Welcome to the 36th Annual

WM Symposia Conference

Non-profit organization dedicated to education and opportunity in waste management

Dr. Inés Triay

Assistant Secretary
US DOE - EM

EM Environmental Management
safety ❖ performance ❖ cleanup ❖ closure

WM2010
PHOENIX

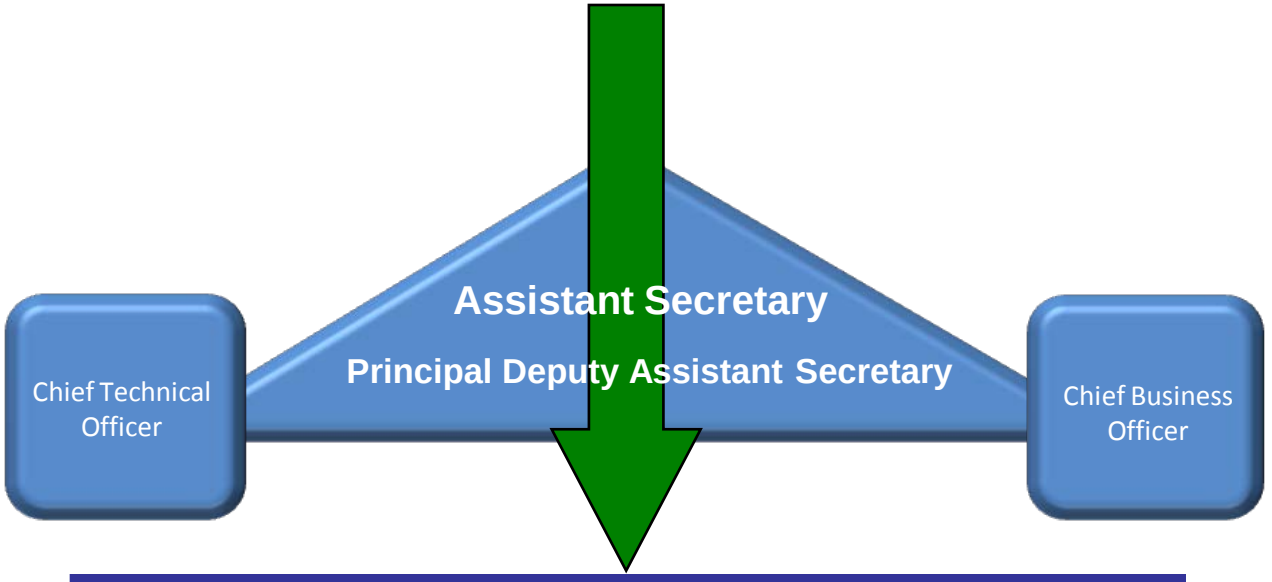
U.S. DEPARTMENT OF ENERGY

2010 Waste Management Symposia

Dr. Inés Triay
Assistant Secretary
Environmental Management

March 8, 2010

EM is embarked on a Journey to Excellence



Our Vision:
"EM completes quality work safely, on schedule and within cost and delivers demonstrated value to the American taxpayer."

EM Mission and 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."






- Activities to maintain a safe, secure, and compliant posture in the EM complex
- Radioactive tank waste stabilization, treatment, and disposal
- Spent nuclear fuel storage, receipt, and disposition
- Special nuclear material consolidation, processing, and disposition
- High priority groundwater remediation
- Transuranic and mixed/low-level waste disposition
- Soil and groundwater remediation
- Excess facilities deactivation and decommissioning (D&D)

EM Program Goals

- **Risk Reduction**
  - Ensure the safety and health of the public and the workers
  - Protect the environment
  - Reduce the EM footprint by 90% by 2015
- **Maintain Compliance**
  - 37 compliance agreements with state and federal regulatory agencies
  - Complete building the capability for dispositioning tank waste, nuclear materials, and spent nuclear fuel
- **EM American Recovery and Reinvestment Act Goals**
  - Thousands of jobs created or saved
  - Reduce the EM footprint by 40% by 2011
- **Improve Project Performance**
  - Improve construction project performance
  - Deliver all projects on time and within cost
  - Get EM projects removed from the GAO High Risk List
- **Establish strategic options for Special Nuclear Materials, Spent Nuclear Fuel, Radioactive Tank Waste, Groundwater and Excess Facilities not currently in the EM portfolio**
  - Overall objective is to reduce life-cycle costs and shorten the period of program execution

EM Strategic Goals

- **Improve Project Management**
  - Restructure the project portfolio
  - Adapt the Office of Science construction project model to EM
    - Construction Project Review, front end planning; appropriate pricing and contingency
  - Establish Performance Metrics for EM operating projects
  - Align project and contract management
  - Streamline the acquisition process

- **Utilize Science and Technology to optimize the efficiency of**
  - **tank waste**
  - **excess nuclear materials**
  - **spent nuclear fuel**
  - **groundwater treatment and disposition**

