



U.S. DEPARTMENT OF ENERGY

2012 Congressional Nuclear Cleanup Caucus

Idaho Cleanup Project
March 28, 2012

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E_M Environmental Management

safety ♦ performance ♦ cleanup ♦ closure

www.em.doe.gov

The Idaho Site

Originally established in 1949 as a national reactor testing base; 52 "first-of-a-kind" test reactors have been constructed at the site.

- **890 square miles**
- **Cleanup workforce of ~1,700**
- **The Idaho Site mission is divided into three contracts**
 - **Idaho Cleanup Project** – managed by the Office of Environmental Management
 - **Advanced Mixed Waste Treatment Project** – managed by the Office of Environmental Management
 - **Idaho National Laboratory** – managed by the Office of Nuclear Energy



The EM Mission & Idaho's Priorities

“Complete the safe cleanup of the environmental legacy brought about from five decades of nuclear weapons development, production, and Government-sponsored nuclear energy research”

Idaho's priorities-

- Maintain a safe, secure, and compliant posture in the EM complex
- Complete radioactive tank waste treatment and tank closure
- Disposition of remote and contact handled transuranic waste
- Complete excess facility deactivation and decommissioning
- Continue soil and groundwater remediation
- Continue safe fuel storage
- Continue progress on the Calcine Disposition Project



Accelerated Retrieval Project VIII Facility Construction



A radiological control technician surveys stored transuranic waste drums at the Advanced Mixed Waste Treatment Project



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EM's Components of the Idaho Site

Cleanup is focused on six major geographic areas:

- Idaho Nuclear Technology and Engineering Center (INTEC)
- Radioactive Waste Management Complex (RWMC)
- Material and Fuels Complex (MFC)
- ✓ Advanced Test Reactor Complex (ATRC)
– cleanup completed
- ✓ Test Area North (TAN)
– cleanup completed
- ✓ Power Burst Facility (PBF)
– cleanup completed

Idaho Nuclear Technology & Engineering Center

- Complete the Resource Conservation and Recovery Act (RCRA) closure of the final four High Level Waste Tanks resulting in all 15 tanks RCRA closed
- ✓ Deactivate & Demolish (D&D) of all facilities and structures that have no future mission
- Complete treatment and disposition of remaining RH –TRU waste containers
- Transfer EBR II Spent Nuclear Fuel bottles to MFC

Test Area North (Completed)

- ✓ Completed D&D of all EM facilities and structures

Advanced Test Reactor Complex (Completed)

- ✓ Complete D&D of all EM facilities and structures

Radioactive Waste Management Complex (location of the Advanced Mixed Waste Treatment Project)

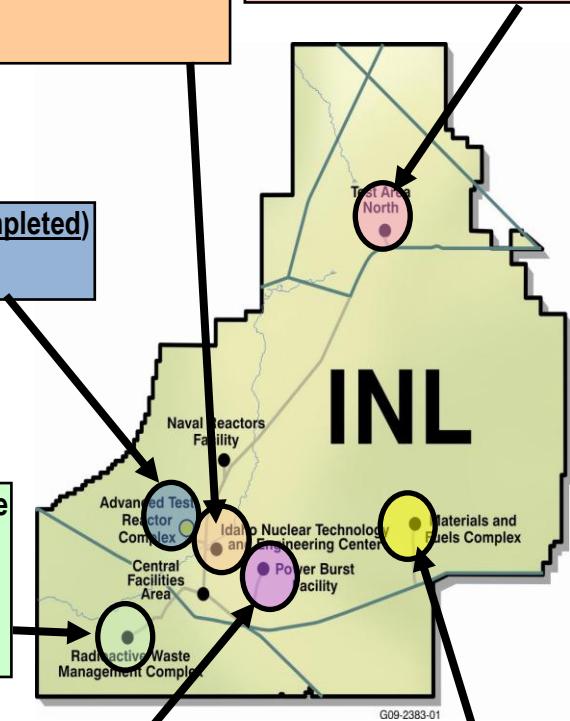
- Complete Disposition of 65,000 m³ of stored TRU waste
- Complete 5.69 acres of targeted buried waste exhumation
- Complete packaging and offsite shipping of 7,785 m³ of targeted TRU waste

Power Burst Facility (Completed)

- ✓ Completed D&D of EM facilities

Materials and Fuels Complex

- Continue retrieval of RH –TRU waste for transfer to INTEC
- Complete receipt of EBR II Spent (Used) Nuclear Fuel for the Office of Nuclear Energy



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Idaho Site Funding

Dollars in thousands

Appropriation	FY 2012 Current Enacted	FY 2013 Cong. Request
Defense Environmental Cleanup	384,669	399,607
Non-Defense Environmental Cleanup	5,131	5,790
Total, Idaho	389,800	405,397

Transuranic and Mixed / Low-Level Waste Disposition

\$163,859

- Process and ship 4,500 cubic meters of contact-handled TRU Waste and 5 cubic meters of remote-handled TRU waste to the Waste Isolation Pilot Plant
- Continue disposition of mixed low-level and low-level waste

