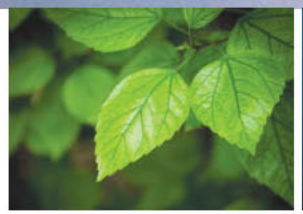
U.S. DEPARTMENT OF ENERGY

EM Performance Metrics for Fiscal Year 2013



Rich Olsen

Office of Integration & Planning

DOE-Savannah River

May 20, 2013

enterprise·srs

Purpose

- Fulfill Strategic & Legacy Management committee work plan requirement to periodically provide Environmental Management (EM) performance updates.
- Provide Performance Metrics definitions as requested by the CAB.
- Provide EM Performance targets for Fiscal Year 2013 and actual performance through April, 2013.

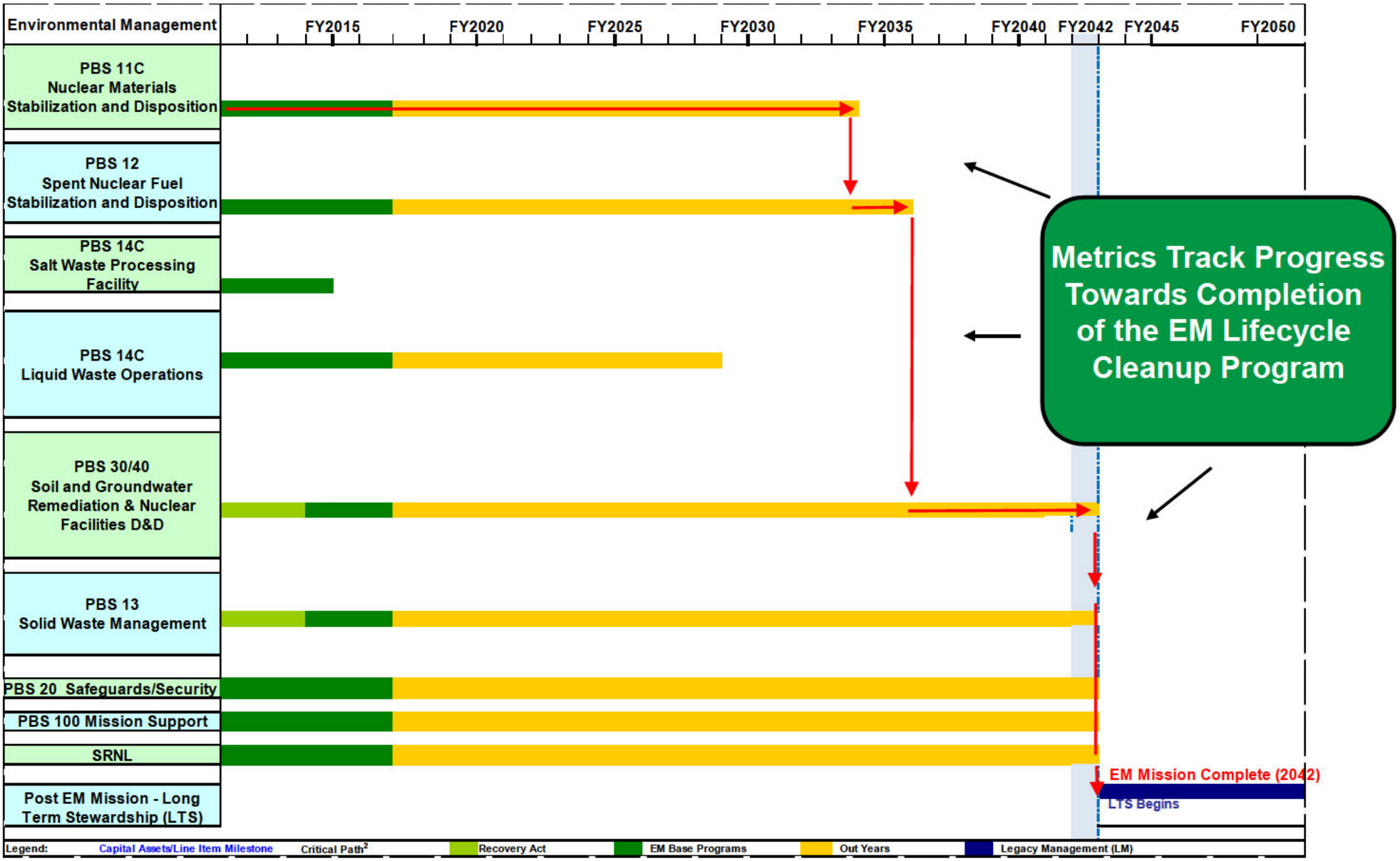
Site Cleanup Program - Background

- **The EM Cleanup Program for the SRS started in the 1990's.**

  - Current Lifecycle Estimate (scope, cost, schedule) indicates EM cleanup completion by 2042.

- **Performance Metrics have been developed to track progress towards end state targets.**

SRS EM Program Lifecycle
FY2012 Update



Site Cleanup Program - Major Areas

Radioactive Liquid Waste PBS 14C	Solid Waste PBS 13	Nuclear Materials Management & Disposition PBS 11C, 12	Soil, Groundwater & Facilities PBS 30
Highly Radioactive Components (Canisters)	Transuranic Waste	Highly Enriched Uranium	Soil & Groundwater Remediation
Low Level Components (Salt Waste)	Mixed & Low Level Waste	Plutonium	Facilities Deactivation & Decommission
Tank Closures	Hazardous Waste	Used Nuclear Fuel	

Performance Metrics Definitions

Liquid Waste

