been transferred to CROET for reuse by private industry.

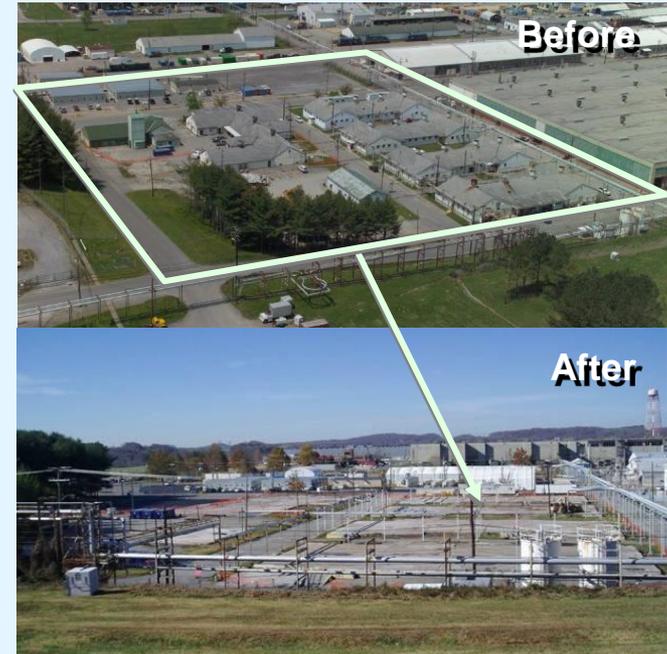
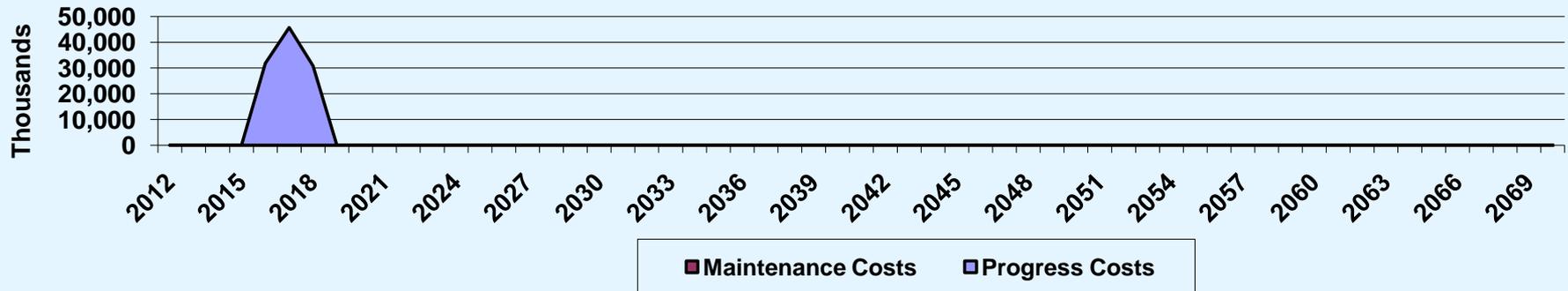


ABB - 273 Cost and Schedule Profiles



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# Facility D&D

## Project Summary Table

Location Description			
Site/Area Description	Santa Susana Field Laboratory; Energy Technology Engineering Center		
EM Field Office	Small Sites Office		
Facility Description			
Major Facility Type	Radiological		
No. Buildings	17		
Gross Total Building Square Feet	73,000		
Construction	Various		
Current Facility State	Closed		
Source Term	Uranium and other fission products waste		
Project Description			
Estimated Cost 2012-2016	\$29,594,000	Remaining Lifecycle Cost*	\$29,672,000
Projected End-State	Brownfield		
Project Start and End Dates	2011-2017		
Contractor	Boeing		
Identifiers	ABB: 307; PBS: CBC-ETEC-0040		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# Facility D&D



## Facility Background

Nuclear research and development for the U.S. Department of Energy (DOE) and its predecessor agencies was conducted in Area IV of the Santa Susana Field Laboratory from 1954 to 1989. Restricted to the 290-acre Area IV in the northwest portion of Santa Susana, the work included developing and operating small research reactors, fabricating and disassembling nuclear fuel, and testing of large-scale liquid metal components such as pumps and heat exchangers.



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# Facility D&D

## Project Discussion

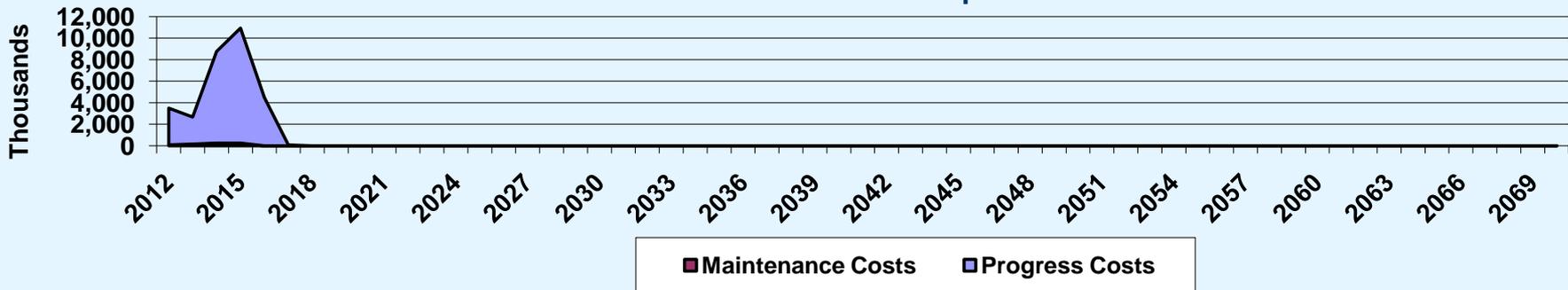
The Radioactive Materials Handling Facility (RMHF) is a group of ten buildings constructed to safely handle new and irradiated nuclear fuel and for the temporary storage and management of radioactive waste. The RMHF will be the last radiological facility to be decommissioned and released for unrestricted use.

Since 1989, operations at the RMHF have been focused on the facility shutdown and highly radioactive spent nuclear fuel is no longer stored there.

The DOE has proposed to remove all the buildings at RMHF as part of the ongoing Deactivation & Decommissioning (D&D) of ETEC. The D&D involves the complete removal and off-site disposal of all above and below ground structural components and any radiologically impacted soil that may exist within the facility's footprint and surrounding area.



ABB - 307 Cost and Schedule profiles



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# TA-54 D&D

## Project Summary Table

Location Description			
Site/Area Description	Los Alamos National Laboratory; Technical Area 54		
EM Field Office	Small Sites Office		
Facility Description			
Major Facility Type	Nuclear		
No. Buildings	34		
Gross Total Building Square Feet	260,000		
Construction	Cement block, steel, asbestos transite siding		
Current Facility State	Operational		
Source Term	Various		
Project Description			
Estimated Cost 2012-2016	\$21,867,000	Remaining Lifecycle Cost*	\$21,867,000
Projected End-State	Demolish; Brownfield		
Project Start and End Dates	2010-2015		
Contractor	Los Alamos National Security LLC		
Identifiers	ABB – 486; PBS VL-LANL-0040-D		

\* Remaining Life-cycle cost is from 2012 to project completion.



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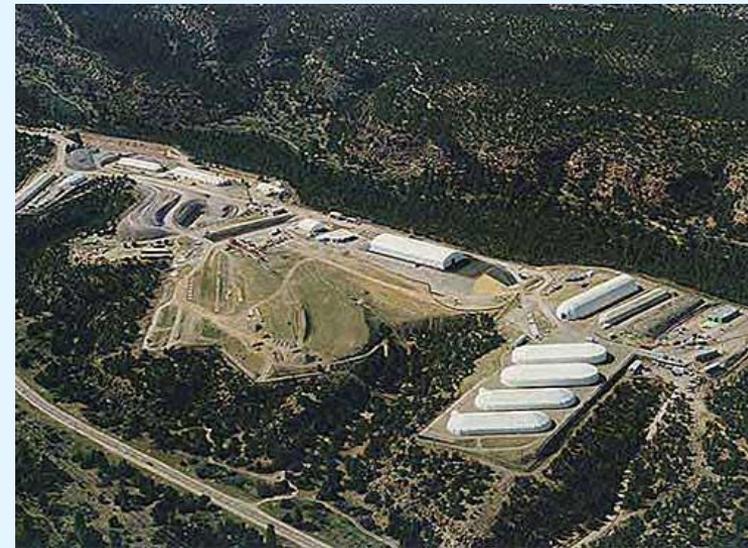
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## Facility Background

Technical Area (TA)-54 is located in the east-central portion of the Laboratory on Mesita del Buey between Pajarito Canyon (south) and Cañada del Buey (north). During the late 1950s, the Laboratory, with approval of the US Atomic Energy Commission and upon recommendation of the US Geological Survey, selected TA-54 for disposal of Laboratory-derived waste.

The site has functioned as a major storage and disposal facility with some permitted treatment for Laboratory-derived wastes. There are four material disposal areas (MDAs), G, H, J, and L at TA-54. Each was historically used to store and/or dispose of solid, sensitive (classified), hazardous, radioactive, or mixed waste generated at the Laboratory.



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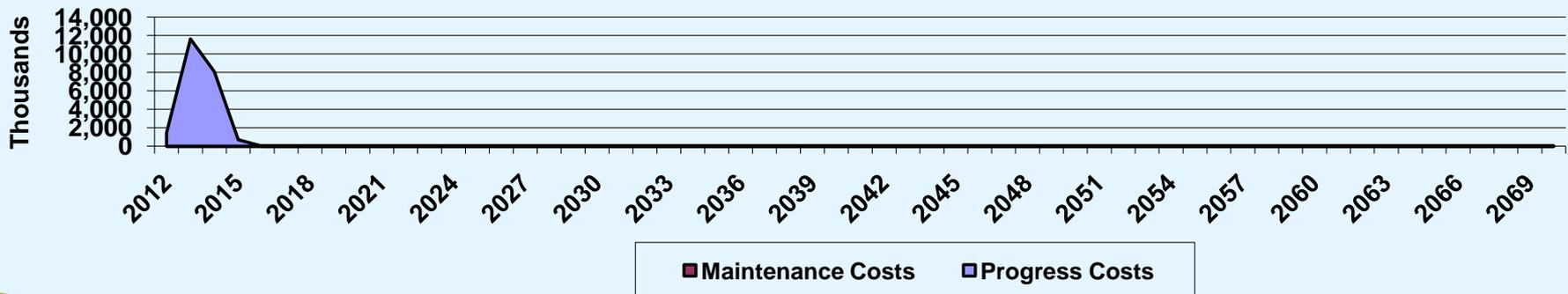
# TA-54 D&D



## Project Discussion

The project objectives are to decontaminate and demolish the TA-54 buildings. The project consists of non-process contaminated facilities that interfere with implementation of corrective actions at SWMUs MDA L and MDA G, as required by the Consent Order with the State of New Mexico. The buildings do not have extensive contamination; minor residual radiological material may exist in systems and on building surfaces. Other specific systems such as drainage and ventilation may exhibit residual local hazardous material inventory.

## ABB - 486 Cost and Schedule Profiles



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# Fast Flux Test Facility (FFTF) D4

## Project Summary Table

Location Description			
Site/Area Description	Hanford; River Corridor; 400 Area		
EM Field Office	Richland Operations Office		
Facility Description			
Major Facility Type	Nuclear and Radiological		
No. Buildings	11		
Gross Total Building Square Feet	188,000		
Construction	Steel reinforced concrete with a steel containment dome		
Current Facility State	Defunct sodium cooled reactor; Deactivated		
Source Term	Uranium, uranium contaminated sodium		
Project Description			
Estimated Cost 2012-2016	\$21,439,000	Remaining Lifecycle Cost*	\$353,052,000
Projected End-State	In-Situ Decommissioning candidate; however not currently planned as such		
Project Start and End Dates	2010-2030		
Contractor	Washington Closure LLC		
Identifiers	ABB – 417; PBS RL-0042		

\* Remaining Life-cycle cost is from 2012 to project completion.



# Fast Flux Test Facility (FFTF) D4

## Facility Background



The FFTF was the world's largest liquid sodium-cooled, fast neutron test reactor of its kind.

Construction of the FFTF was completed in 1978; the first reaction took place in 1980, and 1982-1992 it was used to test various aspects of commercial reactor design and operation. FFTF also produced tritium and other medical and industrial isotopes.

From 1993 through 1996, the active parts of the facility were gradually halted and fuel rods removed and stored in above-ground dry storage vessels. From 1997 through 2004, FFTF was in various stages of deactivation. In 2005 the core support basket was drilled to drain the remaining sodium coolant, which effectively made the reactor unusable.



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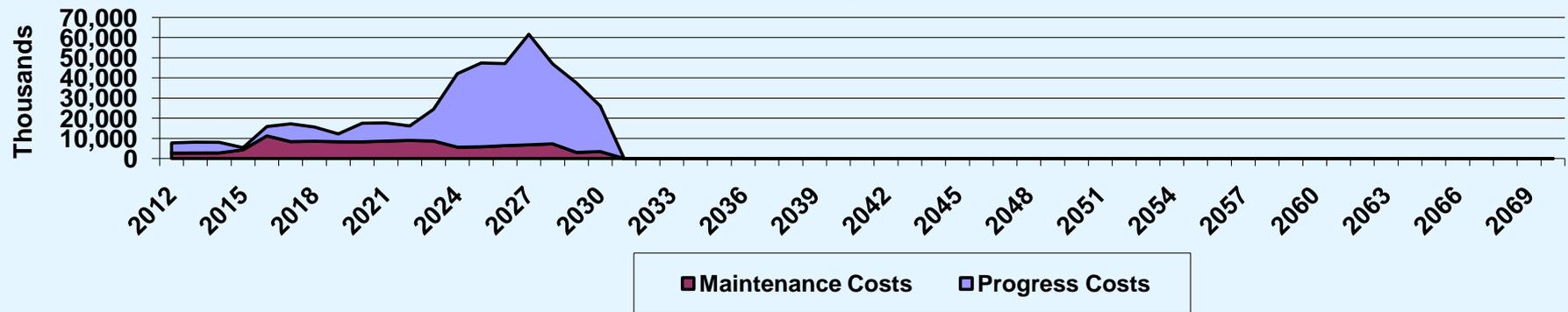
# Fast Flux Test Facility (FFTF) D4

## Project Discussion

In 2009, the contractor completed major deactivation activities at the Fast Flux Test Facility (FFTF), an achievement that helped DOE meet a major Tri-Party Agreement milestone (M-081-00A-T05). This was accomplished 21 months before the milestone's target date of Feb. 28, 2011.



### ABB - 417 Cost and Schedule Profiles



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# H-Area D&D: Non-Area Completion

## Project Summary Table

Location Description			
Site/Area Description	Savannah River Site; H-Area		
EM Field Office	Savannah River Office		
Facility Description			
Major Facility Type	Nuclear		
No. Buildings	129		
Gross Total Building Square Feet	1,133,225		
Construction	Reinforced concrete, steel light frame, steel braced frame		
Current Facility State	Operational for processing spent nuclear fuel		
Source Term	Uranium, TRU waste and other mixed fission products waste		
Project Description			
Estimated Cost 2012-2016	\$19,251,000	Remaining Lifecycle Cost*	\$1,540,834,000
Projected End-State	Canyon = In-Situ Decommissioning ; Others = slab-on-grade		
Project Start and End Dates	2014-2032		
Contractor	Savannah River Nuclear Solutions LLC		
Identifiers	ABB: 62; PBS: SR-0040		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# H-Area D&D: Non-Area Completion

## Facility Background



H Canyon was constructed in the early 1950s and began operations in 1955. The interior of the building resembles a canyon because the processing areas resemble a gorge in a deep valley between steeply vertical cliffs. It is 835 feet long with several levels to accommodate the various stages of material stabilization, including control rooms to monitor overall equipment and operating processes, equipment and piping gallery for solution transport, storage, and disposition, and unique overhead bridge cranes to support overall process operations.



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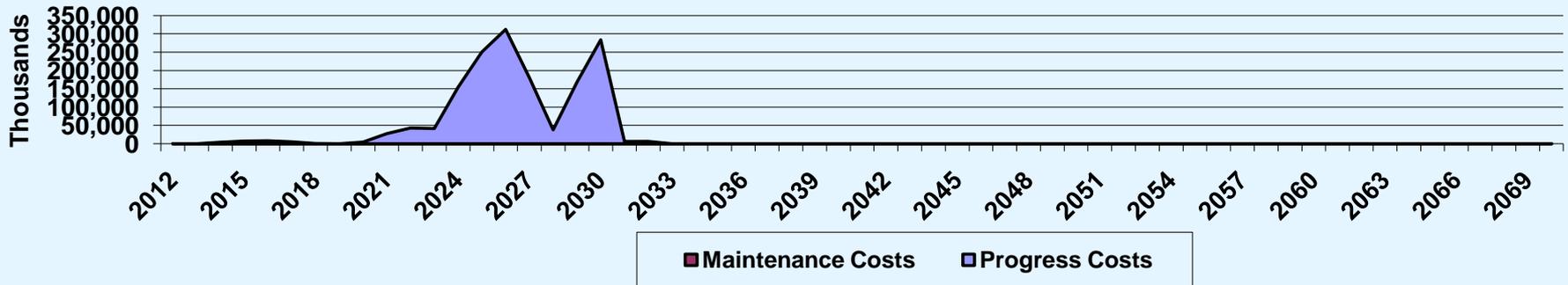
# H-Area D&D: Non-Area Completion



## Project Discussion

In May 2006, DOE approved the Enriched Uranium Disposition Mission, which uses the H Canyon facilities for disposition of the large inventory of spent nuclear fuel from foreign and domestic research reactors and excess enriched uranium and plutonium bearing materials across the DOE complex. This supports both the DOE environmental cleanup and nuclear non-proliferation goals, reduces the footprint and costs associated with maintaining the various DOE sites, and allows for the recovery of enriched uranium for blend down into low enriched uranium fuel. Since this mission was approved, H Canyon has successfully dispositioned materials from Y12, Los Alamos National Laboratory and Lawrence Livermore National Laboratory.

ABB - 62 Cost and Schedule Profiles



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# Sodium Disposition

## Project Summary Table

Location Description			
Site/Area Description	Hanford; River Corridor; 400 Area		
EM Field Office	Richland Operations Office		
Facility Description			
Major Facility Type	NA		
No. Buildings	NA		
Gross Total Building Square Feet	NA		
Construction	NA		
Current Facility State	Defunct sodium cooled reactor; Deactivation in progress		
Source Term	Uranium contaminated sodium		
Project Description			
Estimated Cost 2012-2016	\$13,956,000	Remaining Lifecycle Cost*	\$307,206,000
Projected End-State	Converted to 19 molar (50wt%) sodium hydroxide solution		
Project Start and End Dates	2015-2029		
Contractor	Washington Closure LLC		
Identifiers	ABB: 418; PBS: RL-0042		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# Sodium Disposition

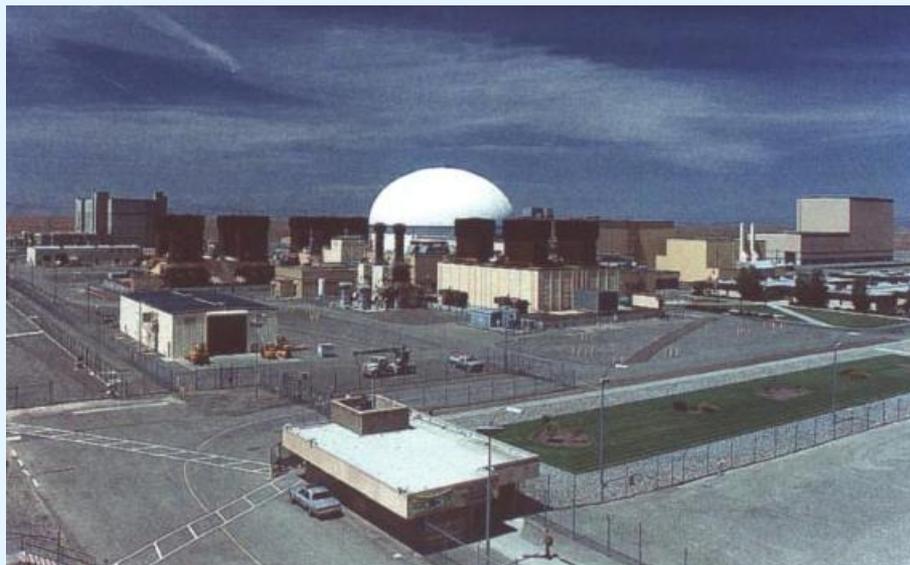
## Facility Background

In 2007, the total Hanford site bulk radioactively contaminated metallic sodium inventory to be dispositioned was estimated to be 284,000 gallons. The sodium was used as coolant in the FFTF, a DOE-owned, formerly operating, 400-megawatt (thermal) liquid-metal (sodium) cooled fast neutron flux nuclear research and test reactor.

