DOE Office of Environmental Management Strategic Vision & Idaho Cleanup Project

Connie Flohr, Manager

Idaho Cleanup Project

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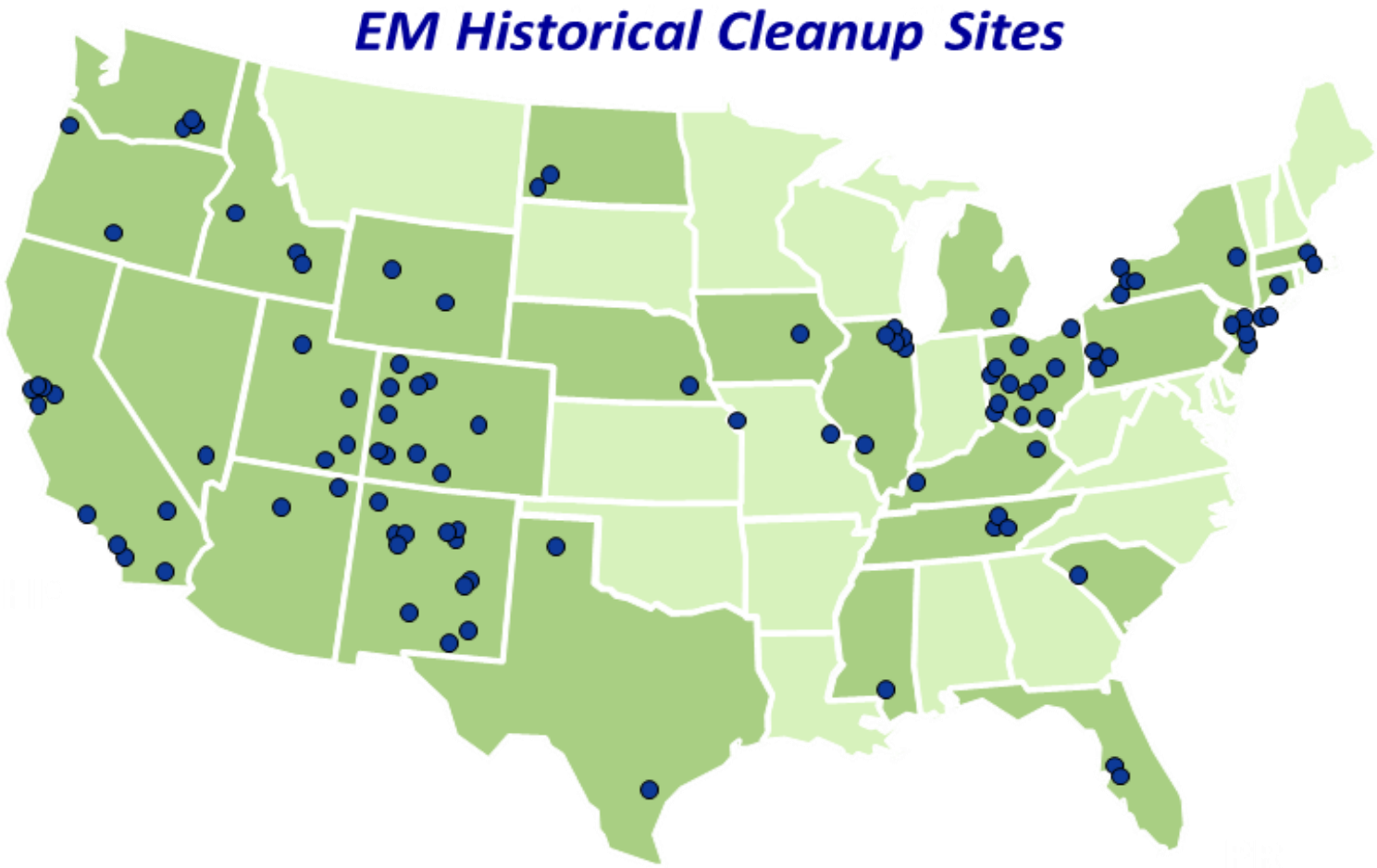
EM Mission

To complete the safe cleanup of the environmental legacy brought about from decades of nuclear weapons development and government-sponsored nuclear energy research. EM's priority is to ensure the safety and health of the public and EM's workforce while continuing to protect the environment

Key Mission Elements

- Tank Waste
- Special Nuclear Material and Spent Nuclear Fuel
- Radioactive Waste Disposal
- Soil and Groundwater Remediation
- Facility Deactivation and Decommissioning

