Attachment 1
NRC Projects and Reports with Similarities to the Capabilities Identified in DOE's Draft Long-Term Stewardship Science and Technology Roadmap

NRC Projects in the Office of Nuclear Material Safety and Safeguards (NMSS) and Office of Research (RES)	
Containment of Residual Contaminants	
Capability 1. Site Conceptualization and Modeling Tools	
Roadmap capability description	NRC-related activities, resources (Reports listed after table)
Improve conceptual models, tools for forecasting long-term environmental conditions.	RES hydrology projects RES chemical effects on transport projects NMSS guidance and reports
Improve tools for modeling community at risk (similar to critical group).	RES dose standard setting projects RES performance assessment projects NMSS guidance and reports
Improve modeling containment system failure (similar to engineered barriers including disposal cell caps).	RES source term projects RES engineered barrier projects NMSS guidance and reports
Capability 2. Contamination Containment and Control Systems	
Roadmap capability description	NRC-related activities, resources (Reports listed after table)
Engineer natural environment, design/build/operate next-generation containment systems.	RES source term projects RES engineered barrier projects NMSS guidance

Monitoring the Site and the LTS System	
Capability 3. Sensors and Sensor Systems for Site Monitoring	
Roadmap capability description	NRC-related activities, resources, and reports
Identify monitoring needs for transport or exposure and fill sensor technology gaps, improve sensor/sensor systems.	RES monitoring project, no reports yet (new project)
Communicating within and beyond the LTS System	
Capability 4. Preservation and Communication of Site Information	
Roadmap capability description	NRC-related activities, resources, and reports
Provide integrated information visualization/display system, intergenerational information archiving	None

Capability 5. Site-Community Relations	
Roadmap capability description	NRC-related activities, resources, and reports
Ascertain effects on public trust and confidence, community involvement, and identify and solve problems that could undermine reliability and constancy in LTS institutions.	NMSS guidance and reports
Management of the LTS System	
Capability 6. LTS System Performance Verification and Monitoring	
Roadmap capability description	NRC-related activities, resources, and reports
Provide techniques to monitor long-term performance and management of LTS systems, integrate preventive maintenance, provide tools to manage performance data.	RES monitoring project, no reports yet (new project)

Capability 7. Effective and Survivable Land-Use Controls	
Roadmap capability description	NRC-related activities, resources, and reports
Develop legal pathway modules to help identify legal strategies, assess agreements, develop draft alternative legal instruments, and provide intergenerational archive options for maintaining land-use control information.	NMSS guidance and reports

Reports and Publications from the NRC's Research Program on Radionuclide Transport in the Environment
Source Term Projects
Clearance
Draft NUREG-1640, Radiological Assessments for Clearance of Equipment and Materials from Nuclear Facilities, March 1999.
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Site Decommissioning Management Plan
Felmy, A.R., "Solubility and Leaching Controls on Radionuclides in SDMP Wastes," U.S. Nuclear Regulatory Commission, draft NUREG/CR-6632, June 2000.
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NUREG/CR-6632, "Solubility and Leaching of Radionuclides in Site Decommissioning Management Plan (SDMP) Slags," February 2002.
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NUREG/CR-6766, "Release of Radionuclides and Chelating Agents from Fuel-System Decontamination and Ion-Exchange Resins," March 2002.

Akers, D. W. "Release of Radionucides and Chelating Agents from Full-System Decontamination Ion-Exchange Resins." NUREG/CR-6766, March 2002.
NUREG/CR-6587 “Environmental Dynamics of Carbon-14 Near a Low-Level Radioactive Waste Burial Ground”
Engineered Barrier Projects
Snyder, K.A., “Effect of Drying Shrinkage Cracks and Flexural Cracks on Concrete Bulk Permeability,” NISTIR 6519, 2000.
Snyder, K.A., “Validation and Modification of the 4SIGHT Computer Program”, NISTIR 6747, NIST, 2001.
Snyder, K. A. "Condition Assessment of concrete nuclear structures considered for entombment," NIST, February 2003.
Hydrology Projects
Nicholson, Thomas J., Chin-Fu Tsang, and Adam Hutter, “Scientific and Technical Issues Related to Mayak and Chernobyl Sites: Summary of a Round Table Discussion,” *Hydrological Science and Technology*, Special Issue, Volume 16, Numbers 1-4, 2000, pp. 3-12, 4th USA/CIS Joint Meeting Conference: Hydrological Issues of the 21st Century: Ecology, Environment and Human Health November 7-10, 1999, San Francisco, California, American Institute of Hydrology.
Timlin, D., J. Starr, R. Cady and T. Nicholson, “Comparison of Estimated Ground-Water Recharge Using Different Temporal Scales of Field Data” NUREG/CR-6653, U.S. Nuclear Regulatory Commission, Washington, DC, April 2000.
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NUREG/CR-6767 "Evaluation of Hydrologic Uncertainty Assessments for Decommissioning Sites Using Complex and Simplified Models," April 2002.
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“Arrangement on The OECD/NEA Sorption Project (Phase II), a ‘Benchmarking’ Exercise to Interpret Selected Well-Characterised Datasets for Sorption onto Complex Materials of Interest to Safety Assessments of Radioactive Waste Disposal Systems Using Several Different Modelling Approaches in Use at Various Organisations,” Nuclear Energy Agency, Organization for Economic Cooperation and Development, Paris, France, August 2000.
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Performance Assessment Projects
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"Residual Radioactive Contamination From Decommissioning - User's Manual DandD Version 2.1," NUREG/CR-5512, Volume 2, April 2001.

"U.S. Nuclear Regulatory Commission Decontamination and Decommissioning Software Testing", SAND2002-3233, October 2002.
"DandD Software Version 2.1 Instruction Manual", SAND2002-3234, October 2002.
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NUREG/CR-6676, *Probabilistic Dose Analysis Using Parameter Distributions Developed for RESRAD and RESRAD-BUILD Codes,* July 2000.
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NUREG/CR-6697, *Development of Probabilistic RESRAD 6.0 and RESRAD-BUILD 3.0 Computer Codes,* December 2000.
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NUREG/CR-6755, *Technical Basis for Calculating Radiation Doses for the Building Occupancy Scenario Using the Probabilistic RESRAD-BUILD 3.0 Code*, February 2002.
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None. The project has just started.

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Best Practices for Effective Public Involvement in Restricted-Use Decommissioning of NRC-Licensed Facilities, prepared by the U.S. Institute for Environmental Conflict Resolution for NRC, June 2002.
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NUREG-1757, Vol. 1, Final, *Consolidated NMSS Decommissioning Guidance,* September 2002. Chapter 17.7 provides guidance for use of institutional controls for restricting future site use.
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NUREG-1620, *Standard Review Plan for the Review of a Reclamation Plan for Mill tailings Sites Under Title II of the Uranium Mill Tailings Radiation Control Act,* June 2000.
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