Agency Priority Goal Action Plan

Environmental Management

Goal Leader:

William White, Senior Advisor for Environmental Management to the Under Secretary for Science

Todd Shrader, Principal Deputy Assistant Secretary, Office of Environmental Management

Overview

Goal Statement

Achieve significant progress in cleaning up the radioactive and chemical contamination left behind by six decades of weapons production and energy research during the Manhattan Project and the Cold War. By September 30, 2021, advance treatment and disposition of waste and excess facilities through the following:

- Complete installation of the Tank-Side Cesium Removal (TSCR) System to provide low-activity waste to the Waste Treatment Plant for vitrification at the Hanford Site;
- Initiate operations of the Salt Waste Processing Facility to treat millions of gallons of liquid radioactive waste for disposal at the Savannah River Site;
- Complete mining of Panel 8 at the Waste Isolation Pilot Plant (WIPP) to support continued disposal of transuranic waste;
- Begin sinking the new utility shaft for the WIPP underground to support continued transuranic waste disposal;
- Initiate radiological operation of the Integrated Waste Treatment Unit (IWTU) for the treatment and packaging of the approximately 900,000 gallons of liquid sodium bearing tank waste at the Idaho National Laboratory;
- Complete the EM cleanup mission at the Brookhaven National Laboratory by demolishing and disposing of the High-Flux Beam Reactor Exhaust Stack.
- Authorize the contractor to begin excess facility demolition activities at two of the five highest risk facilities at Lawrence Livermore National Laboratory.

Challenges and Opportunities

Safe cleanup of the environmental legacy brought about from six decades of nuclear weapons development and government-sponsored nuclear energy research.

Challenge	Opportunity - Goal Indicator
56 Million Gallons of Radioactive and Chemical Waste at the Hanford Site	The Tank-Side Cesium Removal System will allow the site to remove cesium from waste at tank side and provide low activity waste for direct-feed vitrification by December 2023.
36 Million Gallons of Radioactive and Chemical Waste at the Savannah River Site	The Salt Waste Processing Facility is a large capacity facility to separate the highly radioactive component from the salt waste. The salt waste can then be grouted for disposal. The high-level waste is vitrified at the Defense Waste Processing Facility.
Transuranic Waste Disposal	The Waste Isolation Pilot Plant was built to dispose of defense-generated transuranic waste from sites across the country. In order to continue receiving shipments without interruption, the site will begin emplacing waste in Panel 8 once Panel 7 is full. In order to continue to accept waste at the Waste Isolation Pilot Plant at an efficient pace, additional ventilation is necessary. Sinking the new utility shaft for the underground will add the additional ventilation needed for future waste emplacement.
900,000 gallons of Radioactive and Chemical Tank Waste at the Idaho National Laboratory	The Integrated Waste Treatment Unit was built for the treatment and packaging of the remaining tank waste located in Idaho. This waste is known as sodium-bearing waste due to its high sodium content.
Completion of EM Cleanup at Brookhaven National Laboratory	Demolish and dispose of the High-Flux Beam Reactor (HFBR) Stack while very vibration sensitive laboratory operations are ongoing.
High Risk Excess Facilities at Lawrence Livermore National Laboratory	The EM excess facility demolition program will enable broad characterization of the hazards and conditions of higher risk facilities, removal of hazardous material from the facilities, and elimination of risks posed by the facilities through demolition of the facilities and disposal of the resulting wastes. The demolition of these facilities will make available additional space for National Nuclear Security Administration (NNSA) missions.