Soil and Groundwater Remediation

\$155,648

- Continue shipments of retrieved buried targeted waste

Radioactive Tank Waste Stabilization and Disposition

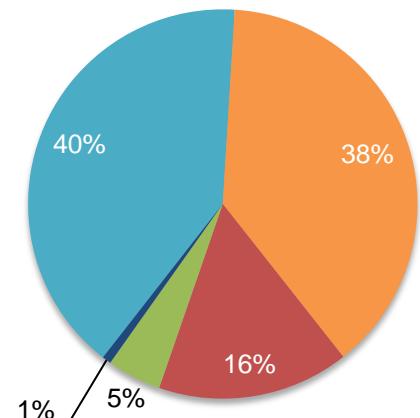
\$64,600

- Continue sodium-bearing waste operations toward December 2012 completion date

Spent Nuclear Fuel

\$18,290

- Continue retrieval of Domestic Research Reactor and Foreign Research Reactor Fuel and retrieval of Experimental Breeder Reactor II fuel from storage



Site Infrastructure / Program Support
(Community and Regulatory activities) - \$3,000

Safety in Idaho

Idaho Cleanup Project

- Reduced recordable injuries by 50 percent since contract inception (May 2005)
- Awarded the Voluntary Protection Program (VPP) Star of Excellence
- Awarded the VPP Legacy of Stars

Advanced Mixed Waste Treatment Project

- Zero Accidents, Zero Injuries since December 7, 2003
- Designated VPP Star Site Status

A radiological control technician helps a fellow co-worker with their personnel protective equipment (PPE)



Accomplishments at the Idaho Site

Buried Waste Retrieval

- Exhumed 2.95 acres of 5.69 acres– including the completion of Pit 9
- One year ahead of schedule



Transuranic (TRU) Waste Disposition

- Remote-handled (RH) TRU
 - Single largest RH-TRU shipper to the Waste Isolation Pilot Plant (WIPP)
 - Averaging two shipments per week
- Contact-Handled (CH) TRU
 - Primary shipper of CH-TRU waste to WIPP
 - Idaho has shipped over 43,000 cubic meters to WIPP
 - 5,087 Idaho shipments out of a total Complex-wide 10,284



Top: The Principal Deputy Assistant Secretary for Environmental Management (4th from left)tours the Accelerated Retrieval Project

Middle: RH-TRU Container being positioned for placement within the hot cell located below grade

Bottom: Manipulator work on an RH-TRU container inside of the hot cell

Accomplishments at the Idaho Site

Deactivation & Demolition

- Demolished 218 of 221 facilities and structures
- Over 2 million square feet of EM facilities removed
- Currently one year ahead of schedule
- Completed cleanup activities at three major complex areas
 - Power Burst Facility
 - Test Area North
 - Advanced Test Reactor Complex



D&D work on the
Test Area North
Hot Shop



The Engineering Test
Reactor Core loaded
and prepared for
ultimate disposal at the
Idaho CERCLA
Disposal Facility

The Advanced Test Reactor Complex



2005

Advanced Test Reactor Complex



2012

Test Area North



Test Area North



Power Burst Facility



Power Burst
Reactor and
Facilities before
D&D



D&D completed on
Support Facilities



Power Burst Facility area
after D&D Completion

American Recovery & Reinvestment Act Accomplishments in Idaho

ARRA Cumulative Status – Through February 2012

	<u>Planned</u>	<u>Actual</u>	<u>Remaining</u>	<u>% Completed</u>
Targeted Waste Exhumations (acres)	0.91	2.05	0	225%
ARP In-Situ Grouting (Holes Grouted)	2,168	2,168	0	100%
MLLW Disposed (cubic meters)	1,195	1,237	0	103%
LLW Disposed (cubic meters)	2,000	2,300	0	115%
RH-TRU Disposed (cubic meters)	21.6	21.6	0	100%
D&D: Target (BASE) - Reduction (ft ²)	258,222	258,222	0	100%
<u>Target – Quantity of Facilities</u>	40	40	0	100%
D&D: Non-Target (New) Reduction (ft ²)	554,593	502,017	52,576	91%
<u>Non-Target – Quantity of Facilities</u>	48	45	3	92%
<u>Total (ft²):</u>	812,277	762,106	50,171	94%
<u>Total Quantity:</u>	88	85	3	97%
D&D: Retention Basins	Qty	2	2	100%
	ft ²	3,058	3,058	100%
<u>Total (ft²):</u>	815,335	765,164	50,171	94%
Total Quantity:	90	87	3	97%

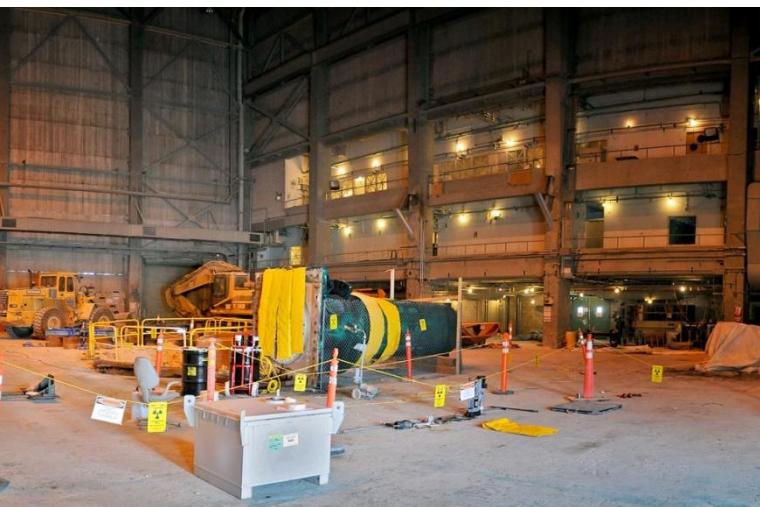
Recovery Act Funded Cleanup at the Materials Test Reactor