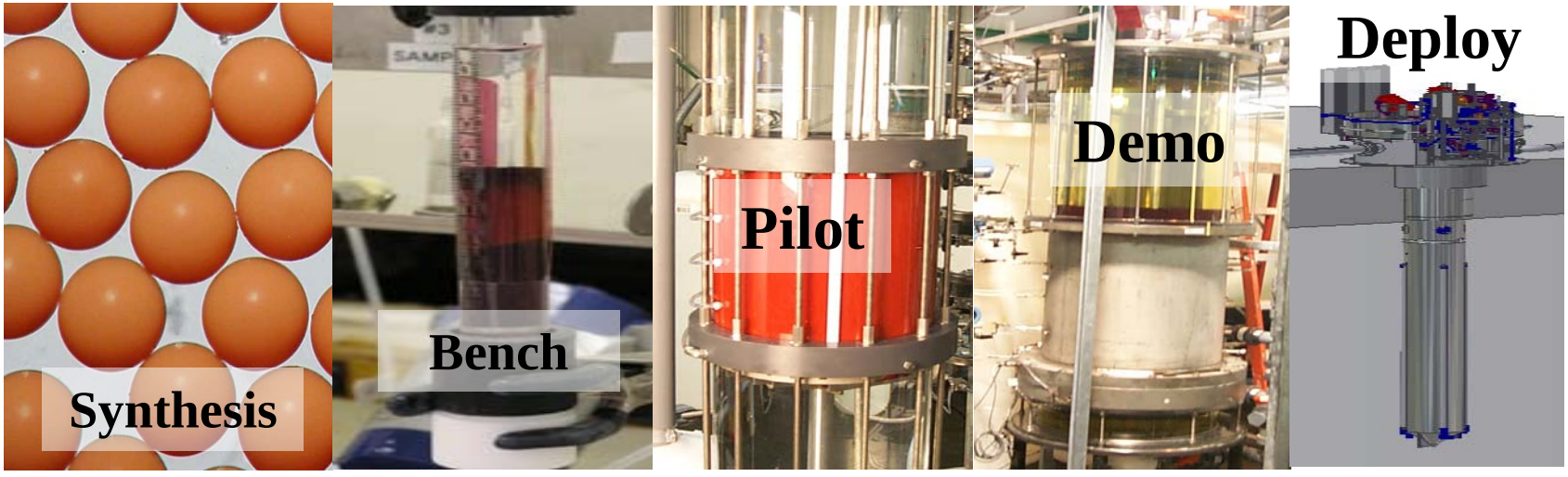
  - Evaluate programmatic alternatives to reduce the life cycle cost and period of execution

Procurement and Contract Management Initiative

- **Expected results: develop specific actions by EM and contractors to fundamentally improve performance**
- **Approach**
  - EM-wide survey to key Federal and contractor staff to identify specific contract management issues and barriers
  - Two targeted workshops: one for key contract executives (March 3) and one for key EM contract managers (March 4) based on survey results to address:
    - What can contractors do to avert performance issues?
    - What can the Federal side do to improve awareness and vigilance?
  - Integrated report developed on actions to be taken by EM and contractors to immediately improve contract performance
  - Follow on vigilance to ensure that all actions are implemented
- **Supports the EM goal to:**
  - Improve construction project performance;
  - Deliver all projects on time and within cost; and
  - Get EM projects removed from the GAO High Risk List

Technology Development Process

(Small Column Ion Exchange)



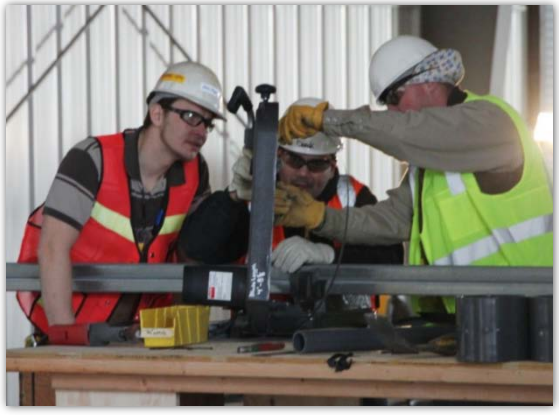
- Technology and Innovation Development has been core provider for developments such as Small Column Ion Exchange
- Process supports bench scale testing to provide conceptual flow sheets, pilot-scaled testing for flowsheet optimization, demonstrations at 1/10 full scale, and deployable designs
- Deployment of Small Column Ion Exchange expected to reduce life cycle by 7 years at Hanford and at Savannah River

Program Status

- **Establishment of the Environmental Management program**
  - Result of Cold War legacy
  - Third largest liability to the United States government and taxpayer
  - Single largest environmental project in the world
- **EM legacy footprint**
  - Past: 3121 square miles at 107 sites in 35 states
  - Projected for end of FY 2011: ~ 450 square miles at 14 sites in 11 states
- **EM is well positioned for continued success**
  - Optimize structure of the portfolio by increasing:
    - Project management focus
    - Operational metrics to ascertain performance
  - Overlay regulatory compliance commitments
  - Best business practices to maximize cleanup progress