At FFTF 243,000 gallons is stored in solid form under inert (argon or nitrogen) cover gas in three 80,000 gallon and one 52,000 gallon steel tanks located inside the 400 Area's Sodium Storage Facility.

At the Hallam Reactor 34,000 gallons are stored in solid form under inert (nitrogen) cover gas in five, 16,000 gallon stainless steel tanks inside the 200 West Area's 2727-W facility, a Butler-type steel building.

At the Sodium Reactor, 7,000 gallons are stored in solid form in 158 55-gallon drums sealed within 85 gallon overpacks inside eight storage modules in 200 Area's Central Waste Complex.



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# Sodium Disposition



## Project Discussion

Based on current planning, the sodium will be converted to 19 molar (50wt%) sodium hydroxide solution and used by the DOE, Office of River Protection (ORP), most likely in the pretreatment of radioactive waste prior to processing in the Waste Treatment Plant or possibly for chemistry control in the high level radioactive waste storage tanks.

ABB – 418 Cost and Schedule Profiles



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# C-Area D&D: Non-Area Completion

## Project Summary Table

Location Description			
Site/Area Description	Savannah River Site; C-Area		
EM Field Office	Savannah River Office		
Facility Description			
Major Facility Type	Nuclear		
No. Buildings	15		
Gross Total Building Square Feet	584,776		
Construction	Various		
Current Facility State	Inactive, awaiting D&D		
Source Term	Uranium and mixed fission waste products		
Project Description			
Estimated Cost 2012-2016	\$13,956,000	Remaining Lifecycle Cost*	\$136,857,000
Projected End-State	Reactor = In-Situ Decommissioning ; Others = slab-on-grade		
Project Start and End Dates	2015-2030		
Contractor	Savannah River Nuclear Solutions LLC		
Identifiers	ABB: 57; PBS: SR-0040		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# C-Area D&D: Non-Area Completion



## Facility Background

C-Area is one of five SRS reactor areas with the original mission of producing material for the Department of Defense nuclear weapons program. C Reactor is a multiple-story facility that contained a heavy water moderated production reactor. The C Reactor Assembly Area, formerly used for the receipt, handling, and storage of new, unirradiated fuel and targets from the M-Area manufacturing area, currently houses the Site Decontamination Center.

C-Area is comprised of nuclear industrial, light machining and administrative facilities. All C-Area waste units are located in the Fourmile Branch Watershed. The current land use for C-Area is site industrial.



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# C-Area D&D: Non-Area Completion



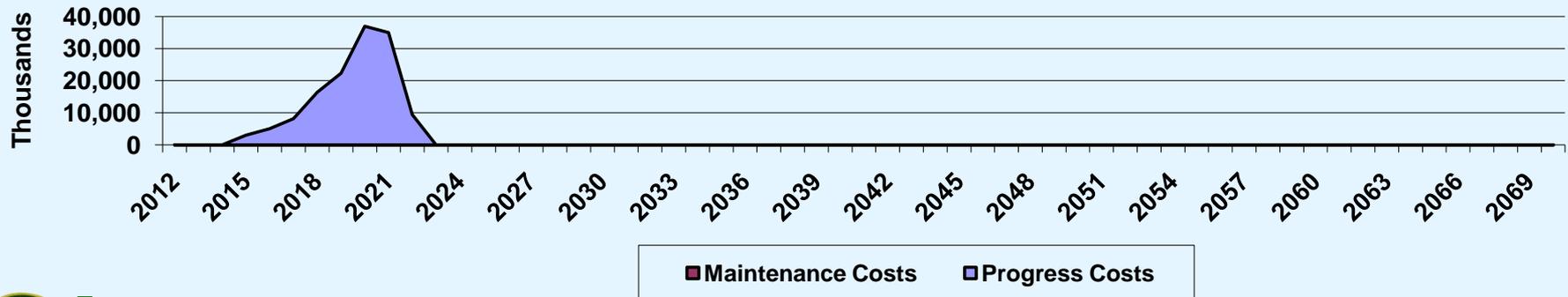
## Project Discussion

The reactor building, 105-C, once its contamination mission is complete, may be saved for Cold War historic preservation.

In addition, other reactor support buildings may be preserved for historic preservation.

All other hardened buildings may be demolished after being evaluated per the CRMP to determine their historic preservation status, as well as an evaluation for the local economic outreach initiative.

### ABB - 57 Cost and Schedule Profiles



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# Tank Farm D&D

## Project Summary Table

Location Description			
Site/Area Description	Hanford Tank Farms - 200 East and 200 West		
EM Field Office	Office of River Protection		
Facility Description			
Major Facility Type	Nuclear		
No. Buildings	443 structures, including underground tanks; approximately 260 buildings		
Gross Total Building Square Feet	780,000		
Construction	Steel, cement block, concrete		
Current Facility State	Buildings are presently supporting waste transfer operations		
Source Term	TRU, Cesium-137, Strontium-90		
Project Description			
Estimated Cost 2012-2016	\$8,058,000	Remaining Lifecycle Cost*	\$449,776,000
Projected End-State	Tanks will be left in place, grouted and capped		
Project Start and End Dates	2014-2050		
Contractor	Washington River Protection Solutions		
Identifiers	ABB – 147; PBS RP-0040		

\* Remaining Life-cycle cost is from 2012 to project completion.



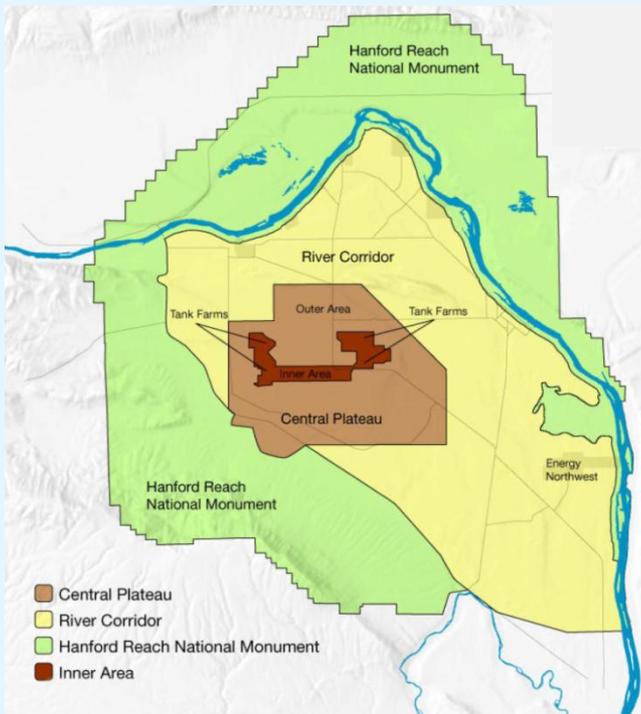
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# Tank Farm D&D

## Facility Background



The Office of River Protection (ORP) focus is the continued safe operations and maintenance of the Tank Farms that hold millions of gallons of liquid waste. Liquid radioactive waste is being transferred from single shell tanks to newer, safer double shell tanks as construction continues on the waste vitrification plant that will process this waste. There are 177 underground storage tanks, 149 of which are single-shells, 28 are double-shells, and approximately 47 are known leakers.



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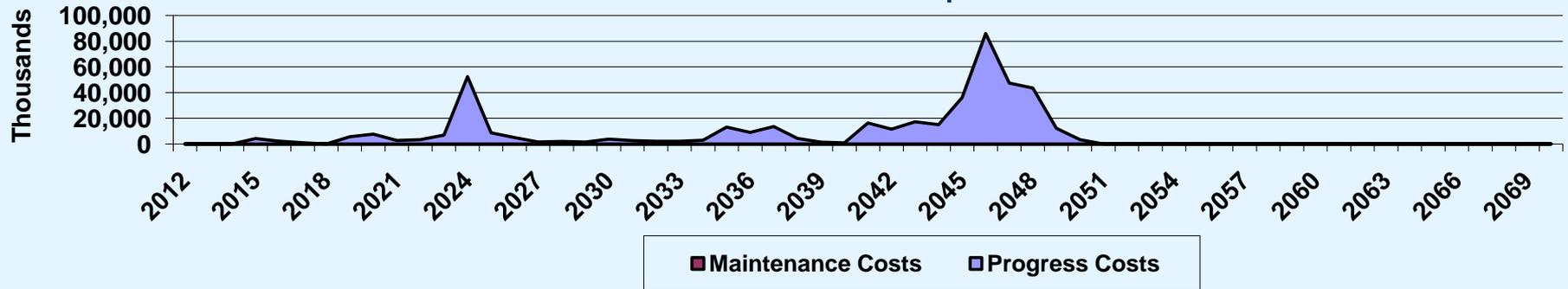
# Tank Farm D&D

## Project Discussion

The objective of the River Protection Project is retrieving, treating, and disposing of 54 million gallons of tank waste and closing hundreds of underground storage tanks. As the tanks are emptied the support facilities and structures around the tanks will undergo D&D, to clear the way for the waste tank disposition.



ABB - 147 Cost and Schedule profiles



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# Zone 11 (PUREX Zone)

## Project Summary Table

Location Description			
Site/Area Description	Hanford; Central Plateau; 200 East Area		
EM Field Office	Richland Operations Office		
Facility Description			
Major Facility Type	Nuclear		
No. Buildings	1 Canyon structure, 10 other major buildings		
Gross Total Building Square Feet	194,000		
Construction	Canyon = reinforced concrete; others = various		
Current Facility State	PUREX is under surveillance and maintenance with the ventilation system operational		
Source Term	TRU waste		
Project Description			
Estimated Cost 2012-2016	\$6,455,000	Remaining Lifecycle Cost*	\$737,734,000
Projected End-State	TBD, In Situ Decommissioning candidate		
Project Start and End Dates	2015-2024		
Contractor	CH2MHill Plateau Remediation Company		
Identifiers	ABB – 403; PBS RL-0040		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# Zone 11 (PUREX Zone)

## Facility Background

The Plutonium/Uranium Extraction (PUREX) facility was constructed from 1953 to 1955 as the third generation of chemical separations plants, or "canyon" facilities, to support plutonium production. PUREX was Hanford's largest chemical processing or separations facility and operated between 1956-72 and between 1983-88.

PUREX is as long as three-and-one-third football fields; 64 feet of height is above ground with another 40 feet below ground with concrete walls up to six feet thick which shielded workers from radiation. The PUREX Plant contains 33 miles of piping.

In the mid-1990s PUREX was used for developing the facility transition & deactivation model, defining end-point criteria and establishing the process of removing hazards or unstable conditions, shutting down active systems, removing all conditions within the facility requiring personnel and monitoring. This allowed the building to be stored at a low-cost, "cold-dark," inactive state for future D&D planning while more urgent hazards were remediated. This deactivation model has been repeated in other facilities across the complex.



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# Zone 11 (PUREX Zone)

## Project Description



*Plutonium-Uranium Extraction Plant*

Deactivation of the facilities associated with the PUREX complex was completed in 1997.

The PUREX building is a candidate for in-situ decommissioning, a concept that will entomb the robust portions of the facility. Entombment will be similar in approach to that planned for the U-Plant, another canyon facility at Hanford. However, PUREX will be considerably more complex because of its greater size, residual transuranic contamination, greater internal gamma radioactivity, and the past use of railroad tunnels on one end of the facility for storage of highly radioactive items in railroad cars that are humanly unapproachable.

## ABB - 403 Cost and Schedule profiles



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# G-Area D&D: Non-Area Completion

## Project Summary Table

Location Description			
Site/Area Description	Savannah River Site; G-Area		
EM Field Office	Savannah River Office		
Facility Description			
Major Facility Type	Industrial		
No. Buildings	70		
Gross Total Building Square Feet	183,000		
Construction	Various		
Current Facility State	Some still operational; some inactive awaiting D&D		
Source Term	Various		
Project Description			
Estimated Cost 2012-2016	\$1,518,000	Remaining Lifecycle Cost*	\$21,852,000
Projected End-State	Slab-on-grade		
Project Start and End Dates	2014-2031		
Contractor	Savannah River Nuclear Solutions LLC		
Identifiers	ABB: 61; PBS: SR-0040-CP		

\* Remaining Life-cycle cost is from 2012 to project completion.



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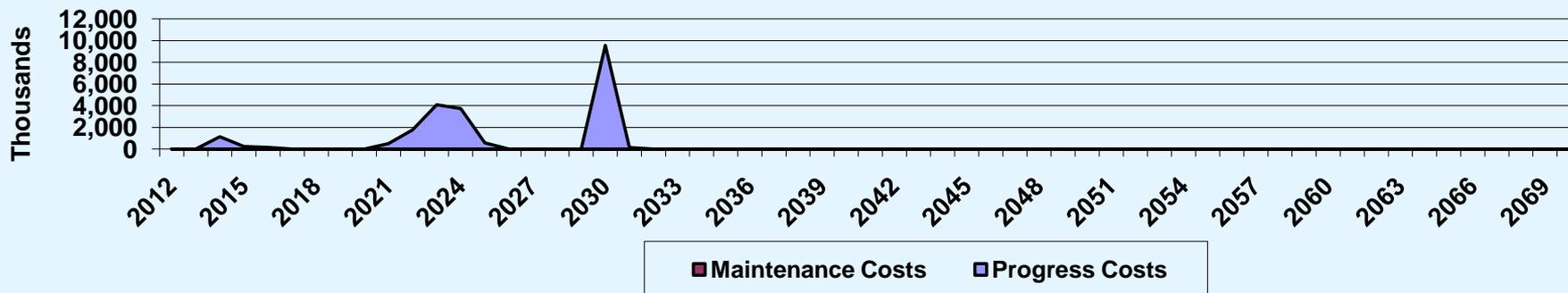


# G-Area D&D: Non-Area Completion

## Project Discussion

G-Area is the area outside the site process areas, encompassing over 95 percent of the site. This area includes USFS-SR facilities, a rail network, research set-aside areas supporting the National Environmental Research Park (NERP) habitat and forest management areas, environmental monitoring activities, and facilities to support subcontractors. The developed portions of G-Area primarily are comprised of light industrial, warehouse, and administrative facilities.

ABB - 61 Cost and Schedule Profiles



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# Zone 5 (B Plant Zone)

## Project Summary Table

Location Description			
Site/Area Description	Hanford; Central Plateau; 200 East Area		
EM Field Office	Richland Operations Office		
Facility Description			
Major Facility Type	Nuclear & Industrial		
No. Buildings	7 Major		
Gross Total Building Square Feet	251,000		
Construction	Various		
Current Facility State	Deactivated		
Source Term	Tru waste		
Project Description			
Estimated Cost 2012-2016	\$1,108,000	Remaining Lifecycle Cost*	\$983,931,000
Projected End-State	Canyon = In-Situ Decommissioning ; Others = slab-on-grade		
Project Start and End Dates	2015-2041		
Contractor	CH2MHill Plateau Remediation Company		
Identifiers	ABB: 411; PBS: RL-0040-CP		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# Zone 5 (B Plant Zone)

## Facility Background

One of Hanford's earliest plutonium processing facilities was the B Plant located in the 200 East Area. The fuel rods which had been irradiated in the nuclear reactors at Hanford were taken to the B Plant where the rods went through a series of chemical baths to remove the plutonium from the rods. Because chemicals were needed to separate the plutonium from the fuel rod, facilities like the B Plant were also called chemical separations plants. Once the plutonium had been removed from the fuel rods it was further processed to be used in America's stockpile of atomic weapons. All of the chemicals needed to extract the plutonium as well as the excess parts of the irradiated fuel rods became waste.

The B Plant operated from 1945 through 1957 when it was shut down. Eleven years later, in 1968, the plant was modified and restarted. Its new mission was to separate the radioactive elements cesium and strontium from the tank waste that was generated when the plutonium was extracted from the irradiated fuel rods processed at B Plant. The cesium and strontium campaign ended in 1985; the canyon was ultimately deactivated in 1998.



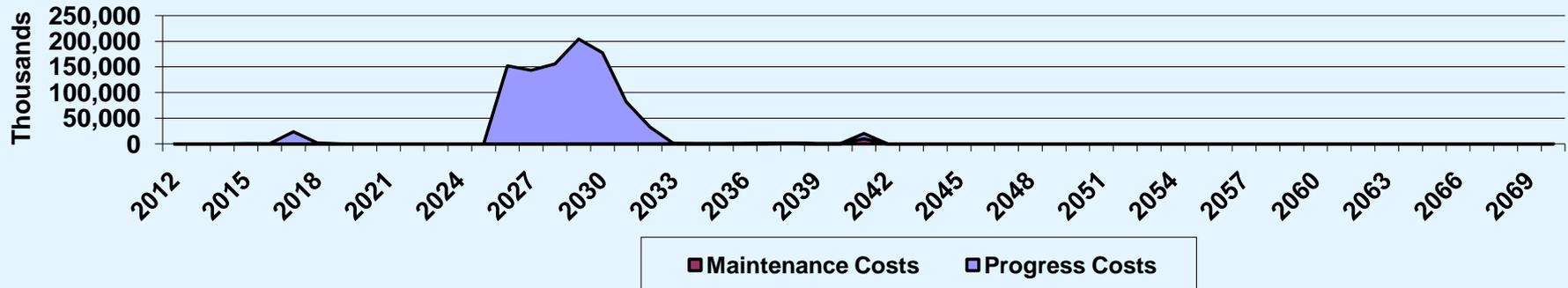
# Zone 5 (B Plant Zone)

## Project Discussion



The cesium and strontium that was removed is now stored in more than 1,900 capsules located in a facility adjacent to B Plant called the Waste Encapsulation Storage Facility (WESF). WESF was built specifically to house these highly radioactive capsules which are safely stored in a water filled basin at the WESF while they await a permanent disposition at a national repository.

### ABB - 411 Cost and Schedule Profiles



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# Zone 12 (REDOX Zone)

## Project Summary Table

Location Description			
Site/Area Description	Hanford; Central Plateau; 200 West		
EM Field Office	Richland Operations Office		
Facility Description			
Major Facility Type	Radiological		
No. Buildings	41		
Gross Total Building Square Feet	234,000		
Construction	Various		
Current Facility State	Inactive; awaiting D&D		
Source Term	Uranium, TRU waste and other mixed fission products waste		
Project Description			
Estimated Cost 2012-2016	\$1,108,000	Remaining Lifecycle Cost*	\$528,723,000
Projected End-State	Canyon = In-Situ Decommissioning ; Others = slab-on-grade		
Project Start and End Dates	2015-2047		
Contractor	CH2MHill Plateau Remediation Company		
Identifiers	ABB: 406; PBS: RL-0040-CP		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# Zone 12 (REDOX Zone)

## Facility Background



The REDOX plant at Hanford was the fourth processing “canyon” constructed and was the last one built in the 200 West Area. It looked different than its earlier models. It wasn’t as long (470 feet) as its predecessors, but it was wider at 160 feet. In comparison to earlier processing canyons like T and B Plants, REDOX produced much less waste in its processing of irradiated fuel rods than earlier models. It was in operation from 1952 through 1967, and processed approximately 24,000 tons of uranium fuel rods. The operations at REDOX consolidated plutonium processing programs into one building and process, which had previously required multiple facilities and processes.

The Reduction-Oxidation Plant had its strengths and weaknesses during the production mission. REDOX was able to recover both the plutonium for weapons and the uranium from the fuel rods during processing where earlier models could not. The recycled uranium could be used again to make more fuel rods. Where T and B Plants could process only between 1 and 1.5 tons of uranium each day, REDOX could process up to 12 tons per day. The down side surrounded the liquid waste generated by REDOX. It was far less in volume than what was produced at T and B Plants, but the liquid waste from Reduction-Oxidation contained many more chemicals than earlier waste types and it was significantly hotter when it went into the tank farms. Additionally, the process to extract plutonium from fuel rods at the Reduction-Oxidation Plant required a material called hexone to be used which is potentially explosive.