Leadership & Implementation Team

William White, Senior Advisor for Environmental Management to the Under Secretary for Science

Todd Shrader, Principal Deputy Assistant Secretary, Office of Environmental Management

Thomas Mooney, Acting Associate Principal Deputy Assistant Secretary For Field Operations

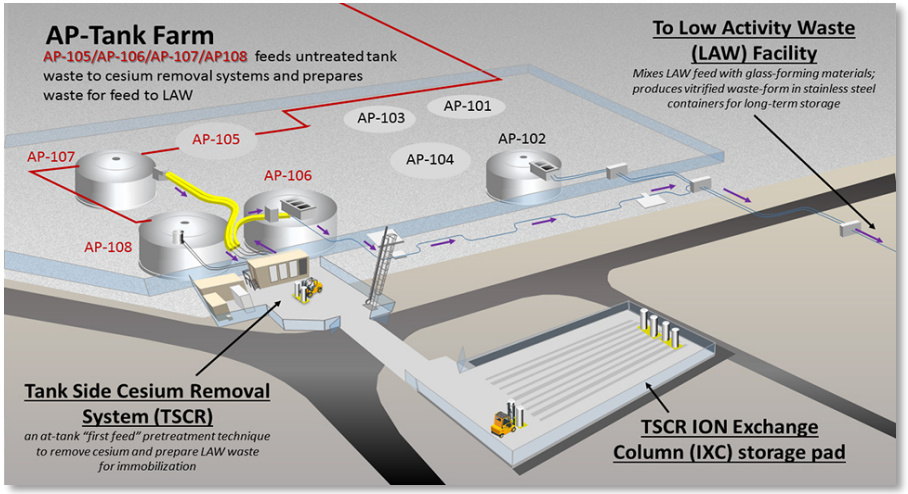
Supported by Lois Jessup, Director, Program Planning Office

	Installation of Tank-Side Cesium Removal System	Initiating Operations of the Salt Waste Processing Facility	Beginning Waste Emplacement of TRU Waste in Panel 8	Begin Sinking the New Utility Shaft for the WIPP underground	Initiating radiological operation of the Integrated Waste Treatment Unit	Demolish and dispose of the HFBR Exhaust Stack	Begin LLNL excess facility demolition activities at two of the five highest risk facilities
Site:	Office of River Protection (ORP)	Savannah River Site (SRS)	Carlsbad Field Office (CBFO)	Carlsbad Field Office (CBFO)	Idaho	Environmental Management Consolidated Business Center (EM-CBC)	Environmental Management Consolidated Business Center (EM-CBC)
Field Manager:	Brian Vance	Michael Budney	Reinhard Knerr	Reinhard Knerr	Connie Flohr	Jack Zimmerman, Director EM-CBC	Jack Zimmerman, Director EM-CBC
Agency partners:	Washington State Department of Ecology	N/A	New Mexico Environmental Division, EPA	New Mexico Environmental Division, Environmental Protection Agency (EPA)	Idaho Department of Environmental Quality	U.S. Army Corps of Engineers (USACE), EPA, New York State Department of Environmental Conservation (NYSDEC)	NNSA – Livermore Field Office

Goal Structure & Strategies

Completing the installation of the Tank-Side Cesium Removal System

- The Tank Side Cesium Removal System plays a key role in implementation of the Direct-Feed Low Activity Waste program.
- Technology has been proven at Fukushima and leverages functional characteristics of the Tank Closure Cesium Removal system designed for the Savannah River Site.



Initiating operation of the Salt Waste Processing Facility

- A Design Capacity Performance Test was completed on September 30, 2019 and successfully demonstrated that the facility will perform at a capacity of at least 7.2 million gallons of highly radioactive salt solutions per year.