20 Years of Progress

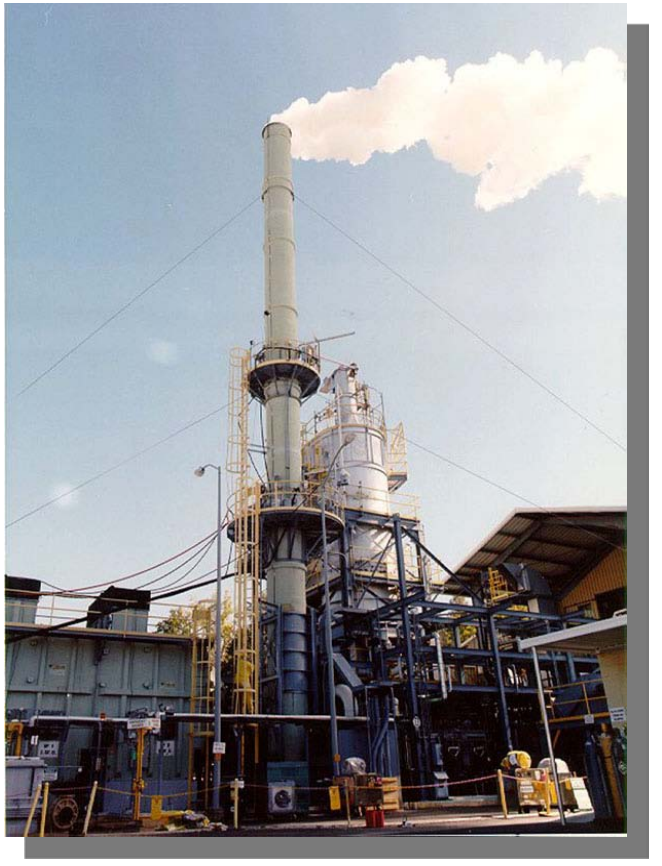
- **Tank Waste Management**
  - Stabilized millions of gallons of radioactive tank waste
    - Completed 9 tank closures (2 tanks at Savannah River; 7 tanks at Idaho)
    - Completed 16 tank retrievals
  - Defense Waste Processing Facility operational in 1996
  - West Valley Demonstration Plant
    - Operational in 1996
    - Produced 275 canisters of vitrified high level waste
    - Completed processing in 2002
  - Construction initiated on three additional tank waste processing facilities
    - Hanford Waste Treatment and Immobilization Plant (2003)
    - Savannah River Salt Waste Processing Facility (2005)
    - Idaho Sodium Bearing Waste Treatment Facility (2007)



- **Stabilized 100% of surplus special nuclear materials**
  - Consolidated all EM-owned surplus Pu at SRS
- **Transferred all spent nuclear fuel from wet to dry storage at Hanford (just over 2,100 metric tons)**
  - Hanford K-East Basin closed and D&D complete

20 Years of Progress

- **Transuranic Waste**
  - **Waste Isolation Pilot Plant opened in 1999**
    - World's only operating deep geologic repository
    - Safely disposed of approximately 64,000 cubic meters of transuranic waste in first 10 years of operation
    - First contact-handled transuranic waste shipment in March 1999 from Los Alamos
    - First remote-handled transuranic waste shipment in January 2007 from Idaho
- **Groundwater**
  - **Treated over 240 square kilometers of contaminated groundwater**
  - **Stabilized more than 180 contaminated groundwater plumes**
    - Hanford—migration to the Columbia River
    - Idaho—Snake River aquifer
- **Accelerated completion of two large former weapons production facilities**
  - **Rocky Flats—50 years ahead of schedule, saving ~$20 billion from original estimate (2005)**
  - **Fernald—23 years ahead of schedule, saving $200 million from original estimate (2006)**



FY 2011 Budget Request Highlights

- **Funds tank waste management and treatment activities across the complex**
  - Hanford Waste Treatment and Immobilization Plant ($740M)
    - to accelerate completion of design
  - Savannah River Salt Waste Processing Facility ($288M)
    - for construction and pre-operations
  - Idaho Sodium Bearing Waste Treatment ($6.5M)
    - to complete construction activities
  - Tank waste retrievals at Hanford and Savannah River ($95M)
    - to meet regulatory commitments
- **Increased funding at Portsmouth to support accelerated D&D**

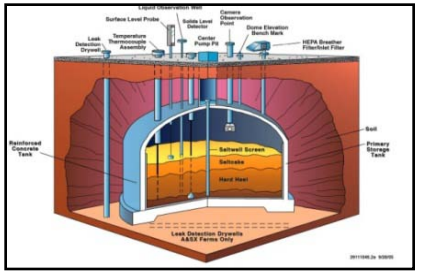
FY 2011 Budget Request Highlights

- **Increased technology investments**
  - Tank Waste Technologies ($60M)
    - Optimize tank waste disposition resulting in technology insertion points into the tank waste system that will yield significant cost savings and reduce the period of execution
  - Groundwater Remediation ($25M)
    - Understand and quantify the subsurface flow and contaminant transport behavior in complex geological systems
- **Small site completions**
  - Brookhaven National Laboratory ($13.8M)
  - Stanford Linear Accelerator ($3.5M)
  - Separations Process Research Unit ($12.5M)
  - General Electric Vallecitos Nuclear Center (less than $100k)

Waste Retrieval and Closure Technologies

Challenge

- Increase capability to remove tank waste material
- Reduce waste volumes
- Increase storage capacity in existing tanks
- Ability to assess environmental safety of grouted waste residuals in tanks



Possible Solutions

- Develop alternative chemical cleaning methods to control tank heel chemistry
- Develop improved methods for tank waste handling and tank space usage
- Develop in-tank settling technologies to separate radionuclides
- Evaluate cementitious materials for in tank closure

Benefits

- Reduces retrieval time and improves efficiencies
- Reduces further environmental impact when retrieving from unsound tanks
- Reduces waste volume to maximize available tank space
- Provides backup evaporative capability to single large evaporator
- Provides predictive modeling and materials for tank closure decisions

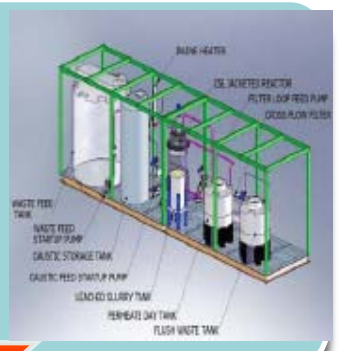
Alternative Waste Pretreatment

Challenges

- Accelerate tank waste treatment by using small, at-tank systems
- Increase incorporation of long-lived radionuclides in immobilized waste forms
- Remove glass-limiting, non-hazardous chemicals from waste to increase WTP's efficiency
- Obtain reliable data without physical sampling