107 Original EM Cleanup Sites



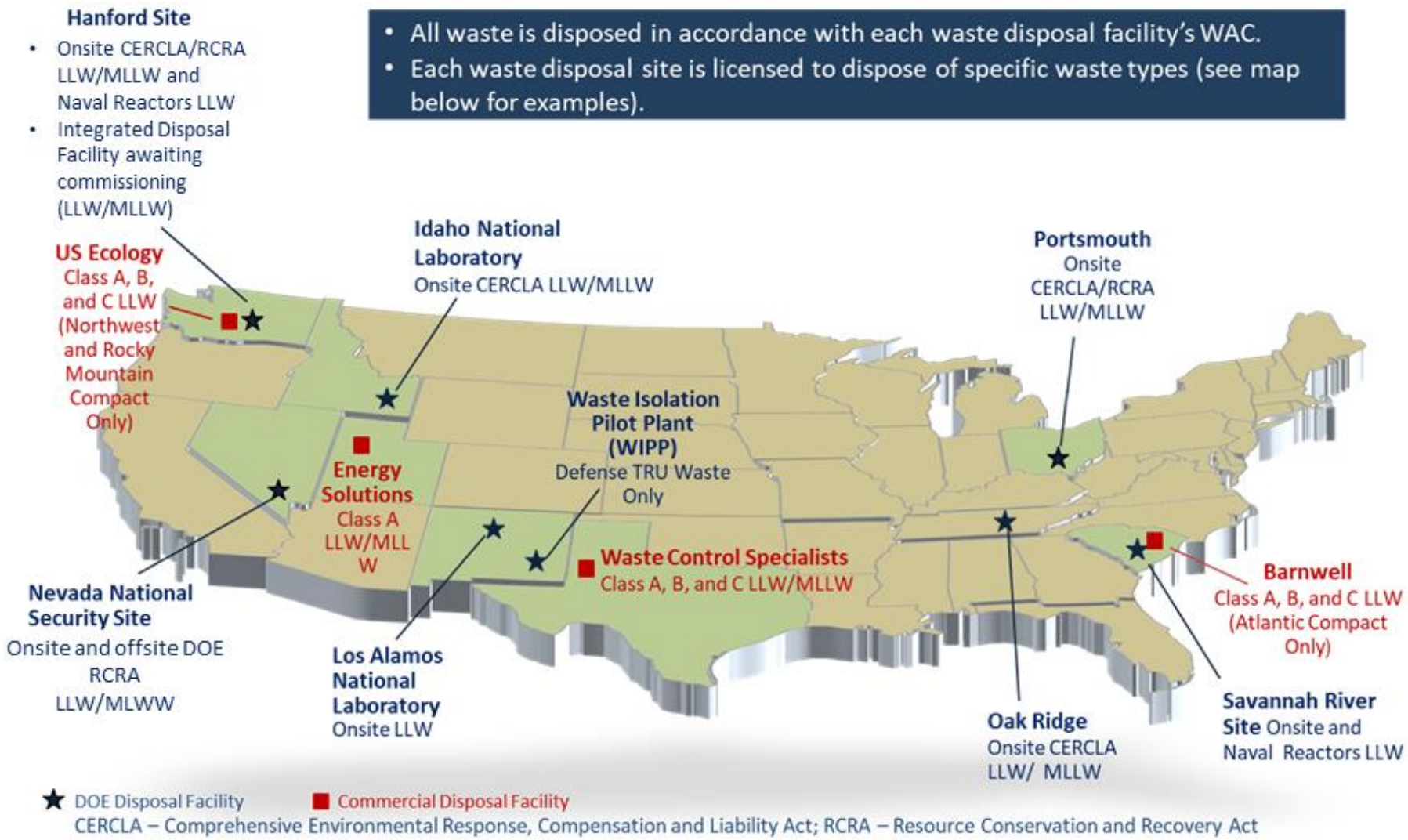
A Proven Record of Cleanup Results

15 Remaining Cleanup Sites

Since 1989, DOE has completed its cleanup mission at 92 of the 107 major nuclear weapons and nuclear research sites

Operating DOE & Commercial Disposal Facilities

- All waste is disposed in accordance with each waste disposal facility's WAC.
- Each waste disposal site is licensed to dispose of specific waste types (see map below for examples).