Reactor Floor
Before



Exterior Before



Reactor Floor
After



Exterior After

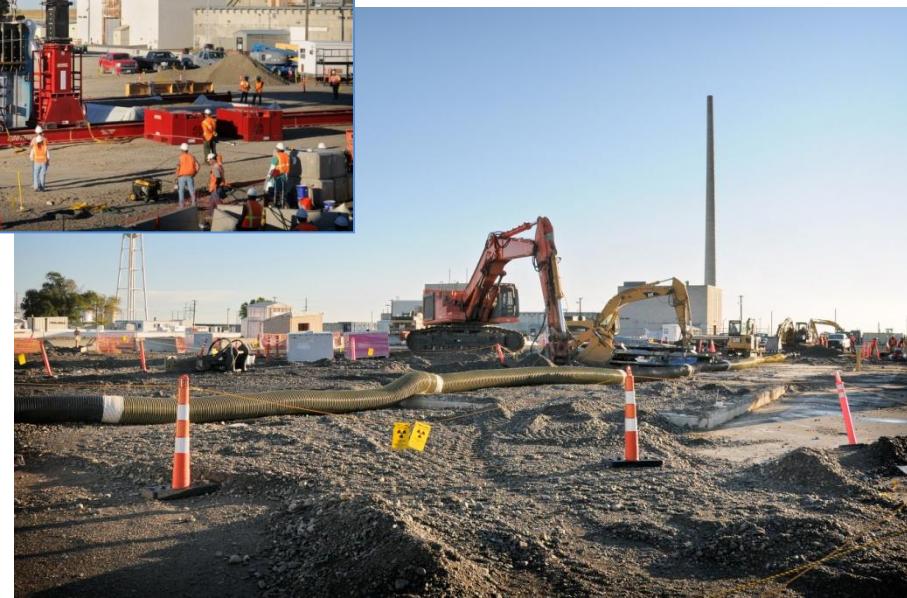
Recovery Act Funded Cleanup at the Hot Cell Facility



Before



Movement of Material Test
Reactor Hot Cell

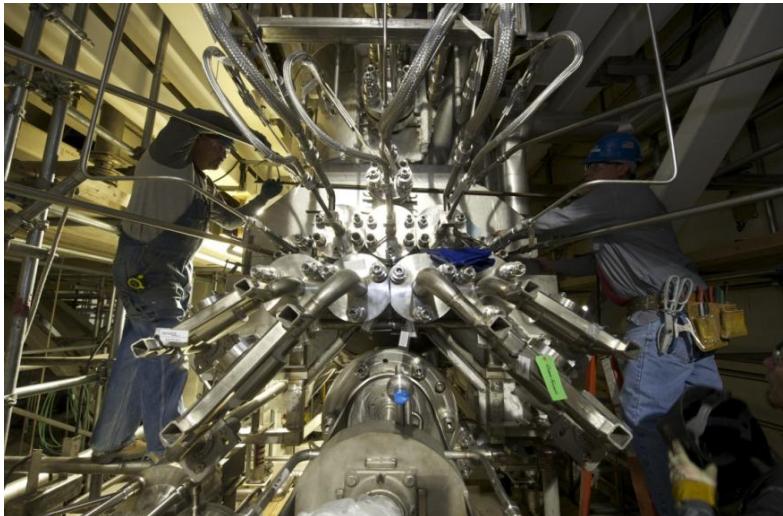


After

In Support of the Secretary's Cleanup Mission

- Complete processing of approximately 900,000 gallons of highly-radioactive liquid tank waste by 12/31/2012.
- Continue shipping stored contact-handled and remote-handled transuranic waste to WIPP.
- Continue to receive domestic and foreign research reactor spent (used) nuclear fuel for placement into dry storage.
- Submit the RCRA Part B Permit Modification to the State of Idaho in support of calcine disposition.
- Continue the retrieval, processing, and shipment of targeted buried waste from the Subsurface Disposal Area.
- Continue the transfer of spent (used) nuclear fuel from INTEC to MFC.

Process pipe installation inside of the Sodium Bearing Waste Treatment Facility



Used (spent) nuclear fuel in dry storage

Idaho is a Sound Investment

- ✓ We continue to maintain excellent rapport with our Regulators through successful completion of regulatory milestones.
- ✓ We receive outstanding support from Tribal Nations and local stakeholders through up front communications and involvement.
- ✓ Idaho's performance has proven that substantial cleanup progress can be achieved within cost and ahead of schedule.
- ✓ Idaho provides successful results with a priority on safety and a value to the taxpayer.
- ✓ Idaho's work is urgent and essential for the health of our local communities and for the protection of the environment.



Stored waste is retrieved at the Advanced Mixed Waste Treatment Project



Contact-handled transuranic waste sorting at the Accelerated Retrieval Project



Idaho Treatment Group



2012 Congressional Nuclear Cleanup Caucus

Advanced Mixed Waste Treatment Project

March 28, 2012

Richard D. Raaz
President and Project Manager
Idaho Treatment Group

Idaho Treatment Group Scope of Work

*ITG manages and operates the
Advanced Mixed Waste Treatment Project
at the U.S. Department of Energy's Idaho Operations site*



The DOE Complex's 10,000th shipment of transuranic waste leaves AMWTP on its one way trip to the Waste Isolation Pilot Plant, Sept. 23, 2011.

