



U.S. DEPARTMENT OF
ENERGY



**2009 CONGRESSIONAL NUCLEAR CLEANUP CAUCUS
JUNE 11, 2009**

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EM Environmental Management

safety ❖ performance ❖ cleanup ❖ closure

www.em.doe.gov

Savannah River Site Rich History

HISTORY

- Established in 1950 to support national defense missions
 - Produced tritium (only source in U.S.) and weapons grade plutonium
 - Over 38,000 workers at peak – SRS covers 198,000 acres [310 sq. mi.]



SRS FIRSTS

- Produced radioactive fuel (Pu-238) for world's 1st “atomic battery” used in a space satellite
- Proved the existence of the neutrino
- Birthplace of modern science of ecology
- Designated 1st National Environmental Research Park
- Pioneered use of microbes in environmental cleanup
- Home to Nation's 1st waste vitrification facility



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Savannah River Site Long-Term Asset

TODAY

- Multi-program Site: DOE–Environmental Management and NNSA missions
- EM cleanup mission is a top priority
- Making measurable progress in cleanup of legacy waste contamination
- National asset with ongoing missions of importance to our Nation
- Dedicated and skilled Federal workforce
- Highly skilled contractor workforce ~11,000 employees
 - Savannah River Nuclear Solutions
 - Washington Savannah River Company
 - Parsons
 - Wackenhut
 - Shaw AREVA
 - U.S. Forest Service
 - University of GA



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SRS EM Mission

**Safely and Efficiently Clean Up Environmental Legacy * Reduce Risk
Protect Public Health and Environment * Transform Site for the Future**

Where We Started



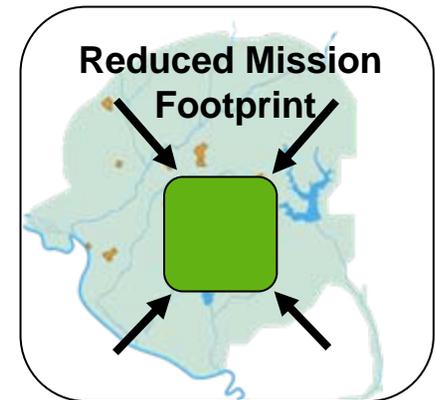
- 800+ contaminated facilities, soils and groundwater
- Excess nuclear materials
- 37 million gallons radioactive liquid tank waste

Ongoing Missions



- Science Leadership
- Innovative Technology
- National Security
- Nuclear Nonproliferation
- Homeland Security
- Energy Independence

THE FUTURE



- Cleanup of nuclear waste and environmental legacy complete
- Home to ongoing missions of national importance



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SRS Budget Summary [\$M]

EM – Environmental Management

EM FUNDING	FY 2009 Enacted	FY 2010 President's Budget
Environmental Cleanup	1,227	1,210
Safeguards & Security	134	132
Federal Program Direction	49	60
TOTAL	1,410	1,402

AMERICAN RECOVERY AND REINVESTMENT ACT *

To ensure adequate controls only 80% of ARRA funds are being allotted to the sites for obligation against contracts. The remaining 20% is being held at Headquarters and will be released after the projects are demonstrating adequate performance. Additionally, only 24% of ARRA funds can be costed until all contractor baseline plans have been submitted, reviewed, validated and approved.

1,615*



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SRS is Getting the Job Done

***Proven Track Record = SUSTAINED public confidence
in the Site's people and capabilities***

CLEANUP SOLUTIONS THAT RESOLVE THE NUCLEAR WASTE LEGACY

- Turning radioactive liquid waste to a solid, safe form for disposal since 1996
- Disposing of salt waste
- Emptying and closing radioactive waste tanks
- Completing disposal of solid waste [29,000 drums of TRU waste dispositioned]
- Protecting groundwater with technologies developed at SRNL [state-of-the-art]
- Single integrated cleanup of large contaminated areas [saving \$\$ and time]
- Decommissioned over 240 facilities, or approx. 2.5 million square feet
- Remediated over 330 of 515 waste units



T Area Before



T Area After

H Canyon



GATEWAY FOR NATIONWIDE NUCLEAR MATERIALS CONSOLIDATION AND ULTIMATE DISPOSITION

- Maintaining critical infrastructure and capabilities [H Canyon, K Area]
- Placing nuclear materials in a form for re-use or safe disposal
- Recycling uranium for commercial power production
- De-inventory and shutdown of other facilities to reduce cost & enhance security

CONTINUING VITAL MISSIONS FOR NATIONAL SECURITY AND ENERGY INDEPENDENCE



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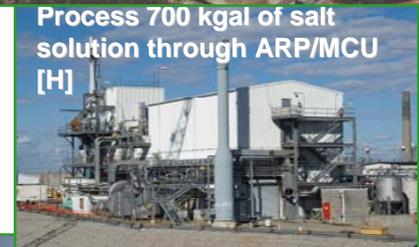
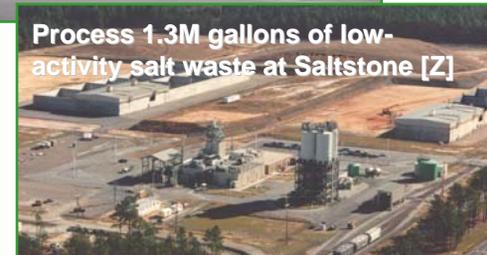
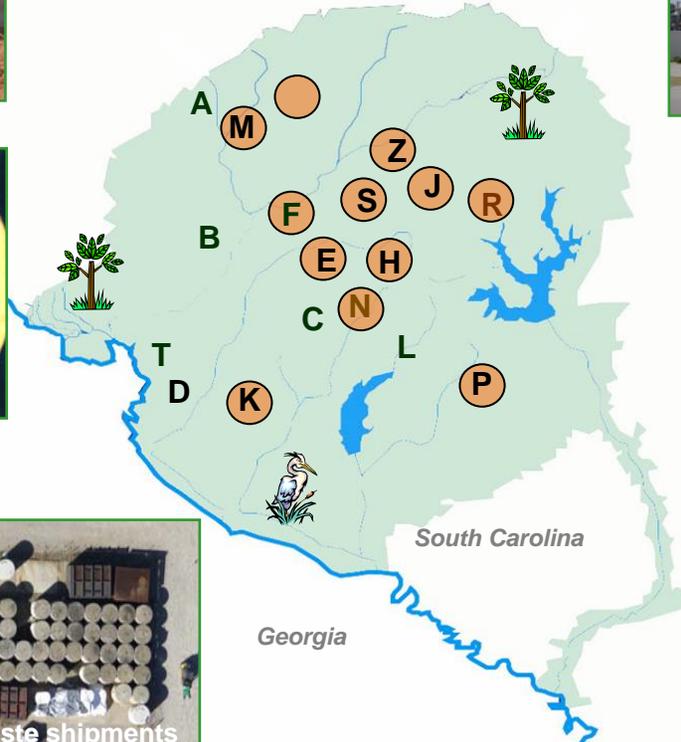
www.em.doe.gov