CERCLA – Comprehensive Environmental Response, Compensation and Liability Act; RCRA – Resource Conservation and Recovery Act

EM Budget

Special Nuclear Materials & Spent Nuclear Fuel
$ 580M / 7%

TRU & Solid Waste
$1,033M / 13%

Soil & Groundwater
$ 511M / 6%

EM's FY 2023 Enacted Budget - $8.263 Billion Total

Radioactive Tank Waste
$ 2,874M / 35%

Facility D&D
$1,755M / 21%

Site Services
$ 1,510M / 18%

EM Sites							FY 23 ($M)
Savannah River	✓	✓	✓	✓	✓	✓	1,809
River Protection		✓				✓	1,730
Richland			✓	✓	✓	✓	1,114
Idaho	✓	✓	✓		✓	✓	472
Oak Ridge	✓		✓	✓	✓	✓	637
Portsmouth	✓			✓		✓	580
Paducah	✓			✓		✓	330
Carlsbad			✓			✓	467
Los Alamos			✓	✓	✓	✓	332
West Valley			✓	✓		✓	94
All Others			✓	✓	✓	✓	698

Idaho Cleanup Project (ICP)

Main EM Operating Areas

- Idaho Nuclear Technology and Engineering Center (INTEC) – includes 8 nuclear facilities
- Radioactive Waste Management Complex (RWMC) – includes 2 nuclear facilities

Idaho Nuclear Technology and Engineering Center

Radioactive Waste Management Complex

Cleanup Mission

- Transuranic (TRU) and mixed low-level (MLLW) waste characterization and shipping
- Environmental restoration of legacy waste under CERCLA
- Spent nuclear fuel (SNF) management
- High-level waste (HLW) management
- Liquid waste treatment
- Work for others (Naval Reactors Facility D&D)

Principal Idaho Waste Streams

Waste Type	Origin	Original Quantity	Planned Destination	Applicable Agreements
High-Level Waste 	Reprocessing of spent nuclear fuel	4,400 cubic meters	Geologic repository	Idaho Settlement Agreement, Site Treatment Plan
Spent Nuclear Fuel 	Site, research and commercial reactors	243.57 Metric Tons Heavy Metal (EM-only)	Geologic repository	Idaho Settlement Agreement
Transuranic and Mixed Low-Level Waste 	Rocky Flats Plant, other DOE facilities, INL operations	65,000+ m3	Waste Isolation Pilot Plant Licensed off-site disposal facilities	Idaho Settlement Agreement, Site Treatment Plan
Sodium-Bearing waste 	Decon. of SNF reprocessing facilities	900,000 gallons	Geologic repository	Idaho Settlement Agreement, Site Treatment Plan, Notice of Non-Compliance/Consent Order
Buried Waste 	Rocky Flats Plant, other DOE facilities, INL operations	10,000+ m3 from 5.69 acres	Waste Isolation Pilot Plant	FFA/CO (CERCLA), Agreement to Implement

Idaho Cleanup Project Vision

IWTU

Near-Term
(Next 5 Years)
2028

- Continue D&D of NR and RWMC facilities
- Continue IWTU operations
- Complete sludge treatment
- Complete SDA cap
- TRU waste certification and WIPP shipments
- Construct ICDF expansion
- Continue execution of INTEC long-term infrastructure plan