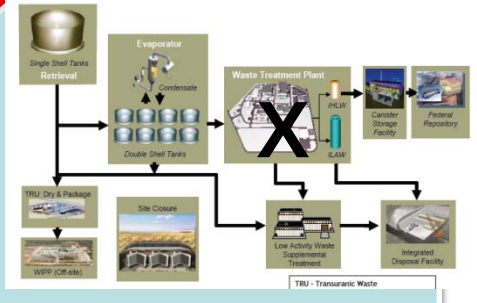
Possible Solutions

- Develop At-Tank/Near-Tank processing to provide supplemental waste treatment cap.
- Develop approaches for managing Technetium during processing
- Develop in-situ tank characterization technologies
- Develop advanced separation technologies to address key waste constituents (aluminum, sodium and sulfate removal; Lithium Hydrotalcite process for sodiu removal, beginning with bench-scale testing)



Benefits

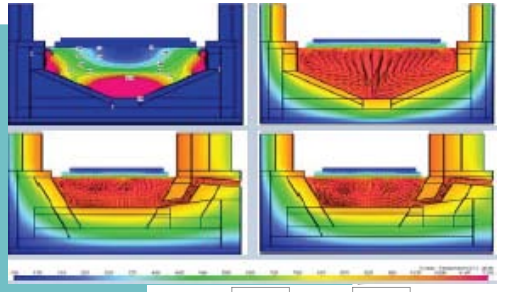
- Decrease WTP mission duration
- Reduce or eliminate second LAW facility
- Increase WTP efficiency
- Reduce amount of glass produced, thus reducing disposal costs
- Minimize releases to Hanford soils and groundwater
- Reduces worker exposure and gives real-time data for process control

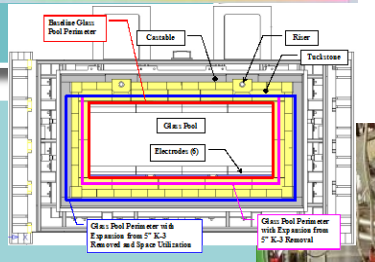


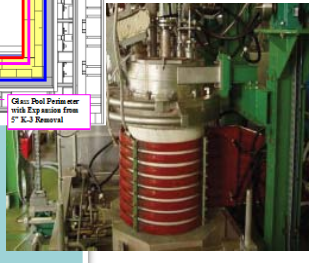
Improved Vitrification Capacity

Challenges

- Next generation melters are needed to increase WTP throughput
- Develop understanding a process tools for maintaining cold cap on melt surface







Possible Solutions

- Develop next-generation melters such as advanced joule-heated melter and cold crucible induction melter
- Develop advance process understanding of cold-cap chemistry

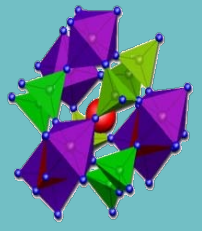
Benefits

- Increase WTP efficiency by increasing melter throughput and increasing waste loading
- Increase flexibility in alternative waste forms
- Increase steady state operations by reducing process upsets

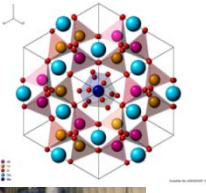
Increased Waste Loadings

Challenges

- Reduce total amount of glass by increasing waste loaded into the glass
- Develop treatment options for broader range of wastes including selected LAW's



iron phosphate local structure



Possible Solutions

- Increase waste loading to reduce the total amount of glass produced
- Develop Alternative Treatment and Disposal Processes

Benefits

- Increases WTP efficiency by increasing waste loading into glass without effecting melt rates.
- Reduces the amount of additional LAW capacity needed
- Provides another waste form for immobilizing waste from entering the environment

Advanced Simulation Capability for Environmental Management (ASCEM)

Challenge

Current performance assessments (PAs) and risk analyses do not always provide realistic estimates of cleanup time and costs due to poor understanding of contaminant fate and transport processes in the subsurface and difficulties in predicting long-term performance of engineered barriers.

Solution

Develop an integrated, high-performance computer modeling capability for waste degradation and contaminant release; multiphase, multicomponent, multiscale subsurface flow and contaminant transport; and environmental exposure and risk assessment, with systematic uncertainty analyses, to support the next generation of PAs.