Quest for Continued Success

Key Priorities of Fiscal Year 2009 Baseline Budget

SAVANNAH RIVER SITE AREAS

○ = FY09 Budget Priorities
Ongoing Mission-Related Work Continues in Other Areas



Do it all SAFELY.



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More Opportunities for Success

SRS Recovery Act Footprint Reduction

AMERICAN RECOVERY AND REINVESTMENT ACT WILL:

- **CREATE** jobs
- **STIMULATE** economy
- **ACCELERATE** SRS cleanup program
- **REDUCE** the site's industrial area by 40 percent by 2011



SRS RECOVERY ACT FOOTPRINT REDUCTION PROJECT

- Funds Provided: Over \$1.6 billion
- Jobs to be created/saved: ~3000
- States impacted: South Carolina & Georgia

Clear work scope, cost estimates, and schedules are fully defined and supported.



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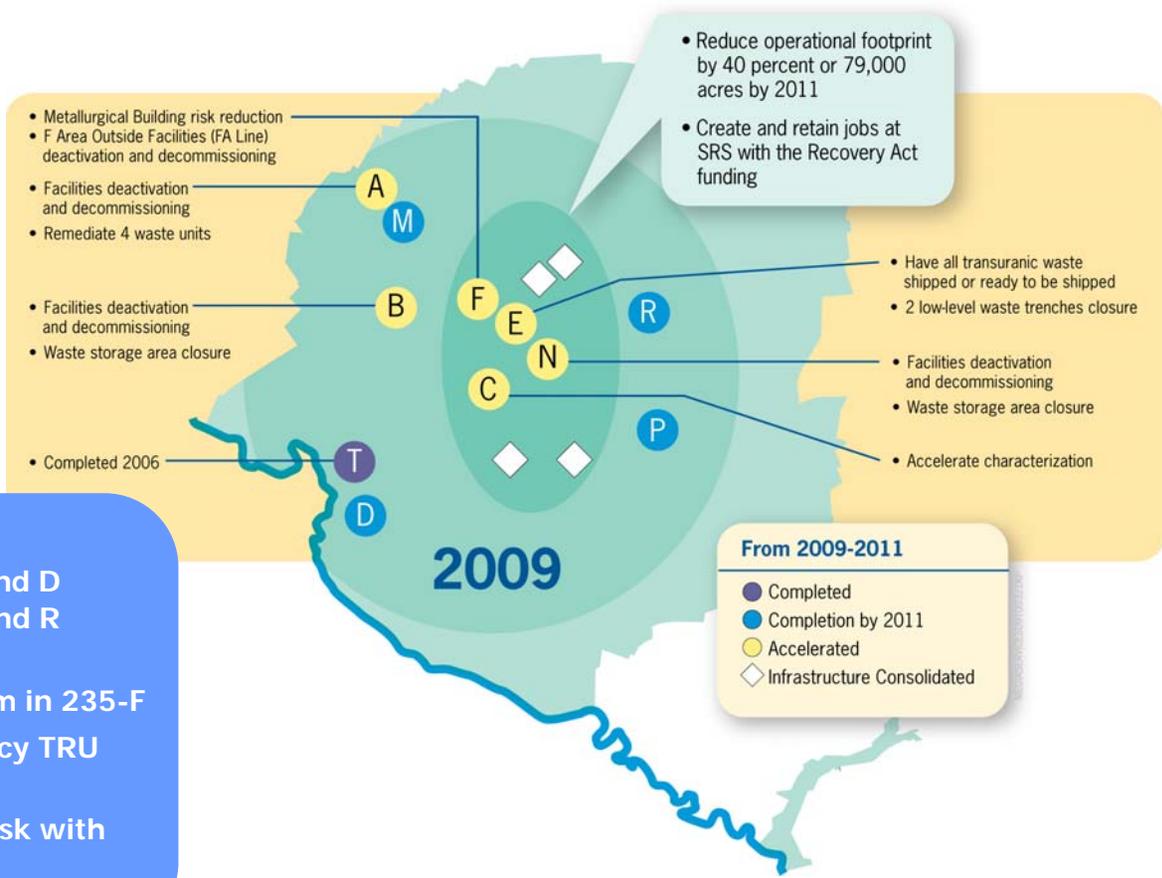
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What We Stand to Achieve . . . Beyond the Baseline

SRS RECOVERY ACT = MORE \$\$ = MORE PROGRESS

www.srs.gov/recovery



ACHIEVEMENTS AT A GLANCE

- Accelerate Area Completion in P, R, M, and D Areas, including decommissioning of P and R Reactors
- Eliminate 90% of the Pu-238 source term in 235-F
- Ship / stage / make ready 4500 m3 legacy TRU Waste for offsite disposal
- Ensure the reduction of environmental risk with large return on investment
- Achieve ~40% reduction of SRS footprint



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Scope of Recovery Work at SRS

MEASURABLE SUCCESS



69 waste units
remediated



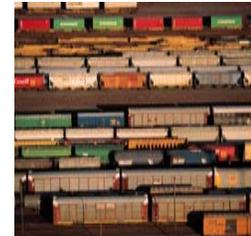
An area the size of 485
football fields end-to-end
or 33 miles