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# Zone 12 (REDOX Zone)

## Project Discussion



REDOX has been shut down for more than forty years, but remains highly contaminated. It is anticipated that the canyon will be brought down to deck level like U-Plant when decontamination and demolition work moves to the Central Plateau area of Hanford. However, the ultimate decision surrounding REDOX's final state will be made in the CERCLA Record of Decision.

### ABB - 406 Cost and Schedule Profiles



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# Zone 1 (200-E Admin Zone)

## Project Summary Table

Location Description			
Site/Area Description	Hanford; Central Plateau; 200 East Area		
EM Field Office	Richland Operations Office		
Facility Description			
Major Facility Type	Industrial & Radiological		
No. Buildings	15		
Gross Total Building Square Feet	739,000		
Construction	Steel light frame		
Current Facility State	In the process of demolition		
Source Term	N/A		
Project Description			
Estimated Cost 2012-2016	\$220,000	Remaining Lifecycle Cost*	\$407,639,000
Projected End-State	Slab-on-grade		
Project Start and End Dates	2016-2048		
Contractor	CH2MHill Plateau Remediation Company		
Identifiers	ABB: 402; PBS: RL-0040-CP		

\* Remaining Life-cycle cost is from 2012 to project completion.



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# Zone 1 (200-E Admin Zone)



## Facility Background

Besides the burial grounds, waste tanks, Environmental Restoration Disposal Facility (ERDF), and Waste Treatment Plant the 200 Area also features hundreds of other facilities and structures. Many of these facilities were office buildings or related to the infrastructure needs of the site. Some remain in use today as the cleanup mission at Hanford continues while others have long since been abandoned and are scheduled to be demolished in the future.



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# Zone 1 (200-E Admin Zone)



## Project Discussion

The delays in demolition of 200-E administrative buildings is due to ERDF higher priority support for containers.

ABB - 402 Cost and Schedule Profiles



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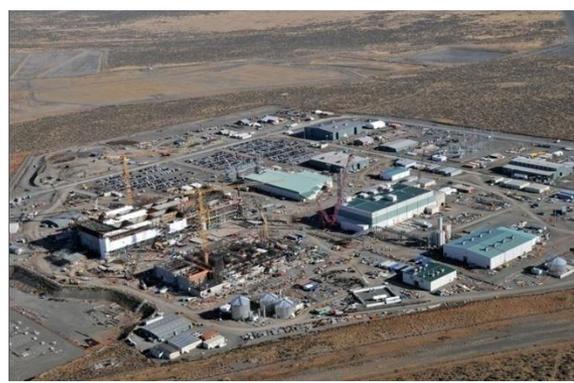
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# Facility Deactivation & Decommissioning Appendix B2 — EM D&D Project Profiles (FY 2017-2050)

2011 Edition



Hanford – Waste Treatment & Immobilization Plant



Oak Ridge – K 27 Building



Idaho National Laboratory – Materials and Fuels Complex

# Introduction to EM D&D Projects

- Appendix B2 presents basic project information for those projects that have not already been captured in Appendix B1 (i.e., are not funded in the 2012-2016 five year planning window).
- The majority of the projects that extend beyond the five-year planning window are comprised of out-year scope that is not well defined; the baseline for these projects is based on planning estimates. The data presented in this report reflects the best available information at this time.
- The level of detail provided for individual “Project Descriptions” pages vary greatly and is consistent with the level of planning accomplished to date. Projects in the out years typically have only general or conceptual levels of available detail that will evolve as additional planning is accomplished.



# The EM D&D Projects Scheduled for FY 2017-2050

Note: Durations are based on the number of years with “progress” dollars budgeted. Several D&D projects with current activity (e.g., K-27 Building) have several years with no D&D activities before resuming D&D later. In these cases the durations will not be equal to the interval between the Start Year and the End Year.

Site	ABB ID	Project (ABB) Name	D&D Project			
			Total Cost (\$ Million)	Duration (yrs)	Start Year	End Year
Office of River Protection	154	Waste Treatment and Immobilization Plant (WTP)	\$1,233	3	2046	2048
Oak Ridge Reservation	280A New	Alpha Buildings D&D	\$1,051	15	2018	2034
Oak Ridge Reservation	284A New	Central Campus Area and other BV Facilities	\$908	20	2018	2037
Oak Ridge Reservation	280D New	Process Facilities D&D	\$878	15	2019	2035
Richland Operations Office	407	Zone 17 (T Plant Zone)	\$860	11	2018	2044
Oak Ridge Reservation	280B New	Beta Buildings D&D	\$637	16	2018	2037
Oak Ridge Reservation	284D New	3019 Complex D&D	\$386	10	2025	2034
Savannah River Site	70	S-Area D&D: Non-Area Completion	\$277	6	2027	2032
Oak Ridge Reservation	284A Existing	Central Campus Area and Other BV Facilities	\$264	14	2018	2031
Oak Ridge Reservation	284B Existing	Melton Valley and MV Reactors D&D	\$258	17	2020	2036
Savannah River Site	64	K-Area D&D: Non-Area Completion	\$218	9	2020	2030
Savannah River Site	63	J-Area D&D: Non-Area Completion	\$204	6	2027	2032
Oak Ridge Reservation	284B New	Melton Valley and MV Reactors D&D	\$204	11	2022	2038
Idaho National Laboratory	106	INTEC D&D	\$169	14	2025	2038
Savannah River Site	65	L-Area D&D: Non-Area Completion	\$154	9	2024	2032
Oak Ridge Reservation	284C New	Waste Treatment Facilities D&D	\$146	15	2020	2034



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# The EM D&D Projects Scheduled for FY 2017-2050

•Note: Durations are based on the number of years with “progress” dollars budgeted. Several D&D projects with current activity (e.g., K-27 Building) have several years with no D&D activities before resuming D&D later. In these cases the durations will not be equal to the interval between the Start Year and the End Year.

Site	ABB ID	Project (ABB) Name	D&D Project			
			Total Cost (\$ Million)	Duration (yrs)	Start Year	End Year
Richland Operations Office	410	Zone 26 (400 Area)	\$145	6	2018	2036
Oak Ridge Reservation	280A Existing	Alpha Buildings D&D	\$145	6	2018	2023
Richland Operations Office	412	Zone 7 (CSB Zone)	\$121	6	2017	2033
Oak Ridge Reservation	280C New	Biology & Lab Complex D&D	\$110	5	2026	2030
Idaho National Laboratory	2014	AMWTP D&D	\$82	4	2021	2024
Savannah River Site	55	A-Area D&D: Non-Area Completion	\$79	6	2021	2031
Savannah River Site	67	N-Area D&D: Non-Area Completion	\$75	8	2022	2031
Savannah River Site	56	B-Area D&D: Non-Area Completion	\$68	4	2028	2031
Savannah River Site	73	Z-Area D&D: Non-Area Completion	\$44	4	2029	2032
Richland Operations Office	409	Zone 23 (100 Area)	\$26	2	2024	2025
Oak Ridge Reservation	280D Existing	Process Facilities D&D	\$24	6	2024	2029
Savannah River Site	59	E-Area D&D: Non-Area Completion	\$21	5	2027	2031
Idaho National Laboratory	2016	Misc. Facilities	\$15	4	2021	2024
Richland Operations Office	413	Zone 9 (ETF)	\$12	4	2017	2020
Oak Ridge Reservation	275 Ex	K-27 Building D&D	\$10	3	2010	2018
Savannah River Site	72	U-Area D&D: Non-Area Completion	\$0.9	4	2021	2024
Brookhaven	504B	HFBR Phase Two	\$0.7	3	2018	2020
Idaho National Laboratory	2015	MFC D&D	\$0.7	4	2021	2024
Brookhaven	504A	HFBR Record of Decision Compliance Phase One	\$0.4	3	2018	2020
Idaho National Laboratory	110	RWMC D&D	\$0.2	4	2021	2024
<b>Total</b>			<b>\$8,827</b>			

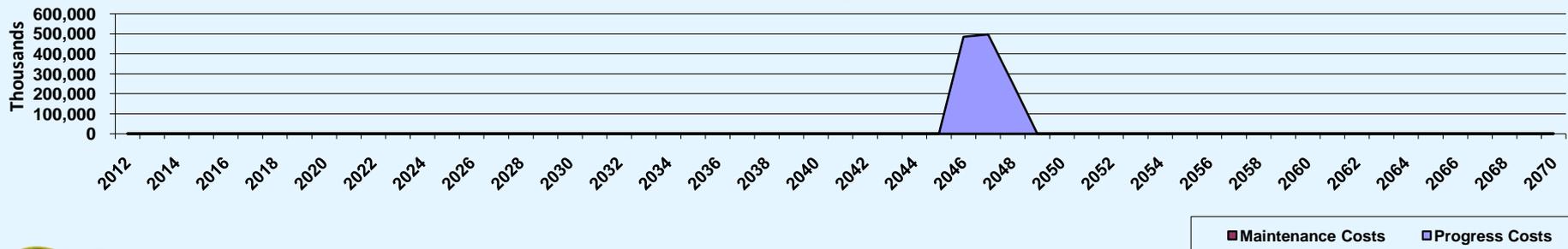


# Waste Treatment & Immobilization Plant (WTP) D&D

Project Summary Table

Location Description			
Site/Area Description	Hanford		
EM Field Office	Office of River Protection		
Facility Description			
Major Facility Type	Nuclear	Number of Buildings	Approximately 30
Construction	Reinforced concrete	Gross Total Building Square Feet	TBD
Current Facility State	Under construction		
Brief Background	Process & immobilize majority of sites 53 million gallons of radioactive & chemical waste		
Source Term	Uranium, Plutonium, mixed fission product		
Project Description			
Estimated Cost	\$1,233,299,000	Contractor	TBD
Projected End-State	TBD, In Situ Decommissioning candidate	Identifiers	ABB: 154; PBS: ORP-0014
Project Start and End Dates	2046-2048		

ABB - 154 Cost and Schedule Profiles



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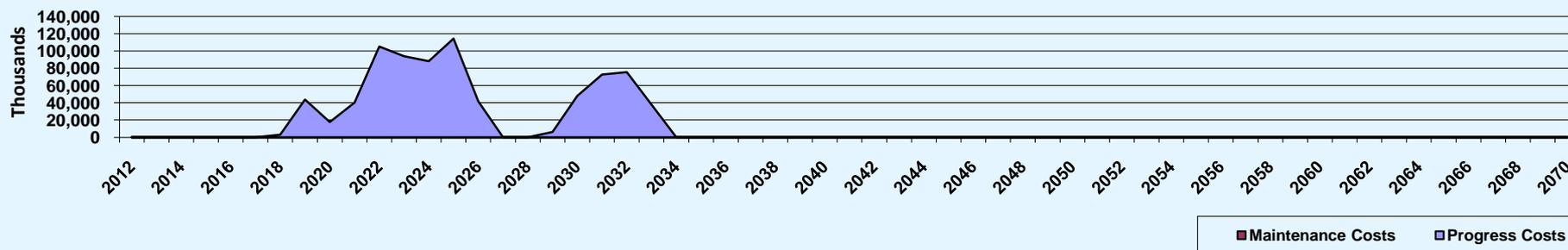
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# Alpha Buildings D&D

## Project Summary Table

Location Description			
Site/Area Description	Oak Ridge; Y-12		
EM Field Office	Oak Ridge Operations Office		
Facility Description			
Major Facility Type	Various	Number of Buildings	22
Construction	Reinforced concrete	Gross Total Building Square Feet	1,183,000
Current Facility State	Several still active. The scope, schedule and cost for this ABB have been revised as a result of the ARRA; which will also affect the estimated cost.		
Brief Background	Scope of this ABB includes Alpha 2, Alpha 3, Alpha 4 Ancillary Buildings, Alpha 5, and Alpha Buildings Legacy Material Disposition		
Source Term	Mercury, Uranium		
Project Description			
Estimated Cost	\$1,050,823,000	Contractor	TBD
Projected End-State	Slab-on-grade	Identifiers	ABB: 280A New; PBS: OR-0041
Project Start and End Dates	2018-2034		

ABB – 280A New Cost and Schedule Profiles



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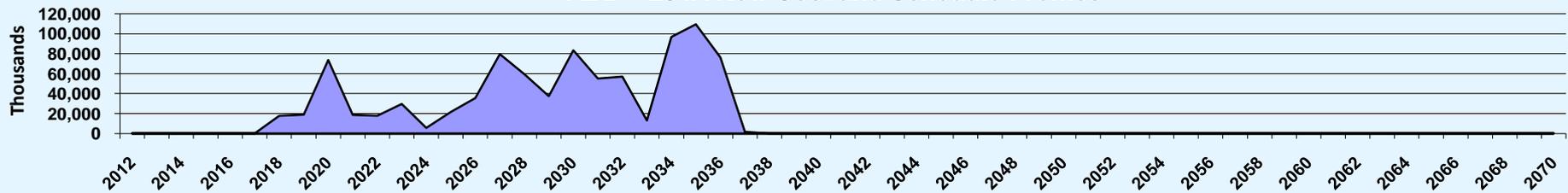
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# Central Campus Area and Other BV Facilities D&D

## Project Summary Table

Location Description			
Site/Area Description	Oak Ridge; Oak Ridge National Laboratory (ORNL)		
EM Field Office	Oak Ridge Operations Office		
Facility Description			
Major Facility Type	Industrial & Nuclear	Number of Buildings	67
Construction	Various	Total Building Square Feet	282,650
Current Facility State	Scope is to demolish or otherwise remediate buildings, soils, pipes, tanks and wells within the Central Campus of ORNL		
Brief Background	ABB includes: Central Stack Hot Cell Facilities Complex, 3525 Complex, SE Services Group, 2525 Complex, 2528 Complex, 2026 Complex, Fire Station Complex, East Bethel Valley Facilities		
Source Term	PCBs, Asbestos, Radiological contamination		
Project Description			
Estimated Cost	\$907,726,000	Contractor	TBD
Projected End-State	Slab-on-grade	Identifiers	ABB: 284A New; PBS: OR-0042
Project Start and End Dates	2018-2037		

**ABB – 284A New Cost and Schedule Profiles**



■ Maintenance Costs    □ Progress Costs



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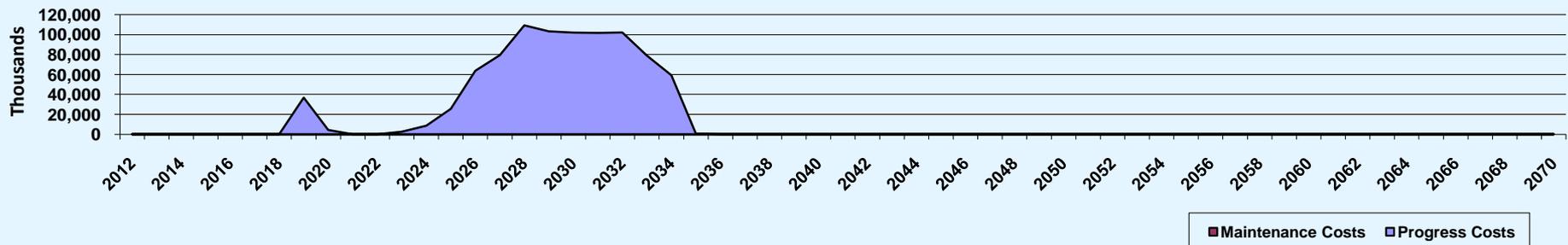
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# Process Facilities D&D

## Project Summary Table

Location Description			
Site/Area Description	Oak Ridge; Y-12		
EM Field Office	Oak Ridge Operations Office		
Facility Description			
Major Facility Type	Industrial	Number of Buildings	53
Construction	Various	Total Building Square Feet	725,517
Current Facility State	9206 Complex is shut down, office space is occupied, 9212 Complex is operational		
Brief Background	Contains 9206 Complex, 9212 Complex, Transition facilities, Balance of facilities, Steam plant facilities, Y-12 EM facilities		
Source Term	PCBs, Asbestos, Freon, Lead		
Project Description			
Estimated Cost	\$877,720,000	Contractor	TBD
Projected End-State	Slab	Identifiers	ABB: 280D New; PBS: OR-0041
Project Start and End Dates	2019-2035		

**ABB – 280D New Cost and Schedule Profiles**



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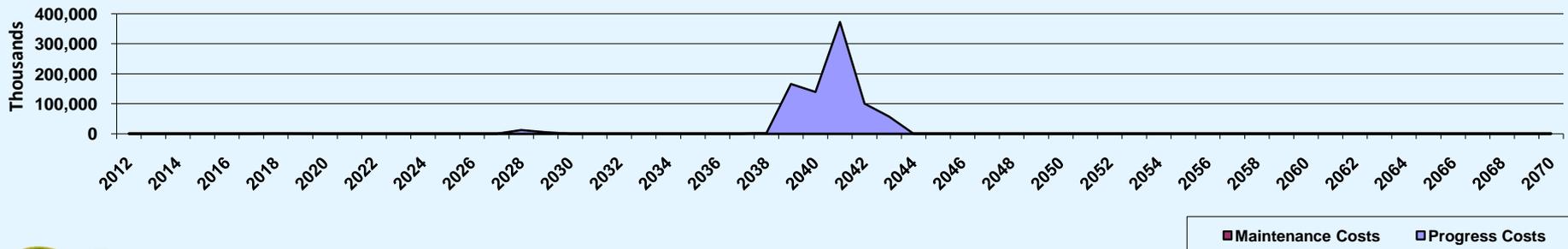
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# Zone 17 (T Plant Zone)

## Project Summary Table

Location Description			
Site/Area Description	Hanford; Central Plateau; 200 West Area		
EM Field Office	Richland Operations Office		
Facility Description			
Major Facility Type	Radiological	Number of Buildings	11 Major
Construction	Concrete framed	Gross Total Building Square Feet	208,000
Current Facility State	Operational for waste processing and packaging		
Brief Background	Zone 17 contains T Plant, the 200 West power plant, the 200 Area Waste Treatment Plant, numerous waste sites, and smaller burial sites		
Source Term	Various		
Project Description			
Estimated Cost	\$860,331,000	Contractor	TBD
Projected End-State	Canyon will be demolished to cell-cover-block level	Identifiers	ABB: 407; PBS: RL-0040-CP
Project Start and End Dates	2018-2044		

ABB – 407 Cost and Schedule Profiles



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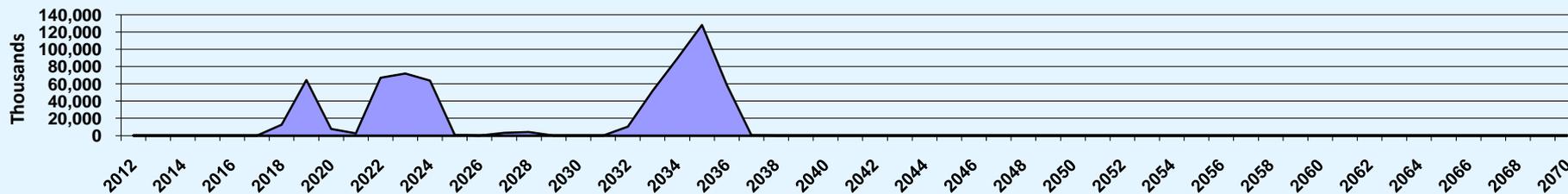
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# Beta Buildings D&D

## Project Summary Table

Location Description			
Site/Area Description	Oak Ridge; Y-12		
EM Field Office	Oak Ridge Operations Office		
Facility Description			
Major Facility Type	Industrial	Number of Buildings	17
Construction	Various	Gross Total Building Square Feet	820,950
Current Facility State	Shut down pending D&D		
Brief Background	Beta buildings included in Legacy Material Disposition, Beta-1 Complex, Beta-4 Complex, Beta-3 Complex		
Source Term	PCB, Lead, Mercury, Asbestos		
Project Description			
Estimated Cost	\$637,338,000	Contractor	TBD
Projected End-State	Slab-on-grade	Identifiers	ABB: 280B New; PBS: OR-0041
Project Start and End Dates	2018-2037		