Workers at AMWTP focus on the safe and compliant retrieval, characterization, treatment and shipment of 65,000 m³ of legacy stored contact handled transuranic contaminated waste for permanent disposal at sites outside of Idaho, and to support the receipt and processing of transuranic waste from other DOE sites for shipment to the Department's Waste Isolation Pilot Plant (WIPP).

ITG: Zero Accidents and Injuries

Target Zero Injury Performance

Maintaining the AMWTP as a zero accident-zero injuries project through:

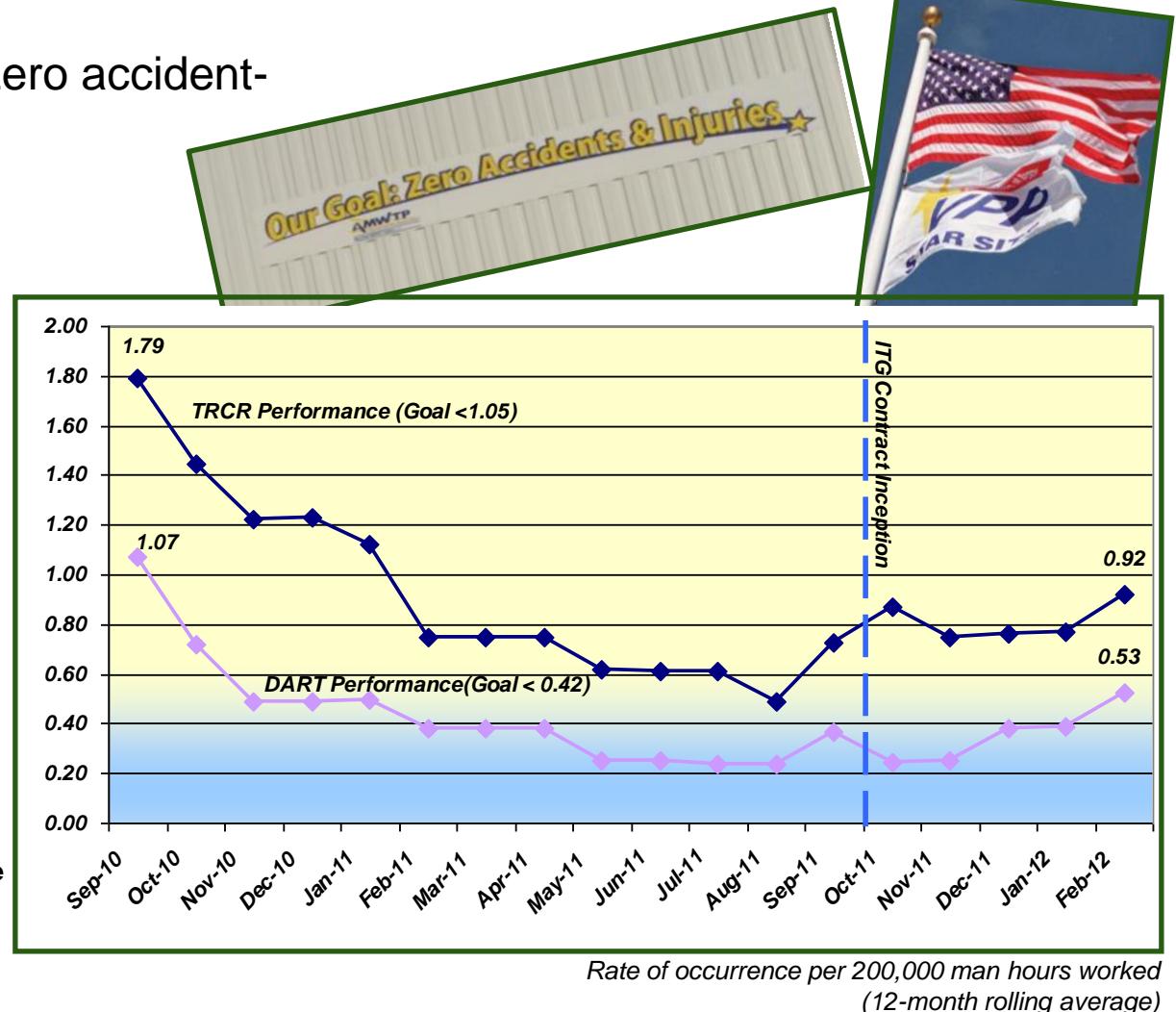
- Achieving VPP Star Site
- Integrated Safety Management System Phase I verification review completed February 2012; Phase II verification review scheduled for June 2012
- Emphasizing Line Management's responsibility for safe, compliant work

