



U.S. DEPARTMENT OF  
**ENERGY**

OFFICE OF  
**ENVIRONMENTAL  
MANAGEMENT**

# Idaho Cleanup Project Progress to Date Citizens Advisory Board

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*Deputy Manager*  
Idaho Cleanup Project

**February 21, 2018**

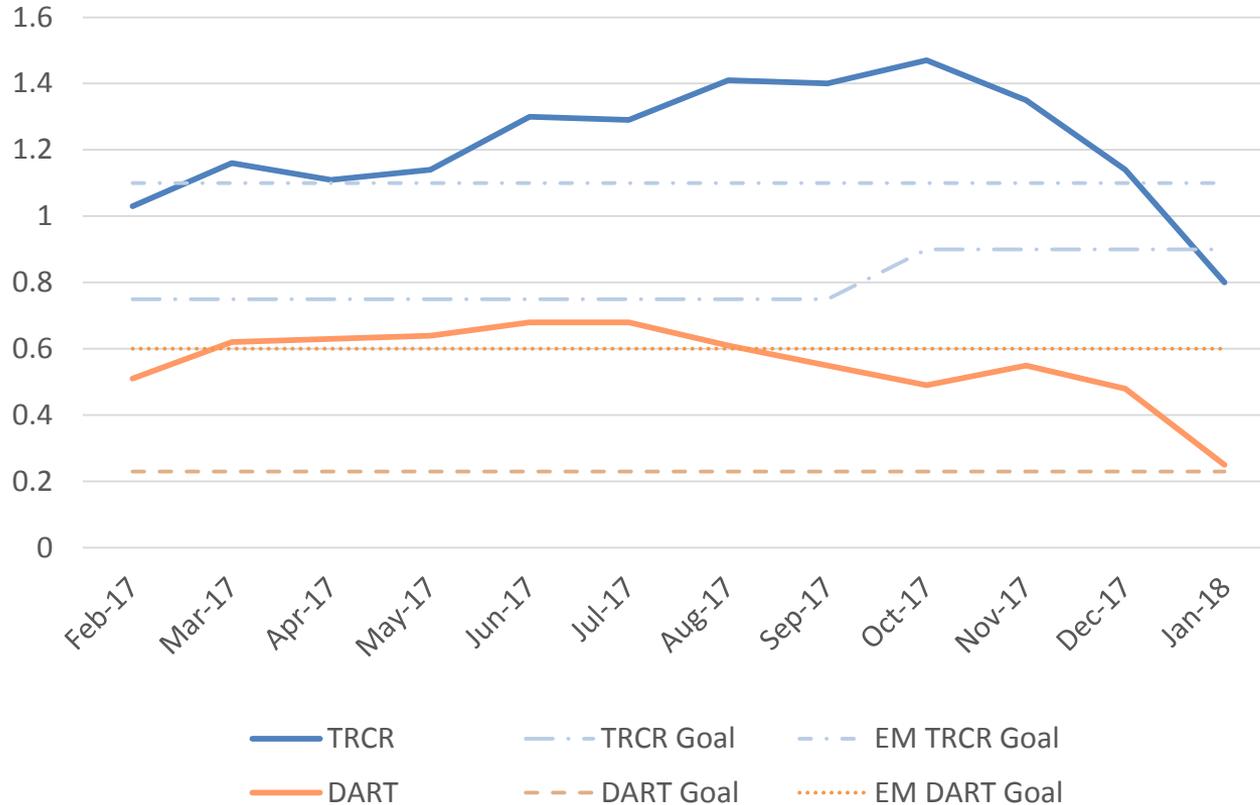
# Idaho Cleanup Project Scope

- 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

## ICP Core Injury Rates



### November 2017

- One First Aid Case and No Recordable Injuries
- No ORPS Reportable Occurrences

### December 2017

- Five First Aid Cases and No Recordable Injuries
- One ORPS Reportable Occurrence:
  - Transuranic waste pyrophoric fire in the AMWTP North Box Line on 12/21/17