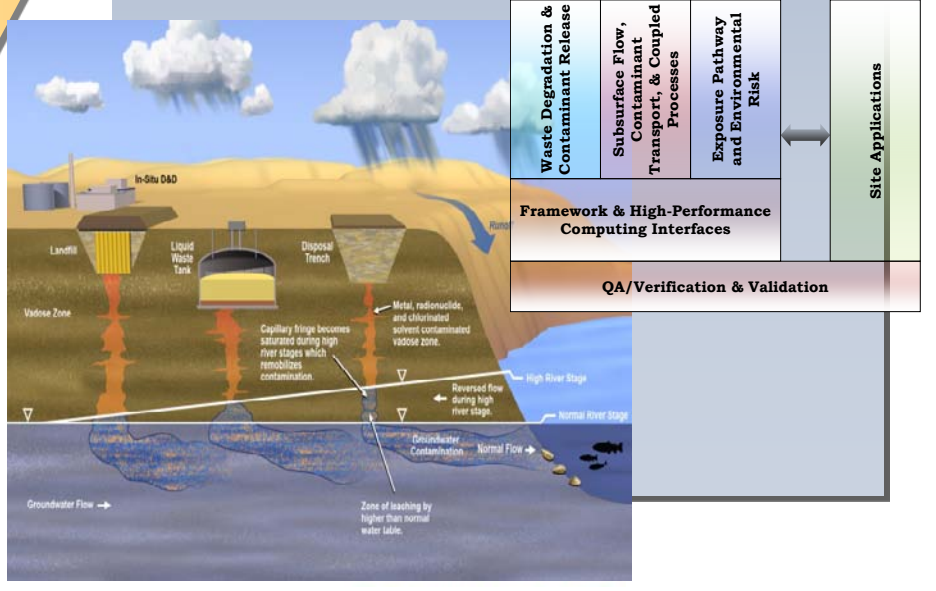
Approach

Progress in SciDAC, SESP, and EFRC (SC) research on subsurface processes; recent advancements in high-performance computing technologies; similar advanced modeling and simulation programs of NE and FE; and RW's total system performance assessment provide essential building blocks and valuable lessons learned for developing ASCEM.

Teaming with SC, NE, RW, and FE as well as other Federal agencies (through ISCMEM) enables full leveraging of existing work for maximum returns on investment.

ASCEM Description

ASCEM is a state-of-the-art scientific tool and approach for understanding and predicting contaminant fate and transport in natural and engineered systems. The modular and open source high performance computing tool will facilitate integrated approaches to modeling and site characterization that enable robust and standardized assessments of performance and risk for EM cleanup and closure activities. Use of ASCEM will help EM better estimate cleanup time and costs, and reduce uncertainties and risks.



Environmental Management

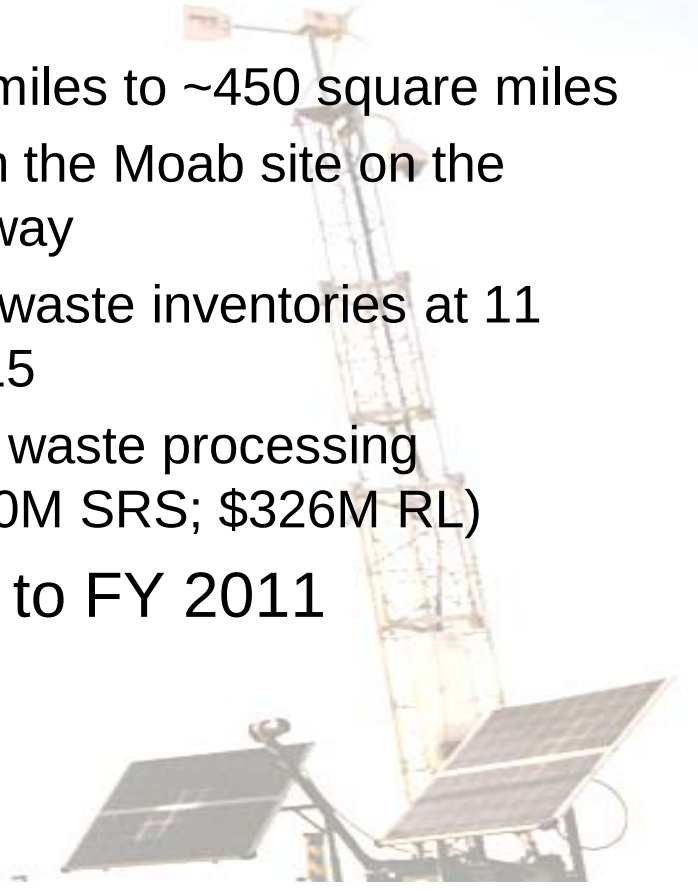
safety ❖ performance ❖ cleanup ❖ closure

Infusion of Recovery Act Funds

- Recovery Act leads to job creation and environmental cleanup progress
  - More than 99% of Recovery Act funds have been allocated to sites
  - $5.77 billion obligated to contracts for EM Recovery projects
  - Over $1.1 billion spent on Recovery work as of January 2010
  - Achieved 136% of EM small business contracting goal
  - Across EM, $2.3B awarded to small businesses as of September 2009
    - Recovery Act Total: $697M
      - Prime Contractors: $397M
    - Base Program Total: $1.6B
      - Prime Contractors: $393M
  - Thousands of jobs created or saved

Infusion of Recovery Act Funds

- Recovery Act accomplishments
  - Drives EM footprint reduction
    - 40% by September 2011; ~900 square miles to ~450 square miles
  - Removal of 2 million tons of mill tailings from the Moab site on the Colorado River to a disposal cell 30 miles away
  - Accelerate disposition of legacy transuranic waste inventories at 11 sites by seven years, from FY2022 to FY2015
  - Build out of infrastructure needed to support waste processing operations once construction complete ($200M SRS; $326M RL)
- Acceleration of 3 small site completions to FY 2011
  - Brookhaven National Laboratory
  - Stanford Linear Accelerator
  - Separations Process Research Unit



EM International Objective: Continuing 15 Years of Cooperation

- **Purpose**
  - Study mutual waste management challenges
  - Continue international cooperation that has produced tangible results in the cleanup efforts
- **Current projects—Russia & Ukraine**
  - Focus on high-level waste and EM site cleanup needs
- **Strategy**
  - Focus cooperation on EM's accelerated closure mission
    - Align with EM Technology Roadmap and Multi-Year Program Plan
  - Leverage international expertise and experience
  - Continue highly-beneficial relationships with leading international scientists
  - Promote the sharing of lessons learned
  - Be an effective mechanism to coordinate national laboratory, university, and industry activity at an international level
  - Promote the EM mission through a focus on transformational solutions

"Energy, Economy, Environment, and Education are Inextricably Linked"