SDA Cap

Intermediate
(Next 10 Years)
2033

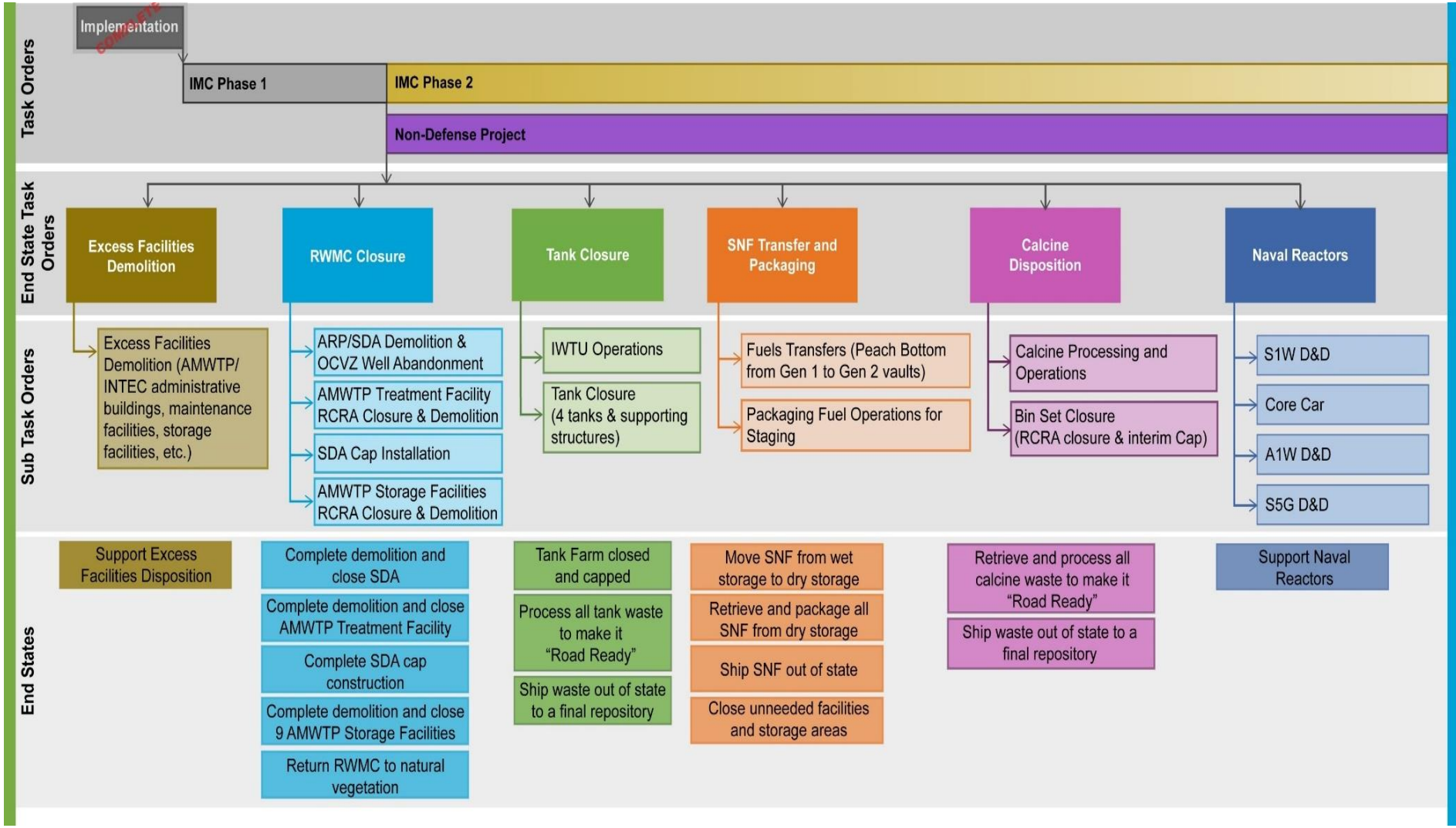
- Continue Naval Reactors D&D work
- Complete RWMC D&D
- Complete SBW treatment and close tank farm

Calcine Bin Sets

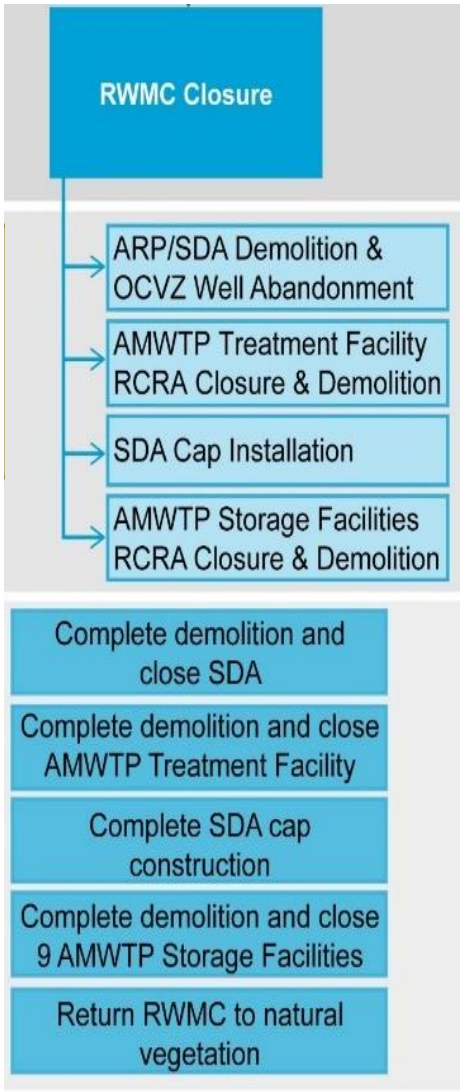
Long-Term
(Next 15 Years)
2038

- Package and store SNF
- Treat calcine to be “road ready”

