



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
**ENVIRONMENTAL
MANAGEMENT**

Idaho Cleanup Project Progress to Date Citizens Advisory Board

Jack Zimmerman
Deputy Manager
Idaho Cleanup Project

June 21, 2018

Idaho Cleanup Project Scope

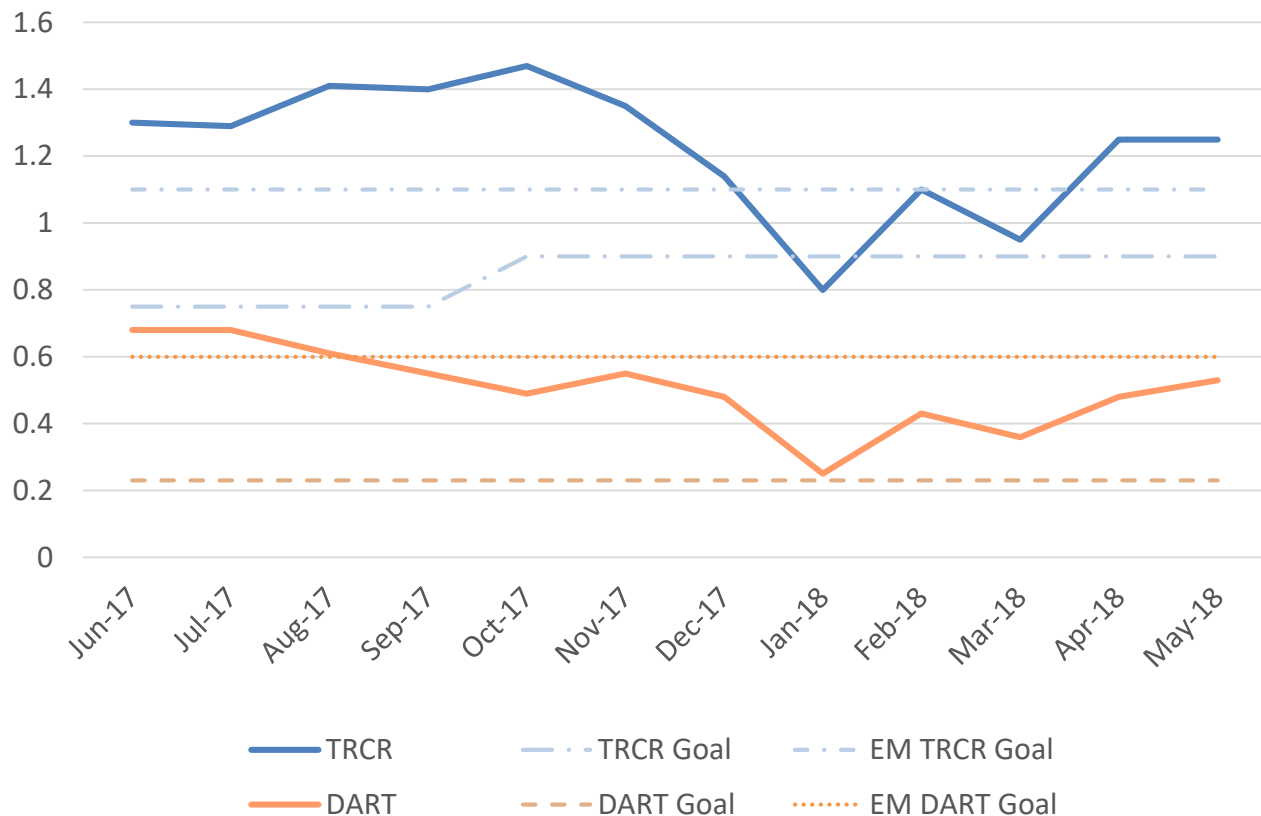
- Transuranic Waste Disposition
- Advanced Mixed Waste Treatment Project (AMWTP)
- Comprehensive Environmental Response Compensation Liability Act (CERCLA) Remediation
 - Waste Area Group (WAG) 1 – Test Area North (TAN)
 - Waste Area Group (WAG) 2 – Test Reactor Area (TRA) - **Complete**
 - Waste Area Group (WAG) 3 – Idaho Nuclear Technology and Engineering Center (INTEC)
 - Waste Area Group (WAG) 4 – Central Facilities Area (CFA) - **Complete**
 - Waste Area Group (WAG) 5 – Power Burst Facility (PBF)/Auxiliary Reactor Area (ARA) - **Complete**
 - Waste Area Group (WAG) 6 – Experimental Breeder Reactor No. I (EBR-I) - **Complete**
 - Waste Area Group (WAG) 7 – Radioactive Waste Management Complex (RWMC)
 - Waste Area Group (WAG) 9 – Argonne National Laboratory – West (ANL-W) - **Complete**
 - Waste Area Group (WAG) 10 – Site-wide Miscellaneous Sites/Snake River Plain Aquifer
- Idaho CERCLA Disposal Facility

Idaho Cleanup Project Scope (cont.)