The Challenge: Maintaining Momentum

- Safely conducting work
- Managing performance-based projects with life cycles over several decades
- Producing results with robust project management practices
- Applying first-of-a-kind technologies
- Achieving footprint reduction and near-term completions
- Managing and maintaining an “able and stable” workforce
- Using Recovery Act funds to create sustainable environmental cleanup jobs, with lasting economic benefits

Back up slides

Discussion Topics

- Journey to Excellence
- EM Mission, Program and Priorities
- Program Status
- 2011 Budget Request
- American Recovery and Reinvestment Act
- EM's International Objective

EM Strategic Goals

- **Improve Safety Performance with the goal of zero accidents/incidents**
- **Improve Project Management**
  - Restructure the project portfolio
  - Adapt the Office of Science construction project model to EM
    - Construction Project Review, front end planning; appropriate pricing and contingency
  - Establish Performance Metrics for EM operating projects
  - Align project and contract management
  - Streamline the acquisition process
- **Achieve Excellence in Management and Leadership with the objective of making EM an employer of choice in the federal government**
- **Align Headquarters and Field Operations in order to streamline decision making and improve efficiency**
- **Utilize Science and Technology to optimize the efficiency of tank waste, excess nuclear materials, spent nuclear fuel and groundwater treatment and disposition**
  - Evaluate programmatic alternatives to smartly reduce the cost of the program and period of execution

EM FY 2010 Goals

Safety: Improve Safety Performance towards a goal of zero accidents/incidents; aggressively evaluate all events to ensure continuous improvements

Goal: Maintain an average Total Recordable Case (TRC) Rate <1.5 and a Days Away from work, Restricted work or job Transfer (DART) Rate < 0.7

Processing/Treatment Capability/Capacity: Complete the high risk cleanup scope

Goal: Ensure line item construction projects are delivered on schedule and within approved baselines

Project Management: Performance is bound by size/complexity of projects, restructuring EM portfolio into appropriate categories and sizes will facilitate improvements in project performance while maintaining transparency of EM progress. Rather than to have all work compliant with DOE O 413.3, work will be categorized into Capital (Construction Projects, Cleanup Projects) and Non-Capital (Operational Activities, EM Programs).

Goal: Identify Key Performance Metrics for operational projects to ensure effective formulation and execution of work. Integration and alignment of the 5-year plan with validated baselines, contract requirements and FY10 formulation for 80% of active project baseline summaries for operating and construction projects.

Footprint Reduction-Recovery Act: Successfully complete scheduled activities for 2010

Goal: EM footprint will be reduced from 900 square miles to approximately 450 square miles by September 2011 and about 90 square miles (approx. 80% to 90%) of the initial footprint by September 2015. Complete legacy cleanup at Brookhaven, SPRU and SLAC by end of FY2011

Science and Technology: Use science and technology development to decrease the life cycle cost and the period of execution of the program

Goal: Establish Strategic Options for the EM portfolio in order to maximize cleanup progress. Identify technology insertion points to optimize the efficiency of tank waste, excess nuclear materials, spent nuclear fuel and groundwater treatment and disposition

Funding by Site (FY 2009-2011)

Site	FY 2009 Approp	FY 2009 ARRA	FY 2010 Cong. Req.	FY 2010 Approp	FY 2011 Request
Argonne	19,479	98,500	-	10,000	-
Brookhaven	8,433	42,355	12,614	15,000	13,861
ETEC	15,000	54,175	13,000	13,000	10,679
Hanford	1,057,496	1,634,500	993,503	1,080,503	1,041,822
Idaho	489,239	467,875	411,168	469,168	412,000
Los Alamos	226,082	211,775	191,938	199,438	200,000
Inhalation Toxicology Lab	272	-	-	-	-
Lawrence Livermore	688	-	1,148	1,148	873
Miamisburg	35,331	19,700	33,243	33,243	-
Moab	40,699	108,350	30,671	39,000	31,000
Nevada	76,741	44,325	65,674	65,674	66,000
Oak Ridge	498,688	755,110	411,168	436,168	450,000
River Protection	1,009,943	326,035	1,098,000	1,098,000	1,158,178
Paducah	169,947	78,800	144,857	172,127	145,000
Portsmouth	240,715	118,200	319,663	303,307	479,035
Savannah River	1,361,479	1,615,400	1,342,013	1,342,013	1,349,863
SPRU	18,000	51,775	15,000	15,000	12,500
SLAC	4,883	7,925	4,600	4,600	3,526
WIPP	240,591	172,375	224,981	234,981	225,000
West Valley	68,300	73,875	59,933	59,933	60,000
Other	38,631	-	12,551	16,551	6,375
Program Direction	309,807	30,000	355,000	345,000	323,825
Program Support	33,930	-	34,000	34,000	25,143
Ur/Th Reimbursement	10,000	68,950	-	-	-
TD&D	31,415	-	55,000	20,000	32,320
D&D Fund Deposit	463,000	-	463,000	463,000	496,700
Unallocated	-	20,000	-	-	-
Subtotal, EM	6,468,789	6,000,000	6,292,725	6,470,854	6,543,700
UED&D Fund Offset:	(463,000)		(463,000)	(463,000)	(496,700)
Domestic Utility Fee Offset:	-		(200,000)	-	-
Defense Prior Year Offset:	(4,197)	-	-	-	-
Non-Def Prior Year Offset:	(925)	-	-	-	-
Transfer from Science:	(10,000)	-	-	-	-
Total, EM	5,990,667	6,000,000	5,629,725	6,007,854	6,047,000

Funding by State (FY 2009-2011)