### January 2018

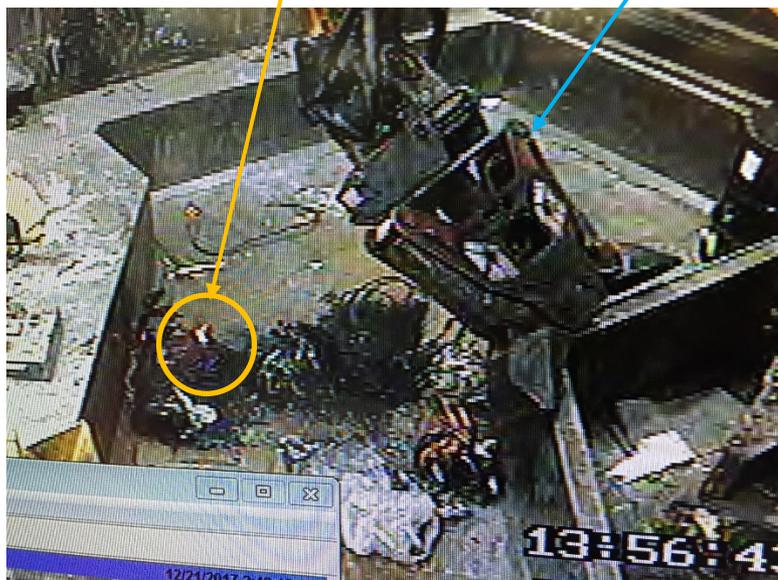
- Two First Aid Cases and No Recordable Injuries
- No ORPS Reportable Occurrences

# December 2017 Advanced Mixed Waste Facility Box Line Pyrophoric Fire

- Pyrophoric Fire from an over-packed 55-gallon drum of TRU waste
  - Fire confined to East Trough of the North Box Line in the AMWTF
  - Started at 1308 on December 21, 2017; quickly diminished to size of a candle
  - Fire declared out at 1610 on December 21, 2017
  - Alert level emergency (localized potential consequences); emergency terminated at 2038
  - No releases to the environment, no injuries, no equipment damage
  - Facility, equipment, and personnel all responded as trained

Small flame continued for approximately 2 ½ hours

Brokk robotic arm



Drum Fire Remnants in Box Line Trough



## December 2017 AMWTF Box Line Pyrophoric Fire (continued)

- Immediately following the fire, Fluor Idaho performed an extent of condition review to ensure no similar containers were within the treatment facility
  - Accomplished via review of Waste Tracking System (WTS) data, including acceptable knowledge, real-time radiography information, and non-destructive assay data
  - One other waste package identified with greater than 5 kg U-238; based on review of WTS, this container did not have similar contents and was processed without issue
- Fluor Idaho conducted an extent of condition review of all other waste containers at the Advanced Mixed Waste Treatment Project
  - 18 other containers were found with greater than 5 kg U-238; all of these containers now have quality control “hold” labels placed on them, requiring detailed evaluation prior to release for processing
- Emergency response efforts at the site went as planned
  - Ongoing improvement opportunities were identified in improving communications between Fluor Idaho and Battelle Energy Alliance (i.e., between the site Emergency Command Center and the in-town Emergency Operations Center)
- West Trough of North Box Line resumed operations on January 3, 2018
- East Trough of North Box Line recovered on January 16, 2018
  - Activity was very well-planned with significant DOE-ID involvement and oversight
  - Recovery went as planned with no unreacted pyrophoric metals
  - Ash and debris were placed in 55-gallon drum with magnesium oxide

# Context: Stored Waste Disposition

- What is the Waste: TRU and MLLW, principally from Rocky Flats, Argonne National Laboratory, Mound, and other smaller generators stored in retrievable configurations at the Transuranic Storage Area and at the Radioactive Scrap and Waste Facility.
- 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. 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 MLLW disposal facilities as appropriate.