- Sodium Bearing Waste Treatment
- Calcine Disposition
- Spent Nuclear Fuel Management
- Decontamination and Decommissioning: Materials and Fuels Complex

Safety Performance – April thru May 2018

ICP Core Injury Rates



April 2018

- One First Aid Case, Two Recordable Injuries, and no Restricted Cases
- Six ORPS Reportable Occurrences:

May 2018

- Four First Aid Cases, no Recordable Injuries, and no Days Away cases
- Two ORPS Reportable Occurrences:

CERCLA Remediation Project Objectives

- WAG 1: Test Area North (TAN)
 - TAN Groundwater Remediation
- WAG 3: Idaho Nuclear Technology and Engineering Center (INTEC)
 - Complete the work associated with the OU 3-14 Record of Decision
 - Operate the Idaho CERCLA Disposal Facility (ICDF) to compliantly disposition CERCLA waste
- WAG 7: Radioactive Waste Management Complex (RWMC)
 - **Exhume 5.69 acres of buried waste (Completed 4.82 acres as of May 31, 2018)**
 - Complete the work associated with the OU 7-13/14 Record of Decision
- WAG 10: Site Wide
 - Maintain site wide institutional controls, and operations and maintenance program
 - Maintain groundwater monitoring program
 - Maintain the New Site Identification Process for future CERCLA sites

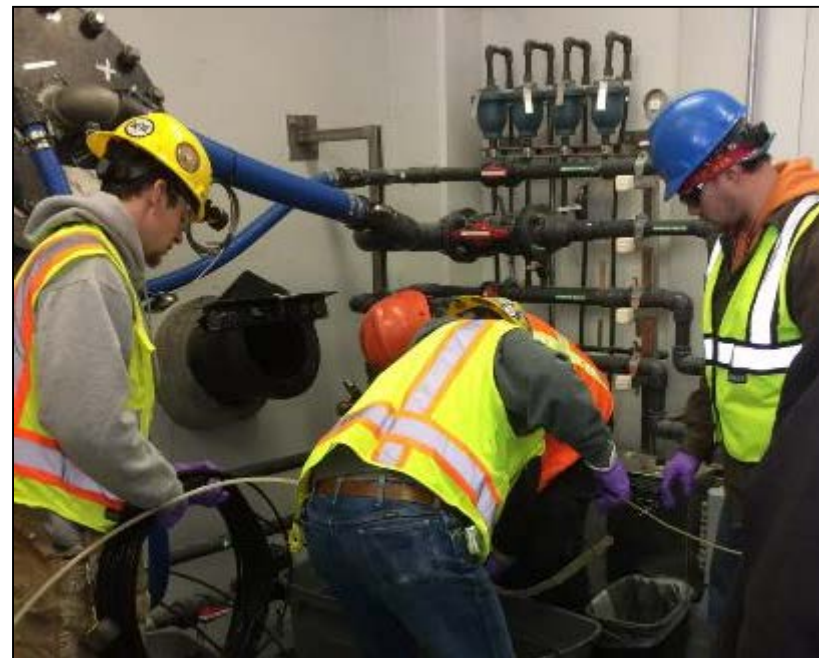
Idaho CERCLA Disposal Facility (ICDF)

Key Activities/Actions:

- FY 2018 (Oct. 2017 through May 13, 2018)
 - Received 15,578 gallons of liquid for disposal to the ICDF evaporation ponds.
 - Received a total of 1,506 cubic meters for landfill disposal.
 - AMWTP MIII Bins and Soil Sacks
 - WAG 3 Tank Farm Debris/Soils
 - NRF D&D Debris/Soils

Ongoing Activities:

- Continue receipt and disposal of aqueous wastes in Evaporation Ponds.
- Dispose CERCLA solid waste
- Continue operation and maintenance of ICDF complex processes and facilities
- Evaluate sample data and sampling frequency

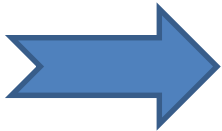


Workers conducting maintenance activities at the ICDF

Dashboard Legend



Ahead of schedule, under budget, better than expected.