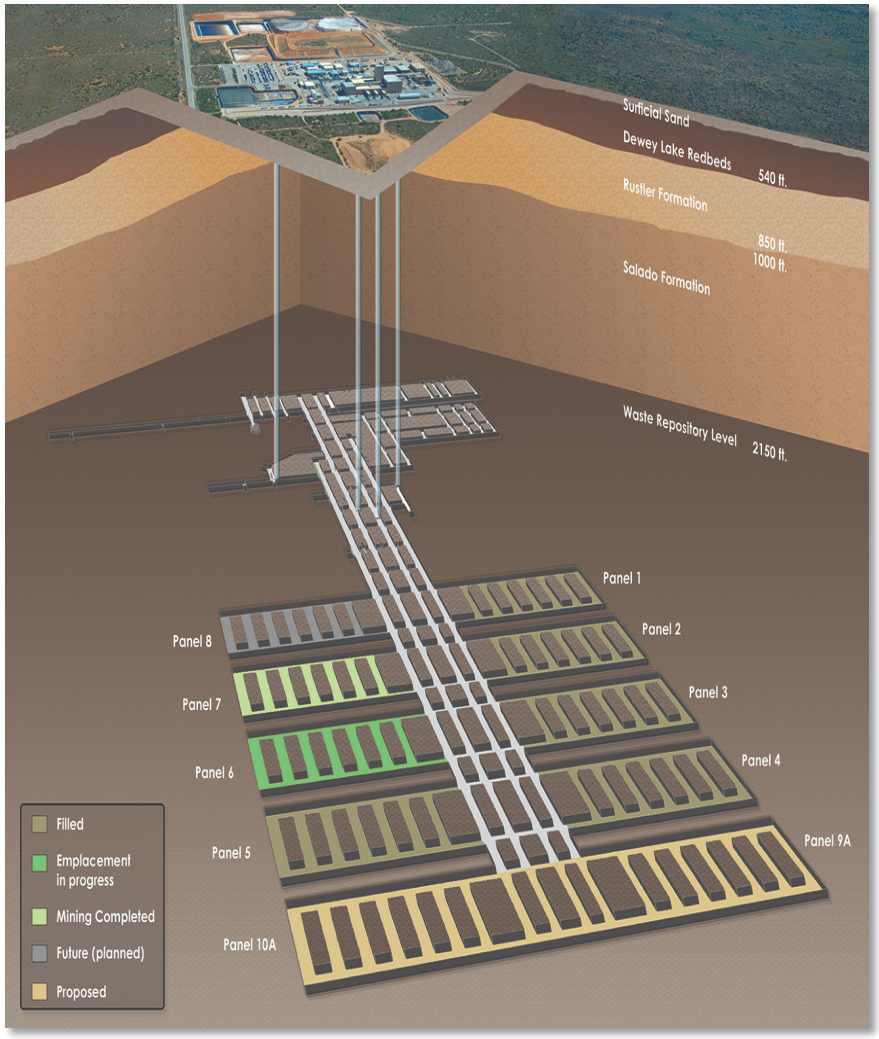
Goal Structure & Strategies

Complete Mining of Panel 8

- Waste emplacement operations are currently targeted to accept up to ten shipments per week. This shipment rate aligns with the availability of Panel 8 prior to Panel 7 reaching capacity.

Utility Shaft Project - Begin sinking the new utility shaft for the underground

- The project provides a new utility shaft to be used as an additional air intake source for the WIPP underground. Shaft project includes: new surface fans to push air underground; incorporation of the utility shaft into new fire protection loop; new exhaust stack; and permanent power provision from the main.

