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October 2002

OCRWM

Annual Report to Congress

Fiscal Year 2001

U.S. Department of Energy
Office of Civilian Radioactive Waste Management

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For further information, contact:

U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Planning and Administration Division, RW-54
1000 Independence Ave., S.W.
Washington, DC 20585

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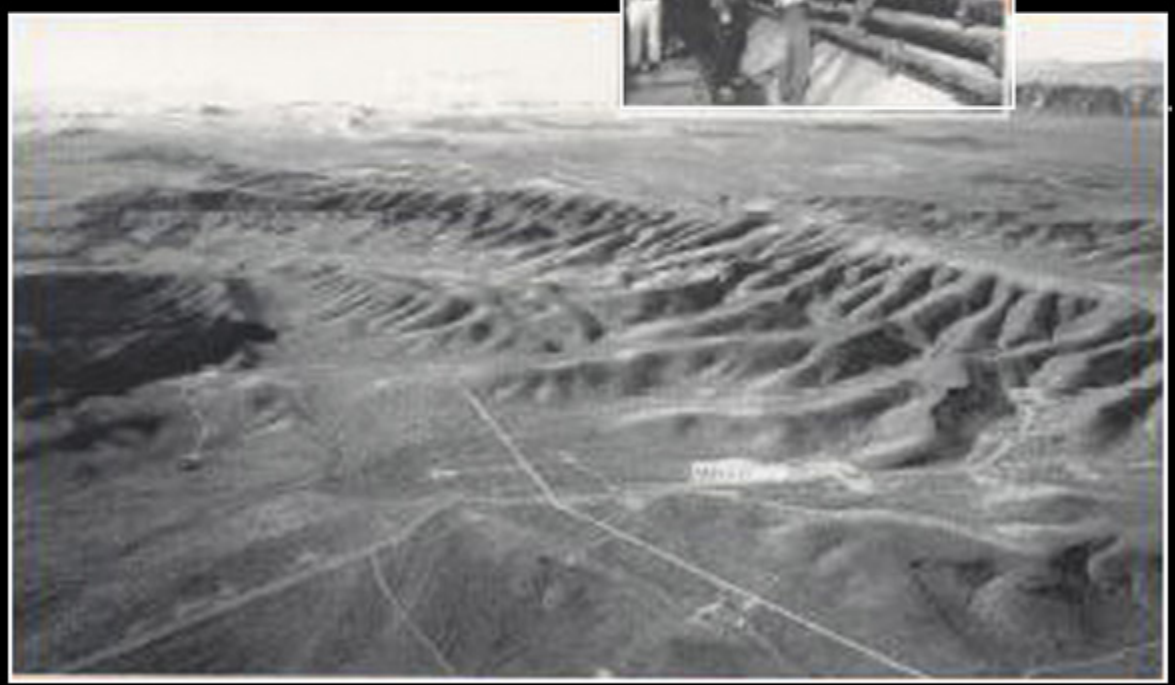

U.S. Department of Energy
Office of Civilian Radioactive Waste Management

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From the Director

On March 18, 2002, I was sworn in as the Director of the Office of Civilian Radioactive Waste Management (OCRWM). This Office is responsible within the Department of Energy for implementing the Nuclear Waste Policy Act and developing a geologic repository and the associated transportation system to safely manage and dispose of the Nation's inventory of spent nuclear fuel and high-level radioactive waste.

It is my responsibility to ensure that an efficient nuclear waste management system is in place, that our disposal decisions are based on sound scientific understanding, and that my organization is responsive to Congress, oversight organizations, and the public. The focus of OCRWM's fiscal year 2001 efforts was the completion of the analyses and reports that constitute the technical basis for a decision and communication of this information to the public to enable them to participate through a public comment process.

OCRWM's endeavor is both technically and institutionally complex. This Administration is committed to making progress toward solving the national problem of spent nuclear fuel and high-level nuclear waste management, while remaining true to the principles of sound science and responsible public policy. Most of the work discussed in this report was completed before I became Director, including major actions in the site characterization phase of the Program that eventually led up to the Secretary's recommendation of Yucca Mountain.

On February 14, Secretary Abraham forwarded his recommendation to the President, based on more than 20 years of research, that Yucca Mountain, Nevada, be developed as the Nation's geologic repository for spent nuclear fuel and high-level radioactive waste. In making his recommendation, the Secretary determined that the Yucca Mountain site is scientifically and technically suitable for development as a repository; that compelling national interests favor proceeding with the decision to site a repository there; and that there are no countervailing considerations that outweigh those interests.

On February 15, 2002, after receiving the Secretary's recommendation, the President announced that he considered Yucca Mountain qualified for a construction permit application to the Nuclear Regulatory Commission. Accordingly, the President transmitted his recommendation of the site to Congress.

On May 8 and July 9, 2002, the House of Representatives and the Senate, respectively, passed resolutions approving the siting of the repository. And on July 23, 2002, the President signed into law the Congressional Joint Resolution designating the Yucca Mountain site as the Nation's first geologic repository.

Next, the Nuclear Regulatory Commission will evaluate the information we have gathered during the past two decades, and the data and analyses we continue to develop, as it considers the site for a construction authorization. The Commission will conduct an open, public process, enabling the public to continue to participate as this Nation works toward the solution to a vital challenge we all share.

Dr. Margaret S. Y. Chu, Director
Office of Civilian Radioactive
Waste Management

Executive Summary

During Fiscal Year 2001, the Office of Civilian Radioactive Waste Management (OCRWM) reached significant Program milestones and, despite challenges, maintained the momentum essential to implementing our Nation's policy for the management of spent nuclear fuel and high-level radioactive waste. We focused on documenting the results of more than two decades of scientific investigations, field tests, and laboratory analyses conducted to determine the suitability of the Yucca Mountain, Nevada, site as a geologic repository. OCRWM prepared the technical basis for a decision on site recommendation and conducted statutorily required public hearings in the vicinity of the site. These Fiscal Year 2001 activities laid the groundwork for the Secretary of Energy's recommendation to the President on February 14, 2002, that the President approve the site and recommend it to Congress as the repository site. On February 15, 2002, after receiving the Secretary's recommendation, the President announced that he considered Yucca Mountain qualified for a construction permit application to the Nuclear Regulatory Commission. Accordingly, the President transmitted his recommendation of the site to Congress.

On May 8 and July 9, 2002 the House of Representatives and the Senate, respectively, passed resolution approving the siting of the repository. And on July 23, 2002, the President signed into law the Congressional Joint Resolution designating the Yucca Mountain site as the nation's first geologic repository.

All four of OCRWM's performance targets in the Department's revised Annual Performance Plan for Fiscal Year 2001 were related to completing the necessary prerequisites for a determination on site suitability. As a result of an appropriation $40.2 million less than the President's budget request, OCRWM adjusted its optimum work scope but met its targets in the Department's Annual Performance Plan.

Aerial view of surface facilities at the North Portal of Yucca Mountain

Performance Target #1: Complete the scientific and technical documents that will provide the technical basis for a possible site recommendation

OCRWM issued the *Yucca Mountain Science and Engineering Report, Revision 0* (S&ER) in May 2001. This report summarized the scientific and technical information developed through more than 20 years of studies of the site. It provided a description of the potential repository, including preliminary

engineering specifications; a description of the waste form or packaging proposed for use, and an explanation of the relationship between the waste form or packaging and the geologic medium of the site; and a discussion of data obtained in site characterization activities relating to the safety of the site.

The technical information in the S&ER, along with that contained in other reports and analyses, was evaluated in the *Preliminary Site Suitability Evaluation* (PSSE). The PSSE, released in August 2001, provides a preliminary assessment of the Yucca Mountain site's performance against the radiation protection standards of the Environmental Protection Agency (EPA) and the licensing regulations of the Nuclear Regulatory Commission (NRC). The evaluation for both the repository pre-closure and post-closure periods concluded that the estimated radiation doses released from the repository would be below regulatory limits. Together, the S&ER, PSSE, and supporting documentation provided an initial basis for public comment on a recommendation of the Yucca Mountain site.

Concurrently with the S&ER, OCRWM issued a *Supplement to the Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada,* which updates the information presented in the 1999 Draft Environmental Impact Statement (DEIS). It reflects, among other changes, important design enhancements such as the addition of titanium drip shields and the redesign of waste packages. Based on these updates, the Supplement reports that estimates for long-term performance of the repository indicate a peak mean annual dose (post-10,000 years) that is lower than that produced by the lowest dose scenario in the DEIS.

Performance Target #2: Conduct statutory hearings in the vicinity of Yucca Mountain to inform the residents that the site is under consideration and to receive comments regarding a possible site recommendation

As required by Section 114(a)(1) of the Nuclear Waste Policy Act, OCRWM held hearings in the vicinity of Yucca Mountain to inform residents in the area and to receive their comments regarding the Secretary of Energy's consideration of whether to recommend Yucca Mountain as the site for the Nation's first repository for spent nuclear fuel and high-level radioactive waste. The public comment period opened on May 4, 2001. The comment period, which was to end on September 20, 2001, was extended twice and ended on October 19, 2001.

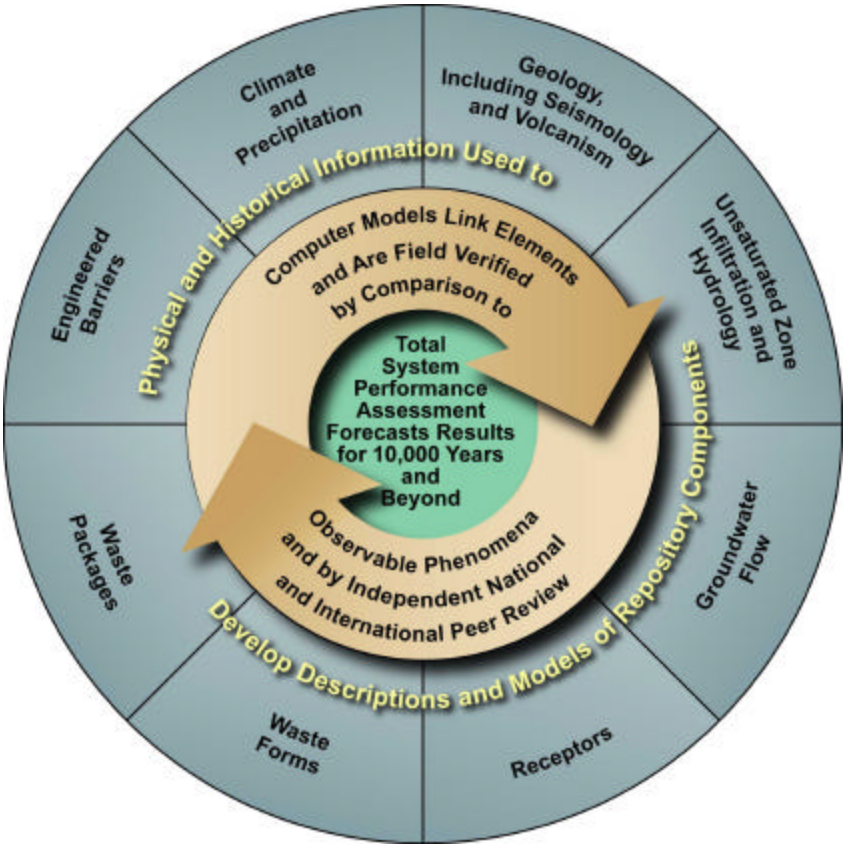
Subsequently, the comment period was reopened from November 14 to December 14, 2001, to provide the public an opportunity to comment on our documents that evaluated the effects of the final rulemakings. The EPA had finalized its radiation protection standards for Yucca Mountain on June 6, 2001. NRC had released its final rule incorporating EPA's standards on November 2, 2001, and the Department of Energy (DOE) had finalized its repository siting guidelines on November 14, 2001.