ABB – 280B New Cost and Schedule Profiles



■ Maintenance Costs ■ Progress Costs



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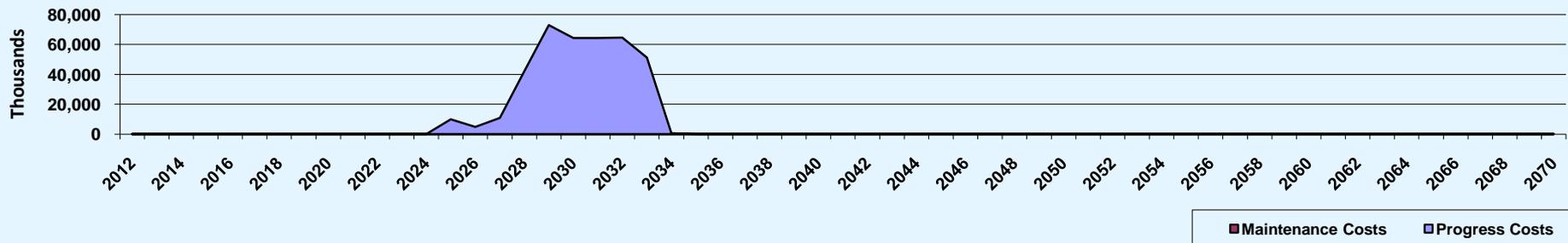
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Office of D&D and Facility Engineering

# 3019 Complex D&D

## Project Summary Table

Location Description			
Site/Area Description	Oak Ridge; Oak Ridge National Laboratory (ORNL)		
EM Field Office	Oak Ridge Operations Office		
Facility Description			
Major Facility Type	Various	Number of Buildings	16
Construction	Various	Total Building Square Feet	87,000
Current Facility State	In modification for processing U-233 for disposal		
Brief Background	Facilities are classified as industrial, low radiological, radiological, and nuclear Hazard 2		
Source Term	Various		
Project Description			
Estimated Cost	\$385,767,000	Contractor	TBD
Projected End-State	To grade	Identifiers	ABB: 284D New; PBS: OR-0042
Project Start and End Dates	2025-2034		

ABB – 284D New Cost and Schedule Profiles



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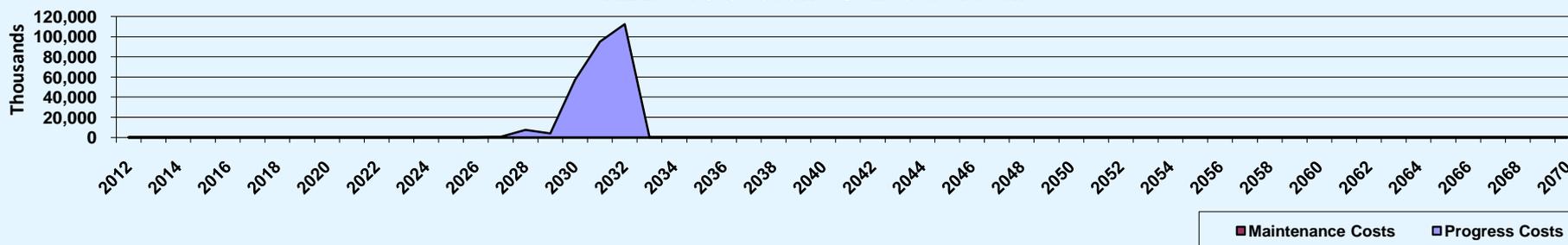
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# S-Area D&D: Non-Area Completion

## Project Summary Table

Location Description			
Site/Area Description	Savannah River Site; S-Area		
EM Field Office	Savannah River Office		
Facility Description			
Major Facility Type	Nuclear	Number of Buildings	33
Construction	Steel & concrete	Gross Total Building Square Feet	556,000
Current Facility State	Operational		
Brief Background	The Defense Waste Processing Facility converts the liquid nuclear waste currently stored at the Savannah River Site into a solid glass form suitable for long-term storage and disposal.		
Source Term	Various		
Project Description			
Estimated Cost	\$276,656,000	Contractor	TBD
Projected End-State	D&D remediation in accordance with Federal Facilities Agreement	Identifiers	ABB: 70; PBS: SR-0040
Project Start and End Dates	2027-2032		

ABB – 70 Cost and Schedule Profiles



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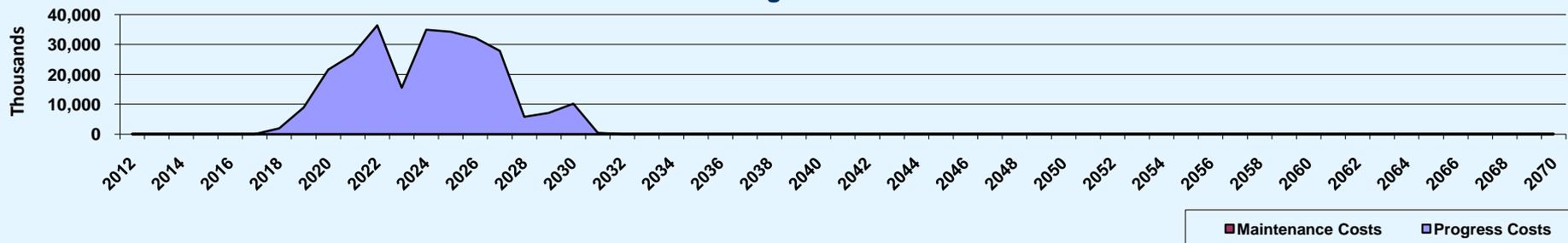
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Office of D&D and Facility Engineering

# Central Campus Area and Other BV Facilities D&D

## Project Summary Table

Location Description			
Site/Area Description	Oak Ridge; Oak Ridge National Laboratory (ORNL)		
EM Field Office	Oak Ridge Operations Office		
Facility Description			
Major Facility Type	Industrial and Nuclear	Number of Buildings	21
Construction	Various	Total Building Square Feet	51,640
Current Facility State	Scope is to demolish or otherwise remediate buildings, soils, pipes, tanks and wells within the Central Campus of ORNL		
Brief Background	This ABB includes: BV Isotopes Area Facilities, BV Tank Area Facilities, BV Chemical Development Lab Facilities		
Source Term	Radiological, PCBs, Asbestos		
Project Description			
Estimated Cost	\$263,768,000	Contractor	TBD
Projected End-State	Slab-on-grade	Identifiers	ABB: 284A Existing; PBS: OR-0042
Project Start and End Dates	2018-2031		

ABB – 284A Existing Cost and Schedule Profiles



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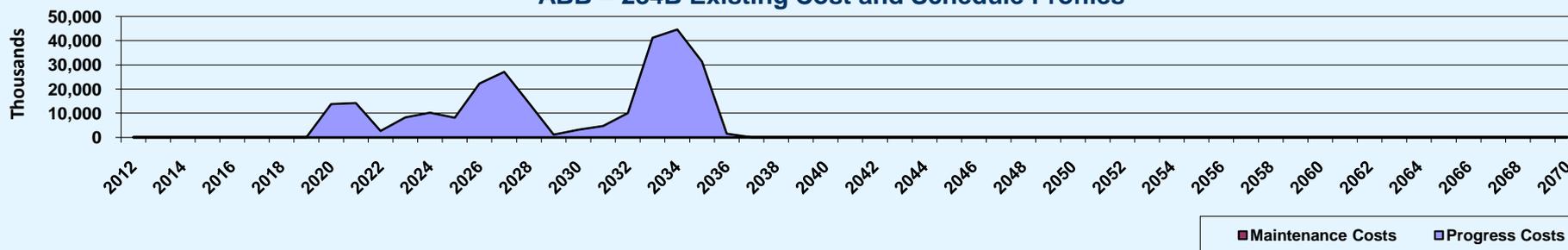
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# Melton Valley and MV Reactors D&D

## Project Summary Table

Location Description			
Site/Area Description	Oak Ridge; Oak Ridge National Laboratory (ORNL)		
EM Field Office	Oak Ridge Operations Office		
Facility Description			
Major Facility Type	Industrial and Nuclear	Number of Buildings	20+
Construction	Various	Gross Total Building Square Feet	71,600+
Current Facility State	Operational		
Brief Background	This ABB includes: the Homogeneous Reactor Experiment, Molten Salt Reactor Experiment, Tower Shielding Reactor, and Integrated Process Demonstration Facility, all of which have associated facilities and structures.		
Source Term	Radiological contamination, PCBs, Asbestos		
Project Description			
Estimated Cost	\$258,246,000	Contractor	TBD
Projected End-State	D&D of select facilities to slab	Identifiers	ABB: 284B Existing; PBS: OR-0042
Project Start and End Dates	2020-2036		

**ABB – 284B Existing Cost and Schedule Profiles**



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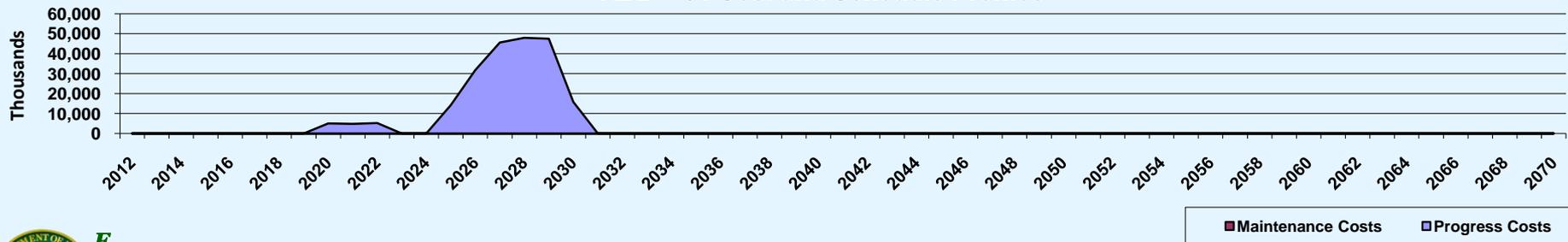
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Office of D&D and Facility Engineering

# K-Area D&D: Non-Area Completion

## Project Summary Table

Location Description			
Site/Area Description	Savannah River Site; K-Area		
EM Field Office	Savannah River Office		
Facility Description			
Major Facility Type	Nuclear and Industrial	Number of Buildings	34
Construction	Concrete & steel	Gross Total Building Square Feet	835,724
Current Facility State	Storing nuclear materials		
Brief Background	K-Area is one of 5 reactor areas, K-Reactor is shut down with the Disassembly Basin de-inventoried and deactivated		
Source Term	Various		
Project Description			
Estimated Cost	\$217,759,000	Contractor	TBD
Projected End-State	In Situ decommissioning (for reactors)	Identifiers	ABB: 64; PBS: SR-0040
Project Start and End Dates	2020-2030		

ABB – 64 Cost and Schedule Profiles



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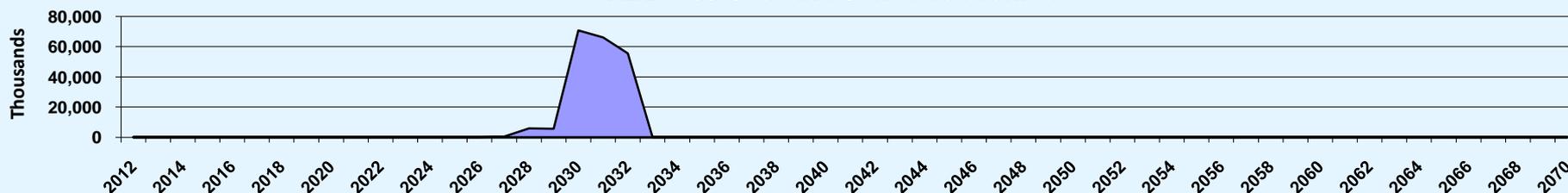
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# J-Area D&D: Non-Area Completion

## Project Summary Table

Location Description			
Site/Area Description	Savannah River Site; J-Area		
EM Field Office	Savannah River Office		
Facility Description			
Major Facility Type	Nuclear	Number of Buildings	TBD
Construction	Reinforced concrete	Gross Total Building Square Feet	TBD
Current Facility State	Under construction		
Brief Background	Salt waste processing facility is currently under construction		
Source Term	Various		
Project Description			
Estimated Cost	\$204,378,000	Contractor	TBD
Projected End-State	In Situ decommissioning candidate	Identifiers	ABB: 63; PBS: SR-0040
Project Start and End Dates	2027-2032		

ABB – 63 Cost and Schedule Profiles



■ Maintenance Costs    ■ Progress Costs



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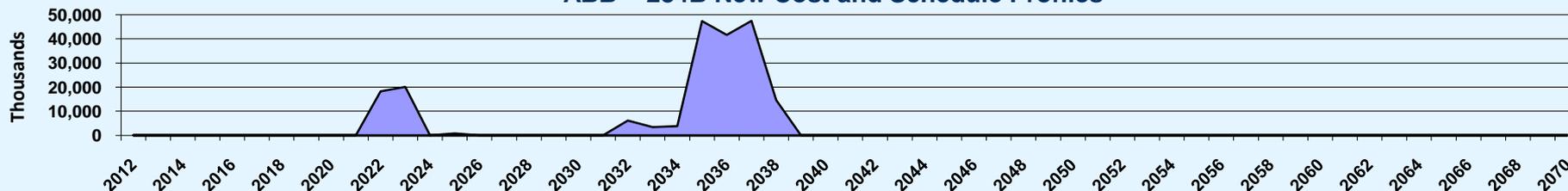
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# Melton Valley and MV Reactors D&D

## Project Summary Table

Location Description			
Site/Area Description	Oak Ridge; Oak Ridge National Laboratory (ORNL)		
EM Field Office	Oak Ridge Operations Office		
Facility Description			
Major Facility Type	Industrial and Nuclear	Number of Buildings	12
Construction	Various	Gross Total Building Square Feet	129,000
Current Facility State			
Brief Background	The scope of this ABB includes: Experimental Gas Cooled Reactor, Health Physics Research Reactor, and MV Legacy Material Disposition		
Source Term	Radiological contamination, PCBs, Asbestos		
Project Description			
Estimated Cost	\$203,547,000	Contractor	TBD
Projected End-State	D&D of select facilities to slab	Identifiers	ABB: 284B New; PBS: OR-0042
Project Start and End Dates	2022-2038		

**ABB – 284B New Cost and Schedule Profiles**



■ Maintenance Costs    ■ Progress Costs



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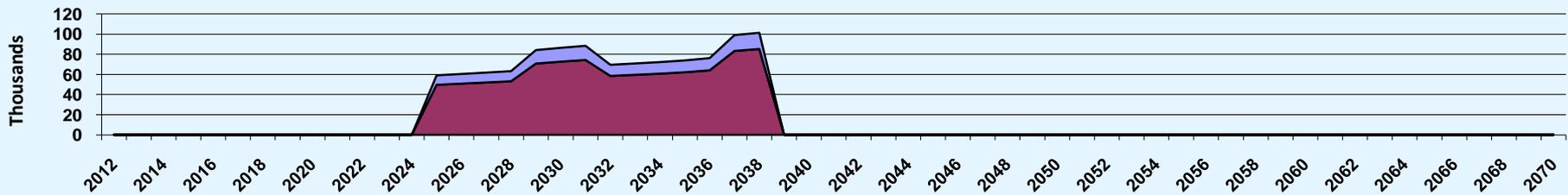
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# INTEC D&D

## Project Summary Table

Location Description			
Site/Area Description	Idaho National Laboratory; Idaho Nuclear Technology and Engineering Center		
EM Field Office	Idaho Operations Office		
Facility Description			
Major Facility Type	Nuclear & Radiological	Number of Buildings	153
Construction	Various	Gross Total Building Square Feet	1,326,000+
Current Facility State	The scope, schedule, and cost for this ABB has been revised as a result of the ARRA. The changes will be recorded in the next revision of the D&D Maps.		
Brief Background	Built in 1950s to recover usable uranium in spent fuel from government reactors. Scope includes 30 Nuclear and 63 Radiological facilities that comprise 46% of the GSF.		
Source Term	Various		
Project Description			
Estimated Cost	\$169,472,000	Contractor	TBD
Projected End-State	Demolition with some other disposition	Identifiers	ABB: 106; PBS ID-0040B/C
Project Start and End Dates	2025-2038		

ABB – 106 Cost and Schedule Profiles



■ Maintenance Costs    ■ Progress Costs

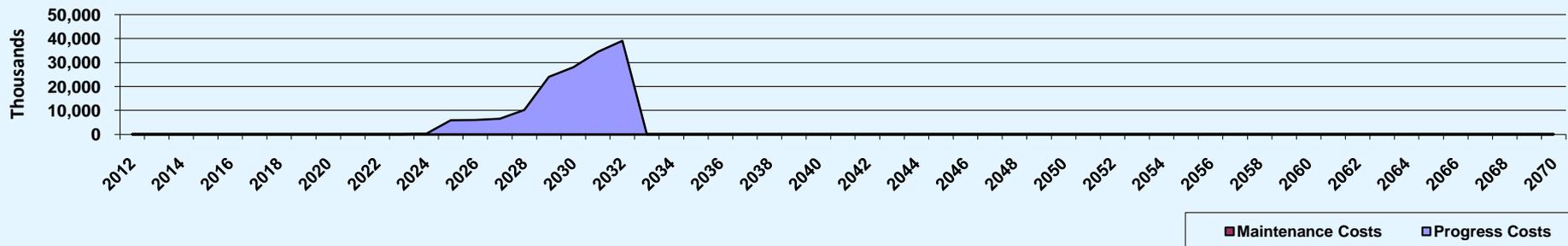


# L-Area D&D: Non-Area Completion

## Project Summary Table

Location Description			
Site/Area Description	Savannah River Site; L-Area		
EM Field Office	Savannah River Office		
Facility Description			
Major Facility Type	Nuclear and Industrial	Number of Buildings	30
Construction	Concrete & steel	Gross Total Building Square Feet	662,000
Current Facility State	L-Reactor is shut down, Disassembly Basin is operational		
Brief Background	Since 1996, the L Area Complex has received about 9,500 spent nuclear fuel assemblies in 444 casks from off-site sources. Fuel types include high and low enriched uranium spent fuel.		
Source Term	Uranium		
Project Description			
Estimated Cost	\$154,410,000	Contractor	TBD
Projected End-State		Identifiers	ABB: 65; PBS: SR-0040
Project Start and End Dates	2024-2032		

ABB – 65 Cost and Schedule Profiles



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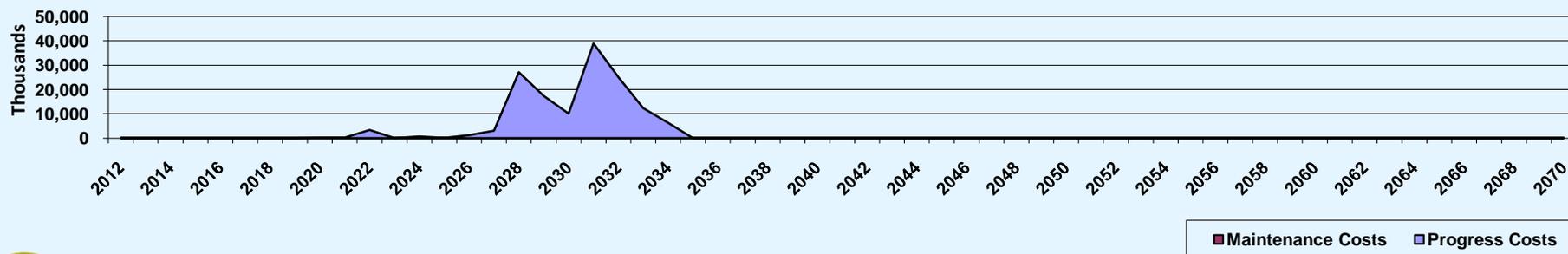
Office of Engineering & Technology, EM-20  
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# Waste Treatment Facilities D&D

## Project Summary Table

Location Description			
Site/Area Description	Oak Ridge; Oak Ridge National Laboratory (ORNL)		
EM Field Office	Oak Ridge Operations Office		
Facility Description			
Major Facility Type	Several	Number of Buildings	Unspecified; over 40
Construction		Gross Total Building Square Feet	288,000
Current Facility State			
Brief Background	The scope of this ABB consists of the Solid Waste Handling Facility inside the protected area and the Mobile Liquid Treatment Facility and has recently been modified to include additional waste facilities		
Source Term			
Project Description			
Estimated Cost	\$145,943,000	Contractor	TBD
Projected End-State	Slab on grade and complete excavation	Identifiers	ABB: 284C New; PBS: OR-0042
Project Start and End Dates	2020-2034		