# Context (continued)

- Current Budget: (Annually)
  - AMWTP (Contact-handled TRU waste retrieval, characterization, treatment, certification)
  - ARP Support to AMWTP (Processing sludge waste, large items)
  - RH-TRU (Processing remote-handled transuranic waste)
  - ICP MLLW (Processing low-level waste for offsite disposal)
  - RWMC Infrastructure
  - Total ~ \$185.5M

## Remote Handled Transuranic (RH-TRU)

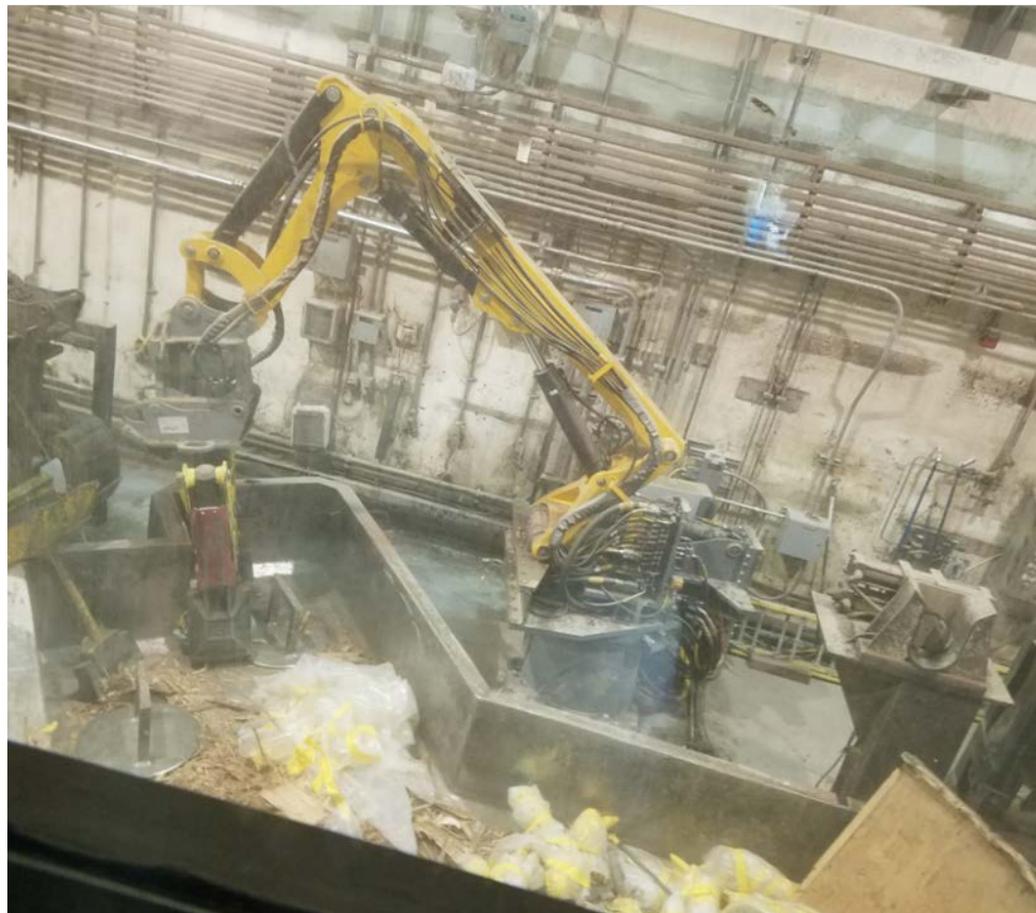
- Suspect RH-TRU Idaho Settlement Agreement waste from the Advanced Mixed Waste Treatment Project (AMWTP) is being treated at the Idaho Nuclear Technology and Engineering Complex (INTEC) when identified.
- Idaho has 161 containers of previously certified RH-TRU waste and 568 containers of RH TRU waste awaiting characterization and certification.
- 10 RH waste stream documents are awaiting review and approval, but this effort is on hold at Carlsbad Field Office (CBFO) due to higher priorities on contact handled waste.
- RH-TRU LOT 10 (Naval Nuclear Propulsion Program – “pieces, parts, and fines”)
  - CBFO reviewed Acceptable Knowledge Summary Report supporting documents November 14-16, 2017

Right and  
Far Right:  
RH-TRU  
waste  
operations  
in hot cells.