End State Contract – Task Order Sequencing



RWMC Closure – Solid Waste

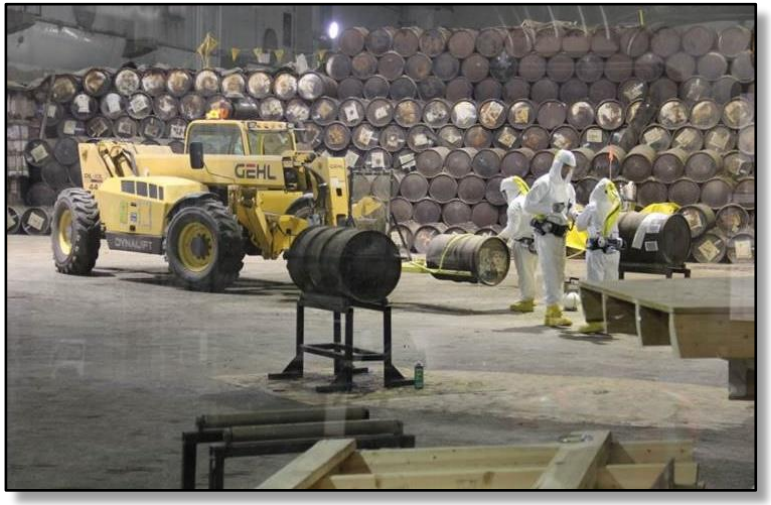


- Completed retrieval of 65,000+ cubic meters in 2016
- Completed exhumation of 10,000+ cubic meters in 2022
- Ongoing waste processing, storage and shipping operations

RWMC Closure – Waste Exhumation and Retrieval

Buried Waste Exhumation

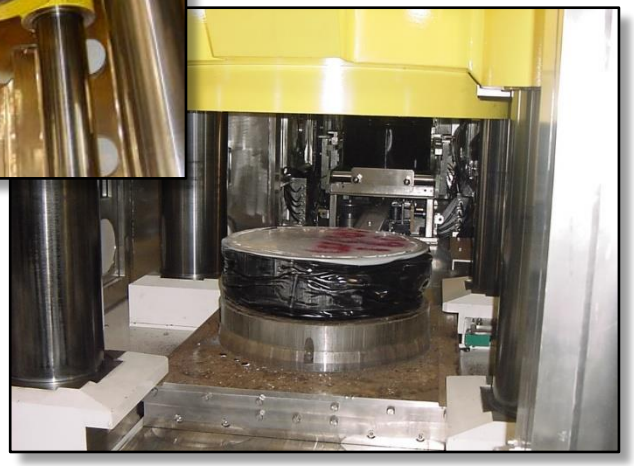
Waste processing and drum packaging



Waste retrieval operations at AMWTP

RWMC Closure – Waste Processing and Shipment

Boxline treating waste



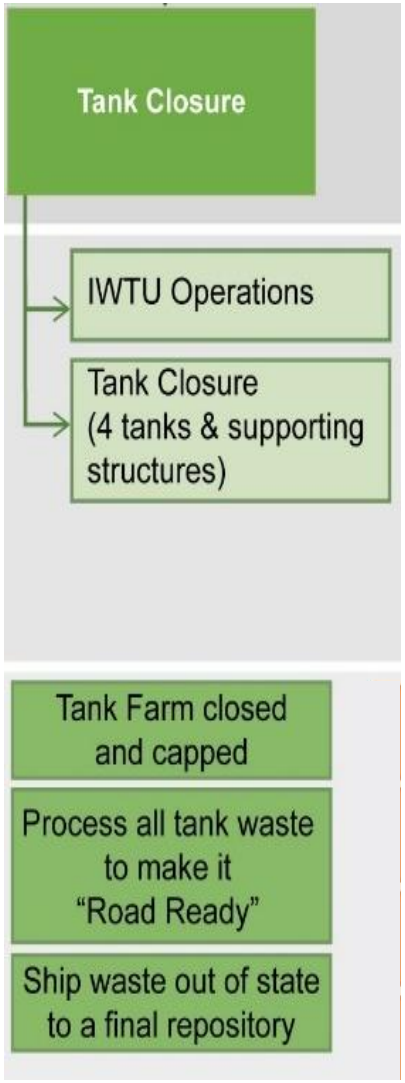
The Supercompactor used to treat transuranic waste at AMWTP