ABB – 284C New Cost and Schedule Profiles



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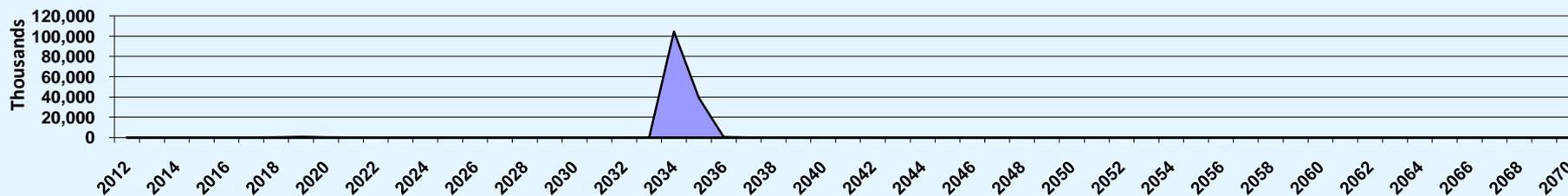
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# Zone 26 (400 Area)

## Project Summary Table

Location Description			
Site/Area Description	Hanford; River Corridor; 400 Area industrial (non-reactor) facilities		
EM Field Office	Richland Operations Office		
Facility Description			
Major Facility Type	Industrial	Number of Buildings	Not specified
Construction		Gross Total Building Square Feet	Not specified
Current Facility State			
Brief Background	This ABB includes structures, industrial waste sites, and underground tanks.		
Source Term	Non-radioactive industrial		
Project Description			
Estimated Cost	\$145,084,000	Contractor	TBD
Projected End-State	Complete restoration	Identifiers	ABB: 410; PBS: RL-0040-CP
Project Start and End Dates	2033-2036		

ABB – 410 Cost and Schedule Profiles



■ Maintenance Costs    ■ Progress Costs



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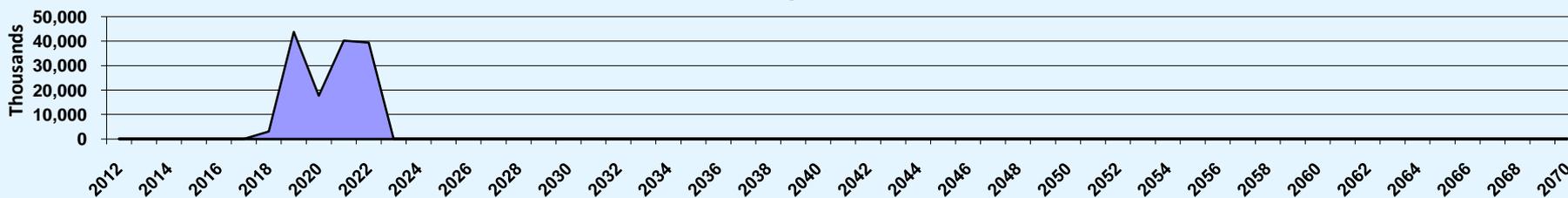
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Office of D&D and Facility Engineering

# Alpha Buildings D&D

## Project Summary Table

Location Description			
Site/Area Description	Oak Ridge; Y-12		
EM Field Office	Oak Ridge Operations Office		
Facility Description			
Major Facility Type	Radiological	Number of Buildings	4
Construction	Reinforced concrete	Gross Total Building Square Feet	513,000
Current Facility State	Several still active		
Brief Background	Scope of this ABB includes Alpha 4. Alpha Buildings were constructed in the 1940s and used for uranium enrichment & other operations.		
Source Term	Mercury, Lead, PCBs, Asbestos		
Project Description			
Estimated Cost	\$144,984,000	Contractor	TBD
Projected End-State	Slab-on-grade	Identifiers	ABB: 280A Existing; PBS: OR-0041
Project Start and End Dates	2018-2023		

**ABB – 280A Existing Cost and Schedule Profiles**



■ Maintenance Costs    ■ Progress Costs



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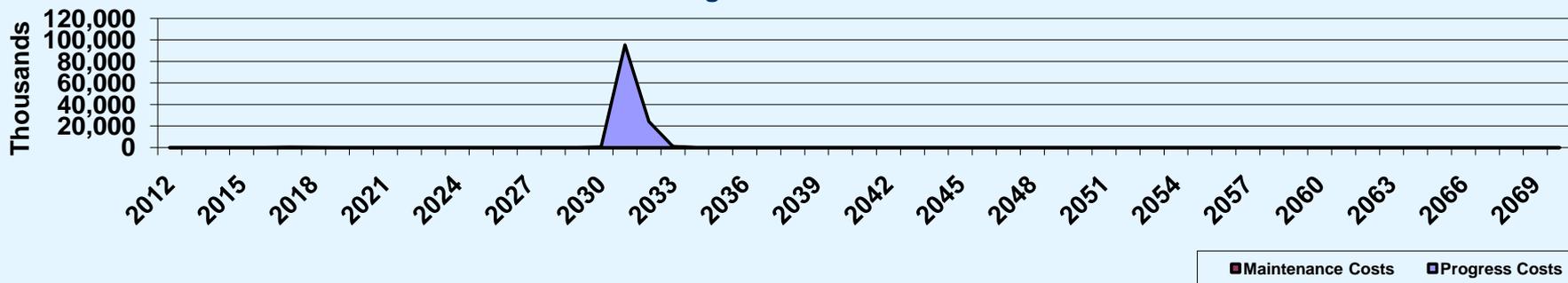
Office of Technical and Regulatory Support, EM-44  
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# Zone 7 (CSB Zone)

## Project Summary Table

Location Description			
Site/Area Description	Hanford; Central Plateau; 200 East Area, Canister Storage Building (CSB)		
EM Field Office	Richland Operations Office		
Facility Description			
Major Facility Type	Nuclear	No. Buildings	5 Major
Construction	Steel frame	Gross Total Building Square Feet	56,000
Current Facility State	Operational with spent nuclear fuel in storage		
Brief Background	The CSB stores about 2,300 tons of spent nuclear fuel		
Source Term	Uranium, mixed fission product		
Project Description			
Estimated Cost	\$121,384,000	Contractor	CH2MHill Plateau Remediation Company
Projected End-State	Slab-on-grade	Identifiers	ABB: 412; PBS: RL-0040-CP
Project Start and End Dates	2017-2033		

ABB – 412 Existing Cost and Schedule Profiles



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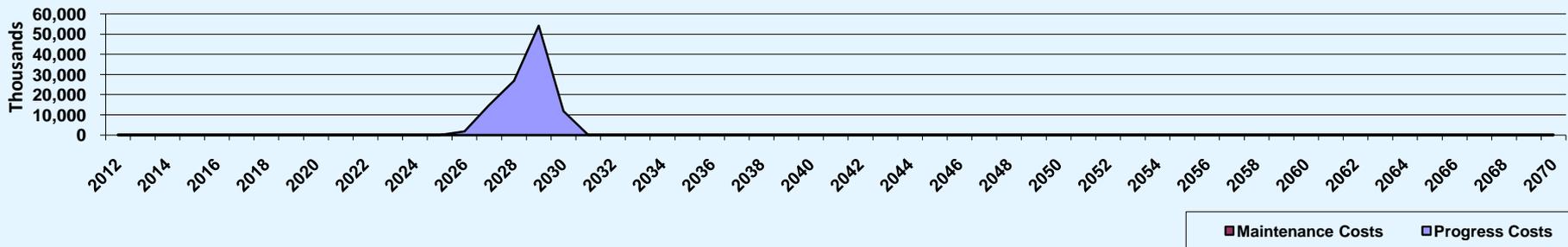
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# Biology & Lab Complex D&D

## Project Summary Table

Location Description			
Site/Area Description	Oak Ridge; Y-12		
EM Field Office	Oak Ridge Operations Office		
Facility Description			
Major Facility Type	Industrial	Number of Buildings	7 Major
Construction	Steel framed	Gross Total Building Square Feet	345,900
Current Facility State	'Cold and dark'. The scope, schedule, and cost for this ABB has been revised as a result of the ARRA. Changes will be recorded in the next version of the D&D Maps.		
Brief Background	Was used for experimentation		
Source Term	Lead, PCBs, Asbestos		
Project Description			
Estimated Cost	\$109,523,000	Contractor	TBD
Projected End-State	Slab-on-grade	Identifiers	ABB: 280C New; PBS: OR-0041
Project Start and End Dates	2026-2030		

ABB – 280C New Cost and Schedule Profiles



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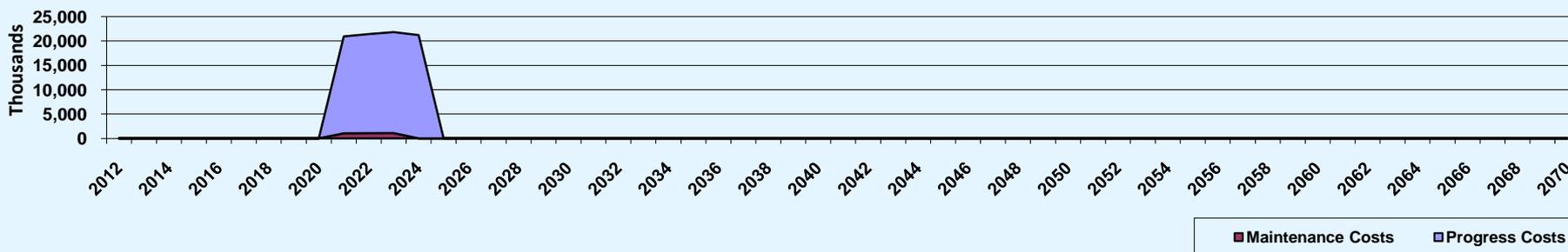
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Office of D&D and Facility Engineering

# AMWTP D&D

## Project Summary Table

Location Description			
Site/Area Description	Idaho National Laboratory; Advanced Mixed Waste Treatment Project		
EM Field Office	Idaho Operations Office		
Facility Description			
Major Facility Type	Nuclear	Number of Buildings	45
Construction	Steel	Gross Total Building Square Feet	821,000 +
Current Facility State	The AWMTP is operational.		
Brief Background	AMWTP processes waste primarily from the manufacture of nuclear components at Colorado's Rocky Flats Plant. There are no nuclear facilities and radiological facilities comprise less than 1% of the total GSF.		
Source Term	TRU waste		
Project Description			
Estimated Cost	\$82,185,000	Contractor	TBD
Projected End-State	D&D to final end-state, EM with no site presence at AMWTP	Identifiers	ABB: 2014; PBS: ID-0040B/C
Project Start and End Dates	2021-2024		

### ABB – 2014 Cost and Schedule Profiles



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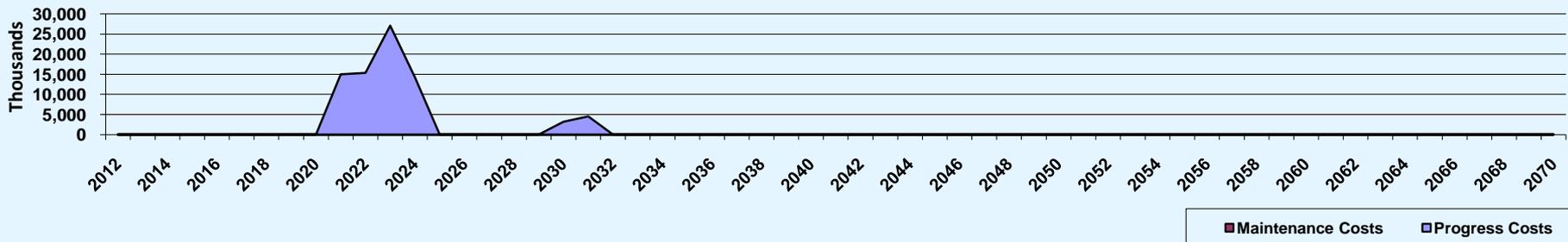
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# A-Area D&D: Non-Area Completion

## Project Summary Table

Location Description			
Site/Area Description	Savannah River Site; A-Area		
EM Field Office	Savannah River Office		
Facility Description			
Major Facility Type	Nuclear & Industrial	Number of Buildings	147
Construction	Various	Gross Total Building Square Feet	1,668,000
Current Facility State			
Brief Background	Serves mostly administrative, laboratory and industrial functions for the Savannah River National Lab and Savannah River Ecology Lab.		
Source Term			
Project Description			
Estimated Cost	\$79,351,000	Contractor	TBD
Projected End-State		Identifiers	ABB: 55; PBS: SR-0040
Project Start and End Dates	2021-2031		

### ABB – 55 Cost and Schedule Profiles



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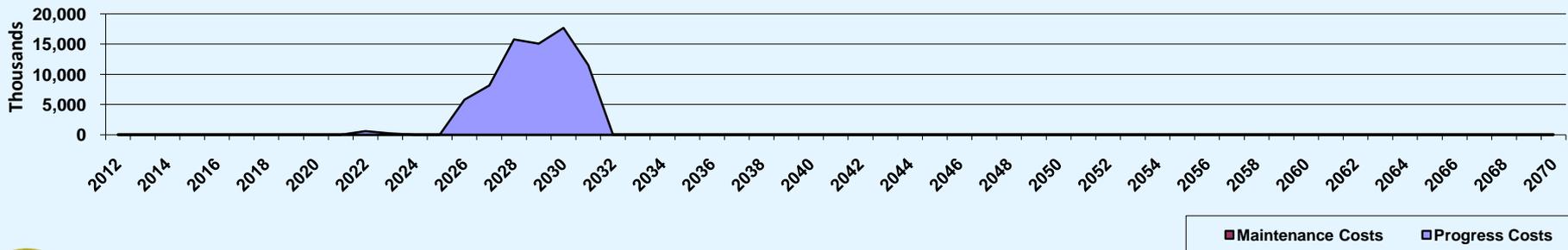
Office of Technical and Regulatory Support, EM-44  
Office of D&D and Facility Engineering

# N-Area D&D: Non-Area Completion

## Project Summary Table

Location Description			
Site/Area Description	Savannah River Site; N-Area		
EM Field Office	Savannah River Office		
Facility Description			
Major Facility Type	Industrial and Nuclear	Number of Buildings	83
Construction	Steel	Gross Total Building Square Feet	917,000
Current Facility State			
Brief Background	Previously designated as the Central Shops, N-Area consists of about 100 acres of Buildings and hazardous waste storage areas.		
Source Term			
Project Description			
Estimated Cost	\$74,850,000	Contractor	TBD
Projected End-State		Identifiers	ABB: 67; PBS: SR-0040
Project Start and End Dates	2022-2031		

### ABB – 67 Cost and Schedule Profiles



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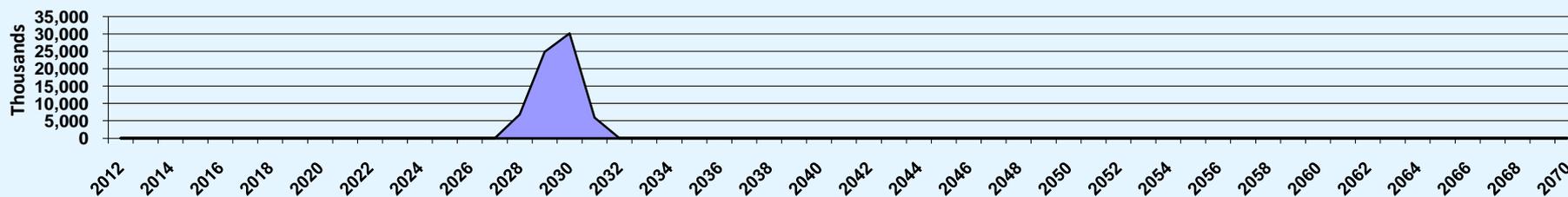
Office of Technical and Regulatory Support, EM-44  
Office of D&D and Facility Engineering

# B-Area D&D: Non-Area Completion

## Project Summary Table

Location Description			
Site/Area Description	Savannah River Site; B-Area		
EM Field Office	Savannah River Office		
Facility Description			
Major Facility Type	Industrial	Number of Buildings	30
Construction	Steel	Gross Total Building Square Feet	614,000
Current Facility State			
Brief Background	The buildings in this area are administrative, industrial, and laboratories. The HCTR reactor is designated as being in the U Area (see B2-36), which is embedded within B Area.		
Source Term	Industrial, asbestos, lab chemicals		
Project Description			
Estimated Cost	\$67,811,000	Contractor	TBD
Projected End-State		Identifiers	ABB: 56; PBS: SR-0040
Project Start and End Dates	2028-2031		

### ABB – 56 Cost and Schedule Profiles



■ Maintenance Costs    ■ Progress Costs



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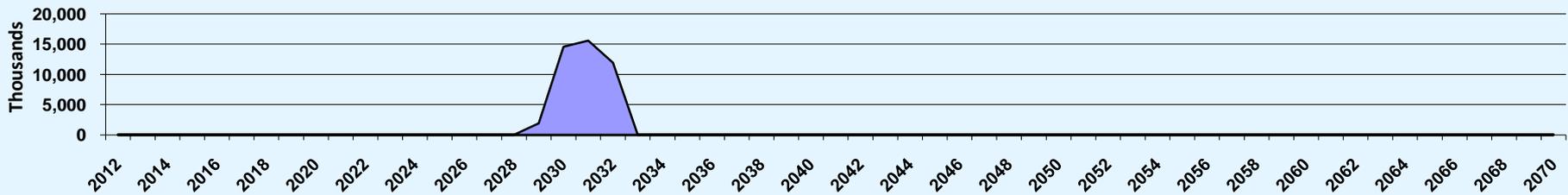
Office of Technical and Regulatory Support, EM-44  
Office of D&D and Facility Engineering

# Z-Area D&D: Non-Area Completion

## Project Summary Table

Location Description			
Site/Area Description	Savannah River Site; Z-Area		
EM Field Office	Savannah River Office		
Facility Description			
Major Facility Type	Nuclear	Number of Buildings	14
Construction	Steel	Gross Total Building Square Feet	208,655
Current Facility State	Operational		
Brief Background	The Saltstone facilities safely stabilize and dispose of low-level radioactive liquid salt wastes produced and stored at the Savannah River Site.		
Source Term	Mixed fission products		
Project Description			
Estimated Cost	\$43,993,000	Contractor	TBD
Projected End-State		Identifiers	ABB:73; PBS: SR-0040
Project Start and End Dates	2029-2032		

### ABB – 73 Cost and Schedule Profiles



■ Maintenance Costs    ■ Progress Costs



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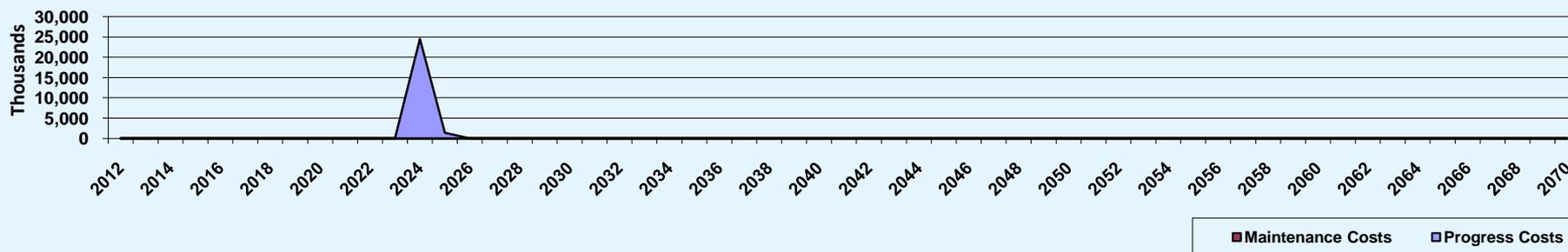
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# Zone 23 (100 Area)

## Project Summary Table

Location Description			
Site/Area Description	Hanford; River Corridor; 100 Area		
EM Field Office	Richland Operations Office		
Facility Description			
Major Facility Type	Various	Number of Buildings	200 +
Construction	Various	Gross Total Building Square Feet	1.75 million
Current Facility State	In D&D		
Brief Background	Where the nine former plutonium production reactors are found (B Reactor, C Reactor, D Reactor, DR Reactor, F Reactor, H Reactor, K-East Reactor, K-West Reactor, and N Reactor).		
Source Term	Various		
Project Description			
Estimated Cost	\$25,905,000	Contractor	TBD
Projected End-State	Residential	Identifiers	ABB: 409; PBS: RL-0040-CP
Project Start and End Dates	2024-2025		