In all, 66 hearings were held in locations across Nevada and in Inyo County, California. Comments received at the hearings and through other public comment channels (e.g., U.S. mail) were categorized and addressed in a Comment Summary Document. The Secretary considered the comments received during this period before making his recommendation to the President.

Performance Target #3: Update all process models and conduct a total system performance assessment for use in the site recommendation

Detailed mathematical models, integrating information from site investigations, laboratory studies, expert judgment, and repository design, enable OCRWM analysts to assess the anticipated performance of a potential repository at Yucca Mountain. The total system model is used to simulate how a repository at the site might perform over thousands of years after it is closed, resulting in an estimate of the radiation dose a person thousands of years in the future might receive from emplaced radioactive waste. This dose estimate is the basis for the comparison that was shown in the PSSE and that supported the final site suitability evaluation.

In Fiscal Year 2001, OCRWM completed the refinement of models used to examine the natural system to reflect new information from site



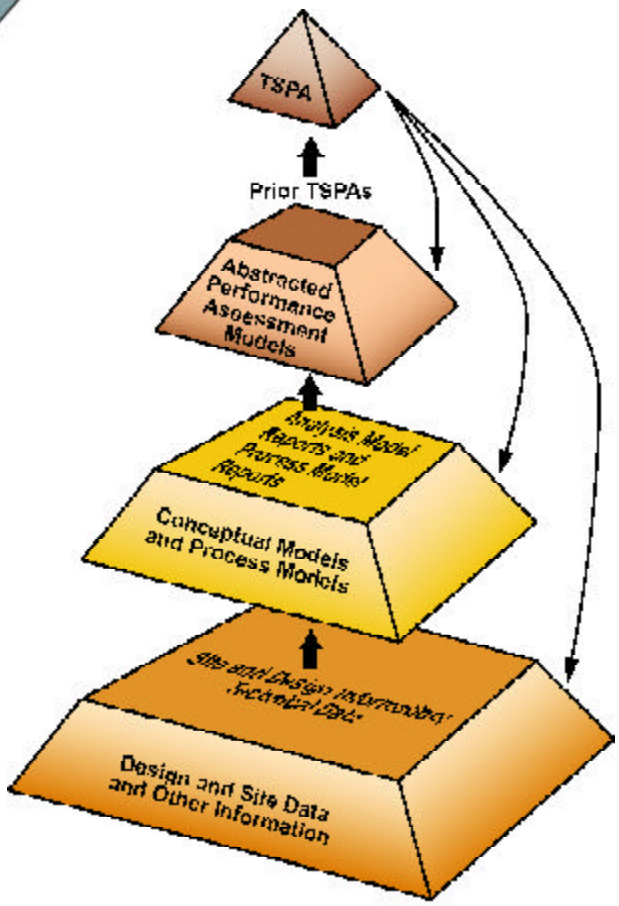
Development of the Total System Performance Model for a 10,000-year assessment

investigations and laboratory studies, advances in modeling physical processes at the site, and an enhanced repository design. We considered the requests and recommendations made by the Nuclear Waste Technical Review Board and the NRC for further design enhancements and details. We used all of these refinements to complete, in December 2000, the *Total System Performance Assessment for the Site Recommendation*.

To further analyze uncertainties in the performance assessment, we developed the *Supplemental Science and Performance Analyses*. Revised process model reports were completed to address comments based on technical reviews of earlier reports. They included comprehensive validation and estimation of the spatial uncertainty associated with each of the models. The results of performance assessment analyses were a major component of the repository safety case that underlies the site recommendation and will be refined for a license application.

Performance Target #4: Complete and issue Total System Life Cycle Cost and Fee Adequacy reports

On May 4, 2001, OCRWM published the *Analysis of the Total System Life Cycle Cost of the Civilian Radioactive Waste Management Program* (TSLCC), which provides our Fiscal Year 2001 total system life cycle cost estimates for a repository system based on the design and operating modes described in the S&ER and the Supplement to the



Total System Performance Assessment method

DEIS. The TSLCC reports that OCRWM expended $6.7 billion (in year-of-expenditure dollars) from 1983 through Fiscal Year 2000, and that the cost to complete the Program is approximately $49.3 billion (in constant 2000 dollars).

The 2001 TSLCC, coupled with projected Program revenues from civilian fees and Nuclear Waste Fund investments, provided the basis for the *Nuclear Waste Fund Fee Adequacy: An Assessment*. That report concluded that the 1-mil-per-kilowatt-hour fee continues to be adequate to pay for the estimated costs presented in the TSLCC, under the assumptions used in the analysis. The analysis considered a range of repository designs and bounding conditions for real interest rates and potential settlement impacts on future utility payments.

Other Significant Activities

In addition to meeting its specific Fiscal Year 2001 performance targets in the Department's Performance Plan, OCRWM continued related scientific and engineering activities and analyses that further refine our understanding of how a repository at Yucca Mountain would perform far into the future. Scientists focused on understanding more fully how lower temperature subsurface operational modes may reduce uncertainties in analyzing long-term repository performance.

Work continued on long-term and confirmatory tests, some of which will be ongoing for many years. For example, DOE's national laboratories continued to conduct long-term testing and modeling of waste forms. In addition, OCRWM conducted an International Waste Package Materials Performance Peer Review, designed to elicit information on materials issues and provide a basis for future experiments and analysis.

Of fundamental importance to the Program was the finalization of the site-specific regulatory framework under which a potential repository at Yucca Mountain could be evaluated and licensed. The EPA published its final radiation protection standards for the site on June 6, 2001, and the NRC released its final regulations for disposal of high-level radioactive waste at Yucca Mountain on November 2, 2001. OCRWM provided comments during the development of both the EPA standards and the NRC's licensing regulations. On November 14, 2001, DOE finalized its site suitability guidelines, making minor changes as necessary to ensure consistency with NRC licensing criteria.

In Fiscal Year 2001, we updated our discharge projections for commercial spent nuclear fuel. In addition, we continued to integrate acceptance criteria and schedules for DOE-owned spent nuclear fuel, high-level radioactive waste, and surplus plutonium managed by the Office of Environmental Management, the Office of Fissile Materials Disposition, and the Naval Nuclear Propulsion Program. Following a request from the Assistant Secretary for Environmental Management that OCRWM assume responsibility for the supply of transportation equipment and services for DOE-owned spent nuclear fuel, we began integrating this activity with our other transportation planning.

In February 2001, OCRWM completed its transition to a new management and operating (M&O) contractor, selecting Bechtel SAIC Company, LLC. The contract secures services for a five-year period with options up to a total of five additional years. A transition management team composed of Federal staff and personnel from the old and new contractors developed a transition management plan, procedures for implementation, and an integrated database to house the numerous issues, resolutions, and costs associated with the transition. Approximately 1,600 people, working for one prime contractor, with 24 subcontractors and a host of laboratories, were successfully transitioned into one M&O contract with six subcontracts and continued support from the national laboratories.

We used the initiatives in *The President's Management Agenda* to prepare for the transition from primarily scientific activities to licensing, construction, and operations, assuming that Congress would approve the Yucca Mountain site. We continued to strengthen our human resources, financial management, procurement, and information management systems so that they will be ready to effectively support the Program's transition from the site characterization to the licensing phase and the commencement of major procurement activities for transportation services.

Fiscal Year 2001 in Context

OCRWM's Fiscal Year 2001 activities are consistent with the long-held goal of commencing waste acceptance in 2010. While many external factors will influence OCRWM's ability to meet this goal, in Fiscal Year 2001 OCRWM substantially completed the documentation of over 20 years of scientific investigations and related laboratory testing and set the stage for imminent national decisions on geologic disposal at Yucca Mountain.

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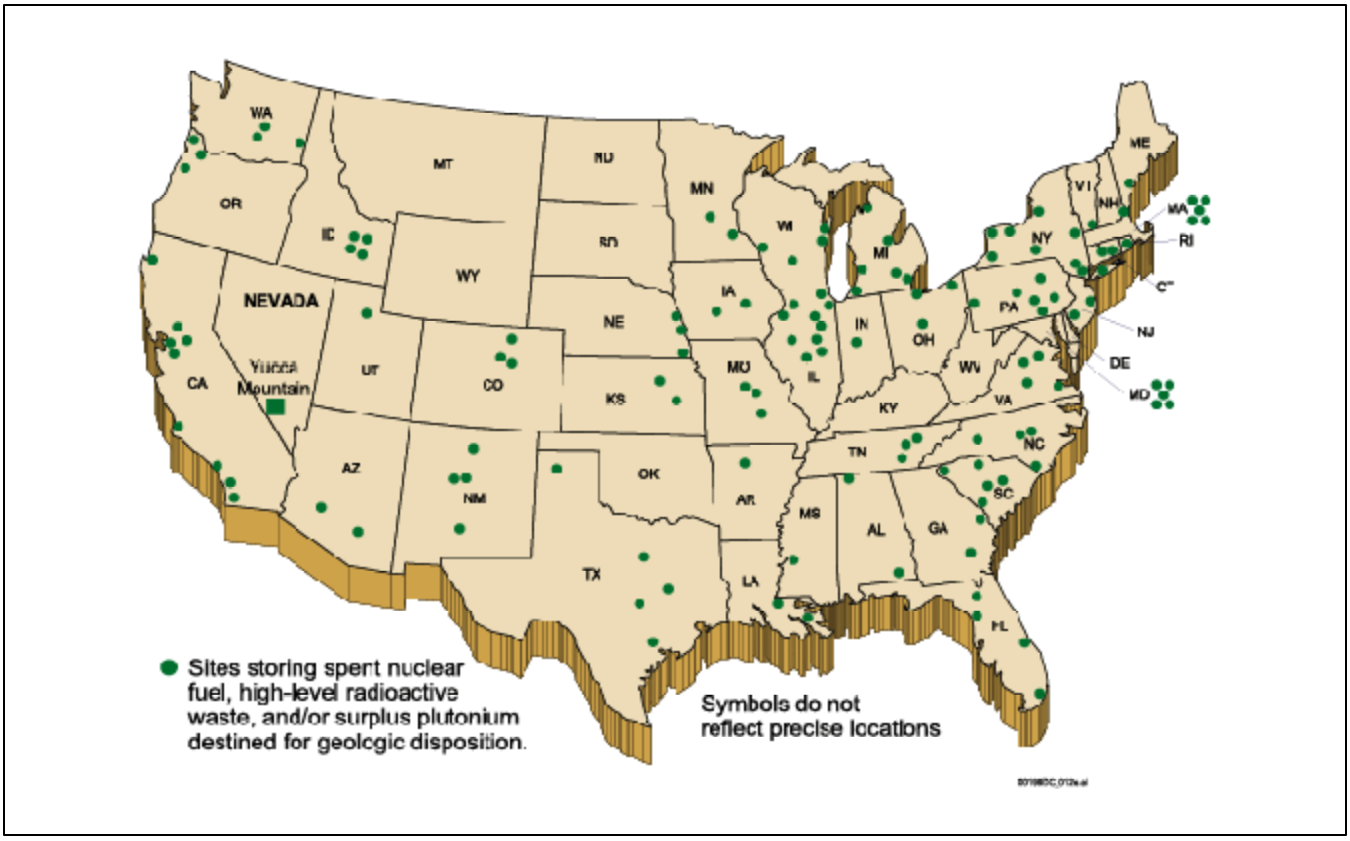
Chapter One