4,500 cubic meters
transuranic waste
disposed or staged



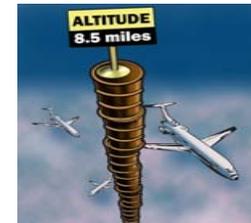
440 garbage truck loads

Decommissioning of
two reactors, including
the use of 260,000
cubic yards of grout



Grout would fill a loaded
train with 1,900 cars or
four average-sized home
maintenance stores

16,000 drums depleted
uranium oxide
disposed



Stack of drums 8.5 miles
high



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Area Closure – P and R

D&D of Production Reactors



DEACTIVATE AND DECOMMISSION (D&D) P REACTOR IN-PLACE



Now

- Place 130,000 cu. yds. permanent grout
- Treat 4 million gallons contaminated water
- Remediate 3 miles underground sewer lines
- Remediate 100 acres contaminated soils



End State

COMPLETE DEACTIVATION AND IN-PLACE DECOMMISSIONING OF R REACTOR



Now

- Complete grouting of Disassembly Basin
- Remediate 120 acres of contaminated soils
- Complete characterization and remediation of the 500-acre R Discharge Canal



End State



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Area Closure – D and M

Critical Cleanup Completions at SRS



COMPLETE CLOSURE OF D AREA [Former Heavy Water Production Facilities]



Before Demolition

- Complete D&D of D Area Powerhouse and 30 support facilities
- Remediate 210 acres and 117,000 cu. yds. tritium contaminated soils and concrete
- Remediate 30-acre contaminated groundwater plume



End State

COMPLETE CLOSURE OF M AREA [Former Reactor Fuel Manufacturing Area]



Before Demolition

- Complete remediation of 19 contaminated areas
- Remediate 45 acres of contaminated soils
- Remove all known sources to 1,500 acre groundwater plume



End State



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More Cleanup Acceleration and Waste and Material Disposition Costs Cut And Operations Consolidated at SRS



ACCELERATE CLEANUP IN OTHER AREAS

- Complete characterization of waste units in A Area and N Area
- 235-F stack and removal of 90% of Pu-238 source term
- Decommission numerous facilities, including:
 - Heavy Water Components Test Reactor
 - A-Line Facility in F Area
 - Consolidated Incineration Facility
 - A Area facilities, including 703-A
 - K Area Powerhouse, K Cooling Tower, and other excess K Area facilities



DISPOSITION LEGACY WASTE AND MATERIALS

- Disposition approximately 4,500 cubic meters of legacy transuranic [TRU] waste presently in inventory at SRS
 - Waste will either be shipped or characterized for offsite shipment to Waste Isolation Pilot Plant WIPP (TRU waste) or Nevada Test Site (treated MLLW)
- Consolidate all Resource Conservation and Recovery Act waste storage operations to E Area and close other facilities
- Disposition 16,000 drums of depleted uranium oxide

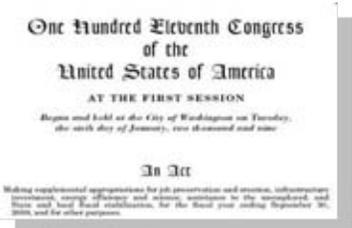
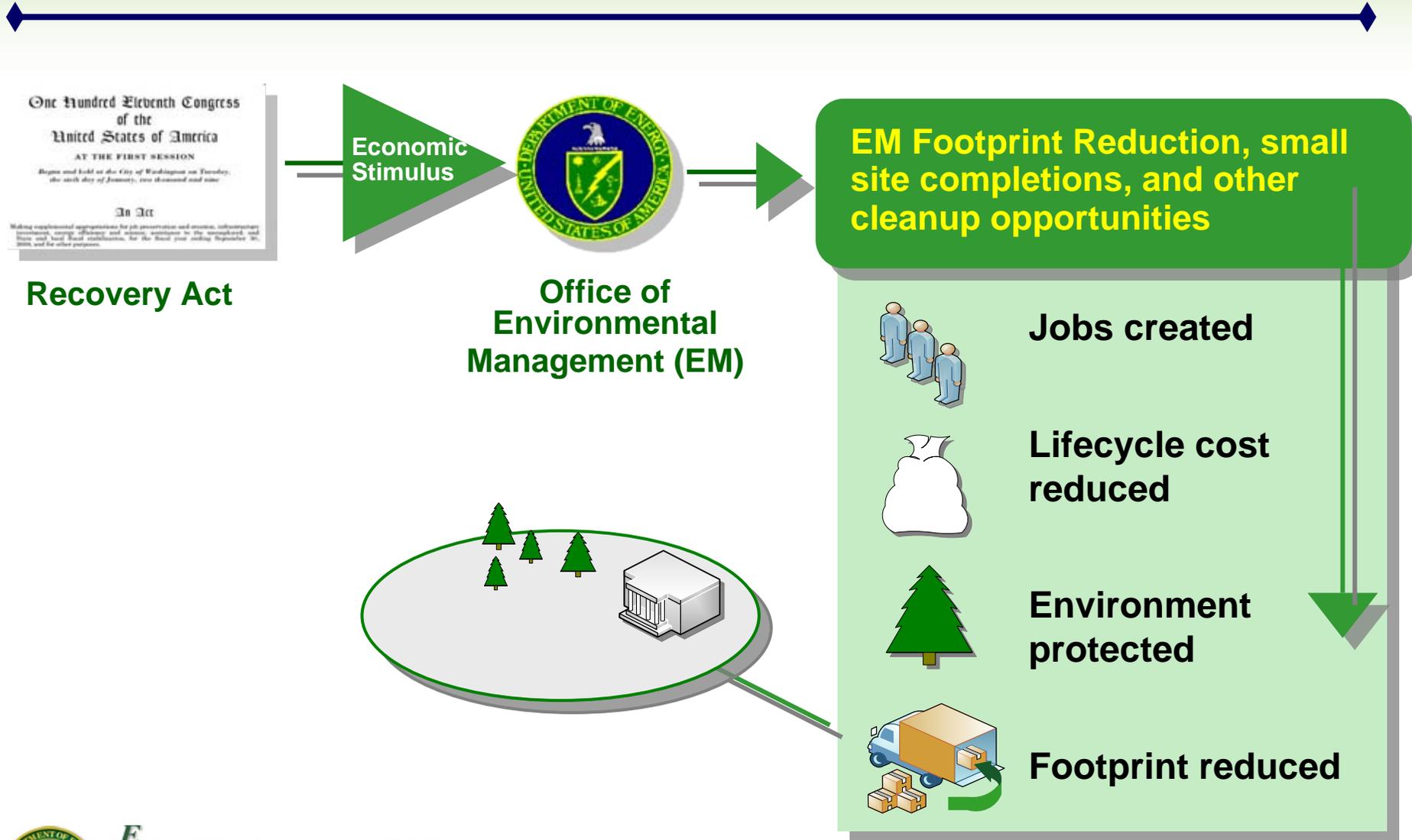