TRCR = Total Recordable Case Rate

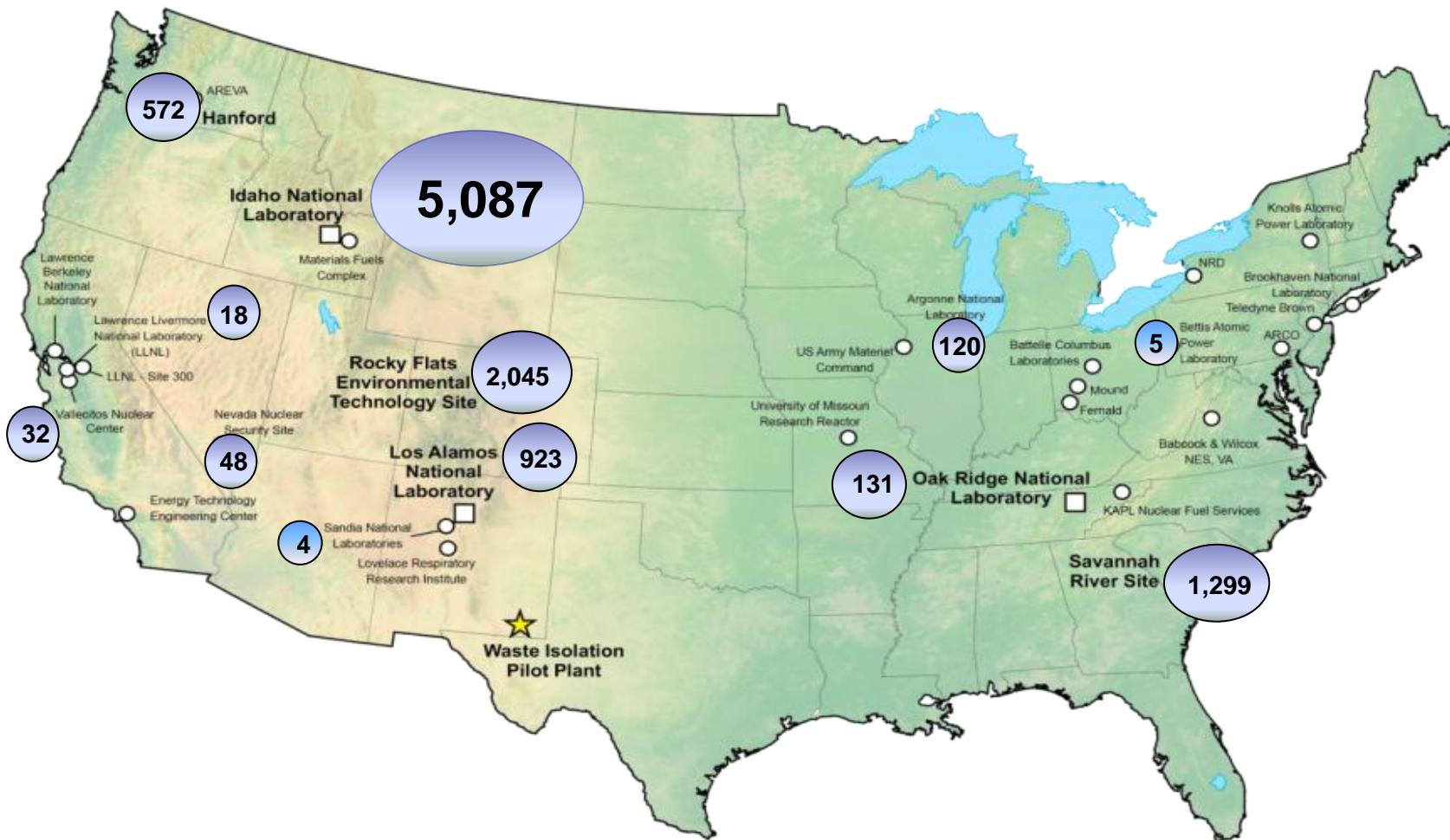
The TRCR measures the rate of occurrence of injuries and illnesses that are recordable per OSHA criteria. The rate is calculated on the total number of injuries and illnesses X 200,000 / Number of hours worked by all employees

DART = Day Away Restricted and Transferred Rate

The DART measures the rate of occurrence of day away injuries, plus the number of restricted injuries and injuries involving transfers. The rate is calculated on the total number of day away/restricted/transferred injuries X 200,000 / Number of hours worked by all employees



WIPP'S #1 Supplier



Transuranic waste shipments from DOE sites to WIPP as of Jan. 23, 2012. AMWTP has made close to 50 percent of all shipments to WIPP.

ITG's AMWTP Facts

- Term: Oct. 1, 2011 through Sept. 30, 2015; \$415.7 million including fee (\$28 million)
 - Paid only when waste leaves Idaho
 - Significant penalties for underperformance
- | Safety | Quality | Schedule | Cost |
|--------|---------|----------|------|
|--------|---------|----------|------|
- Project baseline with an Earned Value Management System
 - New approaches to waste processing
 - Employee Count: 600 (Plant, 537; Town, 63), operating 24 X 7 X 365
 - Remaining waste: ~26,600 cubic meters (RFP)
 - Offsite waste: AMWTP has processed 605 cubic meters of waste from 11 DOE sites



1 = Retrieval, 36 employees (22 support)

2 = Characterization, 101 employees (44 support)

3 = Storage, 36 employees

4 = Treatment, 105 employees (45 support)

5 = Payload & Shipping, 119 employees (29 support)

Employees only = 390 Employees with support = 537

ITG 2012 Milestones

- Renewal of VPP Star Application
- Submission of ISMS Phase II verification
- Facility upgrades and improvements initiated
- Retrieval operations resumed
- MLLW shipments initiated



Top: A BROKK robotic arm operating inside a boxline at the AMWTP Treatment Facility

Middle: A shipment of low-level waste from AMWTP leaves the DOE's Idaho site

Bottom: A shipment of transuranic waste on its way to DOE's Waste Isolation Pilot Plant near Carlsbad, NM

Low Level Waste/Mixed Low Level Waste Program

- Estimate 50% of remaining stored waste is LLW/MLLW
- Restructured LLW/MLLW to develop a more efficient organizational process
- Completed evaluation and revision of all LLW/MLLW program documents
- Updated characterization documents to support new process
- First ITG shipment of LLW to Nevada National Security Site made Feb. 29, 2012



Low Level Waste/Mixed Low Level Waste operations at AMWTP. Clockwise from top left, storage of legacy waste; employees checking low level waste box; employees verifying shipping manifest; first shipment of low level waste made by ITG.