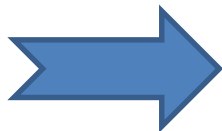
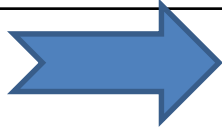
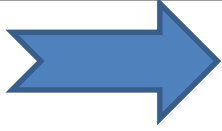
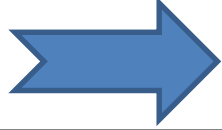


On schedule, on budget, performance as expected.



Behind schedule, over budget, performance less than expected.

Balance of CERCLA (WAGs 1, 3, & 10) Dashboard

Key Questions	Dashboard Indicator	Comments
Schedule Performance		Activities slightly ahead of schedule.
Cost Performance		Cost performance just slightly under budget.
Impact on employment/economic development		Project will continue at a similar level of effort for several years.
Affect on agreements		Project continues to meet regulatory milestones.
Impact on safety and environment		No ongoing safety issues; Safety goals are being met.
Impact on cleanup DOE-wide		No impact on DOE-wide cleanup.

Context: Buried Waste Exhumation

- What is the Waste: TRU waste, principally from Rocky Flats, buried in pits and trenches at the Subsurface Disposal Area at RWMC prior to 1970.
- Potential Risks: Potential contamination of the Snake River Plain Aquifer to above drinking water standards (volatile organic compounds primary contaminants of concern).
- Settlement Agreement: Part of FFA/CO CERCLA remediation of the buried waste under OU 7-13/14 ROD.
- How treated/disposed: Packaged to meet acceptance criteria for disposal at WIPP.
- Current Budget: Current Fiscal Year Budget for buried waste exhumation is \$31.3M.

CERCLA Remediation - WAG 7 Objectives

- Complete remediation work in accordance with the Record of Decision (ROD) for OU 7-13/14
- Conduct Targeted Waste Retrieval at the Accelerated Retrieval Projects (ARP) and disposition waste:
 - ARP I, II, III, IV, V, VI and VII - **completed**
 - ARP VIII: 1.54 acres out of 1.72 acres have been exhumed as of 5/31/18.
 - ARP IX: Buried waste exhumation will begin in 2018 when ARP VIII exhumation is complete.
- ARP I & VI D&D - **completed**
- Complete in situ grouting of 21 locations - **completed**
- Subsurface solvent vapor extraction (OCVZ)
- Environmental monitoring and institutional controls

Key Activities/Actions:

- Continued ARP VIII waste exhumation. 1.54 of 1.72 acres have been exhumed as of May 31, 2018. (90% complete)
- Since 1996, 253,937 pounds of volatile organic compounds have been removed using vapor extraction as of May 20, 2018.

Ongoing Activities:

- Continue to exhume targeted buried waste in ARP VIII. Exhumation was suspended after the April 11, 2018, event in ARP-V until it could be determined if a similar event were possible for exhumed buried waste in ARP-VIII
- Continue organic vapor extraction.
- Continue SDA cap design.



Buried waste exhumation in ARP VIII



ARP VIII Footprint Exhumation Status

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32		
A																													12	40	69	94	A	
B																					9	37	65	94	122	151	180	208	225	225	225	210	B	
C																		28	148	176	205	224	225	225	225	225	225	225	225	225	225	197	C	
D																		36	225	225	225	225	225	225	225	225	225	225	225	225	225	184	D	
E								3	15	27	38	50	62	74	85	97	121	225	225	225	225	225	225	225	225	225	225	225	225	225	225	171	E	
F	85	157	169	181	193	204	216	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	153	F	
G	122	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	145	G	
H	113	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	132	H	
I	104	225	225	225	225	225	225	221	211	201	191	180	170	160	150	140	130	120	110	100	90	80	69	59	71	225	225	225	225	225	225	119	I	
J	28	56	46	36	26	16	6																	10	59	225	225	225	225	225	225	106	J	
K			2	15	24											40	112	128	144	160	175	190	205	220	225	225	225	225	225	225	225	93	K	
L			124	225	222	60	33	49	64	79	95	110	126	141	184	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	80	L	
M			138	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	67	M	
N			153	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	55	N	
O			167	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	42	O	
P			5	20	37	53	69	85	102	118	134	151	167	183	199	216	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	29	P	
Q																		7	17	27	40	55	70	84	99	114	129	143	158	175	192	211	16	Q
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32		
			Remaining -SQ FT																															
			Exhumed -SQ FT																															