### ABB – 409 Cost and Schedule Profiles



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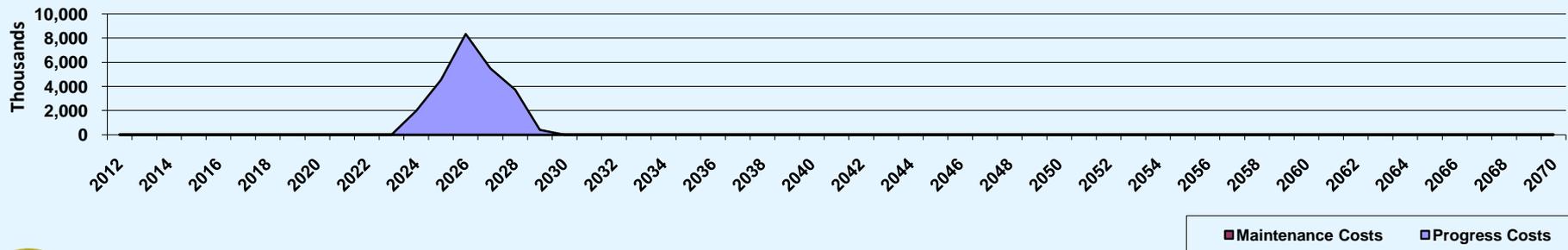
Office of Technical and Regulatory Support, EM-44  
Office of D&D and Facility Engineering

# Process Facilities D&D

## Project Summary Table

Location Description			
Site/Area Description	Oak Ridge: Y-12		
EM Field Office	Oak Ridge Operations Office		
Facility Description			
Major Facility Type	Industrial	Number of Buildings	10
Construction		Gross Total Building Square Feet	106,700
Current Facility State	Transition Facility 9735 has been demolished under ARRA, All others are shutdown pending D&D		
Brief Background	Scope of this ABB is transition facilities and Y-12 EM Facilities.		
Source Term	Lead, Freon, Asbestos		
Project Description			
Estimated Cost	\$24,480,000	Contractor	TBD
Projected End-State	D&D to slab	Identifiers	ABB: 280D Existing; PBS: OR-0041
Project Start and End Dates	2024-2029		

ABB – 280D Existing Cost and Schedule Profiles



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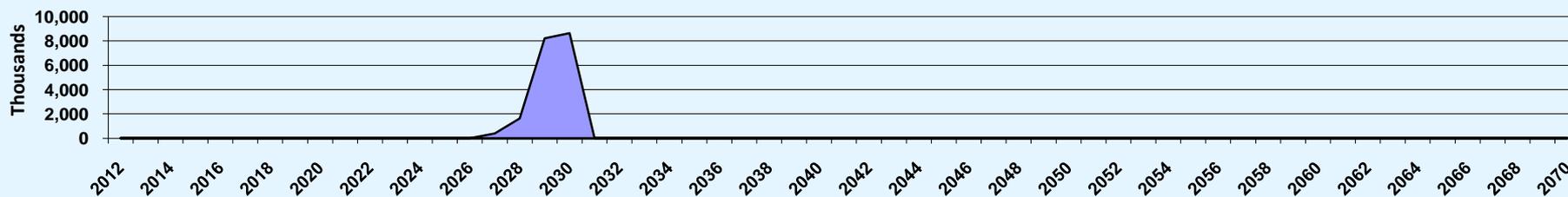
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# E-Area D&D: Non-Area Completion

## Project Summary Table

Location Description			
Site/Area Description	Savannah River Site; E-Area		
EM Field Office	Savannah River Office		
Facility Description			
Major Facility Type	Nuclear	Number of Buildings	23
Construction	Concrete & steel	Gross Total Building Square Feet	279,339
Current Facility State			
Brief Background	E-Area receives low-level solid, TRU, and mixed waste from all SRS site areas		
Source Term			
Project Description			
Estimated Cost	\$21,315,000	Contractor	TBD
Projected End-State		Identifiers	ABB: 59; PBS: SR-0040
Project Start and End Dates	2027-2031		

### ABB – 59 Cost and Schedule Profiles



■ Maintenance Costs    ■ Progress Costs



**EM** Environmental Management

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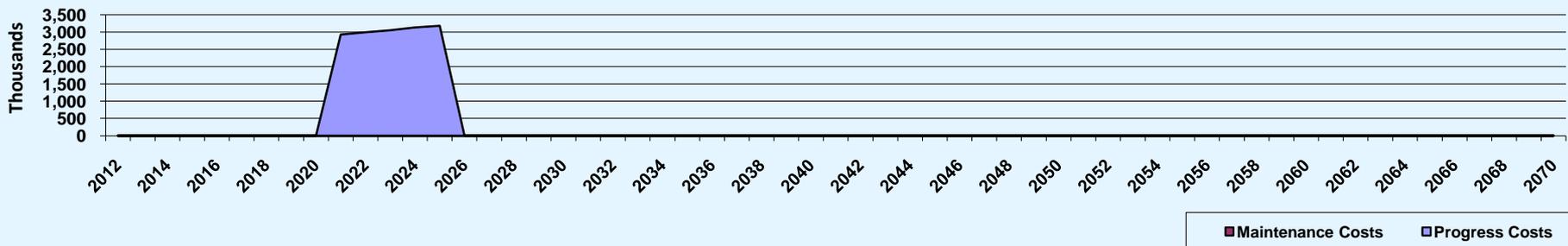
Office of Technical and Regulatory Support, EM-44  
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# Miscellaneous Facilities

## Project Summary Table

Location Description			
Site/Area Description	Idaho National Laboratory and Fort Saint Vrain (FSV) in Colorado		
EM Field Office	Idaho Operations Office		
Facility Description			
Major Facility Type	Reactors and Industrial	Number of Buildings	14
Construction	Concrete and Steel	Gross Total Building Square Feet	129,000+
Current Facility State	The scope, schedule, and cost for this ABB has been revised as a result of the ARRA. The changes will be recorded in the next revision of the D&D Maps.		
Brief Background	Task covers D&D of 5 facilities at Advanced Test Reactor Complex/Power Burst Facility; 3 at TAN; 4 site-wide; 2 at FSV. There are 5 Radiological facilities that comprise 36% of the GSF.		
Source Term	Radiological and Industrial		
Project Description			
Estimated Cost	\$15,293,000	Contractor	TBD
Projected End-State	Facilities decommissioned; no EM presence	Identifiers	ABB: 2016; PBS: ID-0040B/C
Project Start and End Dates	2021-2024		

ABB – 2016 Cost and Schedule Profiles



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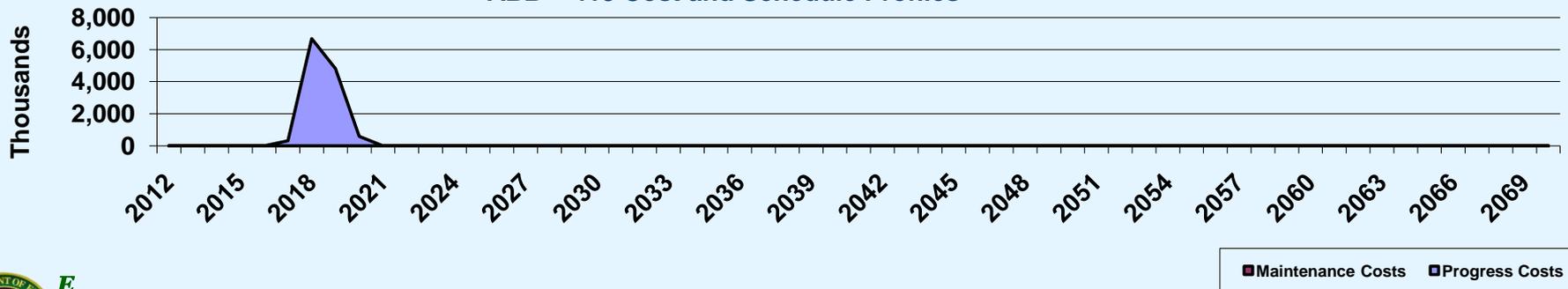
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# Zone 9 (ETF Zone)

## Project Summary Table

Location Description			
Site/Area Description	Hanford; Central Plateau; 200 East Area, Effluent Treatment Facility (ETF)		
EM Field Office	Richland Operations Office		
Facility Description			
Major Facility Type	Radiological	Number of Buildings	3 Major
Construction	Concrete block interior walls, metal exterior walls	Gross Total Building Square Feet	63,000
Current Facility State	Operational; Supports various low level liquid radiological waste		
Brief Background	The Effluent Treatment Facility receives liquids from the Liquid Effluent Retention Facility.		
Source Term	Many radionuclides in water being processed		
Project Description			
Estimated Cost	\$12,400,000	Contractor	CH2MHill Plateau Remediation Company
Projected End-State	Slab-on-grade	Identifiers	ABB: 413; PBS: RL-0040-CP
Project Start and End Dates	2017-2020		

ABB – 413 Cost and Schedule Profiles



**EM** Environmental Management

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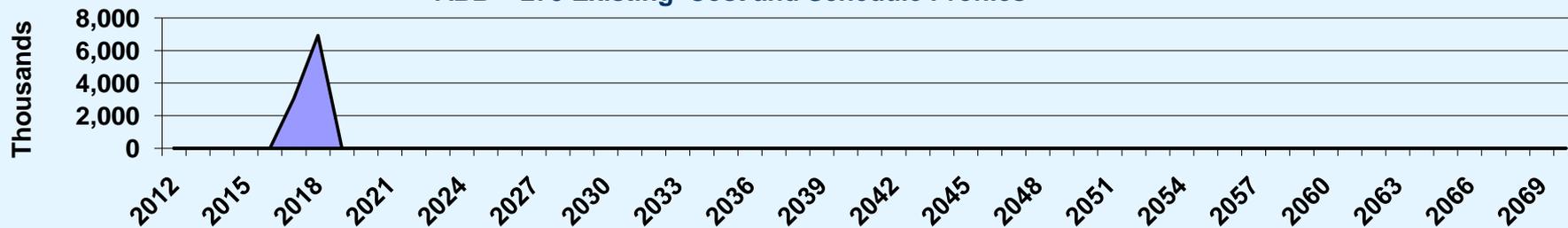
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# K-27 Building D&D

## Project Summary Table

Location Description			
Site/Area Description	Oak Ridge; East Tennessee Technology Park		
EM Field Office	Oak Ridge Operations Office		
Facility Description			
Major Facility Type	Nuclear	Number of Buildings	1
Construction	Steel framed, asbestos transite siding	Gross Total Building Square Feet	374,000
Current Facility State	Demolition preparation		
Brief Background	The K-27 building contains 540 stages of gaseous diffusion process equipment and associated auxiliary systems		
Source Term	Uranium, Technetium-99		
Project Description			
Estimated Cost	\$10,000,000	Contractor	Bechtel Jacobs Company LLC
Projected End-State	Demolition; brownfield industrial reuse	Identifiers	ABB – 275 Existing; PBS OR-0040
Project Start and End Dates	2017-2018		

ABB – 275 Existing Cost and Schedule Profiles



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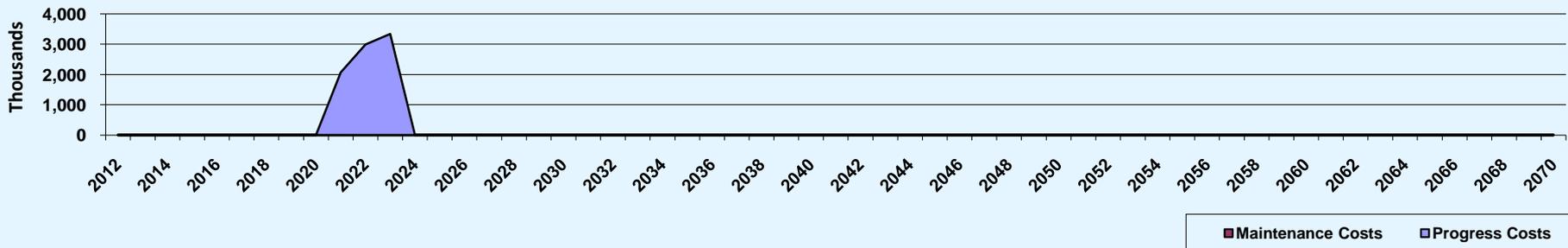
■ Maintenance Costs    ■ Progress Costs

# U-Area D&D: Non-Area Completion

## Project Summary Table

Location Description			
Site/Area Description	Savannah River Site; U-Area		
EM Field Office	Savannah River Office		
Facility Description			
Major Facility Type	Industrial	Number of Buildings	1
Construction	Concrete and steel dome	Gross Total Building Square Feet	4,216
Current Facility State	The Heavy Water Component Test Reactor (HWCTR) project is scheduled to be complete by 2011 as a result of the ARRA.		
Brief Background	The HWCTR was decommissioned in the 1990s.		
Source Term			
Project Description			
Estimated Cost	\$9,262,000	Contractor	Savannah River Nuclear Solutions
Projected End-State	Demolition to grade and below grade filled with grout	Identifiers	ABB: 72; PBS: SR-0040
Project Start and End Dates	2021-2024		

### ABB – 72 Cost and Schedule Profiles



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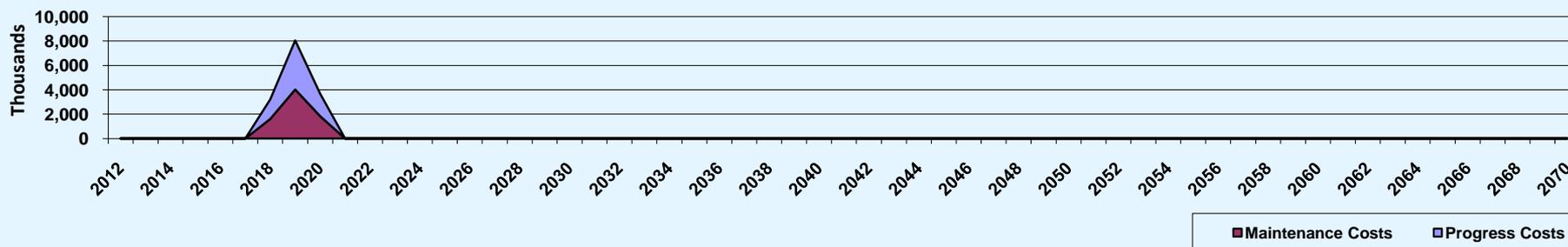
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# High Flux Beam Reactor (HFBR) Phase Two

## Project Summary Table

Location Description			
Site/Area Description	Brookhaven National Laboratory		
EM Field Office	Small Sites Office		
Facility Description			
Major Facility Type		Number of Major Buildings	4
Construction		Gross Total Building Square Feet	Not specified
Current Facility State	The HFBR project is scheduled to be complete by 2011 as a result of the ARRA; which will also affect the estimated cost.		
Brief Background	ARRA has accelerated work; D&D Building 704, Building 802, and Building 740; Long-term stewardship of Building 750		
Source Term	Various		
Project Description			
Estimated Cost	\$63,010,000 (2011 update)	Contractor	TBD
Projected End-State	Various – scope will complete in FY 2011	Identifiers	ABB: 504B; PBS: BRNL-0041
Project Start and End Dates	2018-2020 (ARRA accelerated to 2011).		

### ABB – 504B Cost and Schedule Profiles



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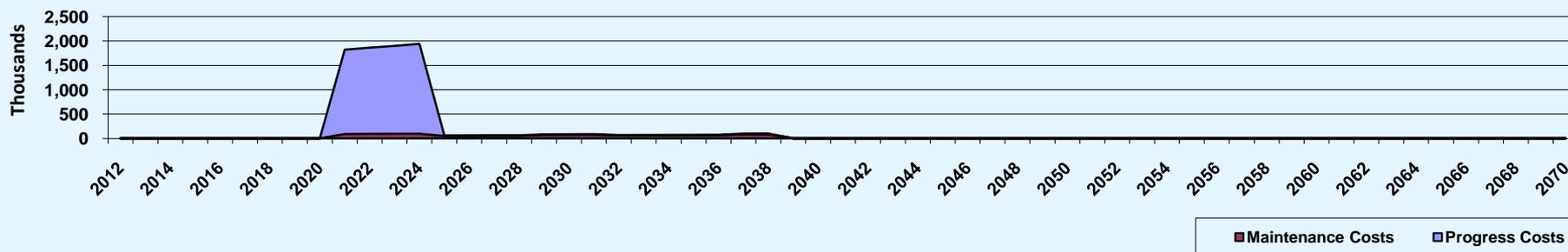
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# Materials & Fuels Complex (MFC) D&D

## Project Summary Table

Location Description			
Site/Area Description	Idaho National Laboratory; Materials Fuels Complex		
EM Field Office	Idaho Operations Office		
Facility Description			
Major Facility Type	Various	Number of Buildings	13
Construction	Various	Gross Total Building Square Feet	30,000+
Current Facility State	The scope, schedule, and cost for this ABB has been revised as a result of the ARRA. The changes will be recorded in the next revision of the D&D Maps.		
Brief Background	This ABB includes 1 Nuclear and 9 Radiological facilities that comprise 72% of the GSF.		
Source Term	Various		
Project Description			
Estimated Cost	\$7,148,000	Contractor	TBD
Projected End-State		Identifiers	ABB: 2015; PBS: ID-0040B/C
Project Start and End Dates	2021-2024		

### ABB – 2015 Cost and Schedule Profiles



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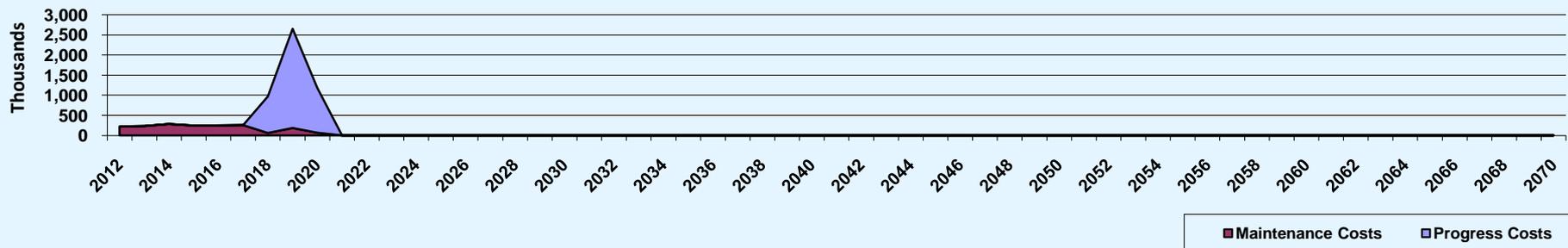
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# HFBR Record of Decision Compliance Phase One

## Project Summary Table

Location Description			
Site/Area Description	Brookhaven National Laboratory		
EM Field Office	Small Sites Office		
Facility Description			
Major Facility Type	Nuclear	Number of Buildings	6
Construction	Industrial	Gross Total Building Square Feet	
Current Facility State	Completed under ARRA.		
Brief Background	Scope included Stack Monitoring Facility, Cooling Tower basin and Pump/switchgear house, water treatment house, cold neutron facility, and guard house.		
Source Term	Radiological and industrial		
Project Description			
Estimated Cost	\$18,750,000 (Revised 2011)	Contractor	TBD
Projected End-State	Dismantled and disposed	Identifiers	ABB: 504A; PBS: BRNL-0041
Project Start and End Dates	Work has been completed.		