Introduction

Decisions made many decades ago to pursue a nuclear weapons program and to develop nuclear energy for civilian use committed the Nation to perpetual custody of a large and growing inventory of radioactive materials, as described in Appendix C. Spent nuclear fuel from commercial power plants constitutes the largest part of the inventory. The balance consists of nuclear materials managed by the Department of Energy (DOE), which result primarily from defense activities and include spent nuclear fuel from weapons production, domestic research reactors, and foreign research reactors; high-level radioactive waste from reprocessing spent nuclear fuel; surplus weapons-usable plutonium waste forms; and naval spent nuclear fuel.

Before reaching a consensus in the Nuclear Waste Policy Act of 1982 (NWPA), the United States studied methods for the safe storage and disposal of radioactive waste for more than 40 years. Many organizations and Government agencies participated in these studies. After analyzing a range of options, disposal in a

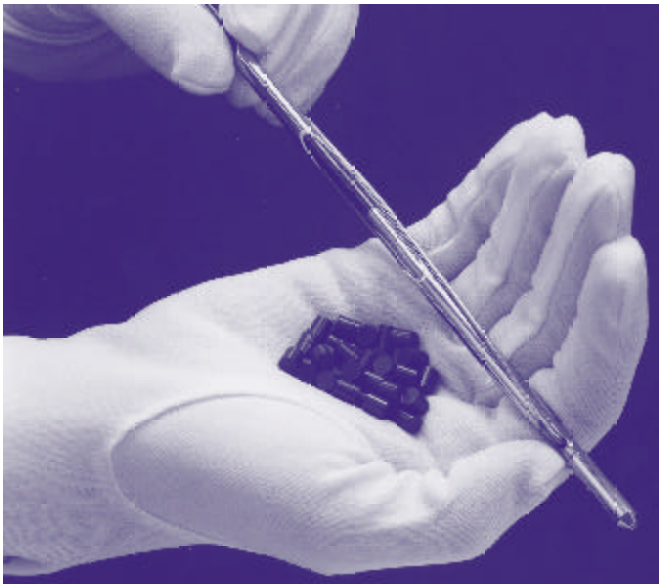


A national map of current waste locations

geologic repository emerged as the preferred long-term environmental solution. The NWPA and related statutes established the framework for addressing the issues of radioactive waste disposal and designated the roles and responsibilities of the Federal Government and the owners and generators of the waste.

The NWPA created the Office of Civilian Radioactive Waste Management (OCRWM) to develop a permanent, safe geologic repository for disposal of spent nuclear fuel and high-level radioactive waste. The NWPA affirmed the authority of the Nuclear Regulatory Commission (NRC) under the Atomic Energy Act and Energy Reorganization Act to authorize construction and operation of the repository. Initially, OCRWM was concerned primarily with disposal of commercial spent nuclear fuel. In 1985, President Reagan determined that defense-related high-level radioactive waste would also be disposed of in the repository. Since then, disposal of DOE-managed nuclear materials has grown in importance.

The Program Profile in Appendix B provides basic information on the Civilian Radioactive Waste Management Program.



A collection of simulated spent nuclear fuel pellets. Each solid ceramic pellet is approximately the size of a pencil eraser

The Nuclear Waste Problem and National Policy

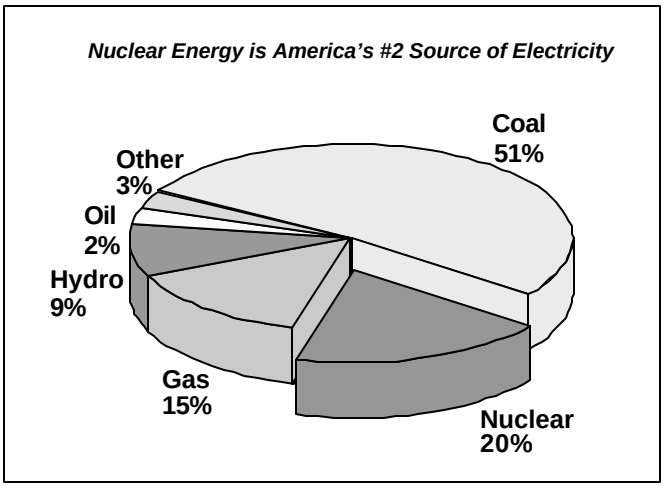
Geologic disposal remains the basic goal of the Nation's high-level radioactive waste management policy. Developing this disposal capability supports national policies for environmental protection and national security:

- The United States is committed to a once-through fuel cycle and to disposing of commercial spent nuclear fuel in geologic repositories. This policy assumes that fuel originating in the United States and used in foreign research reactors will be disposed of in a U.S. repository. It supports our Nation's advocacy of limiting international trade in weapons-usable nuclear materials. Other nations facing the same challenge observe our progress. Our commitment to geologic disposal strengthens our policy of nuclear nonproliferation and provides a model for the efforts of other nations. The discussion of international cooperation in Chapter 4 underscores the importance of the U.S. contribution to resolution of this global problem.

- A geologic repository is critical to the accelerated environmental cleanup of numerous DOE sites around the country. That cleanup serves not only an environmental, but also a fiscal, goal: reduction of the huge mortgage costs (maintenance and oversight at current facilities) that are the legacy of the Cold War.

- The Department of the Navy is committed to ensuring uninterrupted operation of its nuclear-powered fleet and the management of its spent nuclear fuel to facilitate safe disposal. DOE has the responsibility for storage and ultimate disposition of this naval spent nuclear fuel.

- Nuclear power currently supplies approximately 20 percent of the Nation's electricity, and solving the waste problem to ensure this supply capacity is a key recommendation of the Administration's National Energy Policy report, released in



Nuclear power plants produce nearly 20% of our Nation's electricity

May 2001. Operation of nuclear reactors is contingent on the NRC's licensing of the reactors, which in turn depends on periodic reviews that NRC conducts to assess prospects for timely disposal of commercial spent nuclear fuel. Without progress toward a repository, continued reactor operations and license renewals could be jeopardized.

Geologic disposal is a cornerstone of all these policies. The National Academy of Sciences has repeatedly affirmed its support for geologic disposal. The Academy stated in a June 2001 report, *"After four decades of study, the geological repository option remains the only scientifically credible, long-term solution for safely isolating waste without having to rely on active management. Although there are still some significant technical challenges, the broad consensus within the scientific and technical communities is that enough is known for countries to move forward with geological disposal."*

In working to develop a geologic disposal capability, OCRWM remains committed to objective science as the basis for any decision; to full consideration of the views of the residents of Nevada; and to fulfillment of the requirements of the NWPA with regard to the collection, documentation, and public availability of information.

What Have We Achieved to Date?

Nuclear waste management presents a daunting set of challenges: (1) the complexities of managing a large, first-of-its-kind, project in a Federal setting subject to multiple regulatory requirements; (2) the challenges of operating on a scientific frontier; (3) the need to integrate an unusually broad array of scientific, technical, and managerial disciplines; (4) the demands of a complex and lengthy licensing process; and (5) the political sensitivities associated with an inherently controversial mission.

The Congress, several Administrations, regulatory and oversight bodies, stakeholders, OCRWM staff and contractors, and DOE's national laboratories have worked steadily toward the goal of geologic disposal. They have achieved significant results:

- Landmark legislation, the NWPA, that acknowledged the Federal Government's responsibility for high-level nuclear waste disposal, created a financial mechanism to pay for it, and defined an orderly, open process to develop a waste management system.

- An extensive underground laboratory at Yucca Mountain, Nevada, that gives scientists direct

In 1997, we finished boring a 5-mile tunnel that now houses an extensive underground laboratory

access to geologic formations within which a potential repository could be housed.

- An increasingly comprehensive body of scientific, engineering, and performance assessment expertise with which we have: (1) designed site investigations that yielded needed data; (2) designed a repository that could be tailored to the site and comply with NRC's licensing requirements; (3) developed models simulating the performance of a repository under a range of site conditions over thousands of years; and (4) developed the technical basis for a decision on the suitability of the Yucca Mountain site.

- The regulatory expertise needed to participate in a complex licensing procedure that could take at least three years and entail the review of thousands of supporting documents. A shared understanding of how to approach difficult technical issues has been achieved through years of consultation between OCRWM and NRC. The results of this approach were evident in NRC's November 2001 submittal of a sufficiency letter, indicating that the analysis and proposal for the Yucca Mountain site seem to be sufficient for future inclusion in a licensing application.

- A final, interlocking regulatory framework that governed the final site suitability evaluation and a possible licensing proceeding, including radiation protection standards from the Environmental Protection Agency, licensing criteria from the NRC, and site suitability guidelines by DOE.

- Longstanding and productive working relationships. Critical comments from oversight bodies, the larger technical and scientific communities, a host of stakeholder groups, and the public provide input that has strengthened our work.