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The Big Picture

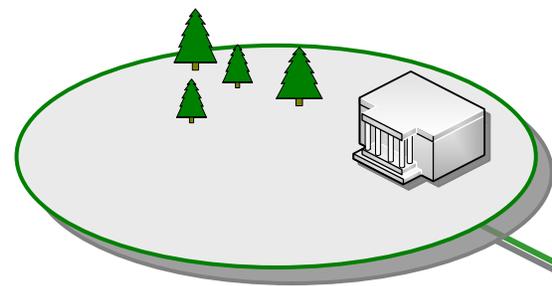
SRS Footprint Reduction Project End State



EM Footprint Reduction, small site completions, and other cleanup opportunities

Recovery Act

Office of Environmental Management (EM)



Jobs created



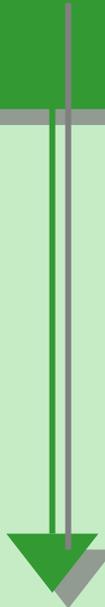
Lifecycle cost reduced



Environment protected



Footprint reduced



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Real People Taking Recovery and Results *Forward at SRS*



TO DATE

- Over 400 Recovery Act jobs created – new workers complete safety and security training
- First shipment of remote handled (RH) transuranic (TRU) waste shipped to Waste Isolation Pilot Plant in New Mexico
- R Reactor deactivation activities under way
- Decommissioning of A Area facilities started



New Employee Training



1st Shipment of RH TRU

SUPPORTS ENERGY SECRETARY'S PRIORITIES

Quickly implement economic stimulus

Create new jobs



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Focused Priorities for SRS Team

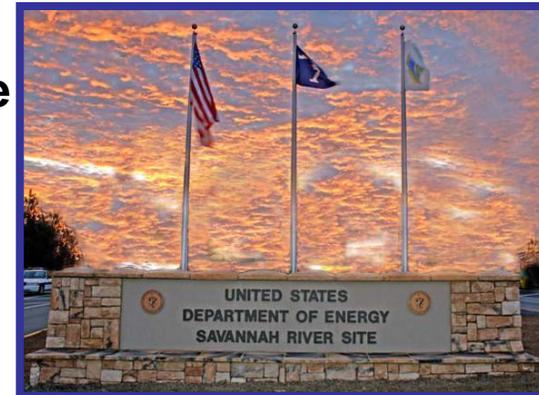
Superior Performance * Raising the Bar Continually * Securing the Future

• ACCELERATE CLEANUP WITH RECOVERY ACT FUNDING

- Strong DOE and contractor oversight
- Funds spent wisely and work completed on schedule
- Openness and accountability to taxpayers

• MAINTAIN PERSPECTIVE

- Disposition of Nuclear Materials and Liquid Waste remain high priority projects



• DOE AND ITS CONTRACTORS DEMONSTRATE ABILITY TO DELIVER

- Support National EM program mission
- Meet cleanup commitments
- Execute all work safely
- Make remarkable reductions in risks
- Cut lifecycle costs



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Dave Olson, Executive Vice President

Washington Savannah River Company



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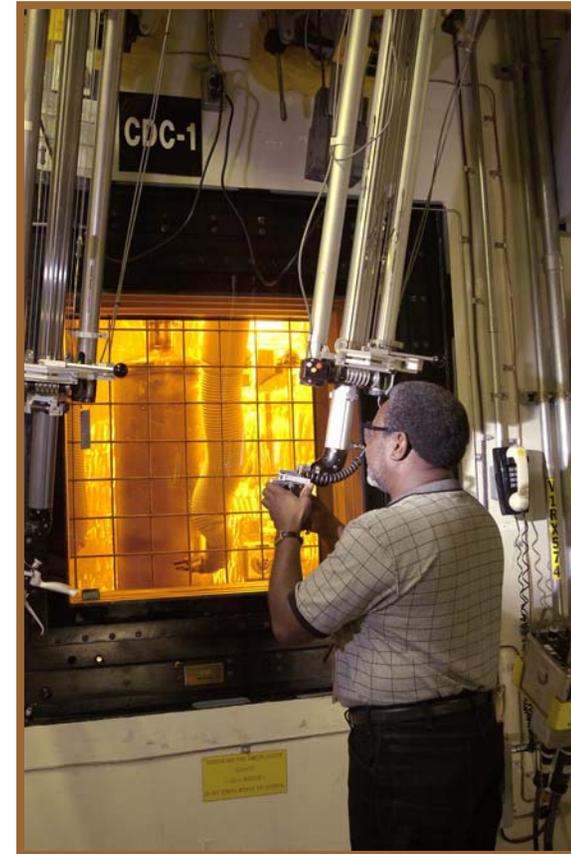
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Washington Savannah River Company

Liquid Waste Contractor at SRS

SCOPE OF WORK

- WSRC is Liquid Waste (LW) contractor for SRS through June 30 [*SRS contractor since 1989*]
- WSRC workforce = 2,000 employees [*incl. subs*]
- Savannah River Remediation (SRR) takes over as LW contractor July 1 [*contract award 12/2008*]
- SRR contract is for the next 6 years, with a 2-year extension option
- **SRS Liquid Waste Operations includes:**
 - 49 remaining waste tanks (2 tank farms)
 - 5 major facilities
 - 37 million gallons of waste
 - Highest risk material in South Carolina
- **LW contract requires safely operating the integrated system of facilities to disposition high-activity radioactive liquid waste and low-activity liquid waste.**