## Contact Handled Transuranic (CH-TRU)

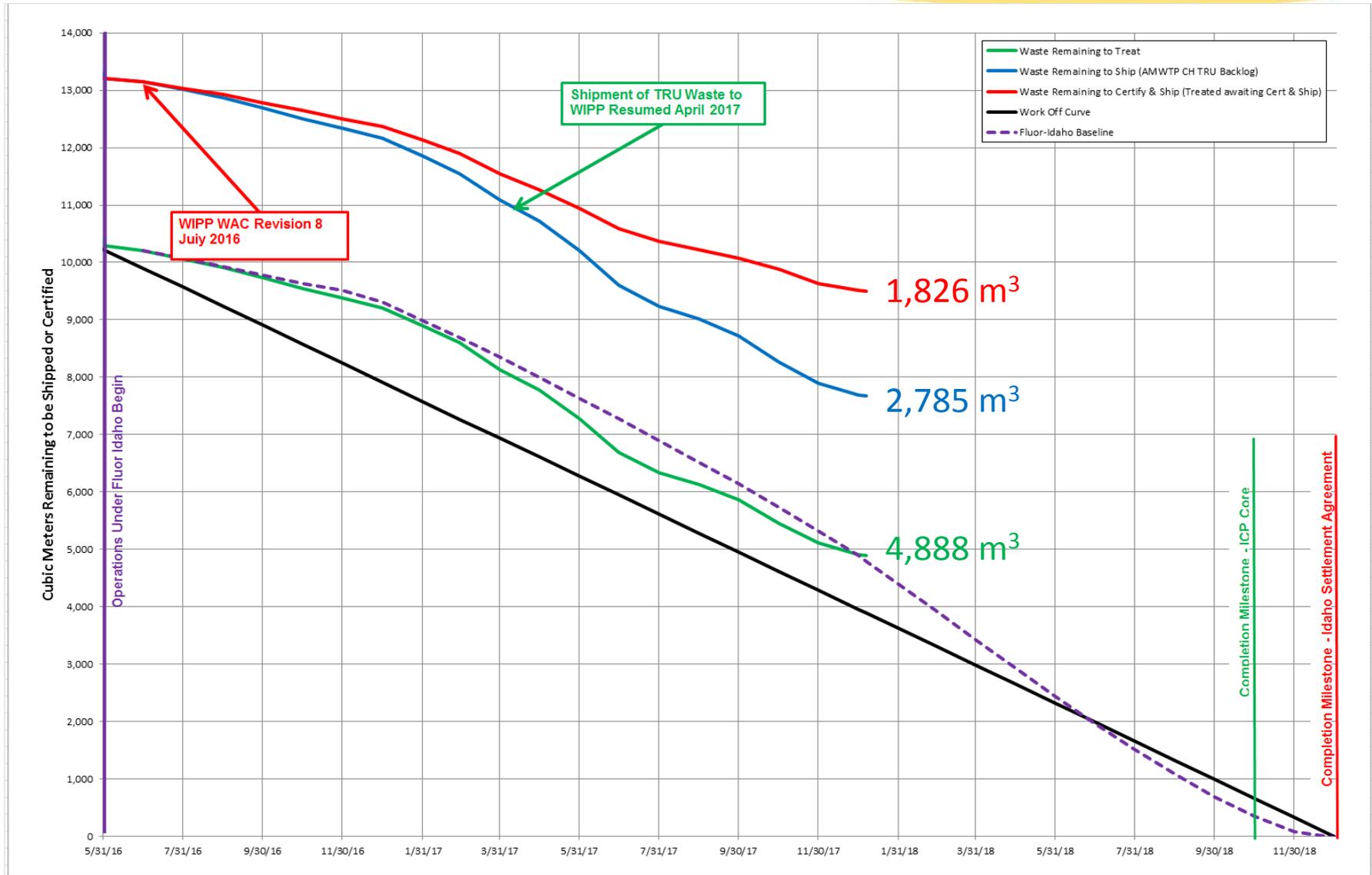
- The treatment facility (TF) continues to treat waste.
  - Increased treatment facility shifts from 7/12 to 24/7 shifts early in 2017.
- Accelerated Retrieval Project (ARP) V facility continues to treat sludge waste and is being considered for treatment of squeezants.
- ARP VII facility continues to segregate large items from waste boxes to speed treatment in the TF.
- ARP IX facility preparations to treat roaster oxides continue.