Canisters Produced - The total number of canisters (2 feet in diameter by 10 feet tall stainless steel bottles) filled typically with about 4,000 pounds of glass and highly radioactive liquid waste components, sealed, and leak tested at the Defense Waste Processing Facility (DWPF).

Salt Solution Processed - The volume of decontaminated salt solution treated at the Saltstone Production Facility to produce grout by mixing the Low Level Waste (LLW) liquid stream with cementitious materials (cement, flyash, and slag).

Radioactivity: Curies Stabilized in Canisters - The calculated value of curies of radioactive waste immobilized within the glass structure of filled canisters, based on sludge batch sample results

Performance Metrics Definitions

Liquid Waste (Cont)

Tank Preparation and Closure

Bulk Waste Removal – Process to remove the majority of salt or sludge from a tank for processing in Sludge and salt batch preparation to complete Bulk Waste Removal Efforts (BWRE).

Heel Removal – After BWRE, using various mechanical and chemical cleanin techniques to remove The balance of material to the extent technically practicable from an engineering perspective.

Annuli Prepared for Closure – Removing, if necessary, any material that has leaked from the main tank into the annulus.

Tanks Isolated –Isolating the tank from all operating systems in the surrounding Tank Farm (e.g., wastetransfer lines, tank ventilation systems, and utilities)

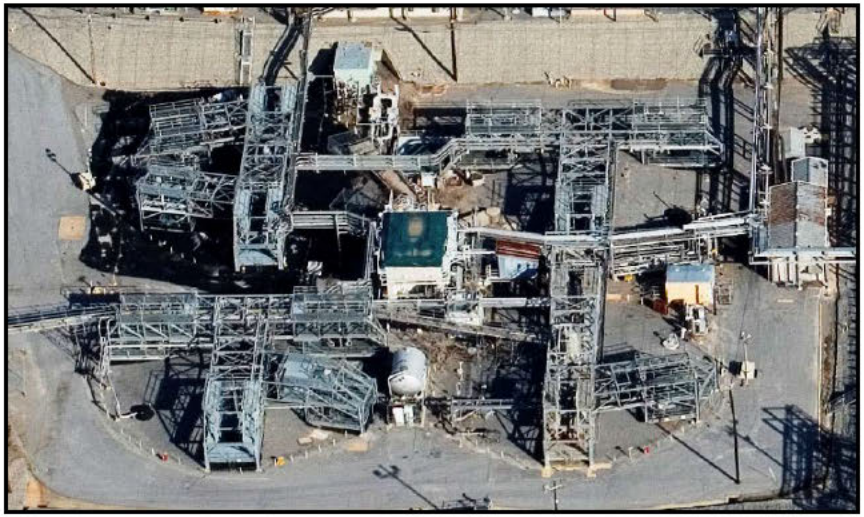
Operationally Closed - The number of waste tanks that have been operationally closed in accordance With the NDAA §3116 tank closure process