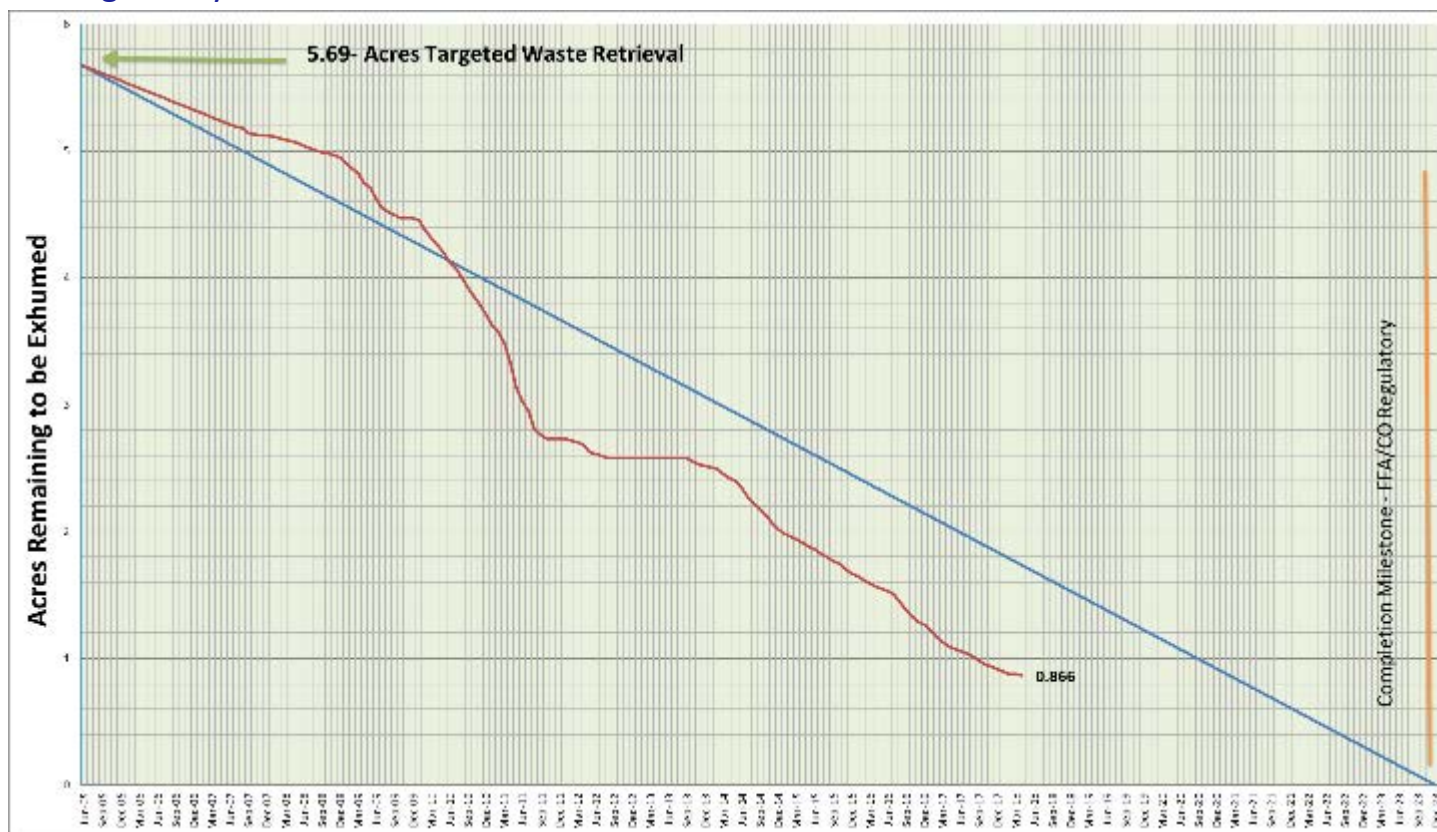
Key Scope: FY 18 Buried Waste Exhumation Performance

- Waste Exhumation (Acres) (FYTD) as of May 30, 2018



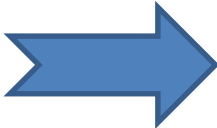



FY-18 Target: 0.26

FY-18 Actual: 0.114

Buried Waste Exhumation was intentionally delayed so exhumation crews could support AMWTP ISA waste processing in the ARPs. In addition, exhumation is on hold until it can be verified that an event similar to the ARP-V drum event is not possible. Overall, exhumation remains about two years ahead of the regulatory schedule.