Box-line operations in the Treatment Facility performed by Brokk robotic arms.

## Advanced Mixed Waste Treatment Project (AMWTP) Certified Program:

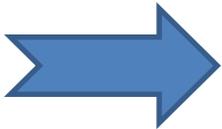
- Starting the week of Sept. 18, Idaho shipments to WIPP were increased to four (4) per week. The 8-week schedule shows 4 shipments continuing through February 2018. (No shipments January 7 through January 21 due to WIPP maintenance.)
  - Completed 92 shipments (April 6, 2017 through January 6, 2018).
  - At 4 shipments per week, Idaho has 37 weeks until the approved waste is exhausted. DOE-ID continues to work with the Carlsbad Field Office to get additional waste streams approved for shipment and disposal.
  
- Comment resolution with the National Transuranic Program, Carlsbad Field Office, and Los Alamos National Lab-Carlsbad Office continues in support of Enhanced Acceptable Knowledge review, Chemical Compatibility Evaluation review, and Basis of Knowledge review.
  
- The next AMWTP Recertification Audit is scheduled for mid-April.



# Dashboard Legend



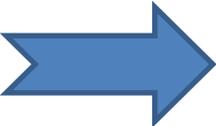
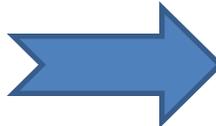
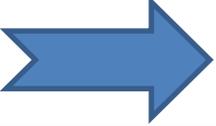
Ahead of schedule, under budget, better than expected.



On schedule, on budget, performance as expected.



Behind schedule, over budget, performance less than expected.

Key Questions	Dashboard Indicator	Comments
Schedule Performance		Activities on schedule.
Cost Performance		Cost performance slightly over budget.
Impact on employment/economic development		Project will continue at a similar level of effort this year.
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.

# CERCLA Remediation Project Objectives

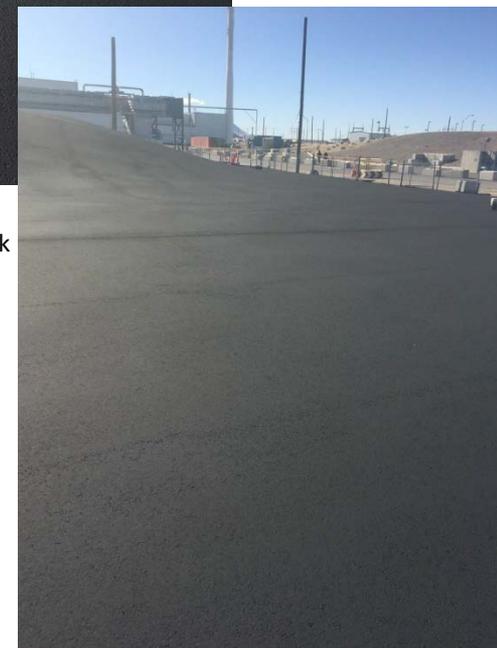
- WAG 1: Test Area North (TAN)
  - TAN Groundwater Remediation
- WAG 3: Idaho Nuclear Technology and Engineering Center (INTEC)
  - Complete the work associated with the OU 3-14 Record of Decision
  - Operate the Idaho CERCLA Disposal Facility (ICDF) to compliantly disposition CERCLA waste
- WAG 7: Radioactive Waste Management Complex (RWMC)
  - **Exhume 5.69 acres of buried waste (Completed 4.8 acres as of January 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

## Key Activities/Actions:

- WAG 1
  - Continued In Situ Bioremediation (ISB) injections into new injection/monitoring well at Test Area North (completed eighth injection in November, 2017).
  - Future ISB injections into well TAN-37 will begin this spring to further optimize treatment of residual TCE source.
- WAG 3
  - Field work to install low permeability pavement over the western two thirds of the Tank Farm was completed in October and the draft Remedial Action Completion Report was submitted to the Agencies ahead of schedule on November 16, 2017. This completes Phase II, Part A of the Operable Unit 3-14 remedy.