Liquid Waste

Canister Production

Saltstone Production

Tank Closure



FY13 EM Performance Metrics Report
through April 30, 2013

Liquid Waste

Measure	Unit of Measure	Cum Actuals thru FY 2012	FY 2013 Analysis		End State Analysis				
			Actuals FYTD	Annual Target*	Cum Act thru 2013 (FYTD)	End State*	% Complete	Forecast to Complete	Regulatory Commitment to Complete
			4/30/13						
DWPF Canisters Poured & Tested									
Canisters Produced[1, 2]	Canisters	3,528	102	275	3,630	7,580	48%	2026	2028
Old-style Tank Preparation and Closure									
Bulk Waste Removal Complete	Tanks	12	0	0	12	24	50%	2019	2020
Heel Removal Campaign Complete	Tanks	6	1	2	7	24	29%	2020	NA
Annuli Prepared for Closure[3]	Tanks	2	1	2	3	16	19%	2020	NA
Tanks Isolated	Tanks	6	0	0	6	24	25%	2021	NA
Operationally Closed	Tanks	4	0	0	4	24	17%	2022	2022
SPF Salt Solution Processed									
Salt Solution Processed	k Gallons	6,719	1,501	1,548	8,220	124,657	7%	2026	2028
Radioactivity									
Curies Stabilized in Canisters[4]	k Curies	47,851	2,968	8,001	50,819	339,851	15%	2026	2028

Liquid Waste Notes:

1. Canister Storage Space Available: 963
2. Alternative Future Canister Storage under Evaluation
3. 16 of 24 Tanks Require Annuli Preparation
4. Estimates based on Sludge Batch Sampling; End State equals sum of "as-poured" and Tank Inventory as of 10/1/2012

***Target and End State Basis**

Quantities based on Liquid Waste System Plan Rev 17 and Rev 18 Inputs and Assumptions

Commitment to Complete

Based on FFA and Site Treatment Plan

Performance Metrics Definitions

Solid Waste

Transuranic (TRU) Waste Disposed- Legacy – Radioactive waste contaminated mainly with plutonium 238 and 239 at concentrations greater than 100 nanocuries/gram that was generated at SRS before April 2009. Disposed off-site.

TRU Waste Disposed - Newly Generated - Radioactive waste contaminated mainly with plutonium 238 and 239 at concentrations greater than 100 nanocuries/gram that is generated at SRS after April 2009.Disposed off-site

Low Level Waste (LLW) Disposed – Newly Generated - Radioactive waste that is not TRU waste or high level waste generated after 2007.Disposed on-site.

Mixed Low Level Waste (MLLW) Disposed – Newly Generated - Radioactive waste that may contain RCRA constituents (chemicals) or listed hazardous waste that is not TRU waste or high level waste generated after 2007.Disposd off-site.

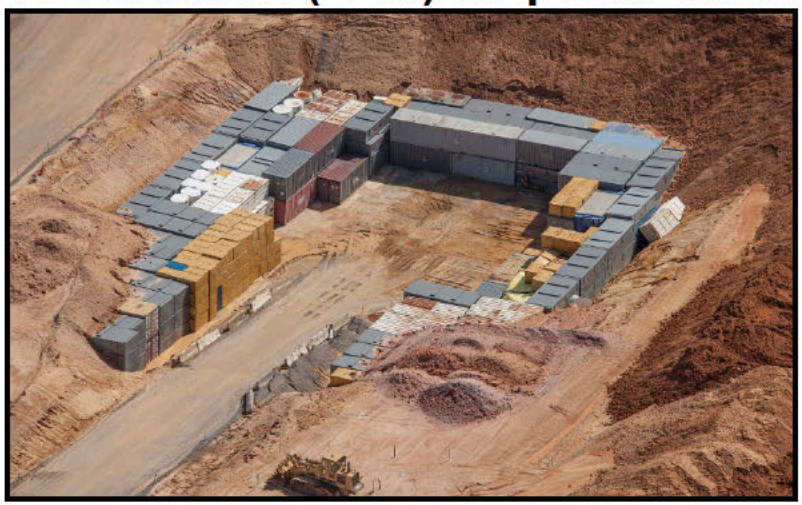
Hazardous Waste - Non-radioactive waste containing hazardous chemicals. Disposed off-site.