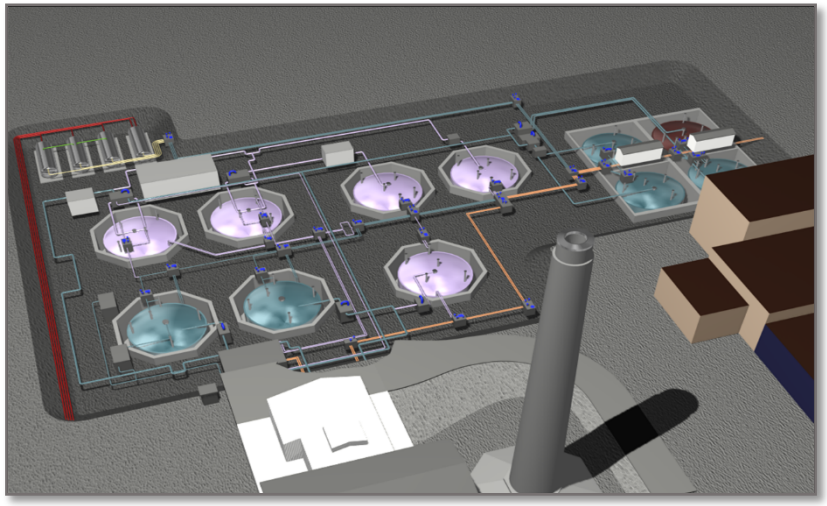


Goal Structure & Strategies

Initiating radiological operation of the Integrated Waste Treatment Unit

- The Integrated Waste Treatment Unit has encountered significant difficulties since facility construction was completed in 2012, preventing startup of the facility for radiological operations.
- Structured approach to address process issues, utilizing pilot plant studies, industry and national lab support, and IWTU simulant runs processing over 100,000 gallons of sodium-bearing waste simulant demonstrated that the process issues have been resolved. Remaining commissioning activities are focused on preparation for radiological operations.

Integrated Waste Treatment Unit



INTEC Tank Farm

Goal Structure & Strategies

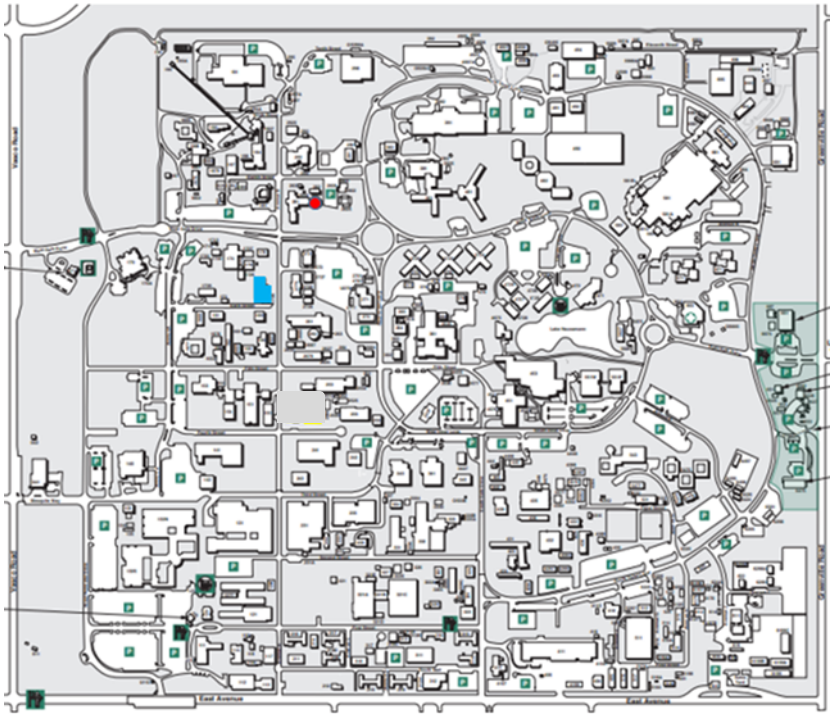
<u>Removal or otherwise disposal of the Building 705, the HFBR Exhaust Stack.</u>

- This 100-meter tall stack was initially constructed to provide an elevated exhaust of the High-Flux Beam Reactor (HFBR) primary and secondary cooling air, is now almost 70 years old, and is no longer needed. Demolition activities include isolation of utilities (e.g., electrical service), demolition and removal of the stack to the pedestal, final status survey, independent verification survey, packaging, transportation, and disposal of the waste, and restoration of the affected site.

Goal Structure & Strategies

<u>Begin excess facility demolition activities at two of the five highest risk facilities at LLNL by authorizing demolition contractor mobilization</u>

- The Consolidated Appropriations Act of 2018 (Public Law 115-141), directed DOE to decommission and demolish the B280 Pool Type Reactor and B175 at Lawrence Livermore National Laboratory.
- EM is using multiple contracting avenues to facilitate decommissioning and demolition of the National Nuclear Security Administration owned high-risk contaminated excess facilities at LLNL.