Processed transuranic waste waiting for shipment to WIPP

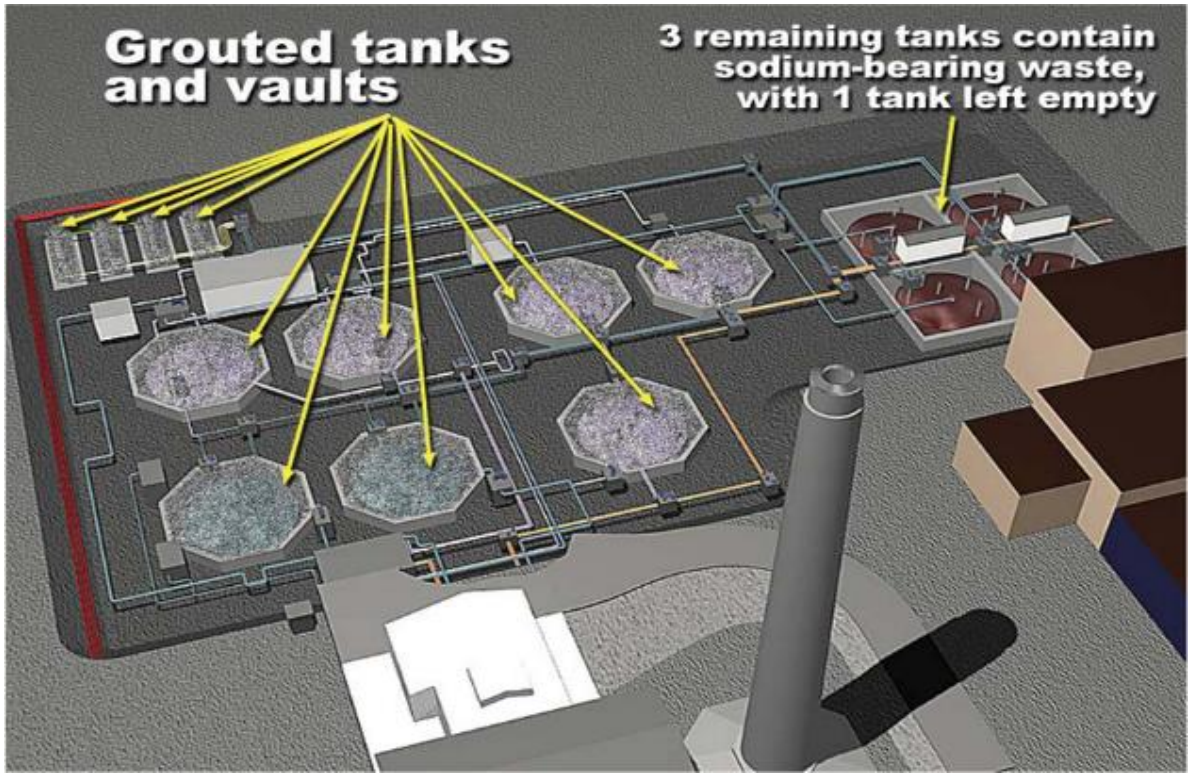
Transuranic waste headed to WIPP

RWMC Closure Video

Tank Closure



- Completed calcination of ~8M gallons of radioactive liquid waste and grouted the tanks by early 2000's
- Commenced Integrated Waste Treatment Unit operations to process 900,000 gallons liquid sodium bearing waste in 2023