Solid Waste

Transuranic Waste (TRU) Shipment to WIPP

Mixed Waste (MLL) Shipment to Utah

Low Level Waste (LLW) Disposal-On Site



FY 2013 EM Performance Metrics Report
through April 30, 2013

Solid Waste

Measure	Unit of Measure	Cum Actuals thru FY 2012	FY 2013 Analysis		End State Analysis			
			Actuals FYTD	Annual Target	Cum Act thru 2013 (FYTD)	End State	% Complete	Target Year to Complete
			4/30/13					
TRU								
Legacy TRU Waste Disposed	Cubic Meters	9,490	894	1,372	10,384	11,084	94%	2014
Newly Generated TRU Waste Disposed	Cubic Meters	73	42	40	115	3,980	On Going	TBD
MLLW & LLW								
Legacy LLW & MLLW Waste Disposed	Cubic Meters	103,171	Completed		103,171	103,171	100%	2008
Newly Generated LL & MLL Waste Disposed	Cubic Meters	37,774	3,754	7,800	41,528	135,017	On Going	TBD

Notes:

TRU = Transuranic Waste
LLW = Low Level Waste
MLLW = Mixed Low Level Waste

End State Basis

Solid Waste End State Quantities and Target Year to Complete are based on 2012 Integrated Lifecycle Plan

Performance Metrics Definitions

Nuclear Materials

Highly Enriched Uranium (HEU) - uranium mixture containing 20 percent or higher of the uranium 235 isotope. When uranium 235 makes up 20 percent or more the weight of the uranium, it is "highly enriched"

HEU Blend Down Program - a program whereby highly enriched uranium (HEU) is mixed with natural uranium to produce low enriched uranium that is offered to the Tennessee Valley Authority (TVA). TVA then produces a fuel acceptable for TVA commercial reactor use (meets the Tennessee Valley Authority specification for "TVA off-spec" fuel).

Used Nuclear Fuel - Fuel withdrawn from a nuclear reactor following irradiation. UNF (aka spent nuclear fuel) is currently safely stored in L-Basin. The word "used" conveys that the remaining uranium in the fuel is not spent but can be recovered and reused.

Performance Metrics Definitions

Nuclear Materials (Cont)

Plutonium Dissolved in H- Area - Plutonium stored in K Area dissolved in the HB Line, sent to H Canyon, neutralized and then sent directly to DWPF for Vitrification or the liquid waste tanks for future Vitrification.

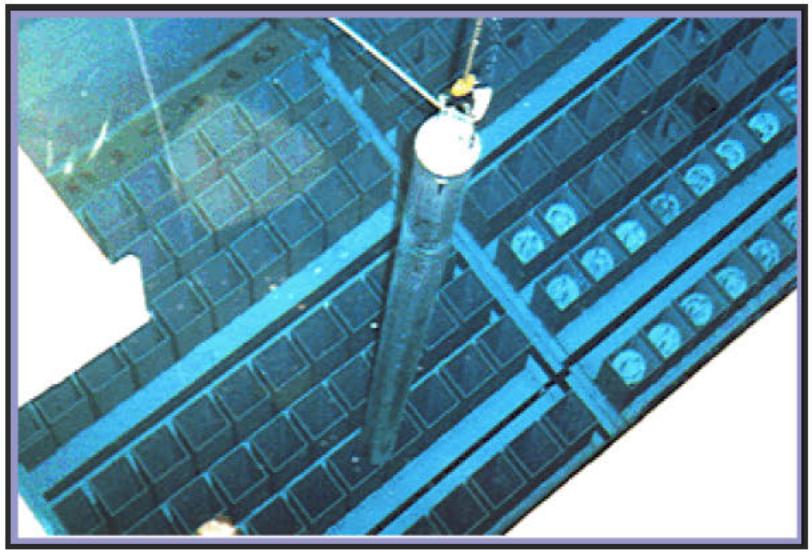
Plutonium Packaged for shipment to WIPP – Plutonium stored in K Area that is sent to and dry blended in HB Line with inert material, packaged in pipe overpack containers, and shipped to E-Area. E-Area prepares the material for packaging in TRU pack containers for shipment to WIPP.