Legend	Activity	Contract
●	Building 280 reactor removal	USACE IAA
■	Building 175 Demolition	LLNS (NNSA M&O)

Summary of Progress – FY 2020, Q1

Complete installation of the Tank-Side Cesium Removal System:

- December 2019 – Completed fabrication and delivery of TSCR System modular components.

Initiate operation of the Salt Waste Processing Facility:

- Contractor declared they have all permits, that procedures are in place, regulatory requirements have been met and the facility is ready to commence start-up activities.
- DOE verification of readiness will begin in FY 2020, Q2.

Complete mining of Panel 8:

- Mining is currently on track to excavate 13,000 tons of salt by end of Q1.

Begin sinking the new utility shaft for the underground:

- Notice to Proceed was awarded to the shaft, and drifts contractor on November 13, 2019.

Initiate operation of the Integrated Waste Treatment Unit:

- Process Gas Filter testing at Hazen Pilot Plant initiated in October 2019.

Summary of Progress – FY 2020, Q1

Demolish and Dispose of HFBR Exhaust Stack:

- Completed detailed vibration analysis study.
- U.S. Army Corps of Engineers (USACE) issued a Request for Proposals (RFP) for demolition contract.

Begin LLNL excess facility demolition activities at two of the five highest risk facilities by authorizing contractor mobilization:

- B280 Reactor removal – Bidder site visit was held
- B175 Demolition - Characterization bids have been received and are under review

Summary of Progress – FY 2020, Q2

Complete installation of the Tank-Side Cesium Removal System:

- Factory Acceptance Testing of the TSCR system was completed as planned using simulated waste.
- Work continues with the Washington State Department of Ecology for needed permits and approvals to begin field preparations for construction and installation of TSCR near AP Tank Farm.
- CD 2/3 authorizing full construction approved February 27, 2020.

Initiate operation of the Salt Waste Processing Facility:

- DOE verification of readiness began in Q2 FY 2020. Radiological operations are expected to commence in Q4 FY 2020. However, commencement of operations may be impacted depending on the duration of reduced operations resulting from the COVID-19 pandemic.

Complete mining of Panel 8:

- The rough cut for Panel 8 was completed.
- Completion of mining Panel 8 expected by Q4 FY 2021.

As a result of the pandemic, mining was suspended. Dependent on the duration of the reduced operational status, mining projections stated above could be impacted into the following quarters.

Summary of Progress – FY 2020, Q2

Begin sinking the new utility shaft for the underground:

- Received temporary authorization to commence and began sinking shaft April 27, 2020.

Initiate operation of the Integrated Waste Treatment Unit:

- Completed final start-up contract baseline
- Plant outage activities and modification updates have continued to address remaining technical issues and establish conditions for sustained radiological operations.

Demolish and Dispose of HFBR Exhaust Stack:

- USACE awarded demolition contract February 20, 2020.

Begin LLNL excess facility demolition activities at two of the five highest risk facilities by authorizing contractor mobilization:

- B280 Reactor removal – bidder proposals are being evaluated with a planned May 2020 award.
- B175 Demolition – building characterization contract was awarded in January.

Summary of Progress – FY 2020, Q3

Complete installation of the Tank-Side Cesium Removal System:

- Factory Acceptance Testing of the TSCR system and CD 2/3 were completed.
- Contractor initiated limited field activities June 1, focused on TSCR preparations near AP Tank Farm.
- Ecology provided the first temporary authorization to support pouring of concrete for the TSCR pad and placement/anchoring of the Process and Ancillary enclosures.
- Balance of Facilities pad conduit and structural backfill, ion exchange column storage pad backfill were completed; form work for both pads is in progress.

Initiate operation of the Salt Waste Processing Facility:

- The project experienced a delay in Q3 due to COVID-19 impacts. Radiological operations are still expected to commence in Q4 FY 2020, commencement of operations may be impacted depending on the duration of reduced operations resulting from COVID-19 impacts.