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Safety Performance at SRS

Safety is a Core Value of WSRC Culture



RISK	PERFORMANCE
Chemical	Manage over 61 million pounds of chemicals without a reportable employee or environmental impact in over 3 years
Industrial	Address typical industrial safety hazards while maintaining injury frequency rates 12 times lower than the national average
Radiological	Process 37 million gallons of high-activity radioactive liquid waste for final disposition without a radiological intake or personnel contamination in the past 14 months

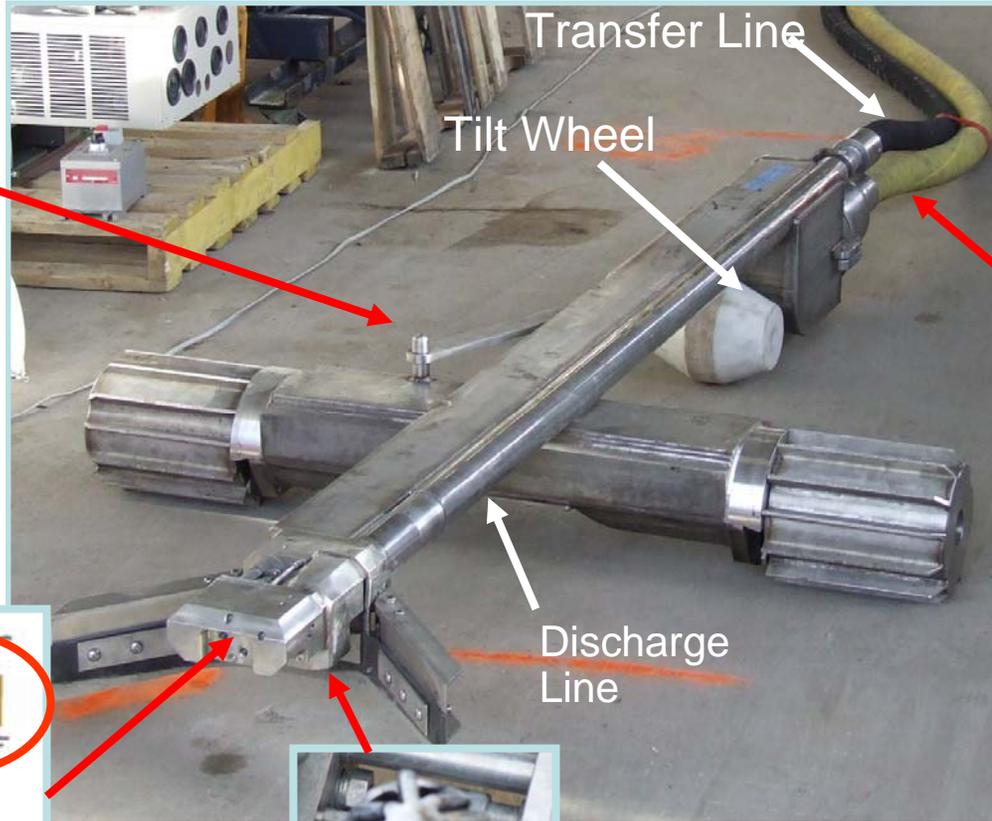
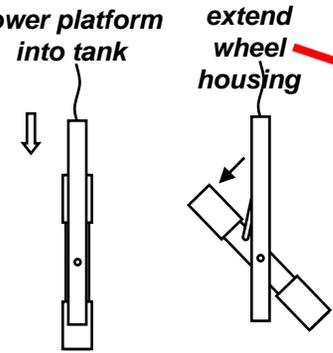
- Recent Safety Awards & Milestones
- 23 Million Safe Hours – Construction
 - 10 Million Safe Hours – LW Operations
 - Second Consecutive VPP Legacy of STARs Award

- Recent Safety Awards & Milestones
- Sixth Consecutive VPP Star of Excellence Award
 - National Safety Council
 - Occupational Excellence Achievement Award
 - Award Given for 10 Million Safe Hours Worked

Science and Technology at Work in Liquid Waste

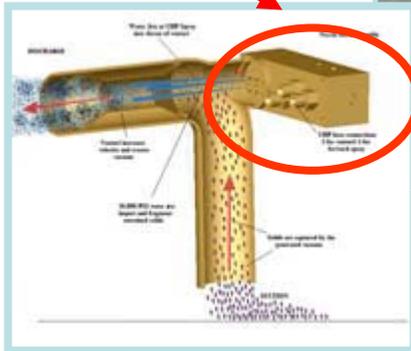
Sand Mantis Removes Hardened Waste from Tank Bottom

Tank Insertion



Video Clip
Umbilical Line
(Contains Hydraulic, HP and UHP Hoses)

Eductor



Suction

Sand Mantis
robotic device
removes much
of the residual
waste from
tanks, further
reducing risk.



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Liquid Waste Operations

Cost and Schedule Achievements/Project Management

INTERIM SALT WASTE PROCESSING

- **Actinide Removal Process/Modular Caustic Side Solvent Extraction Unit (ARP/MCU):** Began operations one year ago on time and under budget
 - ~362,000 gallons processed
 - Providing Salt Waste Processing Facility operational experience to improve its future reliability



DEFENSE WASTE PROCESSING FACILITY

- **Poured 193 canisters in 2008; 64 canisters since Jan. 1**
- **Since operations began at DWPF in 1996: Poured 10 million pounds of glass/topped 2,600 canisters/more than 15 million curies removed from tanks**