### ABB – 504A Cost and Schedule Profiles



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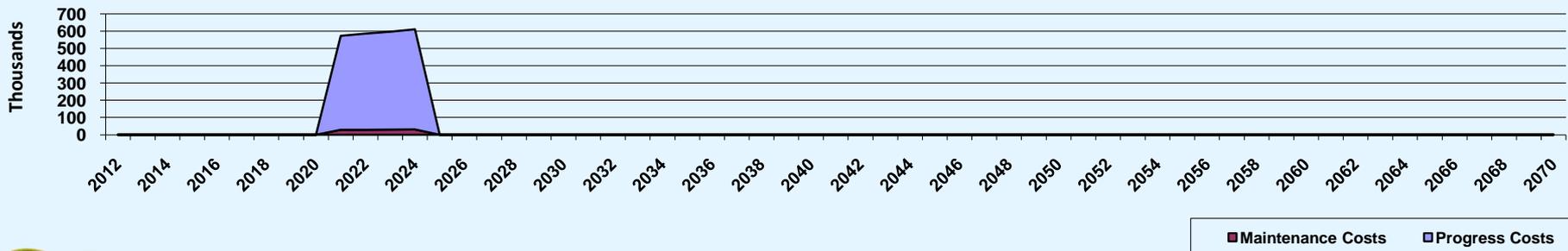
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Office of D&D and Facility Engineering

# Radioactive Waste Management Complex (RWMC) D&D

## Project Summary Table

Location Description			
Site/Area Description	Idaho National Laboratory; Radioactive Waste Management Complex		
EM Field Office	Idaho Operations Office		
Facility Description			
Major Facility Type	Nuclear	Number of Buildings	18
Construction	Steel light frame	Gross Total Building Square Feet	50,000+
Current Facility State	The scope, schedule, and cost for this ABB has been revised as a result of the ARRA. The changes will be recorded in the next revision of the D&D Maps.		
Brief Background	The scope of this ABB includes 9 Radiological facilities that comprise 8% of the GSF.		
Source Term	Various		
Project Description			
Estimated Cost	\$2,249,000	Contractor	TBD
Projected End-State	D&D to final end-state, no EM presence	Identifiers	ABB: 110; PBS: ID-0040B/C
Project Start and End Dates	2021-2024		

### ABB – 110 Cost and Schedule Profiles



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Appendix B2 — D&D Project Summaries for Additional Projects

6/13/2011

B2-40

# Facility Deactivation & Decommissioning (D&D) Appendix C — Summary of Completed Major D&D Projects

2011 Edition



Rocky Flats Site, 1995



Rocky Flats Site, 2007

# Completed D&D Project Sites

- Ashtabula Uranium Plant Closure Project
- Columbus Nuclear Research Facility Closure Project
- Fernald Uranium Plant Closure Project
- Mound Radioisotopic Plant - Miamisburg Closure Project
- Rocky Flats Plutonium Plant Closure Project



# Ashtabula Closure Project (D&D Completed)

## Uranium Processing Facilities Ashtabula, Ohio

**Site Owner:** RMI Titanium Company (RMI),  
a division of Earthline Technologies

**Cleanup Contractor:** LATA-Sharp Remediation  
Services, LLC (LSRS)

**Project Beginning Date:** Closure contract awarded  
September 30, 2005

**Original Mission of the Site:** The site was utilized to  
support uranium extrusion operations that began in 1962.

**Types of Wastes:** Low-level waste, mixed  
low-level waste, and hazardous and industrial wastes.

### **Declaration of Physical Completion:**

The contractor declared physical completion on  
November 1, 2006, more than 2 weeks ahead of  
schedule.



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# Columbus Closure Project (D&D Completed)

## Nuclear Research Facilities Columbus, Ohio

**Site Owner:** Department of Energy

**Cleanup Contractor:** Battelle

**Project Beginning Date:** In December 1993, the NRC issued a letter approving Battelle's Decommissioning Plan.

**Original Mission of the Site:** The Columbus Site consisted of the King Avenue and West Jefferson sites. The King Avenue site consisted of nine affected buildings and was historically a part of the government's fuel and fabrication program. The West Jefferson site consisted of six buildings and was historically a site that performed nuclear research.

**Types of Wastes:** Primarily uranium and thorium.

### **Declaration of Physical Completion:**

Remediation at the King Avenue Site was completed in FY 2000 and the facilities were released to Battelle. Remediation at the West Jefferson site was completed in FY 2006.



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# Fernald Closure Project (D&D Completed)

## Uranium Processing Facilities Cincinnati, Ohio

**Site Owner:** Department of Energy

**Cleanup Contractor:** Fluor Fernald

**Project Beginning Date:** Shutdown in 1989,  
Closure contract awarded November 2000

**Original Mission of the Site:** The site was  
utilized to as a uranium processing facility for  
37 years to support the U.S. weapons program

**Types of Wastes:** Low-level waste, mixed  
low-level waste, and hazardous and industrial  
wastes.

### **Declaration of Physical Completion:**

The contractor declared physical completion  
on October 29, 2006.

**Received Formal Acceptance:** Received from  
DOE on January 22, 2007, that clean-up of the  
1,050-acre site is now complete.



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# Mound Plant - Miamisburg Closure Project (D&D Completed)

## Radioisotopic Processing Facilities Miamisburg, Ohio

**Site Owner:** Department of Energy

**Cleanup Contractor:** CH2M HILL Mound

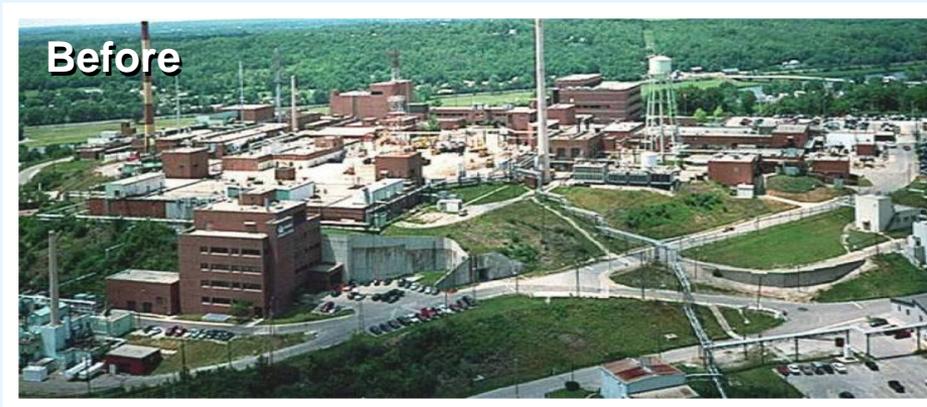
**Project Beginning Date:** In 1998, a sales contract was established between the Miamisburg Mound Community Improvement Corporation (MMCIC) and DOE that allowed conveyance of the Mound property subject to the CERCLA 120(h) process.

**Original Mission of the Site:** Much of the work at the Mound Plant during the Cold War involved production of the polonium-beryllium initiators used in early atomic weapons and the manufacture of and research related to radionuclides.

**Types of Wastes:** Facilities contained plutonium, beryllium, and other hazardous substance contamination.

**Declaration of Physical Completion:** The contractor declared physical completion on July 31, 2006.

**Received Formal Acceptance:** DOE accepted completion of the scope in March 2007



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# Rocky Flats Closure Project (D&D Completed)

**Site Owner:** Department of Energy

**Cleanup Contractor:** Kaiser-Hill

**Project Beginning Date:** In January 2000, Kaiser-Hill signed a closure contract for cleanup. The cleanup required the removal of more than 800 structures, including six plutonium processing and fabrication complexes.

**Original Mission of the Site:** The Rocky Flats Plant was established in 1951 as part of the United States' nationwide nuclear weapons complex to manufacture nuclear weapons components, operating from 1952 to 1994. The key component produced at Rocky Flats was the plutonium pit, commonly referred to as the "trigger".

**Types of Wastes:** Facilities contained substantial plutonium, beryllium, and other hazardous substance contamination; more than 500,000 cubic meters of low-level radioactive waste. Remediation of more than 360 potentially contaminated environmental sites was also required.

**Declaration of Physical Completion:** In October 2005, DOE and its contractor completed an accelerated 10-year, \$7 billion cleanup.

**Received Formal Acceptance:** The EPA certified completion of site cleanup and closure on June 11, 2007.



**Plutonium Processing Facilities  
Denver, Colorado**



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# Completed Major D&D Projects

- Hanford
  - 300 Area
  - 100 Area
  - 200 Area
- Idaho National Laboratory
  - Loss of Fluid Test Reactor
  - Test Area North
  - Engineering Test Reactor
  - Power Burst Facility (PBF) Reactor
- Los Alamos
  - Tritium Systems Test Assembly Facility
- Paducah
  - Metals Plant Facility
- Portsmouth
  - Chemical Engineering Building
  - X-663 Cooling Tower Complex
- Savannah River
  - K Cooling Tower
  - M Area Closure
  - T Area Closure



# Hanford Site

## 300 Area Facility Demolition

The 300 Area's two main functions were production (or fabrication) of fuel for the reactors (performed in the north end of the area) and chemical research to improve the entire production process. Some of the buildings in the 300 Area were constructed during World War II.



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# Hanford Site



**300 Area Facility Demolition**



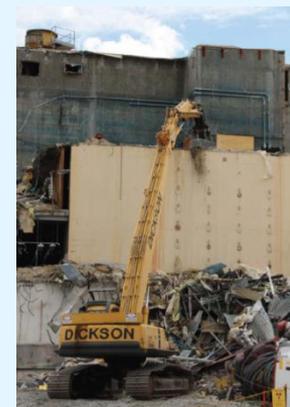
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# Hanford Site

## 100 N Area Facility Demolition



N Reactor demolition



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# Hanford Site

## 100 K Area Facility Demolition



Demolition of tanks in  
K East area



K East reactor  
stack demolition



K East fuel storage basin  
demolition (May 2009)



183 K West chemical  
storage silo demolition



183 K West chlorine  
vault slab demolition



183.3 K West filter basin  
demolition (April 2010)



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# Hanford Site

## 200 Area Facility Demolition



Demolition of 212-N interim fuel storage basin



Ancillary facilities in front of the U Canyon being demolished



212-N basin after demolition



Demolition of 272E building



Demolition of the 212-R interim fuel storage basin



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# Idaho National Laboratory

## Loss of Fluid Test Reactor (LOFT)

In October 2006, the decontamination, decommissioning and demolition of the Loss-of-Fluid Test (LOFT) facility was completed. The 30-year-old research reactor posed significant challenges involving regulations governing the demolition of a historical facility, as well as worker safety issues associated with the removal of the reactor's domed structure.



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# Idaho National Laboratory

Before



After  
(May 2008)



Test Area North (TAN) Technical Support Facility (TSF)



TAN-607 Hot Shop during demolition  
(September 2007)



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Appendix C — Summary of Completed Major D&D Projects

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# Idaho National Laboratory

## Engineering Test Reactor (ETR)



ETR Building Pull-down



Engineering Test Reactor Vessel Rotate



ETR Building Debris Clearing



Engineering Test Reactor Disposed in Idaho CERCLA Disposal Facility (ICDF)



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# Idaho National Laboratory

## Power Burst Facility



The Power Burst Facility (PBF) operated from 1972 to 1985 and was primarily used to test the performance of light water reactor fuel elements during transients or sudden bursts of power. In November 2008, all D&D work scope at the Power Burst Facility was completed. The scope included the isolation of utilities to the PBF facilities and the removal of asbestos-containing materials and hazardous substances prior to interior dismantlement. The PBF reactor vessel was removed in July 2008 and placed in the Idaho CERCLA Disposal Facility and the *PBF before and after D&D* facility's superstructure was demolished.



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Appendix C — Summary of Completed Major D&D Projects

6/13/2011 C-16

# Los Alamos National Laboratory

## Tritium Systems Test Assembly Facility

In June 2010, demolition of the Tritium Systems Test Assembly (TSTA) facility was completed. This 16,000-square-foot building was used for fusion research and is the tenth of 21 buildings to be demolished as part of Recovery Act work.



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Appendix C — Summary of Completed Major D&D Projects

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# Paducah

## Metals Plant Facility

Demolition of three support structures totaling more than 5,000 square feet has cleared the way for the much larger demolition of the seven-story, 60,000-square-foot Metals Plant which is scheduled for demolition in 2011.

The three demolished structures include the Magnesium Storage Building, an emergency power structure, and a conveyor system linking the Magnesium Storage Building to the main part of the Metals Plant.



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# Portsmouth



The Chemical Engineering Building was a 30-foot-high, two-story, flat-roofed, concrete block structure formerly used for pilot and bench scale studies on uranium-bearing materials and chemicals



The demolition of the 20 acre X-663 Cooling Tower complex including four separate towers – two built in 1954 and two constructed in the late 1970s – and a pumphouse.



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# Savannah River Site



K Cooling Tower



K Cooling Tower was constructed in 1992 with 8 36-inch thick walls over a concrete basin that was 345 feet in diameter and 8 feet deep.

The K Cooling Tower was approximately 455 feet tall, with a base diameter of 330 feet.

The tower contained approximately 13,000 cubic yards of concrete, weighing more than 52 million pounds.



The tower contained approximately 19,500 cubic yards (approximately 200 truckloads) of polyvinyl chloride (PVC) fill and piping that helped to distribute the water within the tower.



# Savannah River Site

## M Area Closure

M Area, which operated from 1952 to 1988, was originally home to manufacturing buildings that were used primarily for testing and fabrication of reactor fuel and targets.

The cleanup effort, which took place over eight years, included the demolition of 23 buildings, as well as the remediation of a network of underground industrial piping and sewer lines, soil areas, and groundwater plumes that were contaminated from past spills and operations. The final steps, which included the treatment of contaminated soils using passive soil vapor extraction technology, were completed in August 2010.

Although the entire site will remain under federal ownership, completion of the M Area means 40 square mile area near the northwest boundary of SRS could be available for possible industrial reuse. DOE's Savannah River National Laboratory will also use a portion of M Area for a port security project for the Department of Homeland Security.



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# Savannah River Site

## T Area Closure



In 2003, SRS signed an agreement with its regulators for an innovative process that integrates soil and groundwater cleanup with D&D activities to close entire areas of the site. In 2006, SRS closed T Area, the first of 14 major areas identified under the Area Completion initiative. This Area Completion resulted in cost savings of more than \$37 million and the cleanup was completed two years ahead of schedule. Other Area Completions at M-, P-, R- and D-Areas are presently underway and are expected to yield similar cost savings.



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Appendix C — Summary of Completed Major D&D Projects

6/13/2011 C-22

# Facility Deactivation & Decommissioning Appendix D — D&D Project Basics

2011 Edition

A brief explanation of the DOE's Complex-wide facility D&D work



Loss of Fluid Test Facility at Idaho National Laboratory

# Contents

- **What is D&D?**
- **Why is D&D Important?**
- **What are the DOE Facility Types being D&D?**
- **What are the Disposition End-State Options?**
- **What are the Major Challenges to the D&D Program?**
- **How is D&D Managed?**
- **Why are Waste Types Important?**
- **Who are the Typical Special Interests?**



# What is D&D?

D&D Projects encompass the many stages of taking an active/excess/abandoned facility to a final disposition end state. Various documents interchange the following words for the “D” in “D&D” projects. These labels can be overlapping in activity types. However, the general goal is the same for D&D project: reduce and ultimately eliminate risks, maintenance costs and foot print. The multiple “D” phases cause some D&D projects to be referred to as D4.

The following are general definitions:

- **Decontamination:** the removal of radiological, chemical, or hazardous contaminants to reduce the safety and health risks. The extent and costs of removing contamination influences the disposition alternatives and the subsequent D&D work methods. Decontamination can occur in any or all of the phases described below.
- **Stabilization (Deinventory) Phase:** A stabilization phase may be needed for facilities with unstable process materials requiring neutralization; for facilities with degraded infrastructure; and/or facilities with process system/pipeline holdup.
- **Deactivation Phase:** the removal of nuclear materials, process chemicals and hazardous materials and shutting down of process systems and equipment not required to maintain the safety envelope; relocation of personnel that, in combination, safely reduces or eliminates the need for costly surveillance and maintenance activities. Resulting facility is in minimum-cost, safe surveillance and maintenance condition (**long-term min-safe storage**) and ready for demolition. Frequently referred to as “cold and dark.”
- **Decommissioning Phase:** The dictionary definition involves the steps to remove items necessary to maintain original mission purpose or to take out of service. Resulting facility is ready for final disposition end-state. “**Decommissioning**” is sometimes used to encompass the whole D&D and restoration process or later disposition phases. **DOE O 430.1B and associated Guides** use “**Decommissioning**” to mean final disposition process phase, post-deactivation, including various end-states. Two “reactor decommissioning” definitions: (1) all phases from de-fueling to soil remediation or (2) decommissioning occurs at post –de-fueling and ends with vacant building. Note the potential confusion if two parties are using different definitions for the scope of “decommissioning” work.
- **Disposition:** Final disposition is the end-state established for the facility such as federal reuse, release to public use, in-situ decommissioning (entombment), or demolition. **DOE O 430.1B and associated Guides** use “**Disposition Process**” to describe all D&D stages from deactivation to final end state.
- **Demolition or Dismantlement Phase:** The complete or partial removal of the facility structure. Debris is either recycled or disposed as waste depending on the type of contamination or material economics. This phase may leave bare ground, the concrete foundation, or the core structure based on end-state agreements or transition to environmental (soil & water) remediation projects.

The starting point for D&D projects varies depending on the stage or condition the facility has been left in. D&D can be funded and managed in distinct phases or as one continuous project.



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Appendix D — D&D Project Basics

6/13/2011 D-2

# Typical D&D Costs

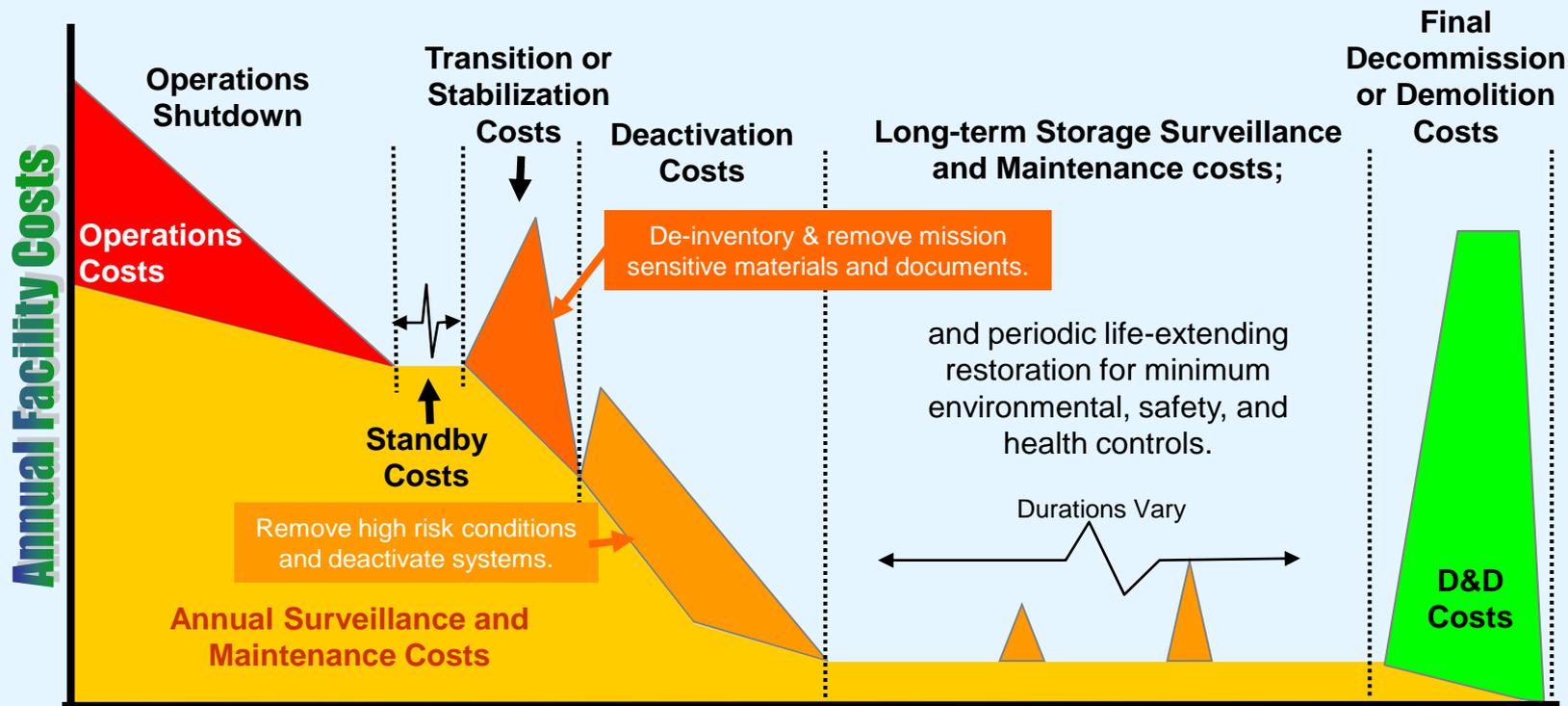
D&D costs of radiologically contaminated facilities vary considerably depending on the type of facility and extent of contamination.