On his first official visit to Yucca Mountain in January 2002, Secretary of Energy Spencer Abraham visited the mountain's crest

The expertise, data, working relationships, and physical assets that we have developed are the resources with which OCRWM reached important milestones in moving toward the national decision to develop a geologic repository at Yucca Mountain. In 1998, we released a comprehensive viability assessment detailing what has been learned from years of site characterization. In 1999, we published a Draft Environmental Impact Statement providing the background, data, and analyses to help stakeholders understand the effects of developing a repository. During Fiscal Year 2001, we completed the information needed to support a determination of site suitability, made that information available to the public, and invited public comment. Based on that body of knowledge, the Secretary, on January 10, 2002, notified the Governor and legislature of the State of Nevada of his intent to recommend to the President that the Yucca Mountain site be approved for development as the Nation's first geologic repository. On February 14, 2002, the Secretary of Energy forwarded his recommendation to the President. On February 15, 2002 the President transmitted his recommendation of the site to Congress

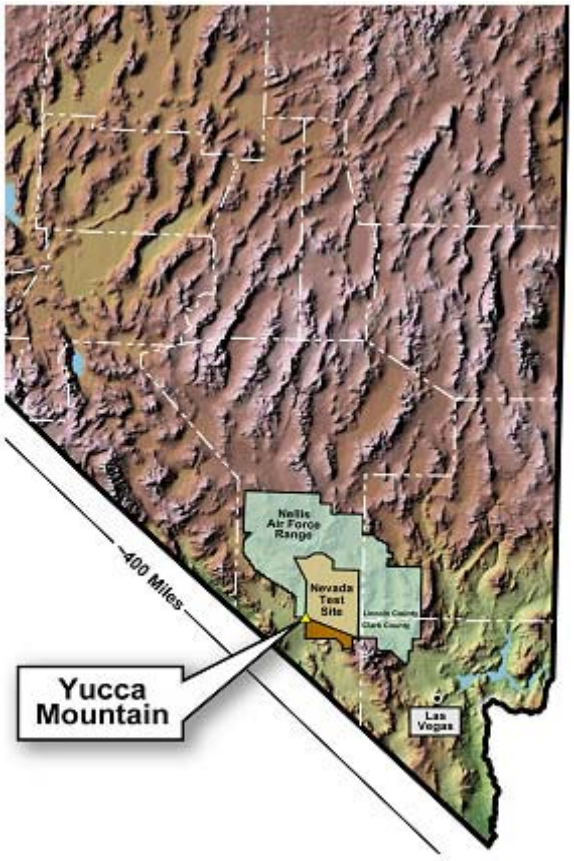
On May 8 and July 9, 2002 the House of Representatives and the Senate, respectively, passed resolution approving the siting of the repository. And on July 23, 2002, the President signed into law the Congressional Joint Resolution designating the Yucca Mountain site as the nation's first geologic repository.

Chapter Two

Yucca Mountain Site Characterization Project

Background

During FY 2001, the Yucca Mountain Site Characterization Project was responsible for investigating the suitability of the Yucca Mountain site, 100 miles northwest of Las Vegas, Nevada, for a geologic repository for spent nuclear fuel and high-level radioactive waste and developing designs for a potential repository. If a repository is developed there, the Office of Civilian Radioactive Waste Management (OCRWM) will accept spent nuclear fuel and high-level radioactive waste from the sites where it is currently stored, transport it to Yucca Mountain, and emplace it in the repository. The Environmental Protection Agency (EPA) and Nuclear Regulatory Commission (NRC) have published regulations governing the repository.

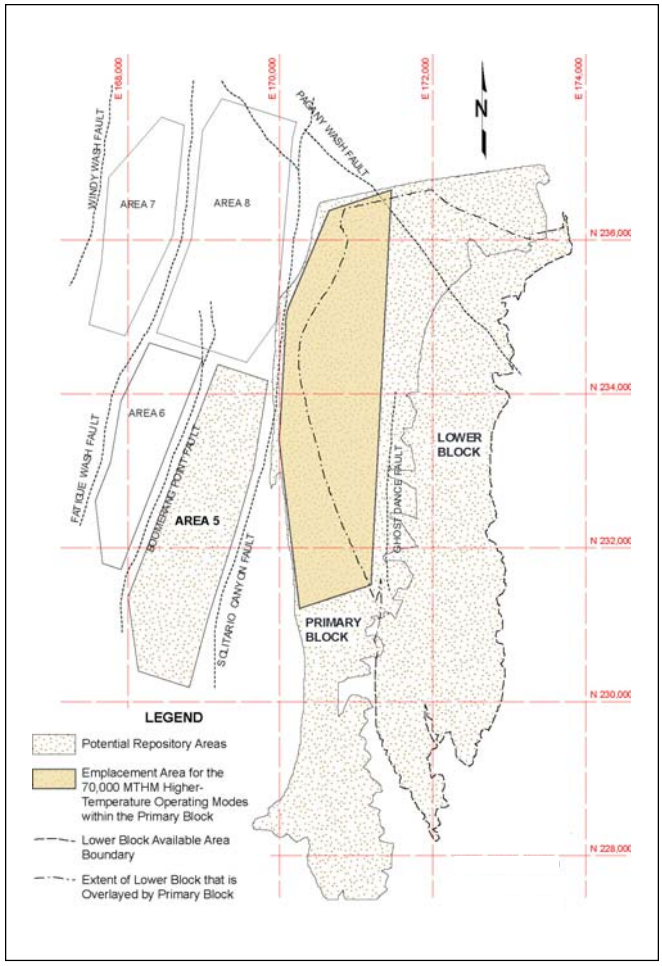


Location of Yucca Mountain within the State of Nevada

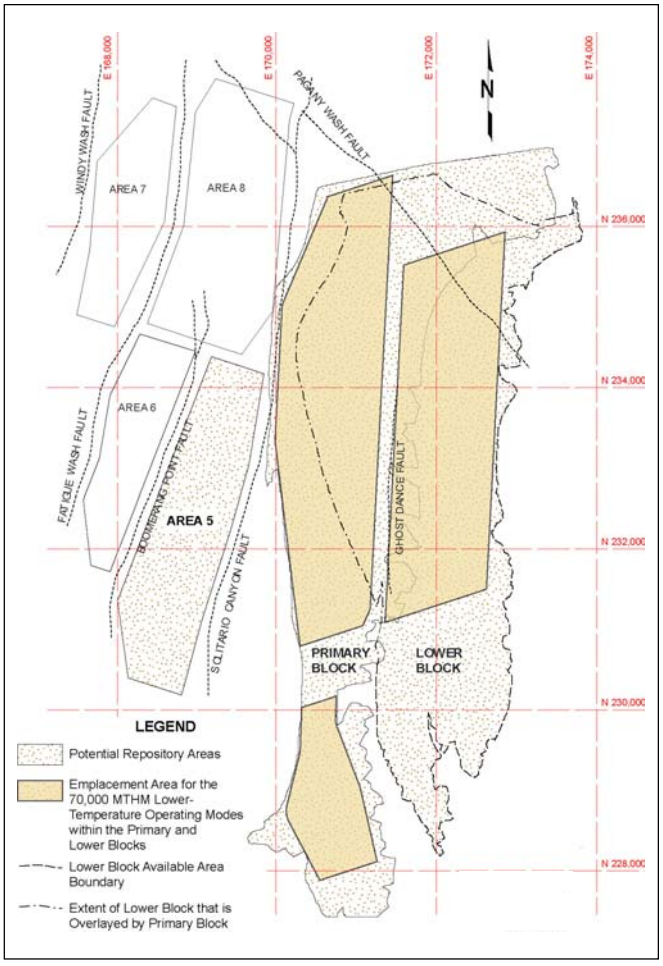
Early in FY 2002, all of the investigations necessary to provide an adequate technical basis for a decision on site recommendation were completed. However, site evaluation and the repository design are ongoing processes and, even now that Yucca Mountain is designated as the repository site, confirmatory testing and monitoring activities are expected to continue until repository closure. New information will be evaluated for its effect on system and subsystem performance as part of an ongoing learning process. Design and operating decisions will be modified based on feedback from these evaluations, as well as other technological and policy developments. The ongoing learning process is designed to challenge models and assumptions and lead to continuous improvement.

Funding

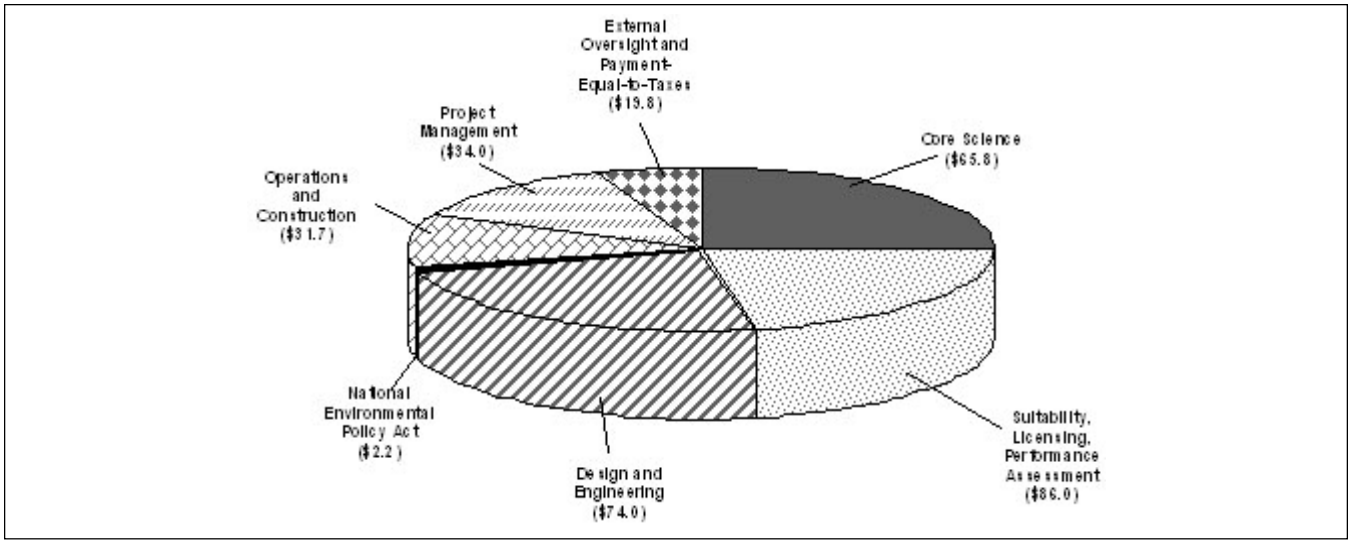
To accomplish the work planned for Fiscal Year 2001, OCRWM allocated $313.5 million of its appropriation of $390.4 million to the Yucca Mountain Site Characterization Project. The distribution was as follows: $65.8 million was allocated to core science; $86.0 million to site suitability, licensing, and performance assessment; $74.0 million to design and engineering; $2.2 million to National Environmental Policy Act compliance; $31.7 million to operations and construction; $34.0 million to project management; and



Potential repository areas and emplacement area for the higher-temperature operating mode



Potential repository areas and emplacement area for the lower-temperature operating mode



Fiscal Year 2001
Yucca Mountain Project Budget
(dollars in millions)

$19.8 million to external oversight and payments-equal-to-taxes (PETT).