WAG 7 Dashboard

Key Questions	Dashboard Indicator	Comments
Schedule Performance		As of May 30, 2018, 4.82 acres (84.8%) of the required total of 5.69 acres have been exhumed. Project is about two years ahead of regulatory requirements.
Cost Performance		Cost performance under budget.
Impact on employment/economic development		Project is expected to continue with same level of employment for several years.
Affect on agreements		Project is ahead of pace to meet regulatory milestones.
Impact on safety and environment		No ongoing safety-related issues; safety goals being met.
Impact on cleanup DOE-wide		Crews performing waste exhumation, sludge/debris/roaster oxide repackaging, in ARP V/VII/VIII/IX

CERCLA Progress

Waste Area Group (WAG)	Milestone Title	Milestone type	Milestone Date	FY2018
WAG 3 (INTEC)	Interim INTEC Tank Farm Cover Phase Phase B (eastern 1/3)	FFA/CO Regulatory	Submit RA Report by Nov. 30 of first field season after tank farm closure (on track)	N/A
WAG 3 (INTEC)	Final Tank Farm Evapo-transporation cover	FFA/CO Regulatory	After INTEC Closure	N/A

CERCLA Progress (continued)

Waste Area Group (WAG)	Milestone Title	Milestone type	Milestone Date	FY2018
WAG 7 (RWMC)	Exhume .35 acres of targeted buried waste	DOE Fiscal Year Work Plan goal	9/30/18	
WAG 7 (RWMC)	Complete 90% Design for final Subsurface Disposal Area (SDA)	FFA/CO Regulatory	9/30/2020	N/A
WAG 7 (RWMC)	Complete Buried waste exhumation (5.69 acres)	FFA/CO Regulatory	12/31/2023	N/A
WAG 7 (RWMC)	Completed SDA final Cover construction	FFA/CO Regulatory	12/31/2028	N/A