Retrieval Improvements



Transuranic Storage Area-Retrieval Enclosure, Pad 1, March 2010



*New Retrieval Contamination Enclosure Wall
Transuranic Storage Area-Retrieval Enclosure, Pad 1, March 2012*

Retrieval Restart

Preparations are taking place to resume suspended retrieval operations to complete work and achieve contract goals.

Improvements included:

- Robust airborne contamination controls
- Upgraded retrieval equipment
- Structured operational sequences to feed downstream disposition

Key start-up dates

- Issued recovery plan to DOE-ID in Nov. 2011
- Management Self Assessment completed March 9, 2012
- DOE Readiness Assessment completed March 23, 2012
- Retrieval operations startup expected in 3rd quarter of 2012

Top: View of stored legacy waste inside the Transuranic Storage Area-Retrieval Enclosure.

Bottom: Inside the Transuranic Storage Area-Retrieval Enclosure looking at the yellow Inner Contamination Enclosure.



Continued Production

Sludge

- Improving existing sludge treatment process efficiency and optimum use of AMWTP capabilities
- Completed demobilization of Polychlorinated Biphenyls (PCB) prior to PCB clean-up
- Remobilized debris box line processing
- Implement alternative treatment option
 - Accelerated Retrieval Project processing capability
 - Container Repackaging Enclosure (CRE)

Total Inventory

Identifying the specific waste stream for “unknowns” and selecting appropriate treatment options.



Drums and boxes containing stored legacy waste at AMWTP.

Process Improvements

Accelerating Production To Expedite Completion

Streamlining Process of Drums In Boxlines

- Current rules require that each drum in the Six Drum Overpack (SDOP) be fully characterized, and loaded into SDOP, and that the SDOP be recharacterized
- Streamlining process to allow drums with debris waste to be loaded in SDOP configuration and SDOP will be characterized
- Streamlining decreases characterization and drum handling movements, while increasing production



Six Drum Overpack of Hanford waste being processed through Treatment Facility boxline



Process Improvements

Accelerating Production To Expedite Completion

Automating Processing of Mixed Low-Level Waste Shipments



Manual recording and verifying drums

- Approximately 50 percent of remaining ~26,600 m³ historically managed transuranic waste is actually mixed low-level waste (MLLW)
- Currently, each MLLW container data is manually transferred from Waste Tracking System to required MLLW shipping software



Another shipment of mixed low-level waste leaves AMWTP and the state of Idaho

AMWTP: Meeting Its Mission

- Safely and compliantly removing waste from Idaho while meeting the Settlement Agreement ahead of schedule
- Delivering value to taxpayers by completing disposal of final oldest, most difficult ~26,600 cubic meters of waste for less cost than first ~36,000 cubic meters of waste
- Continuing to be DOE's primary shipper to WIPP
- Remaining an essential DOE asset for processing transuranic waste



Following inspection by the Idaho State Police, the DOE Complex's 10,000th shipment of transuranic waste leaves the AMWTP gates, Sept. 23, 2011.



ITG's first low-level waste shipment to the Nevada National Security Site, Feb. 29, 2012

Idaho Cleanup Project

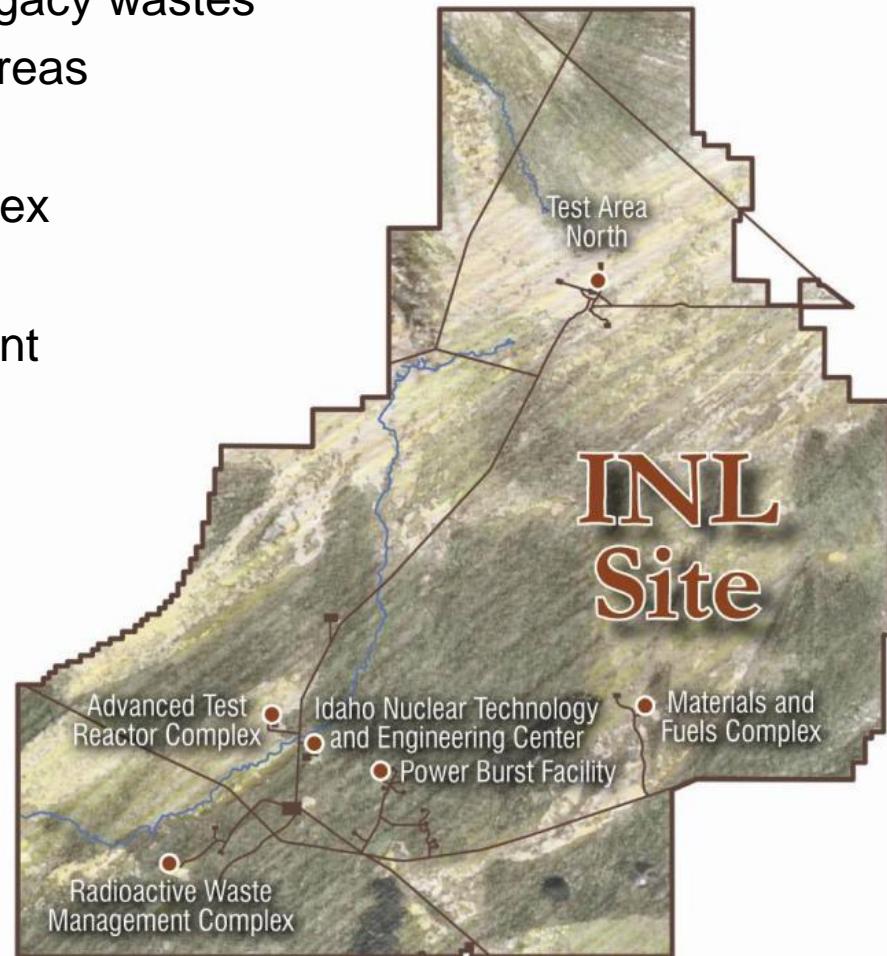
CH2M-WG Idaho (CWI)