Major Fiscal Year 2001 Activities and Results

The Yucca Mountain Site Characterization Project was directly responsible for meeting three of the Program's four performance targets in the Department's Annual Performance Plan for Fiscal Year 2001 and contributed to accomplishment of the fourth. All four of the performance targets were related to the site recommendation.

Performance Target #1: Complete the scientific and technical documents that will provide the technical basis for a possible site recommendation

During Fiscal Year 2001, the Project prepared the following documents to help inform decision makers, regulators, and the public about the scientific and engineering aspects of a potential repository:

- *Yucca Mountain Science and Engineering Report* (S&ER, May 2001), which documents the science and engineering knowledge that accumulated on the suitability of the site during the last two decades. It describes a design which can be operated in a range of thermal environments and which is represented by two examples of operating modes: above boiling (defined as a heat loading of 1.45 kW/m on a line of emplaced canisters) and below boiling (<85 degrees Celsius average maximum waste package surface temperature).

- *Supplement to the Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (SDEIS, May 2001). As anticipated in the 1999 Draft Environmental Impact Statement (DEIS), design enhancements of the repository continued to evolve as the Program evaluated ways to improve long-term performance of the potential repository at Yucca Mountain. To update the DEIS with the most recent information on the design, the SDEIS describes the potential environmental impacts that could occur, based on the design and range of possible operating modes, and compares these impacts to the impacts presented in the DEIS.

- *Preliminary Site Suitability Evaluation* (PSSE, August 2001), which provides a preliminary evaluation of the site's performance against the Department of Energy's (DOE) proposed site suitability guidelines. The preliminary evaluation described in the PSSE is based on information contained in the S&ER, supplemented by more recently available technical information.

Performance Target #2: Conduct statutory hearings in the vicinity of Yucca Mountain to inform the residents that the site is under consideration and to receive comments regarding a possible site recommendation

The Project conducted 66 hearings at locations across Nevada and in Inyo County, California, to inform residents and to receive their comments regarding the Secretary's consideration of whether to recommend Yucca Mountain as a site for a nuclear waste repository. Public hearings on the documents released on the consideration of Yucca Mountain as a site for a geologic repository provided major opportunities for formal public involvement. One series of public hearings was held for the SDEIS in May and June 2001 in Amargosa Valley, Las Vegas, and Pahrump, Nevada. A separate series of public hearings, supporting the site recommendation consideration process and tied to the public comment period that began in May, spanned September and October 2001. A supplemental public comment period was opened from November 14 to December 14, 2001. Comments received at the hearings and through other public comment channels (e.g., U.S. mail) were categorized and were addressed in a Comment Summary Document.

Performance Target #3: Update all process models and conduct a total system performance assessment for use in the site recommendation

In Fiscal Year 2001, OCRWM completed the refinement of models used to examine the natural system to reflect new information from site investigations and laboratory studies, advances in modeling physical processes at the site, and an enhanced repository design. OCRWM published several reports during the year that reflected evolving information and its impact on expected repository performance. These include:

- *Total System Performance Assessment for the Site Recommendation Rev 00 ICN 01* (TSPA-SR, December 2000), which documents a probabilistic performance assessment of the Yucca Mountain repository. It is based on the Analysis and Model Reports that the Project developed in Fiscal Year 2000 and is essentially the culmination of all previous Project work.

- *Fiscal Year 2001 Supplemental Science and Performance Analyses, Volume 1 and Volume 2* (SSPA, July 2001), which updated the TSPA and addressed the potential effects of uncertainties that previously had not been quantified in the performance assessment to give further insight into the possible behavior of the repository. It also included new models and data produced since the Analysis and Model Reports were completed. One major hypothetical change was the inclusion of early waste package failures in the analysis.

- *Total System Performance Assessment – Analyses for Disposal of Commercial and DOE Waste Inventories at Yucca Mountain – Input to Final Environmental Impact Statement and Site Suitability Evaluation* (FEIS/SSE Letter Report, September 2001), which updated the performance assessment analyses to conform to the specific requirements in EPA's final radiation standard.

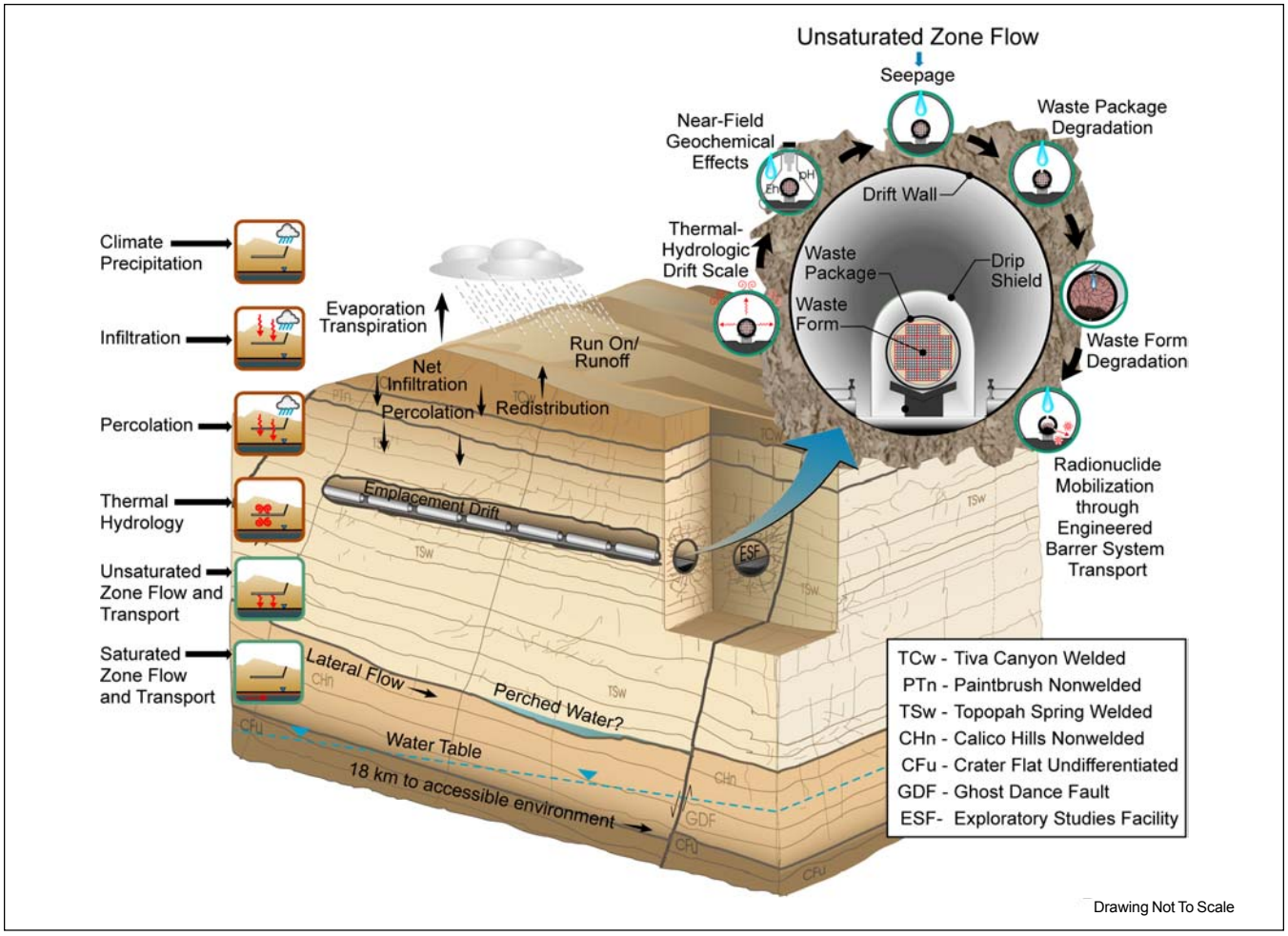
Performance Target #4: Complete and issue Total System Life Cycle Cost and Fee Adequacy reports

The Project contributed design, planning, cost and schedule data, and analysis to this effort. The reports were issued in May 2001.

Scientific and Engineering Accomplishments

Scientific and engineering studies conducted during Fiscal Year 2001 contributed to reducing uncertainty about the effectiveness of a potential repository at Yucca Mountain in isolating radioactive waste. Progress was made in characterizing the details of groundwater movement, the effects of heat on the physical and chemical properties of the repository host rock, the performance of engineered components (e.g., waste containers) of the repository system,

Heater element installation for thermal testing in the cross drift, April 2001



Conceptual illustration of physical processes modeled in the total system performance assessment of a potential Yucca Mountain disposal system

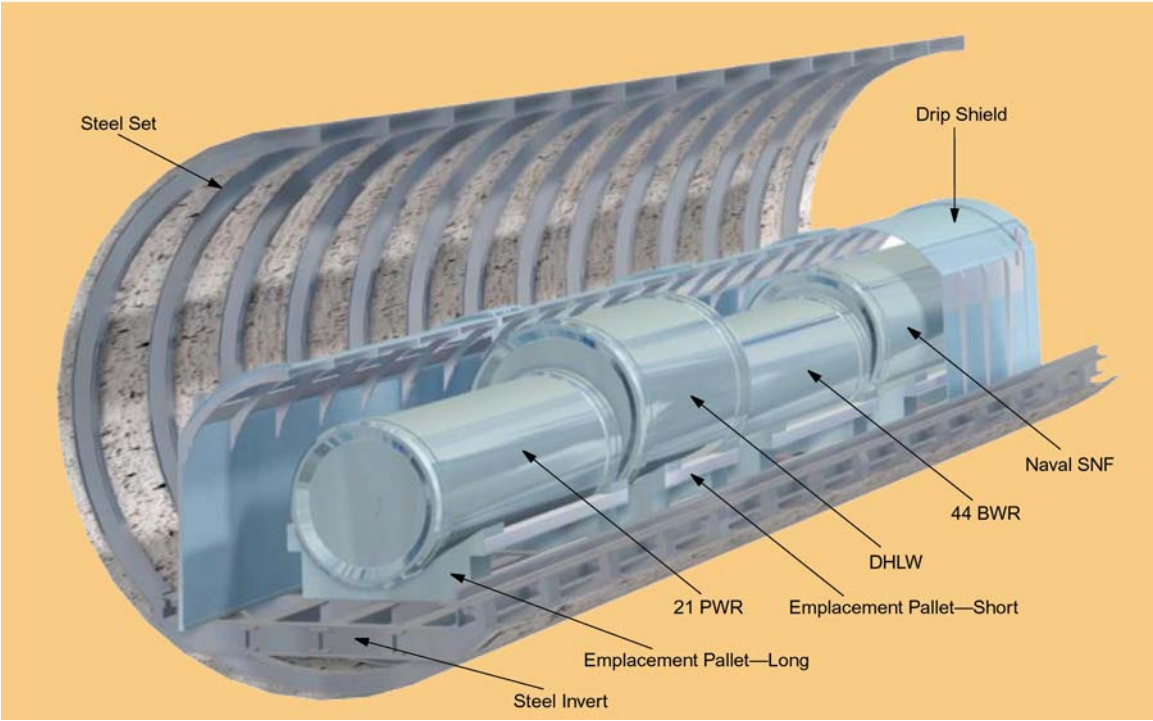
incorporating this scientific and engineering data into site performance models, and identifying and documenting the remaining uncertainties in the models. Results of these studies supported the Secretary's site recommendation decision.