Plutonium Oxide prepared for MOX – Plutonium stored in K Area is dissolved in H-Canyon and sent to HB-Line for purification and oxide conversion. The purified oxide is packaged and sent to K-Area until needed by the MOX facility.

Nuclear Materials

Plutonium
3013 Type Container

Used Nuclear Fuel (UNF) Bundle
Stored in L- Basin



FY 2013 EM Performance Metrics Report through April 30, 2013

Nuclear Materials

Measure	Unit of Measure	Cum Actuals thru FY 2012	FY 2013 Analysis: Actuals (FYTD)	FY 2013 Analysis: Annual Target	End State Analysis: Cum Act thru 2013 (FYTD)	End State Analysis: End State	End State Analysis: % Complete	End State Analysis: Target Year to Complete
Highly Enriched Uranium Disposition			4/30/13					
Blend Down & Ship to TVA	**Trailers**	**336**	**Metric Completed**		**Metric Completed**			**2012**
HEU from SRS Reactor Fuel & DOE Complex Lab Material								
Blend Down & Ship to TVA	**Trailers**	**0**	**0**	**0**	**0**	**TBD**	**0**	**2018**
HEU from L-Basin (FRR/DRR & HFIR[7])								
Dissolved - SRE Campaign[5]	**Bundles**	**7**	**21**	**29**	**28**	**147**	**19%**	**2014**
Plutonium (Pu) Prepared for Disposition								
Pu Dissolved in H-Area[1]		100	0	0	100	100	100%	2011
Package Pu for Shipment to WIPP[3]		27	0	0	27	3,000	1%	TBD
Prepare Pu Oxide for MOX		0	0	40	0	2,500	0%	TBD
Total Pu Prepared for Disposition	**Containers[2]**	**127**	**0**	**40**	**127**	**5,600**	**2%**	**2033**
Used Nuclear Fuel								
L-Basin Inventory	**Bundles**	**3,195**	**3,181**	**3,179**	**3,181**	**3,650[6]**	**87%**	**TBD[4]**
Added: New Receipts	Bundles		5	11	NA	NA		
Removed: Packaged for Disposition								
SRE[5]	Bundles	9	19	27	28	147	19%	2014
FRR/DRR[7]	Bundles	0	0	0	0	1,000	0%	2018
HFIR[7]	Cores	0	0	0	0	200	0%	2018

Nuclear Materials Notes:

1. Quantities Since 2008 (Includes LAP Containers)

2. Standard DOE 3013 Type Container

3. For Metric consistency, quantity of Pu being packaged for WIPP shipments is being measured as 3013 Type Containers. As part of the packaging process the Pu is blended with inert material and transferred from 3013 Containers to Pipe Overpack Containers (POC's). One 3013 container will generate approx 20 POC's.