TANK CLOSURE

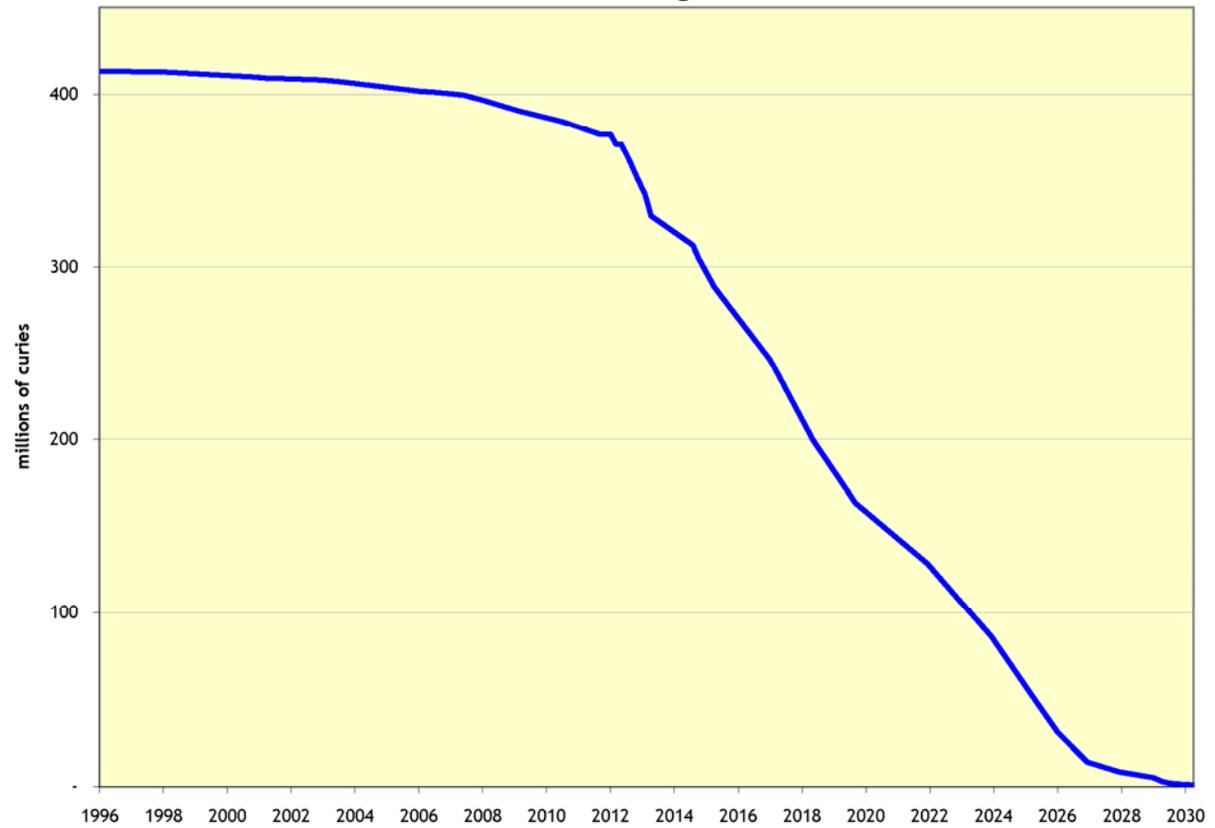
- **Four tanks on schedule to meet or exceed Federal Facilities Agreement closure requirements**



WSRC Delivering Results at SRS

- Highest risk materials being safely dispositioned
- Reducing risk of potential environmental contamination and public threat by emptying waste from oldest waste tanks and cleaning tanks
- Protecting workers and the public
- Reducing the radiological risk

CURIES STORED IN SRS HLW TANKS



Mark Breor, Vice President

Parsons



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Infrastructure and Technology

SRS Salt Waste Processing Facility Project

SCOPE OF WORK

- Contractor for Salt Waste Processing Facility (SWPF) project
- Process over 33 million gallons of stored high-activity radioactive salt waste, reducing a significant hazard to the public and environment at SRS
- Support DOE's highest SRS priority to close tank farms, reduce risk and complete the DOE EM cleanup mission
- December 2008: Final design completed and full construction of first-of-kind facility authorized by DOE
- Safety of our workforce is Parsons' 1st priority



SWPF Project Progression SRS J Area



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PARSONS

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SWPF: Proven Technology and Performance

- **TECHNOLOGY PROVEN** to remove radioactivity from bulk of stored waste at SRS
- **SCHEDULE:** Radioactive operation on track to start in 2013
- **COST :** Total Project Cost is projected below the DOE Performance Baseline of \$1.339 billion
- **LESSONS LEARNED IMPLEMENTED:** Progressive program in place implementing lessons learned from DOE, federal and commercial construction projects



SWPF Project Management

- **SUPPLIER OVERSIGHT INCREASED:** Full-time Parsons oversight in supplier facilities for SWPF critical components ensures safety and quality standards are met.
- **ACTIVE CONSTRUCTABILITY TEAM:** Complexity in wall/floor joints reduced and number of wall concrete pours reduced 40%. Basemat cure times reduced 50%.
- **EARLY OPERATIONS INVOLVEMENT:** Full-time Parsons involvement from start of design and participation in constructability reviews.
- **TRIPPING AND FALL HAZARDS:** Eliminated in basemat design and on rebar walking surfaces.
- **PIPE WELDING:** Conducted rigorous root cause analysis on supplier quality issues and took aggressive action to strengthen oversight and inspections of supplier work. Field welds to install the facility floor drain piping have been performing well with significantly reduced rejection rates (~2%).