New asphalt and sealcoat over north Tank Farm area



New asphalt and sealcoat over south Tank Farm area

# CERCLA Remediation – WAGS 1, 3 and 10 (cont.).

- Ongoing Activities:

- WAG 1 - Continue ISB injections into well TAN-37 - Next nutrient injection (WilClear Plus) April/May, 2018.
- WAG 3 - Continue perched water monitoring and recharge controls at INTEC.
- WAG 10 –
  - Continue monitoring and institutional controls.
  - Continue New Site evaluation/remediation.



Snow fence installed around ICDF disposal cell to reduce the amount of leachate from melting snow

# Idaho CERCLA Disposal Facility (ICDF)

## Key Activities/Actions:

- FY 2018 – First Quarter
  - Received 4,489 gallons of liquid for disposal to the ICDF evaporation ponds.
  - Received a total of 1,197 cubic meters of solid waste 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

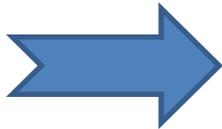


Aerial View of ICDF disposal cell and evaporation ponds –  
September 25, 2017

# Dashboard Legend



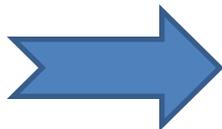
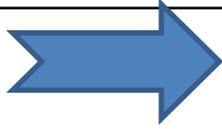
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On schedule, on budget, performance as expected.



Behind schedule, over budget, performance less than expected.

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: 1.51 acres out of 1.72 acres have been exhumed as of 1/31/18.
  - 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. 1.51 of 1.72 acres have been exhumed as of Jan. 31, 2018 (88% complete)
- Since 1996, 252,555 pounds of volatile organic compounds have been removed using vapor extraction as of Jan. 31, 2017.

## Non-CERCLA Activities:

- Continued ARP V repackaging of AMWTP sludge waste. Since March 2015, 3,828 drums and 72 boxes have been repackaged as of Jan. 31, 2018.
- Continued repackaging of AMWTP debris in ARP VII. 78 boxes have been processed and repackaged as of Jan. 31, 2018.
- Ready to begin repackaging roaster oxide waste in ARP IX.

## Ongoing Activities:

- Continue to exhume targeted buried waste in ARP VIII.
- Continue organic vapor extraction.
- Regulatory review of preliminary (30%) design of SDA



Repackaging AMWTP debris boxes in new tent in ARP VII



# 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			133	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	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	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	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

		Remaining -SQ FT
		Exhumed -SQ FT

- Waste Exhumation (Acres) (FYTD) as of January 31, 2018

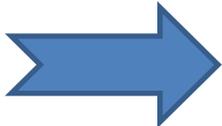
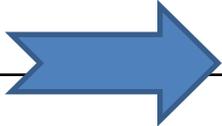
Target: 0.16

Actual: 0.084

Buried Waste Exhumation is slightly behind Fluor's work plan, but is two years ahead of the baseline schedule.



# WAG 7 Dashboard

Key Questions	Dashboard Indicator	Comments
Schedule Performance		As of January 31, 2018, 4.8 acres (84.3%) 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 A (western 2/3)	FFA/CO Regulatory	Submit RA Report by November 30, 2017 (on track)	Complete
	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-transpiration 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: 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.

## Current Year Budget Request: FY18 PBS 12

- Defense-funded SNF program: \$19.975 million
- Non-defense funded SNF program: \$9.000 million
- Total program: \$28.975 million



To the left is CPP-749 – the Underground Fuel Storage Facility.