Integrated Waste Treatment Unit Operations

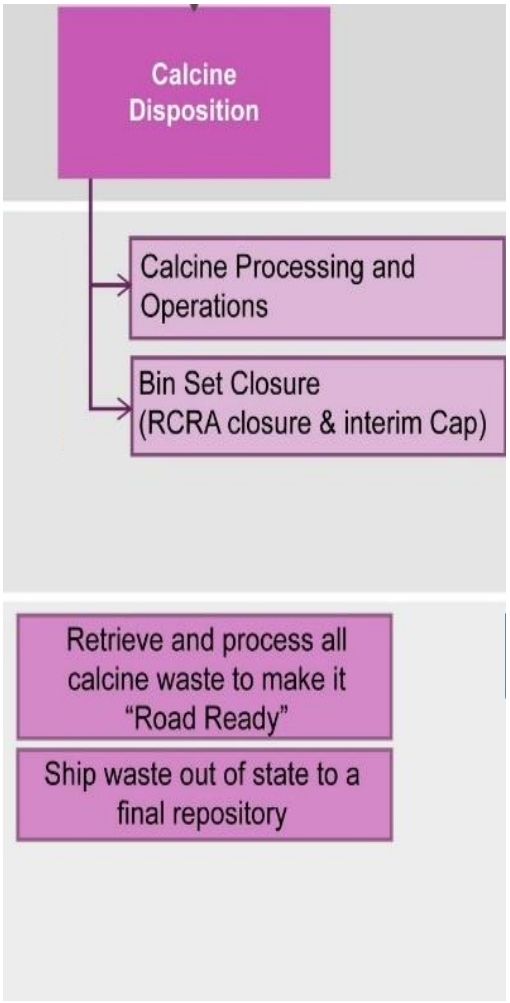
IWTU facility

IWTU control room – startup of sodium bearing waste operations on April 11, 2023

Signing of first canister destined to receive waste

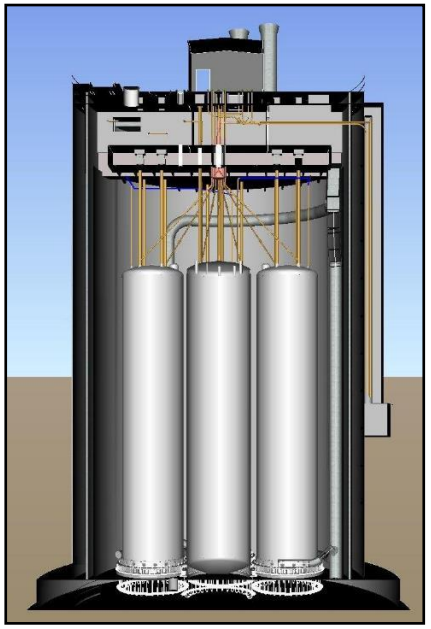
Canister filled with waste

Calcine Disposition



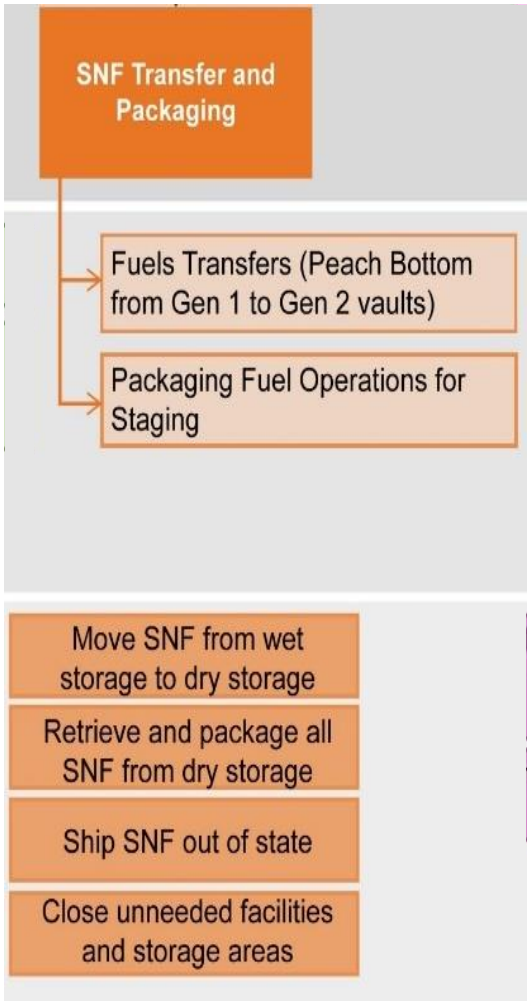
- Calcine is solid radioactive waste (approximately 4400 m3) from spent nuclear fuel reprocessing
- Produced by thermal treatment (calcination) of approximately 8 M gallons of liquid HLW
- Currently stored in 6 bin sets at INTEC
- Current scope focused of retrieval demonstration and initiating line-item project to establish treatment capability

Calcine Solids Storage Facility

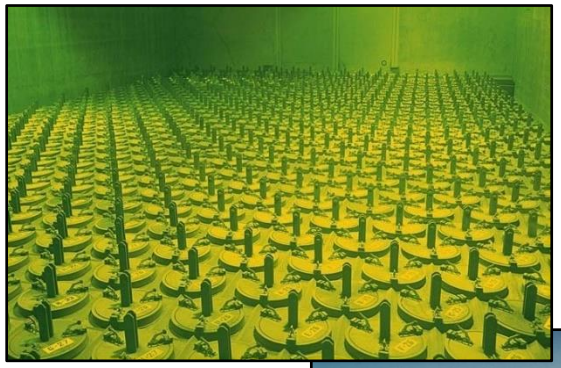


Bin set design

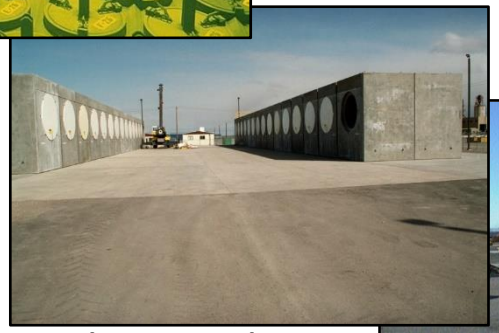
Spent Nuclear Fuel (SNF) Transfer and Packaging



- INL maintains the most diverse SNF inventory in DOE
  - About 220 specific fuel types
  - 268 metric tons of heavy metal
  - Located in various dry storage locations
- Inventory will be packaged and readied for final transport