Lessons Learned Implemented at SWPF



Setting the right standards in welding performance on site and at supplier facilities

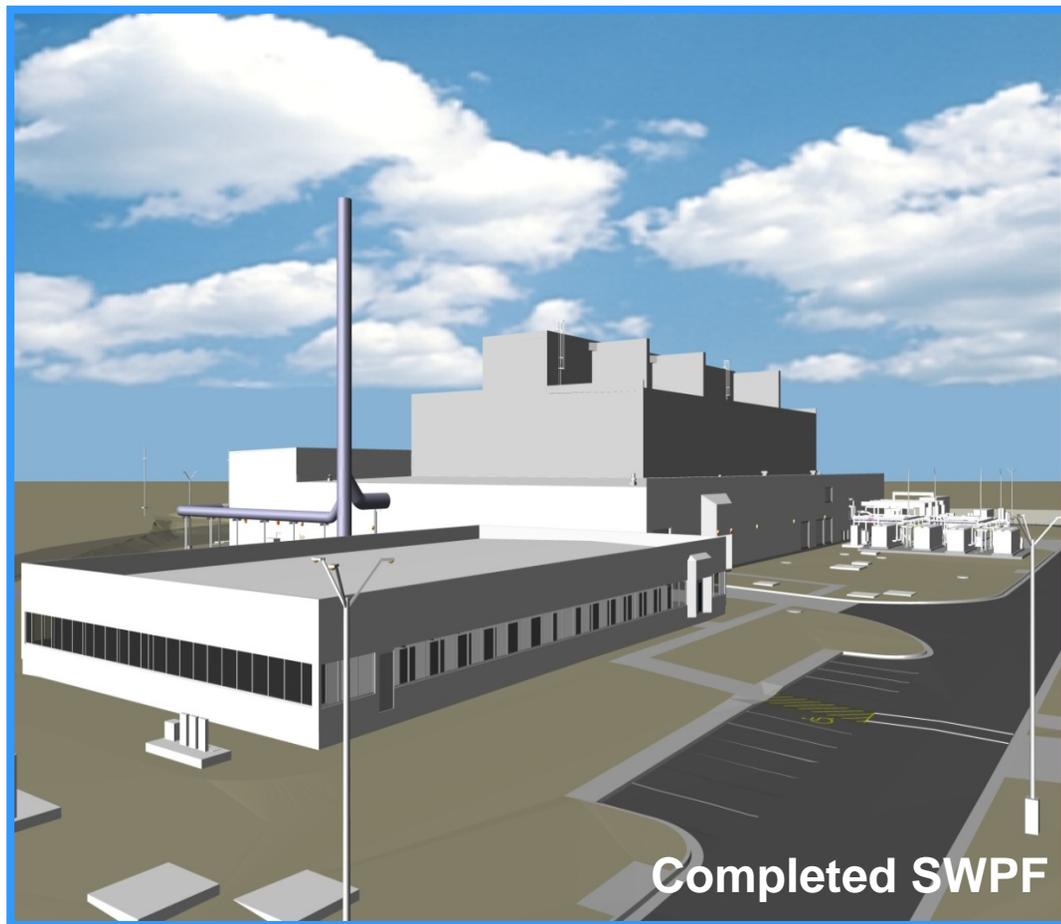


Concrete placement lessons
Hanford Waste Treatment Plant
and commercial industry



Parsons Delivering Results at SRS 2009-2010 SWPF Goals

- Ramp up construction workforce to ~650
- Complete basemat pours
- Complete facility walls
- Install large tanks
- Commence piping installation
- Prepare for roof installation
- Prepare for 2013 startup, which advances SRS EM cleanup and risk reduction goals



Chuck Munns, President and CEO

Savannah River Nuclear Solutions, LLC



Savannah River
Nuclear Solutions, LLC
A Fluor Daniel Partnership



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Savannah River Nuclear Solutions, LLC

SRS Management and Operating Contractor

SCOPE OF WORK

- Management and Operating contractor for SRS and the Savannah River National Lab [*contract award 1/2008*]
- Strong heritage in Engineering, Construction, Global Defense, Technology and Manufacturing
- [*Fluor * Northrop Grumman * Honeywell*]
- 6,000 experienced employees supporting DOE missions:
 - Consolidating nuclear materials from around the nation and preparing for reuse or shipment to long-term disposal
 - Projects for national and energy security
 - Safeguarding proliferable materials
 - Putting science to work to help all EM sites reduce risk
 - Turning weapons-usable uranium into reactor fuel that powers the Southeast
 - Closing entire geographic areas



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Savannah River
Nuclear Solutions, LLC
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Continued Excellence in Safe Operations at SRS



- Nearly 60 years of safely working with nuclear materials in an operational setting
- Environmental releases at all-time low
- Radiation exposure to workers stays at a minimum
- New regulatory interfaces and agreements enhancing safety and enabling productivity



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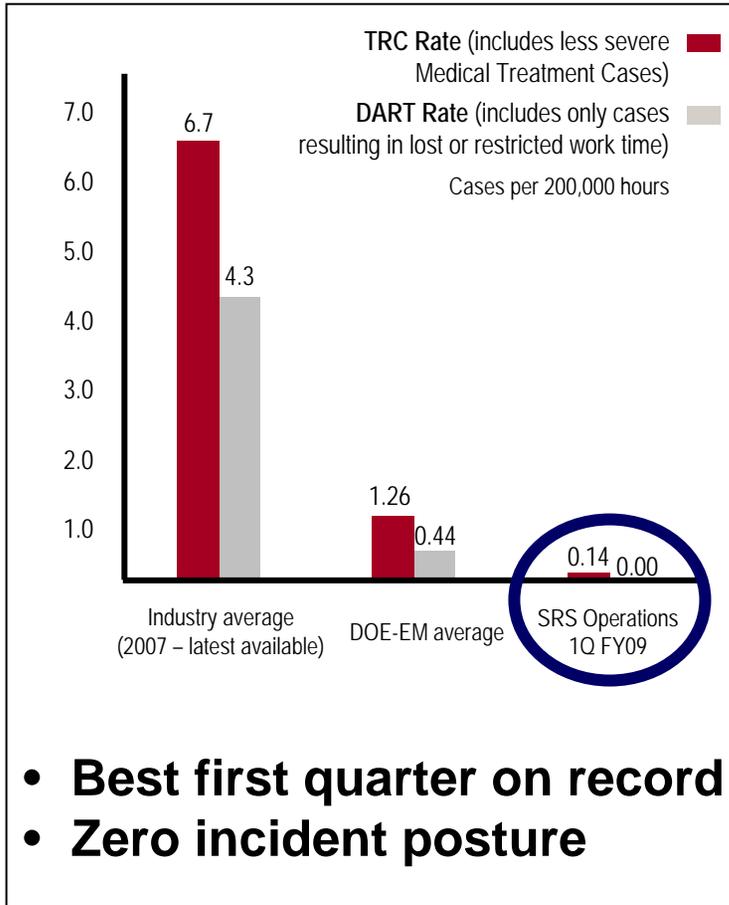
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Safety Performance at SRS