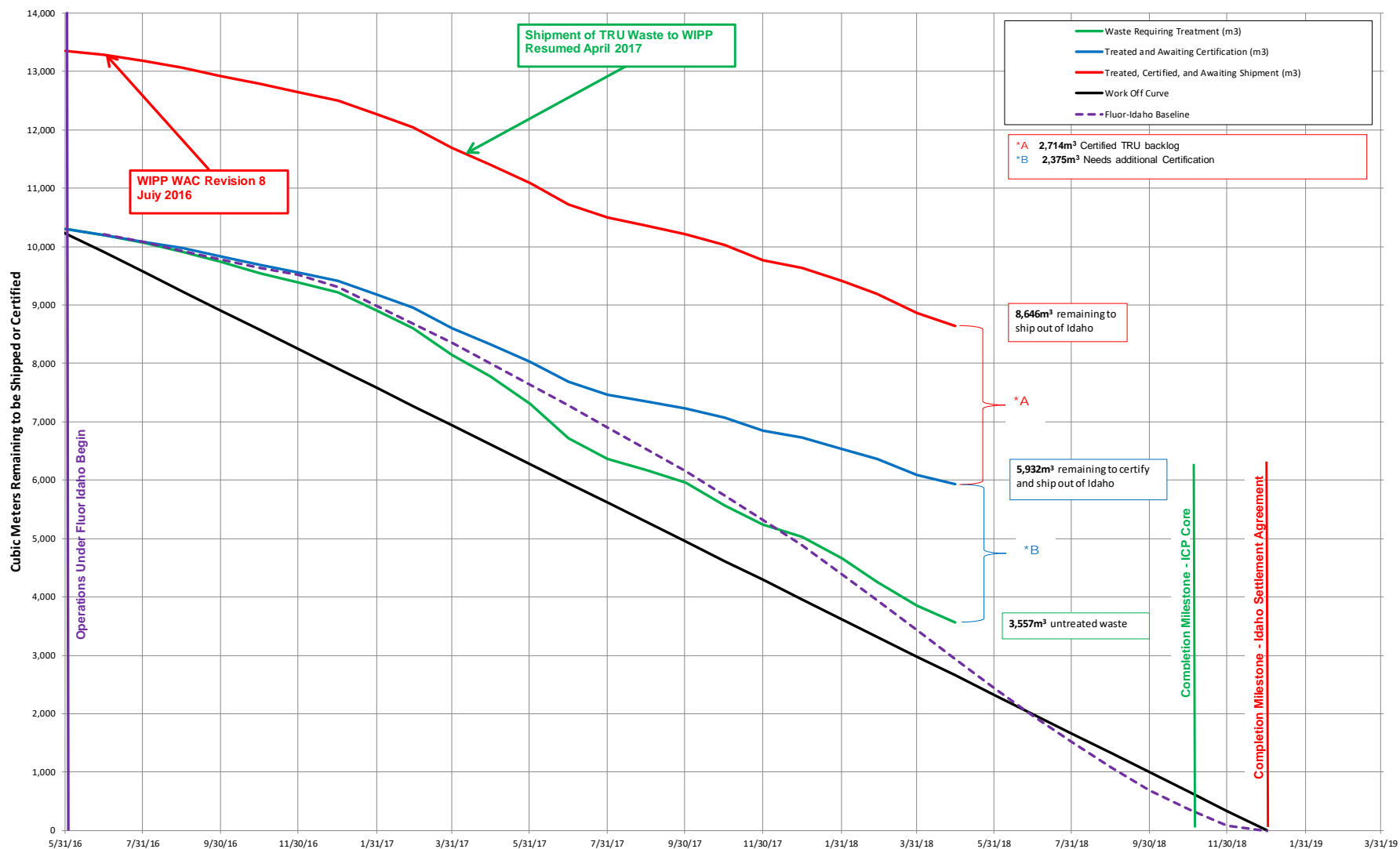
Context: Stored Waste Disposition

- What is the Waste: Transuranic (TRU) and Mixed and Low Level Waste (M/LLW), principally from Rocky Flats, Argonne National Laboratory, Mound, and other smaller generators stored in retrievable configurations at the Transuranic Storage Area (TSA) and at the Radioactive Scrap and Waste Facility (RSWF).
- Potential Risks: Waste contains long lived transuranic isotopes which pose a risk to the workers and the environment. Retrieval of the waste and shipment for disposal in a deep geologic repository (i.e. the Waste Isolation Pilot Plant or WIPP) ensures that humans and the environment are protected from the waste for the thousands of years that it remains harmful.
- Settlement Agreement: Requires removal of estimated 65,000 cubic meters of stored transuranic waste from the State of Idaho by December 31, 2018.
- How treated/disposed: Repackaged, treated to remove prohibited conditions, characterized and certified to meet waste acceptance criteria for WIPP or M/LLW disposal facilities as appropriate.