Complete mining of Panel 8:

- As a result of Covid-19, mining was suspended after approximately 355 tons of salt were mined in the 3rd Quarter FY2020. Completion of mining of Panel 8 is still expected in Q4 FY 2020. Depending on the duration of the reduced operational status due to COVID-19.

Summary of Progress – FY 2020, Q3

Begin sinking the new utility shaft for the underground:

- Shaft and plenum excavation underway at a current depth of 20 feet and progressing on schedule. The temporary collar is in place, while the temporary support and hoisting structures are under construction.

Initiate operation of the Integrated Waste Treatment Unit:

- IWTU Outage is behind schedule due to COVID-19 impacts. IWTU is resuming Outage activities as COVID-19 conditions allow.
- At this time completion of the Outage has continued to experience delay. This will delay start of radiological operations and associated interim milestones.

Demolish and Dispose of HFBR Exhaust Stack:

- Contractor began pre-mobilization sampling and characterization.

Begin LLNL excess facility demolition activities at two of the five highest risk facilities by authorizing contractor mobilization:

- B280 Reactor removal – Building 280 Pool Type Reactor removal contract was awarded in May 2020.
- B175 Demolition – Building 175 characterization field activities were completed in June 2020 after being delayed by the pandemic shelter in-place orders.

Key Milestones – Installation of the Tank-Side Cesium Removal System

Delivering the TSCR System and necessary waste feed delivery upgrades is on track to provide low activity waste for direct-feed vitrification by December 2023.

Milestone Summary		
Key Milestone	**Milestone Due Date**	**Milestone Status**
Complete fabrication and delivery of TSCR System	Q1 FY 2020	Complete
Complete TSCR System factory acceptance testing	Q2 FY 2020	Complete
Obtain Critical Decision – 2/3, authorizing full construction	Q3 FY 2020	Completed Early
Excavate for TSCR System concrete pads	Q4 FY 2020	Completed Early
Install TSCR System concrete pads	Q1 FY 2021	
Install TSCR System equipment on concrete pads	Q2 FY 2021	
Complete TSCR construction	Q3 FY 2021	
Conduct TSCR readiness verification activities	Q4 FY 2021	
Complete TSCR Installation	**Q4 FY 2021**	

Key Milestones – Initiating Operation of the Salt Waste Processing Facility

Initiate operations at a facility that reduces radioactive waste volume requiring vitrification that separates high activity waste (strontium, actinides, & cesium) for treatment at the Defense Waste Processing Facility and separates low activity salt waste treated at the Salt Waste Processing Facility.

Milestone Summary		
Key Milestone	**Milestone Due Date**	**Milestone Status**
Complete Contractor Operational Readiness Review	Q1 FY 2020	Complete
Complete DOE Operational Readiness Review	Q2 FY 2020	Complete
Achieve Authorization to Operate	Q2 FY 2020	Delayed*
Commence Hot Commissioning (confirmation of processing using radioactive or hazardous feed)	Q2 FY 2020	Delayed*
Initiate radiological operations of SWPF	**Q3 FY 2020**	Delayed*

*Milestones delayed to Q4 due to COVID-19 impacts.

Key Milestones – Complete Mining of Panel 8

- Panel 8 Mining continues at a reasonable rate dependent on underground access
- Waste emplacement is planned at 8 to 10 shipments per week

Milestone Summary		
Key Milestone	**Milestone Due Date**	**Milestone Status**
Mine 12,000 tons of salt*	Q1 FY 2020	Complete
Mine 22,800 tons of salt	Q2 FY 2020	Complete
Mine 8,000 tons of salt	Q3 FY 2020	355 tons mined**
Mine 1,000 tons of salt Complete mining of Panel 8	Q4 FY 2020	
Outfit Panel 8	Q1 FY 2021	
Certification of Panel 8 for waste emplacement	Q2 FY 2021	
Panel 7 waste emplacement complete	Late Q3 FY 2021	
Complete Mining of Panel 8	**Q4 FY 2021**	

*Mining is dependent on sufficient air quality in the underground. Waste emplacement is dependent on the availability of shippable waste.
**Shortfall due to suspension of mining operations due to COVID-19 impacts.