4. Target Year for Receipts is is 2019 for FRRS & 2032 for DRR

5. UNF from Sodium Reactor Experiment (SRE) campaign (36 SRE, 4 FNR, 107 DR3)

6. Current Capacity of L-Basin

7. Amended ROD authorizes processing of up to 1000 bundles of FRR/DRR and up to 200 HFIR cores

Acronyms

LEU	Low Enriched Uranium
HEU	Highly Enriched Uranium
FRR	Foreign Research Reactor
DRR	Domestic Research Reactor
UNF	Used Nuclear Fuel
HFIR	High Flux Isotope Reactor

Performance Metrics Definitions

Soil, Groundwater & Facilities

Waste Unit – An area where a hazardous substance has been deposited, stored, disposed of, placed, or otherwise come to be located at SRS. 515 waste units have been identified at SRS

Remediations Complete - those waste units (of the 515 SRS identified units) that have been completed (excavated, treated, put under land use controls, or found to need no further action), these include waste units where a final remediation system is still in operation and those waste units where a final passive remedy is in place, such as Monitored Natural Attenuation.

Facilities, Deactivated & Decommissioned (D&D) - those Industrial facilities, Nuclear facilities, or Radioactive facilities that have been completed (demolished and removed, closed in situ [as P-Area and R-Area reactors have been], or transferred to another DOE Program).1,103 facilities at SRS have been identified to be deactivated & decommissioned as part of the EM cleanup program

Soil, Groundwater & Facilities

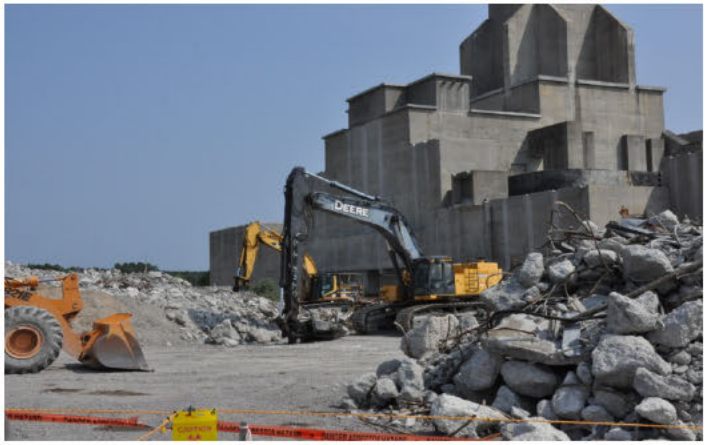
Waste Site Remediation

R Area Ash Basin

R Area Ash Basin

Deactivation & Decommission

P Area Disassembly Basin



Heavy Water Components Test Reactor

FY 2013 EM Performance Metrics Report
through April 30, 2013

Soil, Groundwater & Facilities *Measure*	Unit of Measure	Cum Actuals thru FY 2012	FY 2013 Analysis		End State Analysis			
			Actuals (FYTD)	Annual Target	Cum Act thru 2013 (FYTD)	End State	% Complete	Target Year to Complete
			4/30/13					
Remediations & Facilities								
Remediations Completed	**Waste Sites**	**399**	**0**	**0**	**399**	**515**	**77%**	**2042**
Facilities -Deactivated & Decommissioned								
Industrial Facilities- Major[1]		252	0	0	252	848		
Nuclear Facilities		11	0	0	11	201		
Radioactive Facilites		21	0	0	21	54		
Total Facilities D&D'd	**Major Facilities**	**284**	**0**	**0**	**284**	**1,103**	**26%**	**2042**

End State Basis

Soil, Groundwater & Facilities End State Year to Complete are based on 2012 Integrated Lifecycle Estimate

Summary

- **DOE-SR will continue to update and validate Lifecycle measures for the key operational areas of EM cleanup operations.**
  - Revised Nuclear Materials targets, resulting from Amended Record of Decision (ROD), will be shared with the CAB when available
- **Suggestions from the CAB for any additional improvements are welcomed.**

Acronyms

ARP	Actinide Removal Process
D&D	Deactivation & Decommission
DWPF	Defense Waste Processing Facility
FYTD	Fiscal Year to Date
HEU	Highly Enriched Uranium
LLW	Low Level Waste
MCU	Modular Caustic Side Solvent Unit
MLLW	Mixed Low level Waste
Pu	Plutonium
SRE	Sodium Reactor Experiment
SWPF	Salt Waste Processing Facility
TRU	Transuranic Waste
UNF	Used Nuclear Fuel
WIPP	Waste Isolation Pilot Plant