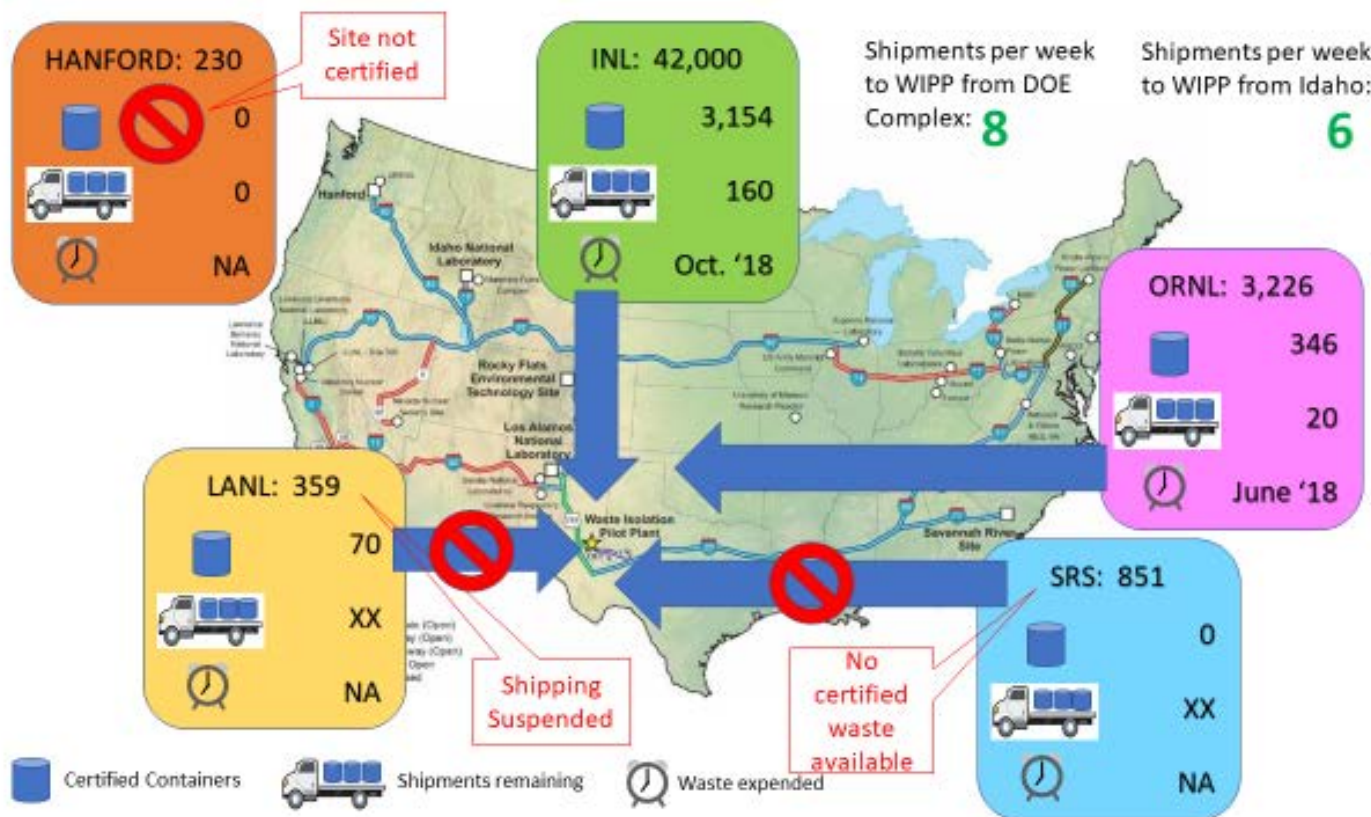
Stored Waste Disposition

- Current Budget: (Annually)
 - Advanced Mixed Waste Treatment Project (AMWTP) - Contact-handled Transuranic waste characterization, treatment, certification, and shipping
 - Accelerated Retrieval Project (ARP) support to AMWTP - Processing sludge waste, large items, roaster oxide conditioning
 - Mixed Low-Level Waste (MLLW) - Processing mixed low-level waste for offsite disposal
 - Remote Handled-Transuranic (RH-TRU) - Processing remote-handled transuranic waste
 - Radioactive Waste Management Complex (RWMC) Infrastructure
 - Total ~ \$185.5M

Settlement Agreement TRU Production Status



CH-TRU Shipping Status



CH-TRU Waste Treatment



Above: Waste processing in the Boxline using a robotic Brokk arm.

Right:
Super-
compactor



Left: AMWTP TRU waste
drums in characterization
assay equipment que.

Right:
Waste in a
Ten Drum Over-pack
being loaded
into a TRU Pact II.



CH-TRU Treatment of Sludge Waste in ARP V

Key Activities:

- Sludge waste repackaging in ARP V is on hold due to 4/11/2018 drum event.
- DOE-HQ surveillance of DOE-ID oversight was conducted the week of May 14, 2018

Upcoming Activities:

- Event Investigation continues.
- Causal analysis continues.
- General clean-up will continue.
- Sample analysis at Southwest Research Laboratories and Savannah River National Lab will continue.

CH-TRU Waste Repackaging in ARP VII

Key Activities:

- Large Item repackaging continues in ARP VII.

Upcoming Activities:

- Complete waste repackaging and return facility to CERCLA for D&D.



Above: Excavator removing large item from fiberglass reinforced waste box.



Above: Crews decontaminate the back-up roller for disposal as M/LLW.



Above: Crews decontaminate the machinery items for disposal as M/LLW.

Waste Treatment in ARP IX



Excavator bucket raking Roaster Oxides to ensure treatment



Drum of Roaster Oxide waste on the treatment table

Key Activities:

- Roaster oxide waste is treated/conditioned and repackaged for disposal.

Upcoming Activities:

- Turn over facility to make preparations for return to targeted waste exhumation.

RH-TRU Waste Treatment



Above: Suspect RH Waste from AMWTP treated by RH program at INTEC



Above: Suspect RH-TRU waste processing and sorting in CPP-659 hot-cell.