March 28, 2012

Presented by
Tom Dieter
President and CEO

Idaho Cleanup Project Mission

- Cleanup of the Department of Energy's Idaho Site, which is contaminated with legacy wastes
- Centers around six major project areas
 - Test Area North
 - Advanced Test Reactor Complex
 - Materials and Fuels Complex
 - Radioactive Waste Management Complex
 - Idaho Nuclear Technology and Engineering Center
 - Power Burst Facility



Cleanup Scope

- Treat 900,000 gallons of sodium-bearing waste
- Prepare high-level waste tanks for closure
- Dispose of hazardous, low-level/mixed low-level radioactive, and transuranic wastes
- Remove targeted waste from the Subsurface Disposal Area
- Demolish or otherwise disposition more than 200 facilities including reactors, spent (used) fuel basins, and hot cells
- Remediate environmental release sites
- Transfer spent (used) nuclear fuel from wet to dry storage
- Developed calcine technology

Cleanup Risks/Mitigations

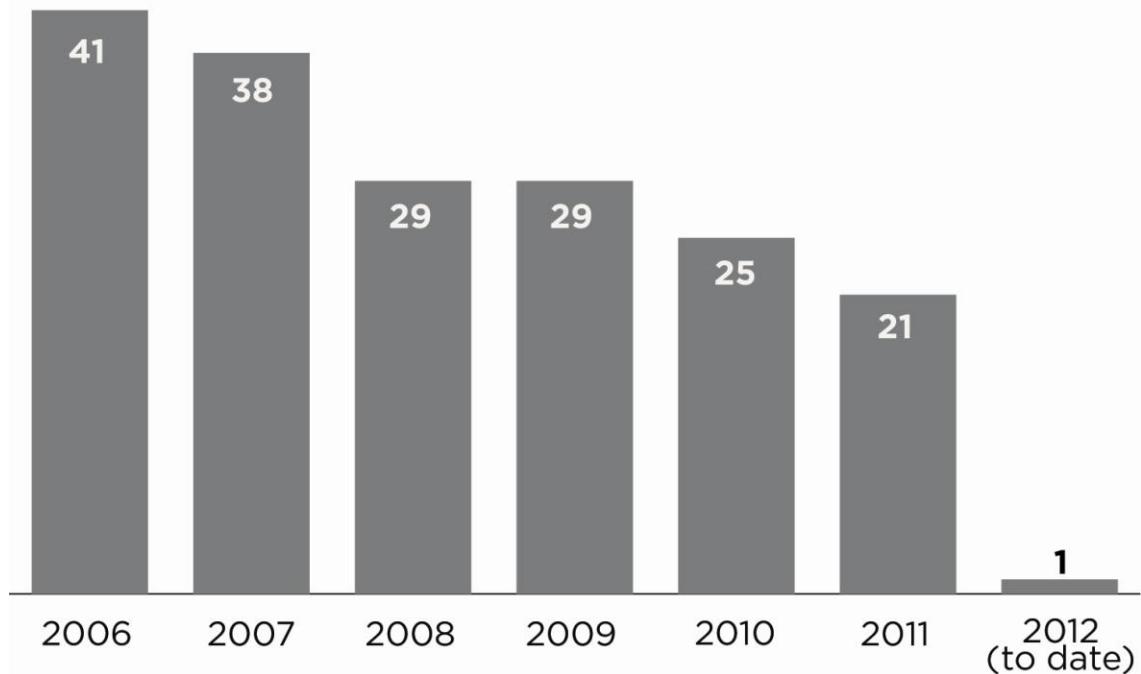
Daily Risks	Mitigations
<ul style="list-style-type: none">• Radiological• Chemical• Explosives (for demolition)• Heavy equipment• Lifting and handling• Natural elements (wind, snow, ice)• Human factors	<ul style="list-style-type: none">• Employee-owned safety program• Peer observation program to identify at-risk behaviors• 43,600 observations submitted• Leadership expectations and training• Safety culture imbedded in processes• Extreme focus on relationships built on mutual respect, trust, and openness<ul style="list-style-type: none">- Workforce- Union leadership- Regulators- Client

Safety

Maintain a safe, secure, and compliant posture

- 50 percent reduction in recordable injuries since contract inception (May 2005)
- ~22,000 entries (FY11) into radiological/contamination areas at the Accelerated Retrieval Project without a ORPS reportable radiological incident
- Worked 13.1 million hours since last reportable skin contamination event