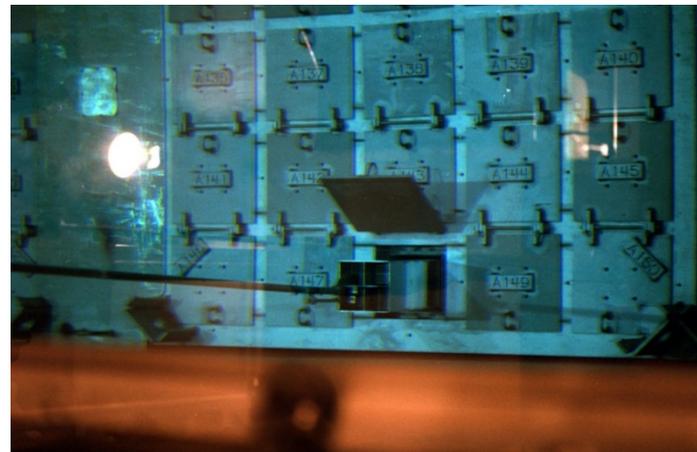
# Spent Nuclear Fuel Disposition Project

## Key Activities/Actions:

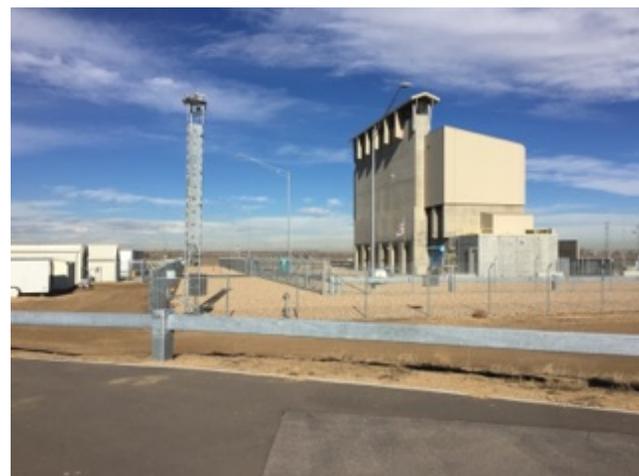
- Completed four of six planned EBR-II spent fuel transfers out of wet storage in CPP-666 to the Materials and Fuels Complex for FY 18.
- There are 24 planned Advanced Test Reactor (ATR) transfers out of wet storage in CPP-666 into CPP-603 dry storage for FY 18. This year's campaign has not yet begun.
- License renewal application for the Three Mile Island Independent Spent Fuel Storage Installation is under technical review by the NRC. Technical queries have been received.
- Completed the Fort St. Vrain Facilities Upgrade Project in December within cost and schedule.

## Upcoming Activities:

- Continue EBR-II spent fuel transfers out of wet storage.
- Continue ATR spent fuel transfers out of wet storage in CPP-666 to dry storage in CPP-603.
- Starting in FY 19, ATR spent fuel will be transferred from ATR directly into dry storage in CPP-603.

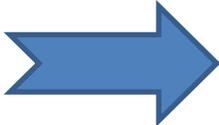
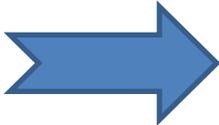
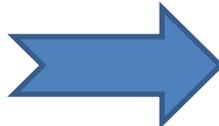
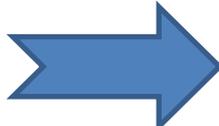


CPP-666 – Pulling a fuel basket from a rack.



Outside view Fort St. Vrain ISFSI with multiple barriers and tower.

# Dashboard Summary – Spent Nuclear Fuel Disposition Project

Key Questions	Dashboard Indicator	Comments
Percent of project completed		As of 01/24/18, the SNF project is 20 months into a sixty month project. Slight variance will be managed with a rebaselining of scope. Progress (schedule) is satisfactory.
Percent of budget expended		As of 01/24/18, the SNF project has expended ~23% of its planned budget with a positive cost variance (under cost). Progress (cost) is satisfactory.
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 performance has improved significantly.
Impact on cleanup DOE-wide		No outstanding impacts.