State	FY 2009 Approp.	FY 2009 ARRA	FY 2010 Cong Req.	FY 2010 Approp	FY 2011 Cong. Req.
Arkansas	1,903	0	0	0	0
California	20,758	62,100	19,010	19,010	15,078
Colorado	9,302	0	6,375	6,375	6,375
Hawaii	1,618	0	0	0	0
Idaho	499,579	468,090	422,578	479,702	422,776
Illinois	19,479	98,500	0	10,000	0
Kentucky	180,788	79,430	154,921	181,419	153,951
Mississippi	3,806	0	0	4,000	0
Montana	1,903	0	0	0	0
Nevada	80,846	44,325	69,931	69,602	69,932
New Mexico	482,749	384,275	436,302	452,535	439,363
New York	94,733	168,005	87,547	89,933	86,361
Ohio	323,786	139,310	402,029	382,136	520,279
Pennsylvania	2,854	0	0	0	0
South Carolina	1,410,708	1,615,700	1,401,659	1,397,082	1,404,326
Tennessee	515,446	755,285	430,596	454,104	466,610
Texas	1,000	0	0	0	0
Utah	45,699	108,350	30,671	39,000	31,000
Washington	2,138,163	1,961,135	2,169,803	2,250,793	2,270,826
Washington, DC	170,669	115,495	198,303	172,163	160,123
Subtotal	6,005,789	6,000,000	5,829,725	6,007,854	6,047,000
PY Offsets	-15,122	0	0	0	0
Total	5,990,667	6,000,000	5,829,725	6,007,854	6,047,000

Note:
State Distribution includes funding for Program Direction and Safeguards and Security activities.
Excludes States with no EM presence, but total reflects all states funding.

Advanced Unit Operations and Scaling

Challenges

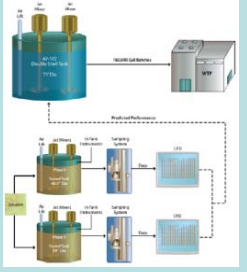
- To predict waste transport and mixing properties
- Validated waste simulants that mimic the actual waste for large-scale testing

Possible Solutions

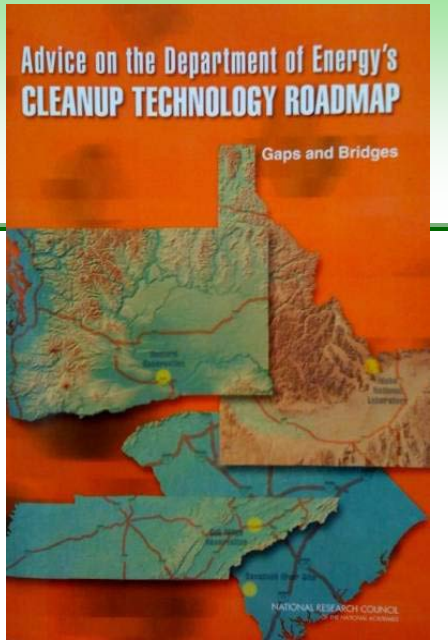
- Develop advanced multi-phase mixing methods
- Develop simulants to enable design verification

Benefits

- Optimizes WTP flowsheet by reducing over-conservatism
- Increases WTP flowsheet flexibility
- Allows for validated testing on large-scale equipment



EM Groundwater & Soil Program Technology Challenges

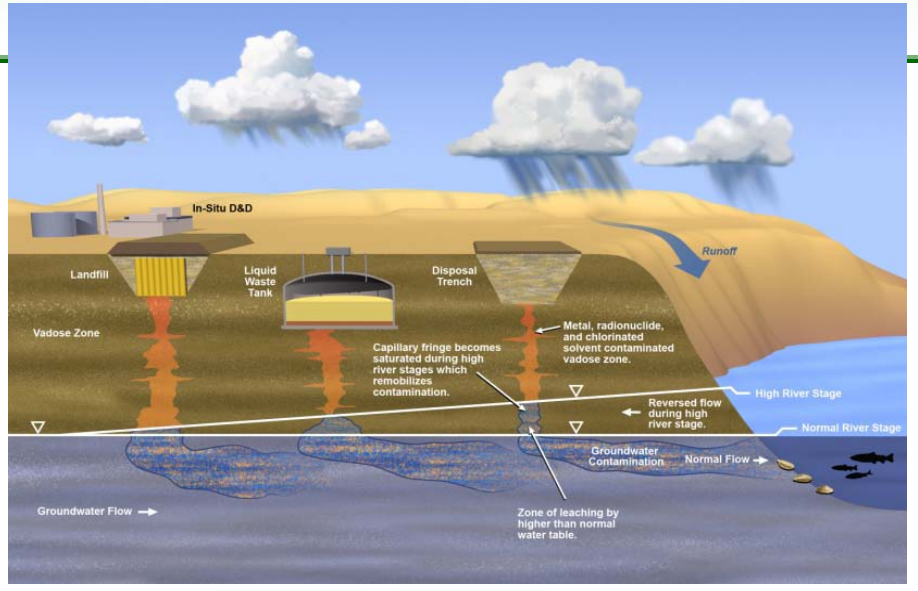


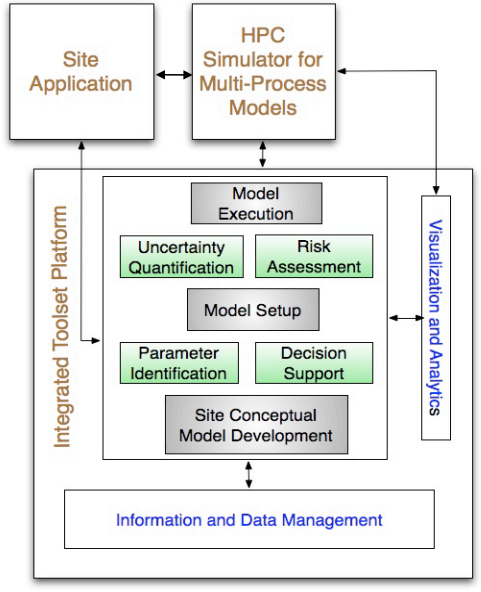
- **EM Technology Roadmap issued March 2008**
- **National Academies of Science reviewed and validated the EM Technology Program: *Advice on the Department of Energy's Cleanup Technology Roadmap: Gaps and Bridges* (2009)**