Safety is a Core Value of SRNS Culture



• The Hazards

- Nuclear criticality and controls
- Nuclear material handling, manual and remote
- Constantly changing hazards in D&D work
- Radiological controls
- Heavy equipment

• The Controls

- Processes in place
 - Integrated Safety Management
 - Behavior Based Safety
 - Human Performance Initiative
 - Automated Hazards Analysis
- Continuing emphasis
 - Pre-shift briefings
 - Toolbox meetings
 - Subcontractor quarterly safety forums



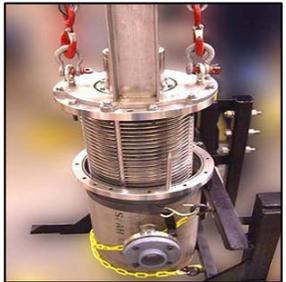
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Science and Technology at SRS

SRNL Putting Science to Work



- **Projects that support Complex-wide cleanup as EM's Corporate Laboratory**
 - Pretreatment solutions for tank cleanup
 - Center for Sustainable Soil and Groundwater
 - Performance of cement as waste form
- **Technologies and projects to support FY09 planned accomplishments**
 - Increase waste loading and production for DWPF
 - Public radiological protection through waste disposal assessments
- **Technologies and projects that fit into and support opening the Site for other missions/beneficial reuse**
 - Biofuels work from regional non-food products
 - Production of H₂ using SRNL's Hybrid Sulfur Thermochemical process
- **Energy efficiency**
 - Smart grid research and development, using excess grid capacity
 - New biofuel power plant will dramatically improve energy production



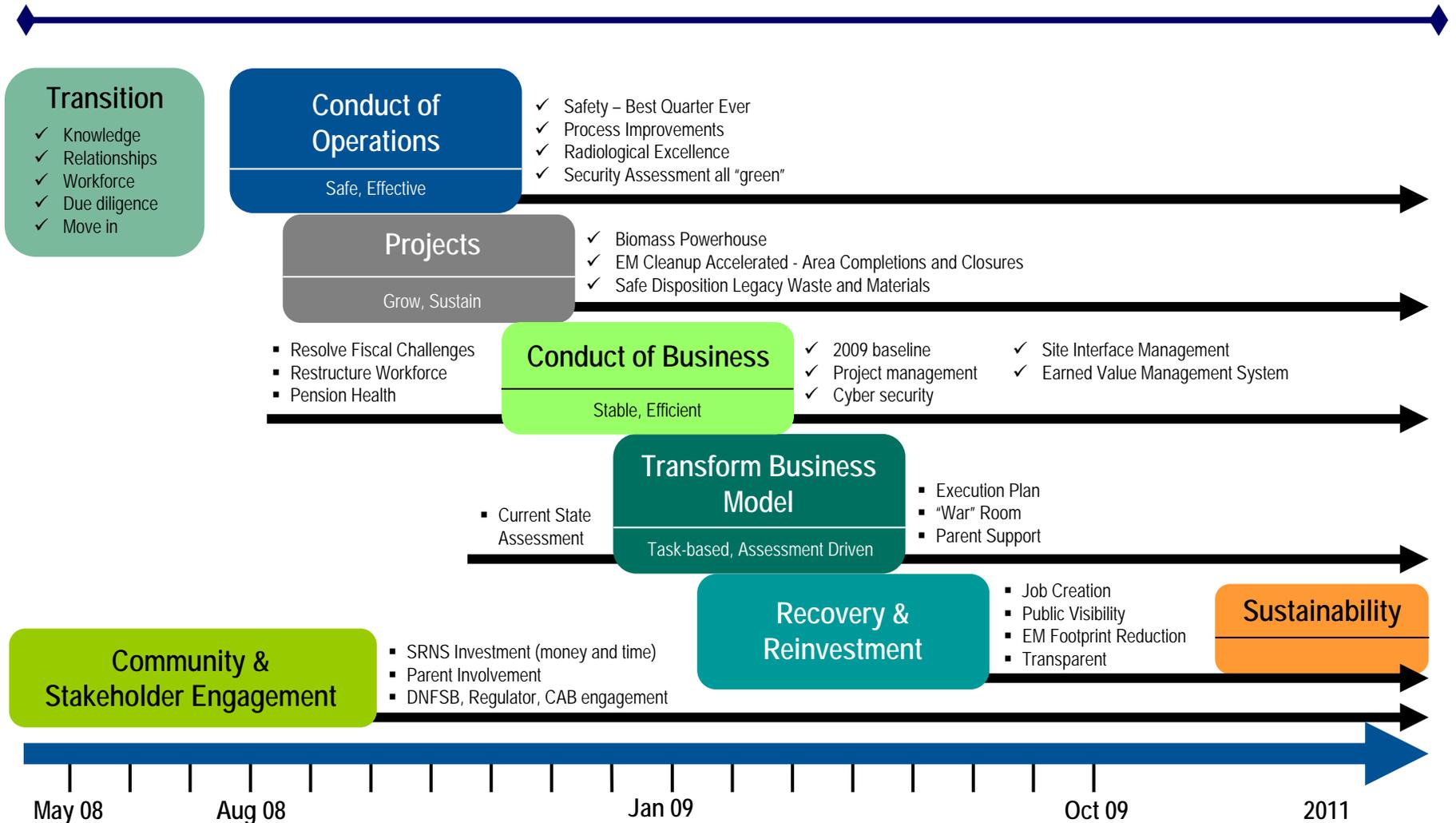
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SRS Management and Operations

Rigor ♦ Renewal ♦ Results



SRNS Delivering Results at SRS

- **Cleaning up and reducing risk**
- **Protecting environment and public with focus on safety**
- **Putting people to work**
- **Accelerating the baseline**
- **Efficiently using taxpayer dollars**
- **Managing EM's plutonium mission at SRS**
- **Serving a nonproliferation need for the nation and the world**
- **Finding answers for future mission opportunities**



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Implementing Recovery Act Investments at SRS



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