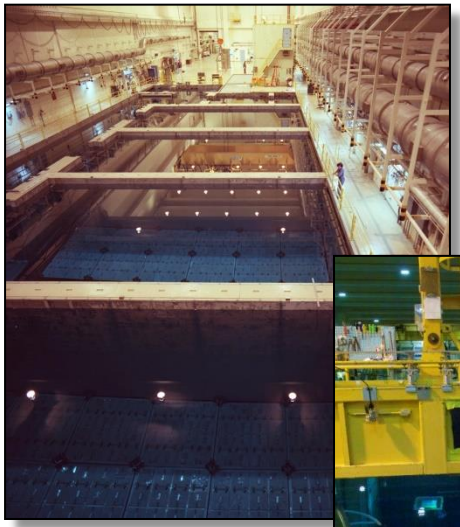
Fuel storage facility



Above ground

Underground vault storage

SNF Wet to Dry Storage Completion



Fuel Storage Pools

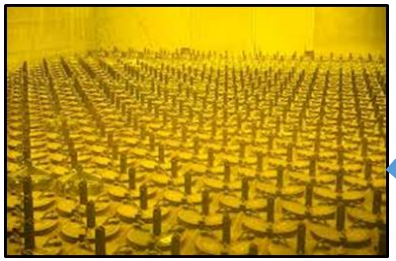
Transferring fuel for cask loading

EM's Ike White, Idaho Governor Brad Little and Fort Hall Business Council member Ladd Edmo at the wet to dry completion celebration on March 28, 2023

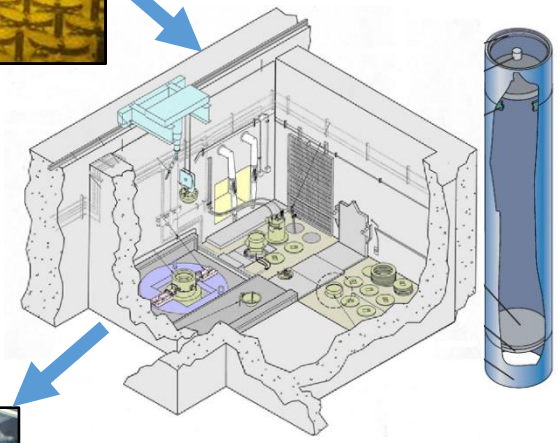
Last wet to dry transfer on March 16, 2023

SNF Packaging Demonstration Plan

- Load DOE standardized canister with limited fuel types from the CPP-603 dry storage facility in the CPP-603 Fuel Handling Cave
- Move DOE standardized canisters to Staging Facility
- Initiate Transportation Certification License Amendment for contents of storage casks (10 CFR Part 71)



Dry Storage



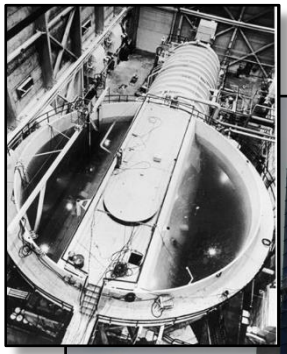
CPP-603 Fuel Handling Cave & Standard Canister

Multi-canister Basket

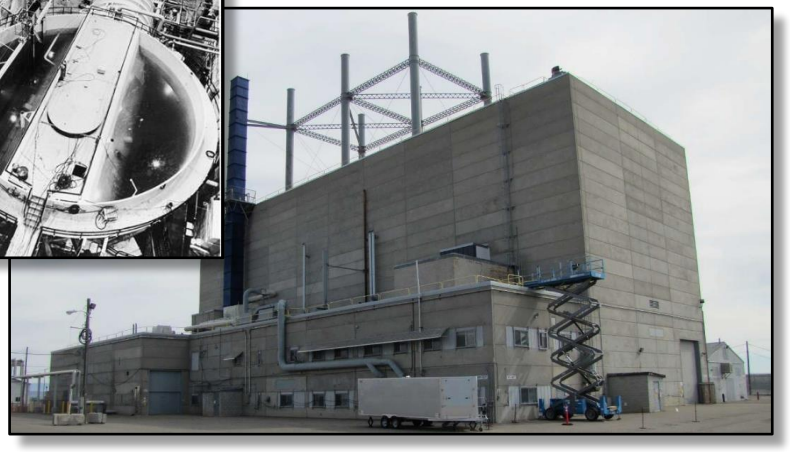
Staging Facility

Naval Reactors D&D

- Naval Reactors
  - S1W D&D
  - Core Car
  - A1W D&D
  - S5G D&D
- Support Naval Reactors



S1W



A1W