NAS prioritization of needs for the Groundwater and Soil Remediation Roadmap Area

GS#	Gap	Priority
GS-1	Contaminant behavior in the subsurface is poorly understood.	high
GS-2	Site and contaminant source characteristics may limit the usefulness of baseline subsurface remediation technologies.	medium
GS-3	Long-term performance of trench caps, liners, and reactive barriers cannot be assessed with current knowledge.	medium
GS-4	Long-term ability of cementitious materials to isolate wastes is not demonstrated.	high

What Will ASCEM Entail?





ASCEM Goals

- Simulate coupled processes (hydrological, geochemical, microbiological, & geomechanical)
- Develop graded, iterative and modular toolsets to accurately represent complex EM sites
- Include engineered barrier and waste form degradation, flow and transport, and environmental exposure
- Implement formal uncertainty quantification and decision tool analysis in a standardized framework
- Implement the capability to be portable from laptops to supercomputers
- Collaborate with user community to demonstrate ASCEM at EM sites
- Based on scientific understanding of subsurface processes and verified and validated with site performance data

Transformational Technology

- A science-based, flexible and extensible modular HPC simulator
- Enhanced uncertainty quantification and sensitivity analysis
- Advanced site and model data management capabilities

2011 Budget Request Compliance Status

- **Funds all essential activities to maintain a safe and secure posture in the EM complex**
  - Met 95% of the 176 major enforceable agreement milestones in FY 2009
  - In FY 2010, there are 137 major enforceable agreement milestones due
  - EM's goal is 100% compliance
- **Addresses EM cleanup activities governed by 37 agreements with federal and state regulators**
- **Fully funds the recently negotiated Tri-Party Agreement settlement with Washington state**
- **Supports the required TRU waste retrievals at Idaho consistent with the terms of the Idaho Settlement Agreement**

Base Program and Recovery Act Corporate Performance Measures

Performance Measure	Units	EM Program - FY 2009 Actuals			EM Program - FY 2010 Targets			EM Program - FY 2011 Targets		
		Base Program	ARRA	EM Total	Base Program	ARRA	EM Total	Base Program	ARRA	EM Total
Plutonium packaged for long-term disposition	number of containers	5,089	0	5,089	Measure Complete					
Enriched Uranium packaged for disposition	number of containers	7,629	0	7,629	7,728	0	7,728	7,728	0	7,728
Plutonium or Uranium Residues packaged for disposition	Kg. Bulk	107,828	0	107,828	Measure Complete					
Depleted and Other Uranium packaged for disposition	Metric Tons	14,636	0	14,636	14,636	11,646	26,282	32,186	11,646	43,832
Liquid Waste in Inventory eliminated	thousands of gal.	2,924	0	2,924	3,624	0	3,624	4,424	0	4,424
Liquid Waste Tanks closed	number of of tanks	9	0	9	9	0	9	11	0	11
High-Level Waste packaged for final disposition	number of containers	3,070	0	3,070	3,256	0	3,256	3,553	196	3,749
Spent Nuclear Fuel packaged for final disposition	MT of Heavy Metal	2,128	0	2,128	2,128	0	2,128	2,128	0	2,128
Transuranic Waste Dispositioned - Total	cubic meters	63,586	197	63,783	70,245	3,260	73,505	80,006	8,518	88,524
Low-Level/Mixed Low-Level Waste disposed	cubic meters	1,065,098	4,468	1,069,566	1,070,804	24,096	1,094,900	1,080,923	72,080	1,153,003
Material Access Areas eliminated	number of areas	26	0	26	30	0	30	30	0	30
Nuclear Facility Completions	number of facilities	93	8	101	99	19	118	110	37	147
Radioactive Facility Completions	number of facilities	363	6	369	369	43	412	390	87	477
Industrial Facility Completions	number of facilities	1,558	12	1,570	1,623	55	1,678	1,700	98	1,798
Remediation Complete	number of release sites	6,788	3	6,791	6,985	55	7,040	7,181	98	7,279
Geographic Sites Eliminated	number of Geographic sites	88	0	88	89	0	89	90	3	93

EM International Objectives: Continuing 15 Years of Cooperation

- **Explore collaborative technology development with international partners**
  - UK - Information and technical exchanges with the Nuclear Decommissioning Authority on technology readiness assessments, technology maturation plans, glass formulation and vitrification technology, and nuclear materials and facility life management
  - Russia - glass processing technology, groundwater & soils data
  - South Korea - melter technology
  - Potential collaborations with other countries
- **Maintain strong international ties with the IAEA**
- **Maintain ties to Nuclear Energy Agency**
- **Lead the U.S. government's technical implementation of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management**
- **Host and participate in international forums such as this Waste Management Symposium and the EM-30 Next Generation Melter Technology Workshop held March 3-5, 2010 in Washington involving representatives from China, Japan, Europe, United Kingdom, and many other countries**