Scientific investigations update

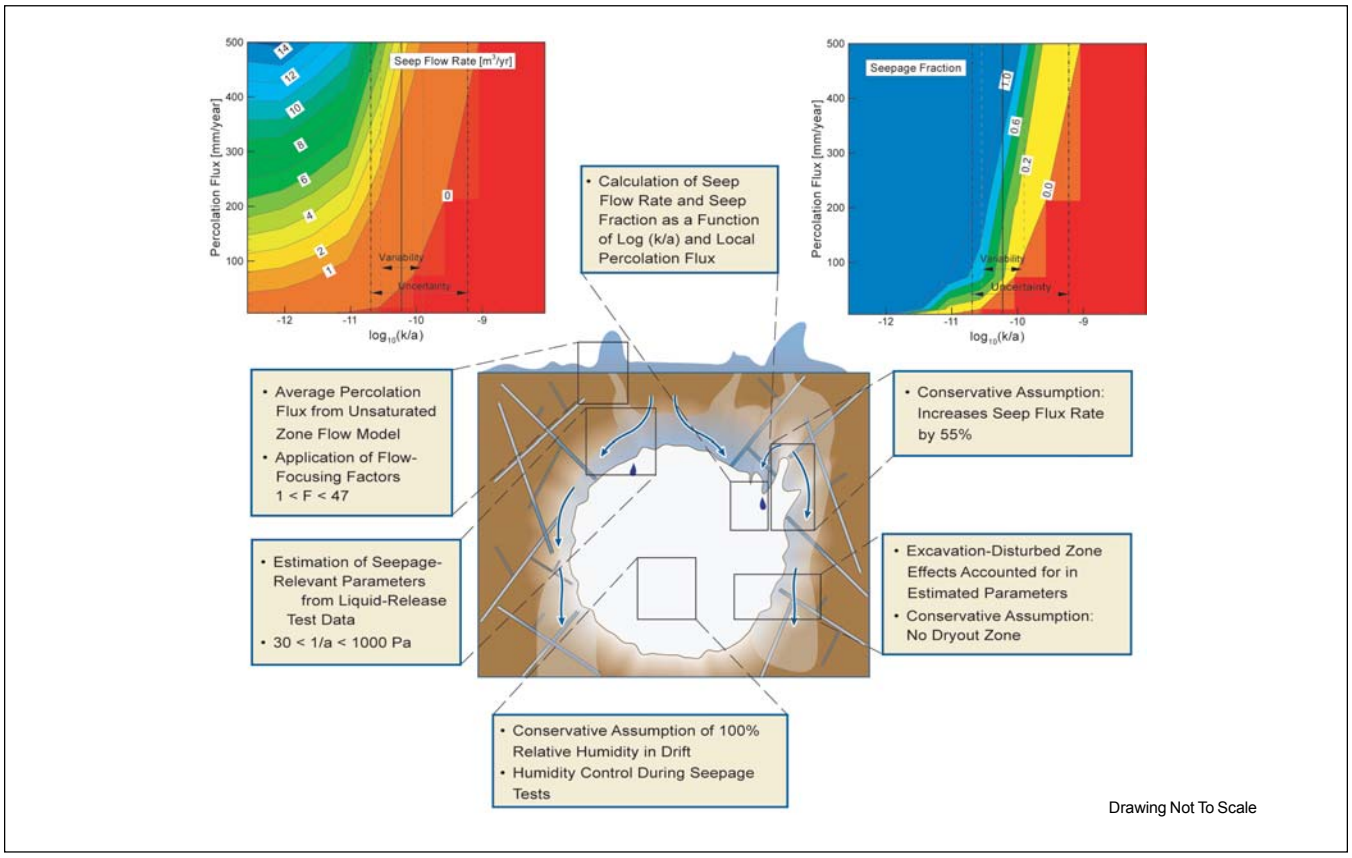
During Fiscal Year 2001, we continued to conduct site investigations at test facilities at the Yucca Mountain site and in its vicinity and at several off-site laboratories. Our facilities include nearly 11 kilometers (7 miles) of tunnels in the Exploratory Studies Facility and cross-drift, dozens of surface sites, and hundreds of boreholes. The facilities are used to study the natural features of the site, water and chemical movement through the rock, and the effects of heat and water on the physical and chemical properties of the rock. In addition, many rock and water samples have been sent to off-site laboratories for testing. The results of our scientific studies are used to develop engineering designs that will be effective in containing waste and as input to performance assessment models that help identify areas of uncertainty and areas where design enhancements will be most beneficial.

Key scientific studies of Fiscal Year 2001 and their results include:

- **Drift seepage** – Capillary attraction tends to hold water in the rock matrix and prevent it from dripping from the roof or walls of drifts (tunnels) until a high enough saturation is



Typical section of emplacement drift with waste packages and drip shields in place



Summary of results from seepage testing and modeling

reached. We conducted measurements under ambient and induced flow conditions to assess the effects on seepage of the excavation-disturbed zone, drift geometry, and surface roughness. Under ambient conditions, seepage is virtually nonexistent – the one location at which it was observed may have been affected by nearby maintenance activities. Testing under induced conditions, e.g., where water is applied to a surface above the measurement site, indicates that percolation flux would have to be orders of magnitude higher than current natural rates to initiate seepage. In principle, seepage would only be observed under specific conditions, such as where the average percolation flux from a large area became concentrated into only a few flow paths — a situation known as "flow focusing." Other tests during previous years demonstrate that, even in regions with pervasive fracturing associated with through-going faults, seepage into excavated underground openings under present-day percolation fluxes is not expected.

- **Nye County Drilling Program** – We continued to integrate our efforts with Nye County and its Early Warning Drilling Program, which is being conducted with funding from OCRWM. During Fiscal Year 2001, project scientists assisted county scientists as they began drilling a third series of boreholes. Stratigraphic data and information from rock and groundwater samples collected during and after drilling has been integrated into our conceptual model of the saturated zone and our site-scale model. Further information on the Early Warning Drilling Program can be found on Nye County's web site: www.nyecounty.com/ewdpmain.htm.

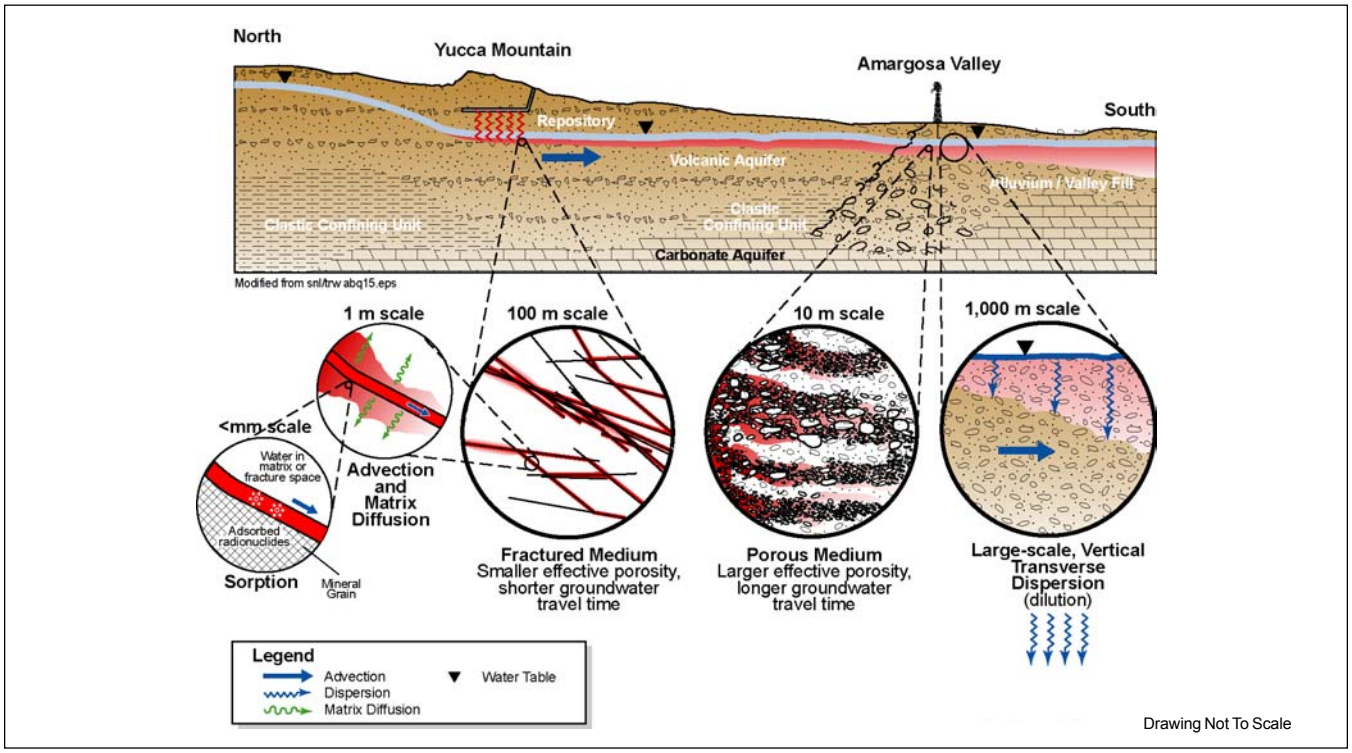
- **Colloid Transport** - In Fiscal Year 2001, we completed single-well and began multi-well hydraulic and tracer testing at the alluvial testing complex in an effort to better understand flow and radionuclide transport through the alluvial portion of the aquifer. The data from the initial single-well test provided information for colloid and radionuclide transport models prepared for the site recommendation. The multi-well tracer test will provide validation of the single-well test results and facilitate the calculation of more complex transport parameters not obtainable from the single-well tests.

- **Unsaturated and Saturated-Zone Radionuclide Transport Tests in Large Blocks** – In Fiscal Year 2001, we began tracer injection tests in two 1-cubic meter blocks excavated from the Busted Butte fault. The tests are being conducted by Atomic Energy of Canada, Limited. The results thus far support the transport behavior of radionuclides observed under a much smaller, laboratory-scale as well as the site-scale measurements in the C-Wells.