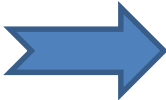





Left: Sources removed from suspect RH-TRU waste from AMWTP



Left : Example of debris from Suspect RH waste from AMWTP being treated at INTEC

TRU Waste Program Dashboard

Key Questions	Dashboard Indicator	Comments
Schedule Performance		Project will miss the milestone to ship all waste out of Idaho. Risk not treating all waste by 12/31/18.
Cost Performance		Cost performance over budget.
Impact on employment/economic development		Project will continue at a similar level of effort this year.
Affect on agreements		Project will miss the milestone to ship all waste out of Idaho.
Impact on safety and environment		No ongoing safety issues; Safety goals are being met.
Impact on cleanup DOE-wide		No impacts to the DOE complex.

Context: Spent Nuclear Fuel

Material: *Spent Nuclear Fuel* (SNF) is nuclear fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing. (Nuclear Waste Policy Act, 1982). Within DOE, SNF is managed as a material of interest and value until it might be declared a waste prior to final disposition. Therefore, SNF is not considered waste.

Hazard to the Public or the Environment: Low. While SNF typically is highly radioactive, it is safely, securely, and appropriately stored, managed and protected. The high radiation levels require shielding (e.g., cask, water, concrete).

How Treated: SNF is managed through safe, secure, and compliant storage, which includes surveillance and maintenance of storage facilities. It will be repackaged prior to transfer to a final repository.

How Disposed: DOE intends to dispose of SNF in a geologic repository.

Budget: Combined DOE and NRC-licensed fuels: \$29 million.

Spent Nuclear Fuel Disposition Project

Key Defense Funded Activities/Actions:

- Completed eight of twelve* planned Experimental Breeder Reactor – II (EBR-II) spent nuclear fuel (SNF) transfers out of wet storage in CPP-666 to the Materials and Fuels Complex (MFC) for FY18. (* Rebaselined planning from six to twelve.)
- There are 20 planned Advanced Test Reactor (ATR) SNF transfers out of wet storage in CPP-666 into CPP-603 dry storage for FY18. This year's campaign will begin in June.
- Transferred good quality used fuel to the USGS reactor in Colorado and the University of Texas.

Key Non-Defense Funded Activities/Actions:

- License renewal application for the Three Mile Island-2 Independent Spent Fuel Storage Installation has been submitted to the NRC. Technical queries have been received. On track to respond to NRC queries by September.

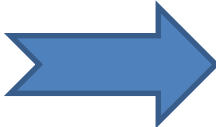
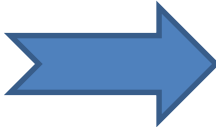
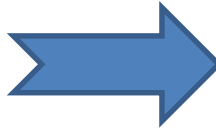
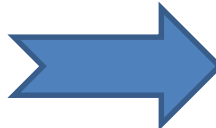
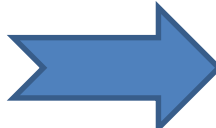
Upcoming Activities:

- Starting in FY19, ATR SNF will be transferred from ATR directly into dry storage in CPP-603.
- A second shipment of used fuel for the University of Texas is planned for the fall.









SNF Crew transferring EBR-II fuel to the cask loading pool

Dashboard Summary – Spent Nuclear Fuel Disposition Project

Key Questions	Dashboard Indicator	Comments
Percent of project completed		For the reporting period, the SNF project is 23 months into a sixty month project. The project is on schedule.
Percent of budget expended		For the reporting period, the SNF project has expended ~24% of its planned budget. The project is under cost.
Affect on agreements		The SNF project is meeting its planned scope commensurate with existing agreements.
Impact on safety and environment		INTEC projects routinely report among the lowest recordable incidents and contribute to the overall positive performance towards ICP safety goals.
Impact on cleanup DOE-wide		The SNF project is meeting its goals.

ICP Dashboard Summary

Key Questions	Dashboard Indicator	Comments
Amount of project completed		Reflects IWTU, TRU waste delays.
Amount of budget expended		IWTU, TRU waste issues causing life cycle costs to rise.
Impact on employment/economic development		Employment largely stable.
Affect on agreements		IWTU delay, WIPP closure impacting milestones.
Impact on safety and environment		Fluor safety (and operational) performance need improvement.
Impact on cleanup DOE-wide		No outstanding impacts.