Key Milestones – Begin Sinking New Utility Shaft for the Underground

- Infrastructure construction continues
- Preparation continues on the request to the New Mexico Environmental Division for Temporary Authority to begin shaft sinking while the Class 3 permit modification request/approval is in process

Milestone Summary			
Key Milestone	**Milestone Due Date**	**Milestone Status**	**Comments**
Award Notice to Proceed to the Contractor	Q1 FY 2020	Complete	Notice to Proceed was awarded to the contractor November 13, 2019.
Contractor mobilizes to the WIPP Site at the shaft construction site location.	Q2 FY 2020	Complete	
Receive Temporary Authorization to commence the sinking of the shaft from the New Mexico Environmental Division.	Q3 FY 2020	Complete	
Begin sinking the new utility shaft for the underground.	Q3 FY 2020	Complete	

Key Milestones - Initiate radiological operations of IWTU

Milestone Summary		
Key Milestone	**Milestone Due Date**	**Milestone Status**
Process Gas Filter (PGF) replacement filter selection	Q1 FY 2020	Complete
Initiate long-term pilot plant testing of PGF filter replacement media	Q1 FY 2020	Complete
Complete final start-up contract baseline	Q2 FY 2020	Complete
Complete IWTU outage with installation of PGF modification and contamination control modifications	Q1 FY 2021	
Complete IWTU confirmatory run on Sodium Bearing Waste (SBW) simulant to verify facility performance in preparation for radiological operations	Q2 FY 2021	
Complete facility readiness verification activities	Q2 FY 2021	
Initiate radiological operations of IWTU	Q3 FY 2021	

Key Milestones - Demolish and Dispose of HFBR Exhaust Stack

- Demolish, remove or otherwise dispose of the Building 705, the HFBR Exhaust Stack and all associated structures/systems/components and soil removal.

Milestone Summary		
Key Milestone	**Milestone Due Date**	**Milestone Status**
USACE Awards Demolition Contract	Q2 FY 2020	Complete
Regulatory Completion Milestone - All structures/systems/components/soil Removed	Q4 FY 2020	
Project Completion Milestone - Final project closeout documentation	Q2 FY 2021	

Key Milestones – Begin LLNL excess facility demolition activities at two of the five highest risk facilities

Milestone Summary		
Key Milestone	**Milestone Due Date**	**Milestone Status**
Award Building 175 Characterization Contract	Q3 FY 2020	Complete
Commence Building 280 Reactor Characterization	Q1 FY 2021	
Begin demolition of the Building 280 Pool Type Reactor - Issue Notice to Proceed	Q2 FY 2021	
Begin demolition of Building 175 - Issue Notice to Proceed	Q3 FY 2021	
Begin LLNL excess facility demolition activities at two of the five highest risk facilities by authorizing D&D contractor mobilization	Q4 FY 2021	

Data Accuracy and Reliability

The Tank-Side Cesium Removal System, Salt Waste Processing Facility, Utility Shaft and excess facilities demolition are projects subject to the rigorous management requirements of DOE Order 413.3B, Program and Project Management for the Acquisition of Capital Assets, to include monthly reporting against baseline costs and schedule.

The mining panel 8 has similar management and reporting as the capital projects even though it does not fall under DOE O 413.3B. Progress can also be measured in tons of salt physically removed, and disposed of, from the mine.

Additional Information

Contributing Programs

Organizations:

- State environmental regulatory agencies for CA, ID, NM, NY, SC and WA.

Program Activities:

- National Nuclear Security Administration – key partner for Lawrence Livermore National Laboratory demolition activities.

Other Federal Activities:

- Environmental Protection Agency