- A rough estimate for Commercial Power Reactor D&D is about \$500 Million
- Variability in DOE facilities makes generalization difficult. Rocky Flats completed D&D between 1999 and 2005. Preliminary evaluation of data indicates that average D&D costs at Rocky Flats were as follows:
  - Nuclear Facilities (Type 3): \$1,200 per square foot
  - Radiological Facilities (Type 2): \$800 per square foot
  - Industrial Facilities (Type 3): \$100 per square foot



# Typical End-of-Life Phases of a Nuclear Facility

This is the typical, conceptualized cost profile for the stages of facility disposition where the facility is transitioned from operations and deactivated to a low cost minimum surveillance and maintenance holding period until decommissioning funding is available.



**End-of-Life-Cycle Annual Costs Profile for a Radiological Facility**



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# Why is D&D Important?

**Work Scope Background:** Since the early days of the Manhattan Project, in the 1940's, the nuclear weapons program was under schedule-driven deadlines to deliver products. Costs, environment, and sometimes even safety were secondary to delivering results. Facilities were built in record-breaking size and speed, often for short-lived, mission-specific purposes. The 40 years of Cold War, from the 1950's through the 1980's drove similar production quota priorities. Old facilities were often unfunded and abandoned, as additional facilities were built for newer missions and changes in technology. As the Cold War closed and the veil of secrecy lifted, it revealed a huge environmental legacy including a large inventory of radiological facilities needing final disposition.

**The key drivers for D&D** are reduction in safety and environmental hazards or liability, and the reduction in facility and infrastructure footprint to reduce the associated surveillance and maintenance costs. **The longer these facilities sit, the further they degrade and the more dangerous and costly they are to maintain and/or disposition. Currently, there are more than a few facilities in such disrepair as to prohibit access to workers and as such requiring remote/robotic D&D approaches to be used.**

**The goal for D&D** is establishing the radiological facility end-of-life disposition path and removing facilities from the DOE EM inventory.



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# Facility Category Types Requiring D&D



## Nuclear Facilities

Nuclear facilities contain or have contained nuclear materials that warranted robust designs both in structural mass and system redundancies. These are typically the reactor buildings, separation process canyons, nuclear process testing buildings, and nuclear materials fabrication buildings. Disposition of nuclear facilities requires detailed characterization, rigorous planning, application of appropriate technologies and thousands of man-hours of work in highly hazardous conditions.



## Radiological Facilities

Radiological facilities are typically buildings that handled radioactive materials whose types or quantities allowed less robust structures and systems. These are typically radiological support operations such as laboratories, test facilities, or waste handling and storage buildings.



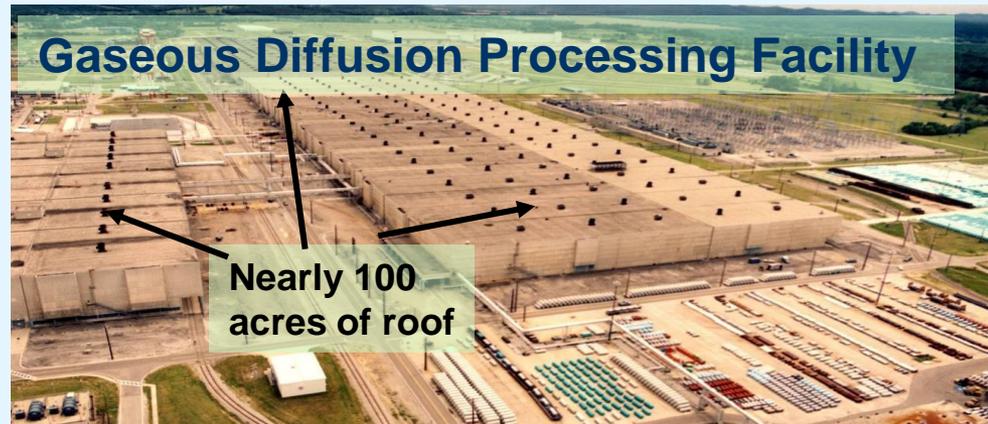
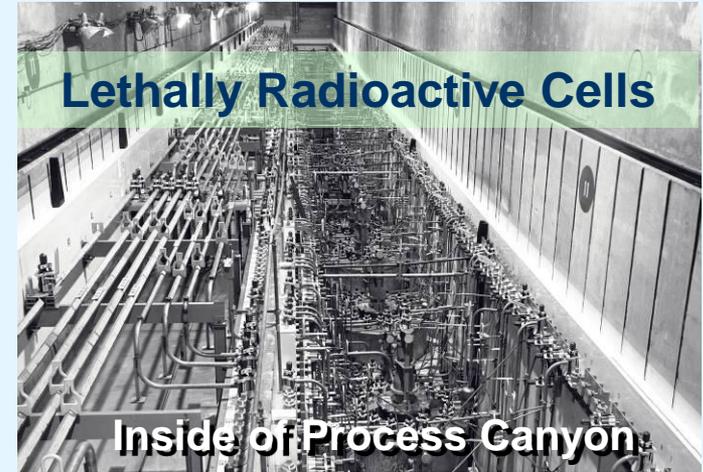
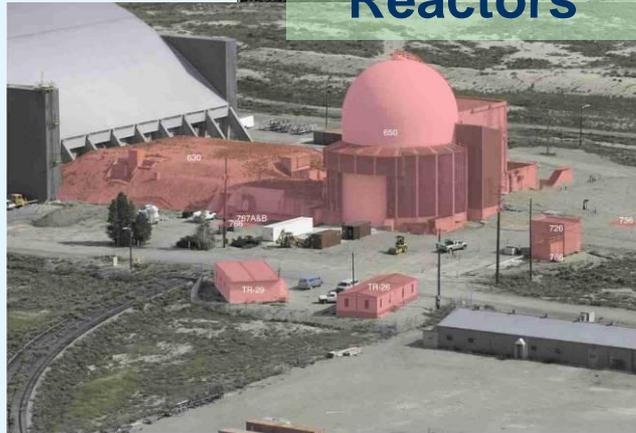
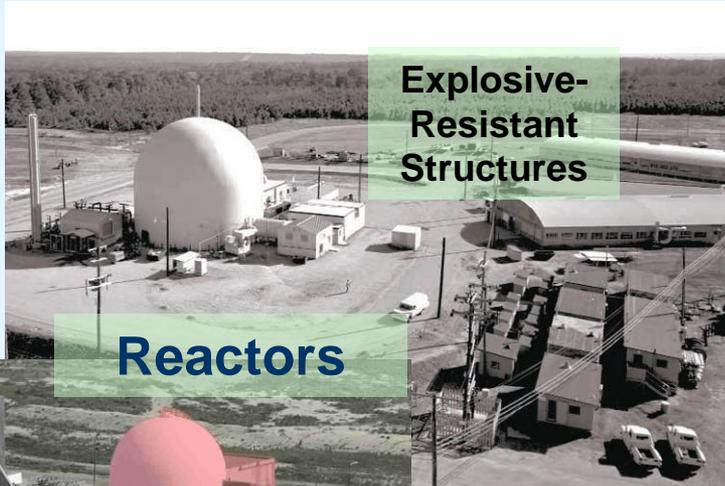
## Industrial Facilities

Industrial facilities are buildings and structures that provide non-radiological support operations. These can have a wide variety of hazards ranging from radioactive, chemical, and physical. These facilities include various ancillary structures whose inventory, contamination and other factors do not require categorization as nuclear or radiological hazards.

*The majority of DOE's facilities are 40–50 years old; many with minimal surveillance and maintenance; some abandoned with some level of physical degradation.*



# Major Nuclear Facility Types To Be D&D



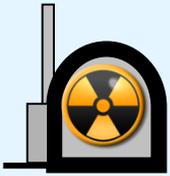
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# Nuclear Facility D&D End-State Options

## Temporary, Partial, Complete



**Long-term Min-safe Storage or S&M (cold & dark)**: This is a minimum safe, low-cost surveillance and maintenance storage or “moth-balled” condition. All significant quantities of nuclear materials are removed and facility is deactivated by shutting down the active safety and utility systems not required to maintain the safety envelope. The facility is monitored on a minimal cost schedule to maintain integrity of the remaining containment structures. Twenty-year structural upgrades provided as needed. Not a final end state. Allows prioritization flexibility to delay final disposition costs.



**Partial D&D to Cocoon**: All significant quantities of nuclear material and waste are removed and facility support buildings and utility systems are demolished. The building’s central massive shield/containment structure is integrated with a new containment “cocoon” structure for passive containment of highly radioactive portions (generally the reactor core) over a minimum 50 to 100-year life with minimum monitoring. Not a final end-state. Reduces worker hazard exposure and waste disposition costs by allowing hazard reduction through natural radiological decay. This is most applicable to older, cast-in-place, reactor cores, and is the implemented strategy for the Richland reactors along the Columbia River.



**In-Situ Decommission (ISD)**: Similar to cocooning but considered a final end state. ISD (entombment) is designed to take advantage of the robust containment structure and grouted cavities to ensure “encapsulation” of chemicals and radioactive isotopes as required by performance assessments. Additional low level waste may be entombed in cavities prior to grouting and final capping. Minimum 1000-year life assumed in design. This strategy reduces worker safety risks and the cost of demolition and waste transportation and disposition. This is the strategy being implemented at the Richland U-Plant and Savannah River Reactor facilities.



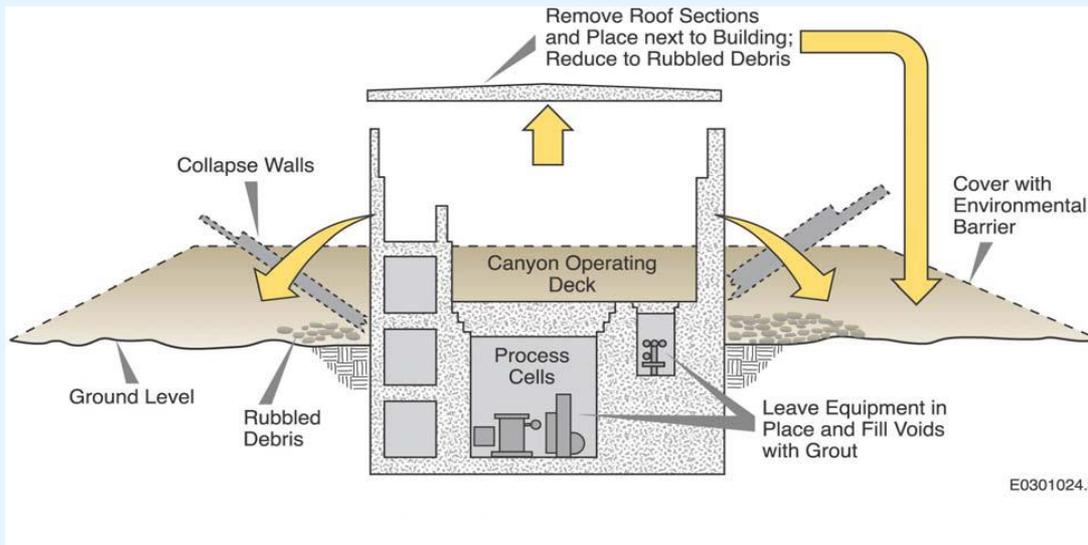
**Complete D&D**: All structures and waste are removed. Most costly, but least controversial end-state.  
**Brownfield end-state**: Property is retained for limited, controlled (limited access or industrial) uses.  
**Greenfield end-state** (extremely high cost): property is cleaned to condition of unlimited reuse and releasable for private use.



# Nuclear Facility D&D Options

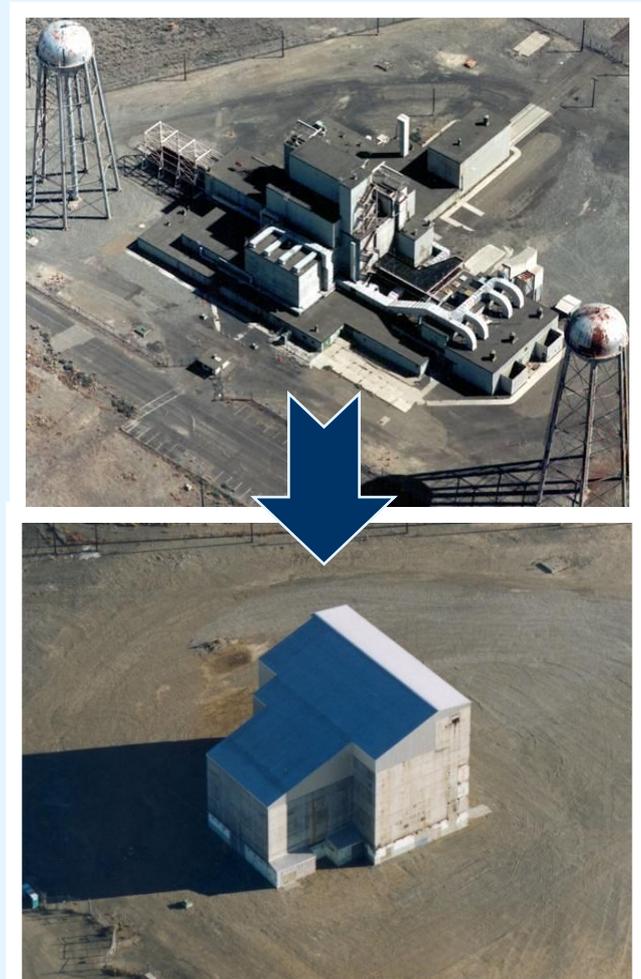
## Cocoon or In-Situ Disposition (ISD)

### Hanford “U” Canyon In-Situ Disposition (ISD) Option



Currently limited in application to Savannah River P-Reactor and Richland U-Plant. From a planning perspective, lessons learned will be applied to the other major Richland canyons and Savannah River reactors. Planned guidance being developed by EM's Office of Engineering and Technology will establish ISD as an accepted end state and identify criteria for its use. Preliminary estimates indicates the potential cost savings can be tens of million dollars per facility.

### Partial D&D Hanford “C” Reactor Cocoon



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Appendix D — D&D Project Basics

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# Major Challenges to D&D Program



**Lack of Priority** – D&D has been a lower EM priority in risk based prioritization. Most facilities are maintained at a minimum surveillance and maintenance cost, in various states of partial or complete shutdown and are not seen as high risks requiring immediate disposition. However, some old facilities are not maintained and even those facilities in long-term storage have a limited life before major investments must be considered to maintain ability to safely enter the deteriorating structures for D&D work. Experience throughout the complex (most recently at Oak Ridge K-25 project) has repeatedly demonstrated the increased risks and project costs resulting from deferred D&D.



**Non-EM Facilities/Future Liabilities/Expanding Scope** – EM inherited a large backlog of legacy facilities from fifty years of nuclear research and operations. Other Program Offices continue to identify additional surplus facilities to be transferred to EM for D&D in the 5+ out-years. This backlog is continuing to grow. The 2008 evaluation of proposed transfers from NNSA, SC and EM estimated over 300 facilities and a cost range exceeding \$6 Billion.



**Negotiations to Resolve Final End-State** – Each site has its own unique combination of stakeholders with their separate and often conflicting interests. Citizen advisory boards are established to create a forum where these conflicting positions can be discussed and compromise solutions defined that allow the D&D projects to move toward an established and agreed upon goal.



**Risk Modeling** – In parallel to the political interests of the end-state, there are the technical issues for establishing confidence that the end-state is safe and environmentally sound. This requires extensive characterization and risk modeling to define the most cost-effective end-state technical requirements.



**Waste Disposition Mapping** – One of the earliest strategic planning elements of D&D is characterizing the sizes and conditions of the facilities, and the type and levels of contamination. From this characterization, the classifications and volumes of generated waste are estimated to determine that each type of waste has, or will have, a disposition path and final destination. Disposition for wastes with no disposition paths are difficult, expensive and time consuming efforts.



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# How is DOE D&D Managed?

- **EM Management D&D Strategy and Budgeting Priority:**
  - Highest risk reduction
  - Highest S&M cost reduction (often interdependent with high risk)
  - High value (visibility) foot print reduction
- Some sites are managed by DOE Environmental Management (EM) as a total site environmental restoration project and some D&D projects are managed by EM in cooperation with NNSA or SC Operations at their sites for selected facility foot print reduction within an operating site.
- Most D&D projects are managed under a letter of agreement with the EPA as CERCLA “non-time-critical removal” projects with DOE EM as the lead agency.
- DOE is self-regulated for radiological waste under the AEA and uses DOE O 435.1 for waste management and oversight guidance. DOE also uses many Orders and Guides in project management, safety, conduct of radiological operations, and quality assurance.

**DOE Facility D&D Specific Guides & Standards** are also used to aid in the development, planning, and implementation of requirements and activities.

- **DOE G 430.1-2 Implementation Guide for Surveillance and Maintenance during Facility Transition and Disposition**
- **DOE G 430.1-3 Deactivation Implementation Guide**
- **DOE G 430.1-4 Decommissioning Implementation Guide**
- **DOE G 430.1-5 Transition Implementation Guide** – provides guidance for transitioning from facility operations to S&M and/or D&D.



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# Why Are Waste Types Important?

The wastes resulting from D&D activities have various levels of hazardous constituents. Disposal sites are licensed to accept waste within established limits. Therefore, D&D waste must be segmented into the types that can be sent along the appropriate disposal path. Radiological and hazardous waste costs are driven by stricter disposal standards, higher fees, and longer shipping routes to remote locations. Some waste disposition paths are hard to establish (and a few are not resolved) and will define the critical path of the project schedule. The general D&D goal is to minimize the most expensive waste types. General types of waste (in order of increasing costs to disposition) are as follows:



**Reusable equipment or recyclable materials:** clean or decontaminated items with marketable value are sold through excess process. **A DOE moratorium prohibits recycling metals from a radiological area. Resolving this moratorium could potentially result in significant cost offsets.**



**Commercial waste or fill material:** Uncontaminated waste materials can be taken to commercial landfills, or waste disposal sites.



**Hazardous waste:** Waste made up of or contaminated with chemicals and/or bio-hazards that are classified as harmful to life. Hazardous waste is incinerated or buried at facilities licensed for this type of waste.



**Low-level Waste (LLW):** Waste that is contaminated at low thresholds with radioactive isotopes makes up the majority of D&D waste. LLW can be disposed at licensed LLW burial grounds, either remote or on site, if on site burial operation is established.



**Mixed Waste or Mixed LLW (MW or MLLW):** Hazardous waste that has radiological contamination or vice-versa. This waste is difficult to dispose of due to the dual category that disposal licenses rarely allow.



**Transuranic Waste (TRU):** Waste that is contaminated to thresholds, with primarily long-life, man-made alpha/beta emitters such as plutonium. Presently the Waste Isolation Pilot Plant (WIPP) is the only licensed disposal site for TRU waste.



**High-Level Waste (HLW):** Waste that is made up of materials with high levels of radioactivity, mostly gamma/ neutron emitters. This waste is kept in shielded dry casks or submerged in water pools at origin sites or licensed temporary storage sites until a HLW disposal site is licensed by the NRC.



# Major Special Interest Group Types

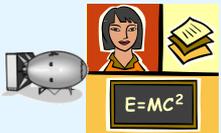
DOE sites have many stakeholders and private citizen groups with interests in the outcome or final disposition end-state of the D&D projects. To help resolve the inherent conflicts and manage the input of these interest groups, DOE assists in the creation of **Citizen Advisory Boards (CABs)**. These CABs provide a venue for building consensus and getting rational public input to the projects. Interest groups are generally motivated to:



**Retain or Revitalize the Nuclear Mission:** Groups that are interested in retaining the jobs and financial support structure that exists. Try to maintain the status quo as much as possible.



**Convert Facilities to Commercial / Industrial / Research:** Groups that support cleanup but want to retain the economic vitality by finding new federal missions or private businesses.



**Historical Preservation:** Groups that want to preserve areas and facilities for their scientific, World War II or Cold War historical significance.



**Pristine Environmental Restoration:** Groups that want to remove all trace of the facilities and return the land to some form of nature park or preserve for public access.



**Native American Rights:** Native American Groups that want to regain rights or access for historical or sacred traditions.



**EM Environmental Management**

safety ♦ performance ♦ cleanup ♦ closure

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