RECORDABLE INJURIES BY YEAR



Sodium-bearing Waste Treatment

Complete radioactive waste treatment and closure

Treatment

- 53,000 square foot, first-of-a-kind facility built to stringent seismic standards (2,500 year event)
- Uses steam reforming technology to treat 900,000 gallons of sodium-bearing waste stored in three underground tanks
- Completed
 - Construction (June 3, 2011)
 - Milestone test (October 20, 2011)
 - Corporate Operational Readiness Review (ORR) (March 9, 2012)
 - Passed review; strengths noted
 - Nine pre-start findings
 - No hardware issues, primarily paper/documentation
- Federal ORR commenced on March 26, 2012
- Operations to begin in April 2012

Tank Farm closure

- 11 liquid waste tanks grouted
- Grouting prep for remaining tanks



Liquid waste tanks are grouted

Integrated Waste Treatment Unit



Waste Disposition

Disposition remote-handled transuranic waste

- Shipped all contract scope remote-handled transuranic waste to the Waste Isolation Pilot Plant (216 shipments)
 - Delivered nine months ahead of schedule with \$4 million in cost savings
- Completed an additional 44 shipments of remote-handled transuranic waste made possible by Recovery Act dollars

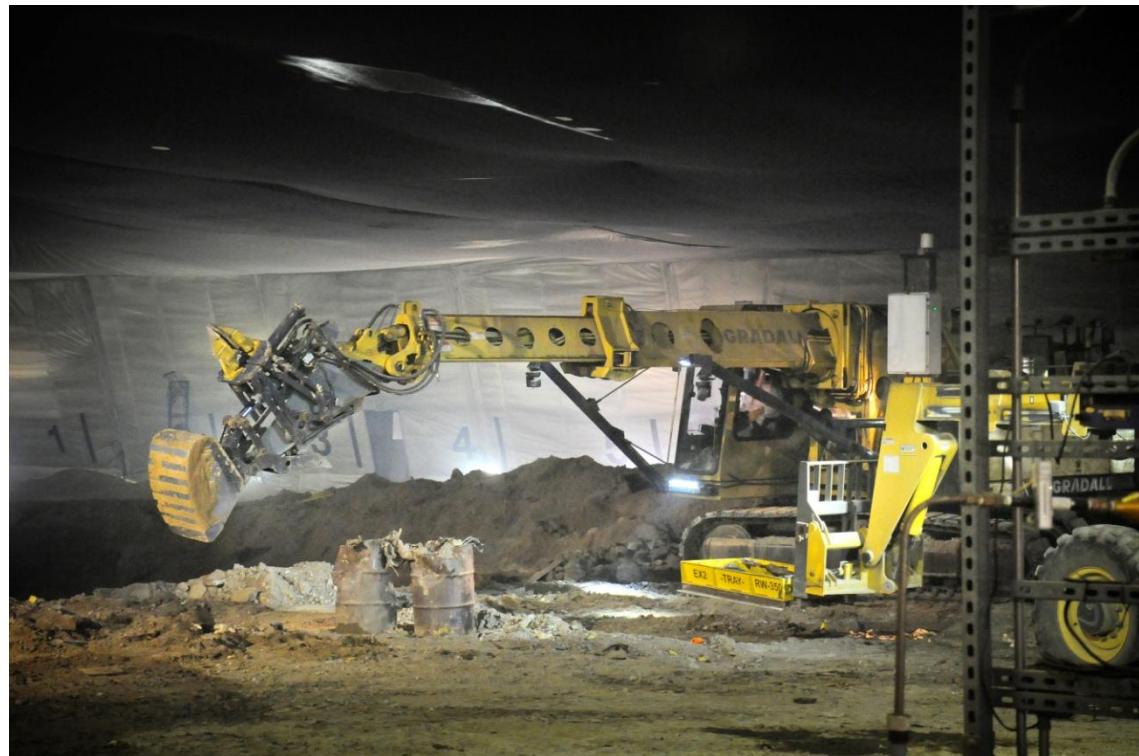


The first Recovery Act shipment leaves the Idaho Site

Waste Disposition (continued)

Disposition contact-handled transuranic waste

- Exhumed 2.95 acres – completed contract scope of 2.55 acres, one year ahead of schedule with \$22 million in cost savings
 - Completed Pit 9 one year ahead of schedule and \$10 million under budget
- Shipped 99 %* of exhumed targeted waste (contact-handled transuranic) to the Waste Isolation Pilot Plant



*CWI contract

Pit 9 exhumation

Facility Demolition

Complete facility deactivation and decommissioning

- Demolition of 218 (of 221) facilities and structures
 - Over two million square feet of footprint reduction
 - Delivered one year ahead of schedule with \$307 million in cost savings
- Includes four reactor facilities – Loss-of-Fluid Test, Power Burst Facility, Materials Test Reactor, and Engineering Test Reactor
- Developed technology to treat passivated sodium

One-million pound hot cell en route to Idaho CERCLA Disposal Facility



Site Remediation

Soil and groundwater remediation

- 120 contaminated sites remediated
 - Completed contract scope ahead of schedule with \$67.5 million in cost savings
- 68 hazardous tank systems closed
 - Completed contract scope ahead of schedule with \$4.3 million in cost savings



A technician gathers samples at the Radioactive Waste Management Complex

Spent Nuclear Fuel Disposition

Continue safe fuel storage

- Transferred 3,186 units of spent (used) nuclear fuel from wet to dry storage
 - Completed contract scope ahead of schedule



Fuel operators bag a canister containing Tory-II fuel prior to moving it to dry storage

Reducing risks, honoring commitments, delivering value