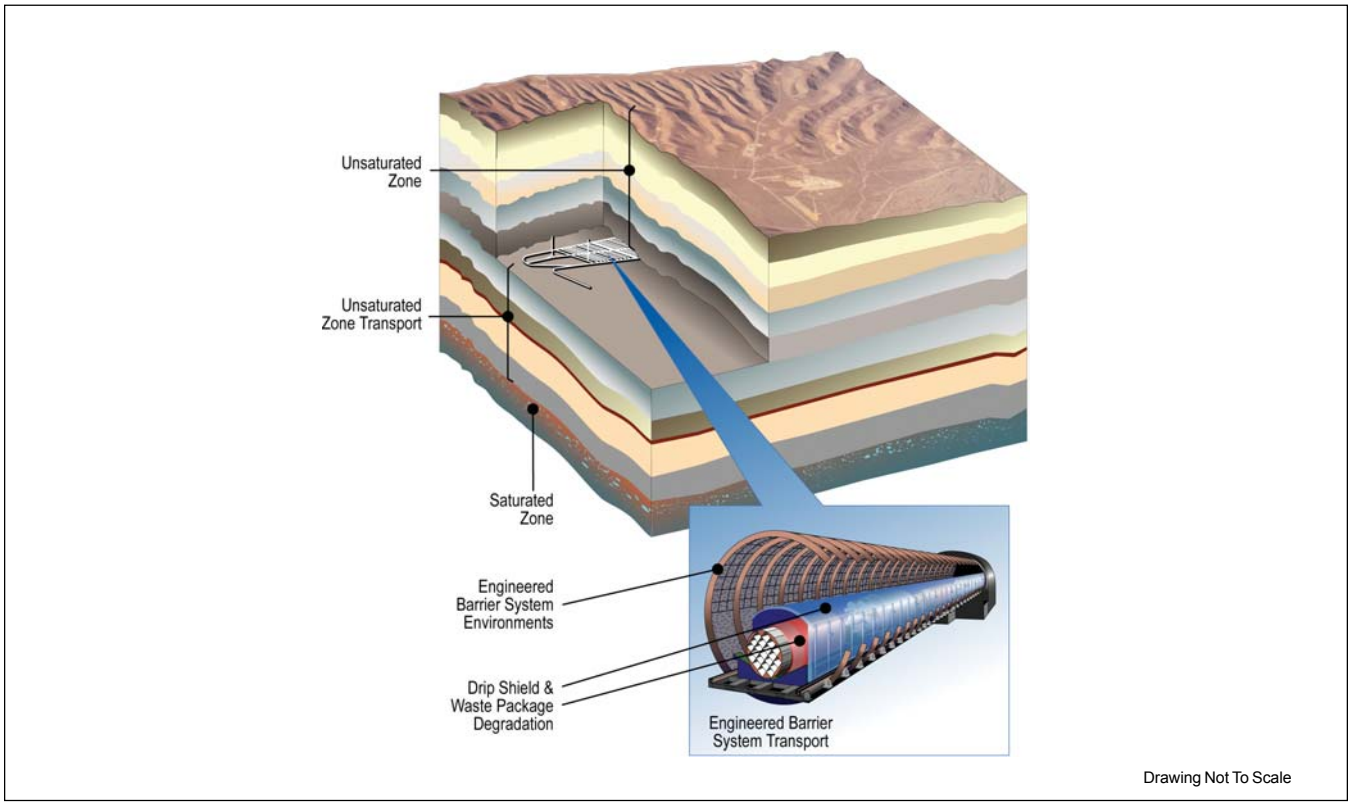
- **Heat Effects** - In Fiscal Year 2001, altered rock samples were collected at the drift scale heater test and the mineral alteration was characterized. These results have been utilized to validate models of coupled thermal-hydrochemical processes. In the drift scale test, approximately 15,000 cubic meters (about 19,600 cubic yards) of rock was heated for four years to simulate heat from actual canisters of spent nuclear fuel. A four-year cooling cycle began in Fiscal Year 2002.

- **Seismic Testing** - During the summer of 2001, engineers used equipment to generate seismic surface waves along more than 30 lines located at the crest of Yucca Mountain and recorded the effects. This experiment enabled us to determine how shear-wave velocity varies with depth and how this depth dependence varies spatially. The shear-wave velocity information will be used in calculations of seismic ground motion at the surface of the mountain for seismic design considerations.

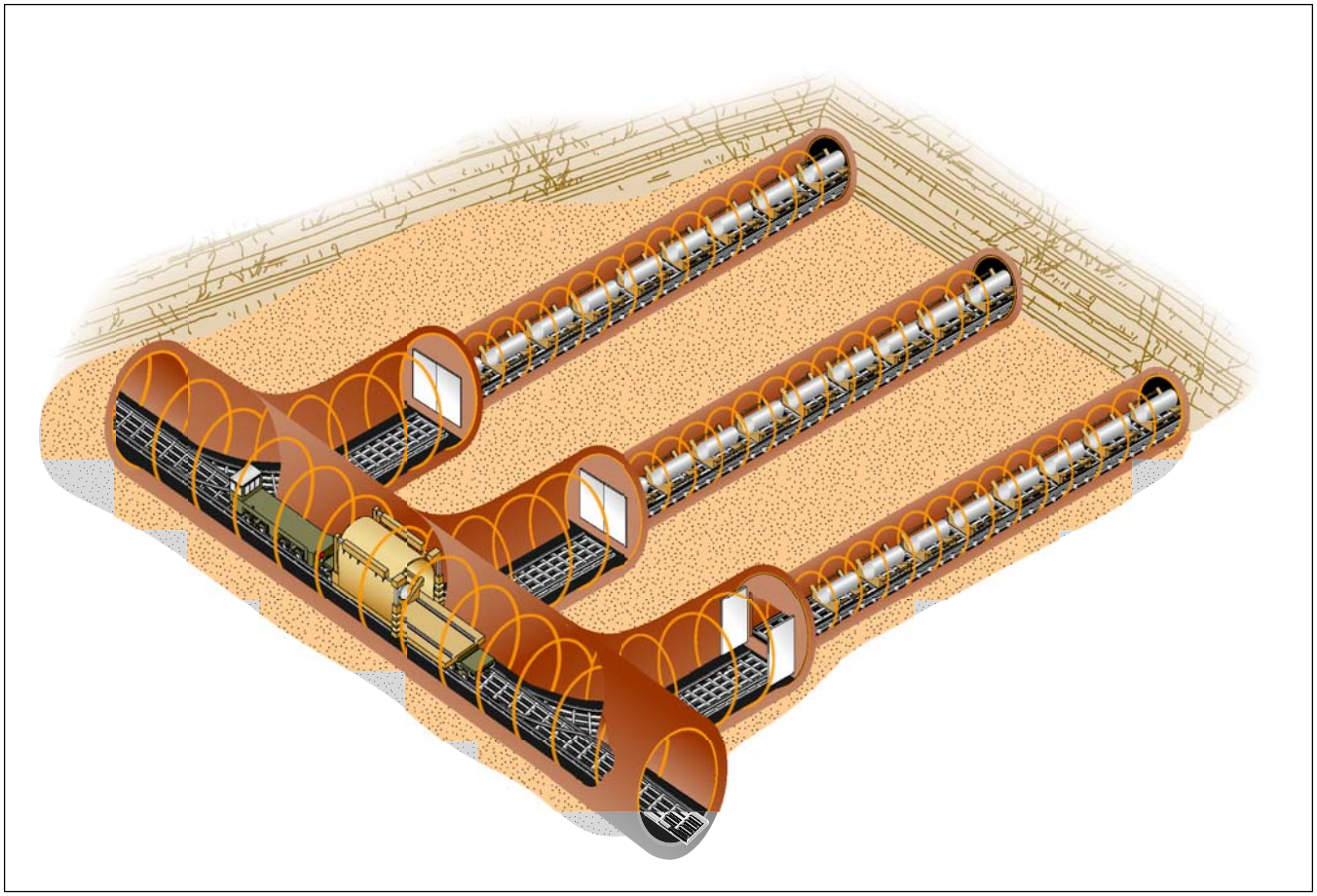
- **Groundwater Modeling** - In Fiscal Year 2001, scientists completed all work on the final steady-state, pre-development, Death Valley Regional Flow System model. A draft report on the model was completed and submitted for



Schematic illustration of different transport processes



Natural and engineered barriers would work together to protect the environment



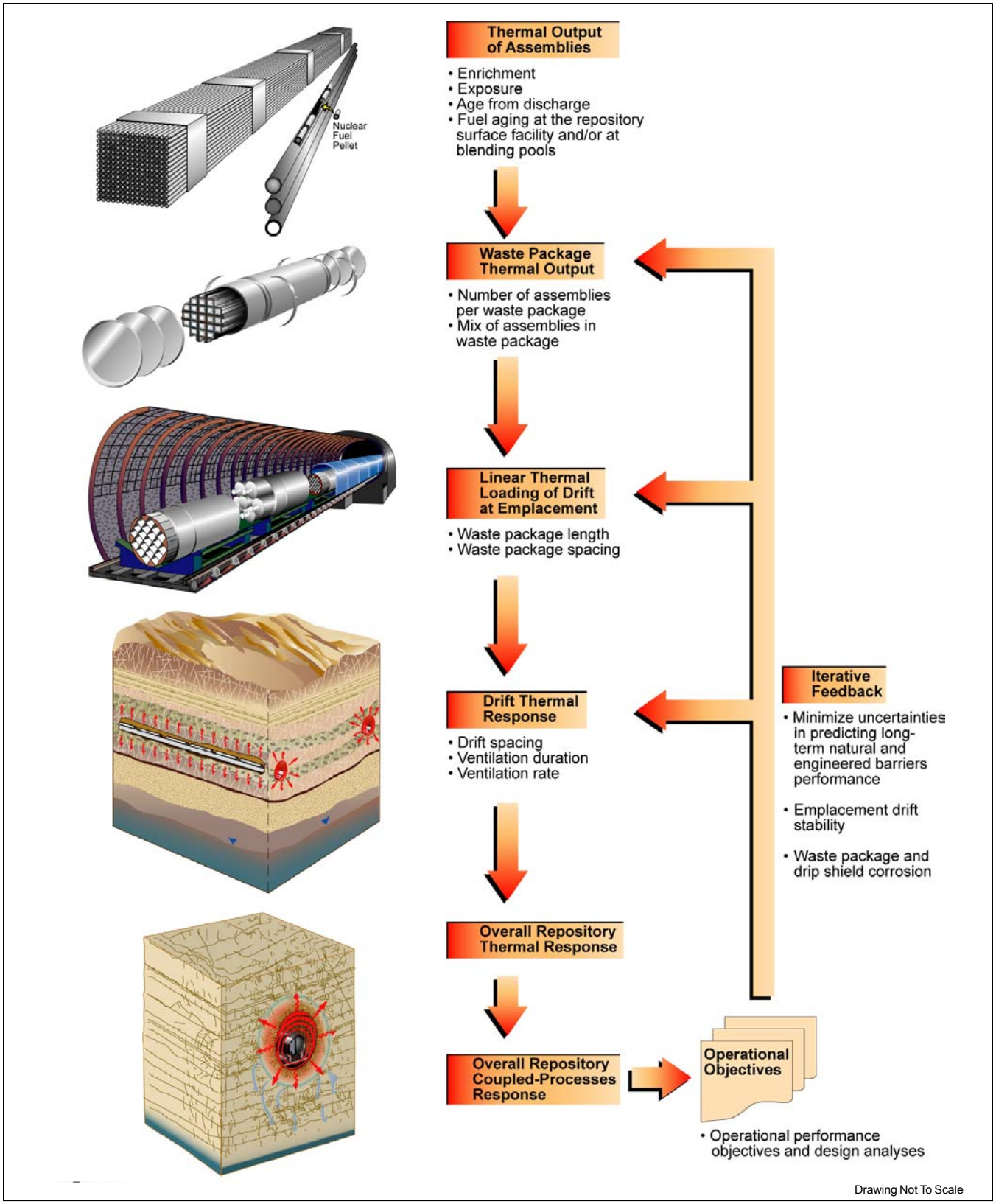
The repository would be a series of drifts where waste packages would be emplaced and monitored

technical review. The final draft of the model report will be available in Fiscal Year 2002, and work on a transient model is scheduled to be completed in Fiscal Year 2004. The model is being built in cooperation with the Nevada Test Site; the U.S. Geological Survey; the Bureau of Indian Affairs; Nye, Lincoln, and Clark Counties in Nevada; Inyo County in California; the National Park Service; the U.S. Air Force; and the Nevada State Engineer's Office. Our model is a tool for simulating and evaluating the effects of climate change on the regional water table.

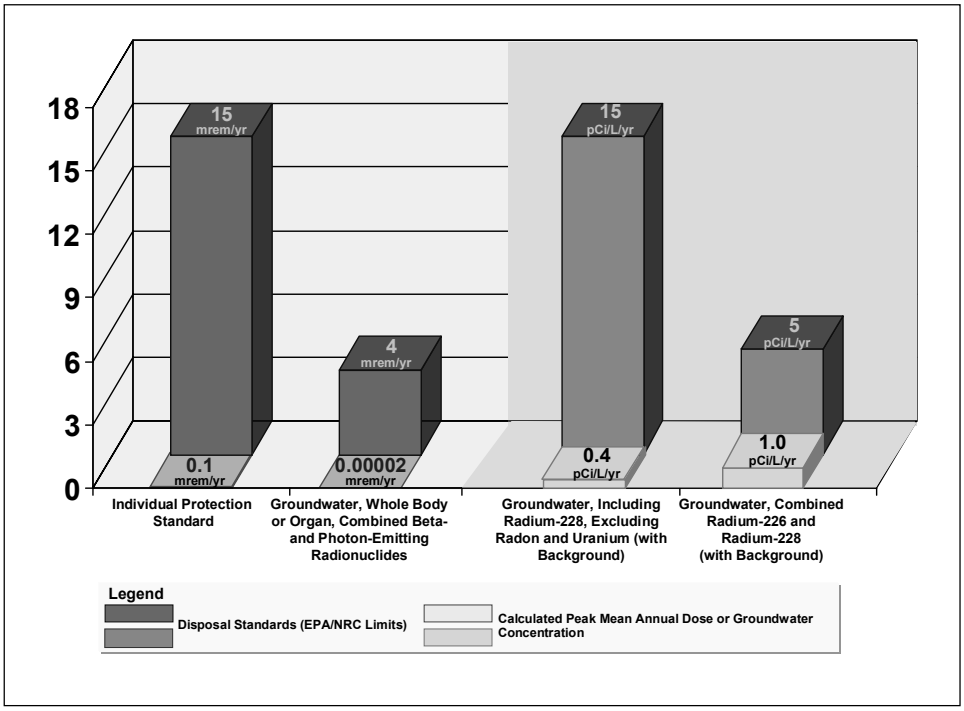
In addition to the key results discussed above, many ongoing monitoring, data collection, analysis, and modeling activities continued. Some of the areas being studied include: how the chemical composition of water near the emplacement zone may change as minerals are precipitated and redissolved due to heating and cooling; delineation of the regional groundwater flow system; and a search for evidence of fast paths that could facilitate percolation of water to the repository horizon.

Design and engineering accomplishments

In Fiscal Year 2001, OCRWM conducted sensitivity studies of the design and analysis concepts presented in the S&ER to determine critical variables and to confirm the robustness in the prediction of the repository's performance. This evaluation also included more realistic models and improvements to models that incorporated our understanding of new science and data developed after preparation of the S&ER. The new models and data were used to evaluate a wide range of thermal operating modes. The insights from this additional analysis help to increase our confidence in the models and predictions of a potential repository's performance.



Variables affecting the thermal performance of the repository



Design must demonstrate compliance with strict radiation protection standards

In Fiscal Year 2001, we expanded the testing and analysis that support the technical basis for predicting the waste package materials' performance in the expected conditions of the repository. OCRWM conducted an International Waste Package Materials Performance Peer Review. The peer review report was structured around five subissues: (1) potential degradation modes; (2) long-term behavior of corrosion resistant metals; (3) composition of aqueous environments; (4) localized corrosion; and (5) stress corrosion cracking. Although the peer review interim report identifies some issues regarding waste package materials performance, it also provides a basis for optimism that we can substantially reduce remaining uncertainties about long-term performance of waste package materials through future experiments and analysis. Many of the interim report's recommendations for additional testing and analysis have been included in our yearly work plans. However, budgetary constraints have impacted our ability to complete the work scope. The peer review final report was released in the spring of 2002.

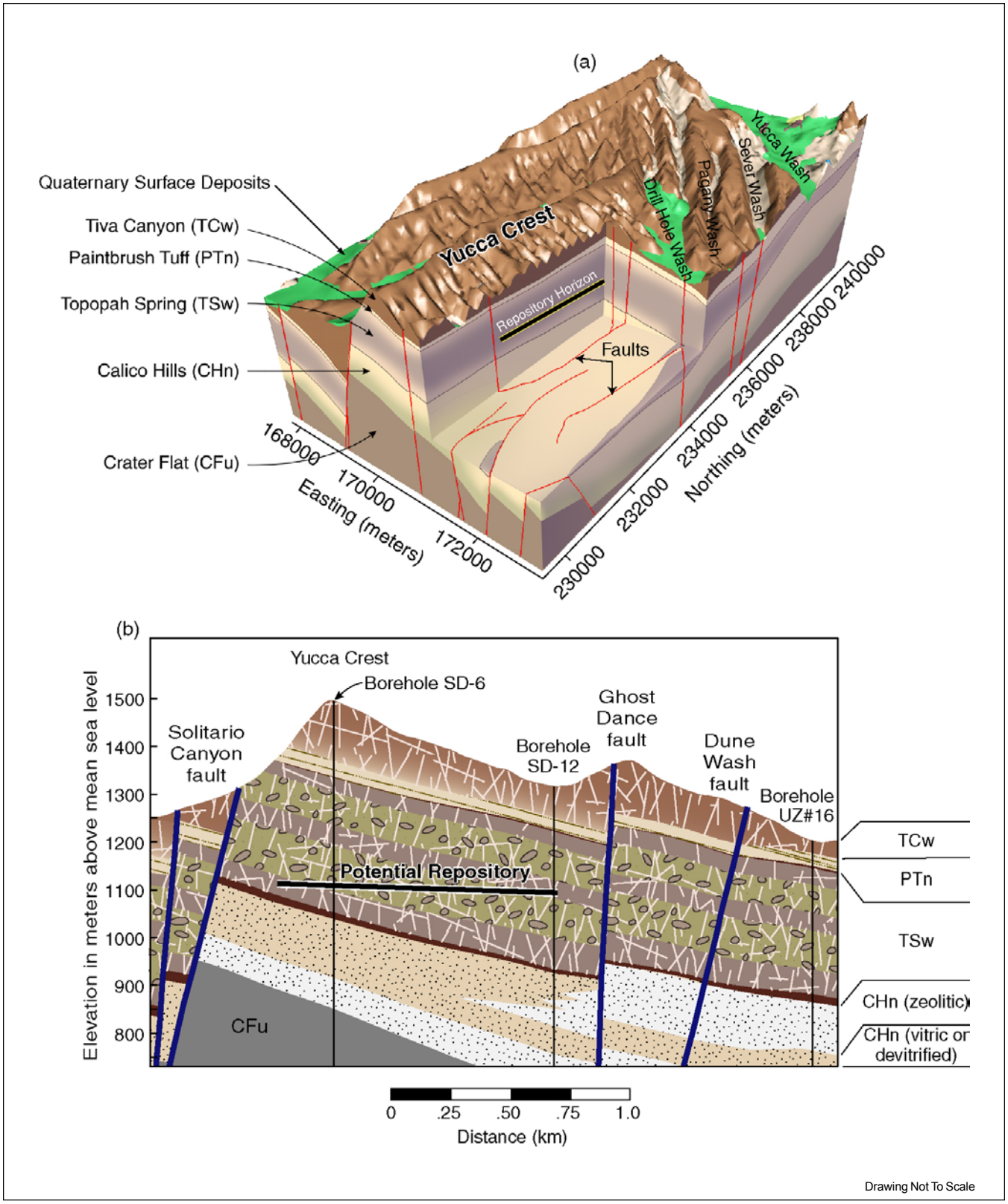
During Fiscal Year 2001, work on the design of surface facilities supported development and preparation of site recommendation technical baseline documents for the site recommendation. Surface facility work also included evaluations of the waste handling building modular design concept, which may help meet expected budget constraints, and spent nuclear fuel handling operations. We began work on the surface facility site development plan, which will provide a layout of the facilities and a plan and schedule for development.

The Regulatory Framework for Repository Development

The requirements for the repository regulatory framework have evolved over time. The Nuclear Waste Policy Act (NWPA) directed EPA to establish generic radiological protection standards for repositories, NRC to establish licensing criteria for geologic repositories, and DOE to issue general guidelines for selecting repository sites for site characterization. The 1987 Nuclear Waste Policy Amendments Act limited characterization of candidate repository sites to Yucca Mountain. The Energy Policy Act of 1992 directed EPA to develop site-specific radiation standards for a repository at Yucca Mountain and directed NRC to revise its repository licensing criteria to be consistent with EPA's standards. DOE, accordingly, decided to amend its general siting guidelines to reflect a site-specific evaluation. This regulatory framework was finalized shortly after the end of Fiscal Year 2001.

EPA radiation protection standards

After receiving public comment on its 1999 proposed rule and refining certain requirements, EPA finalized its radiation protection standards and issued the final rule, 40 CFR Part 197, on June 13, 2001. The final rule



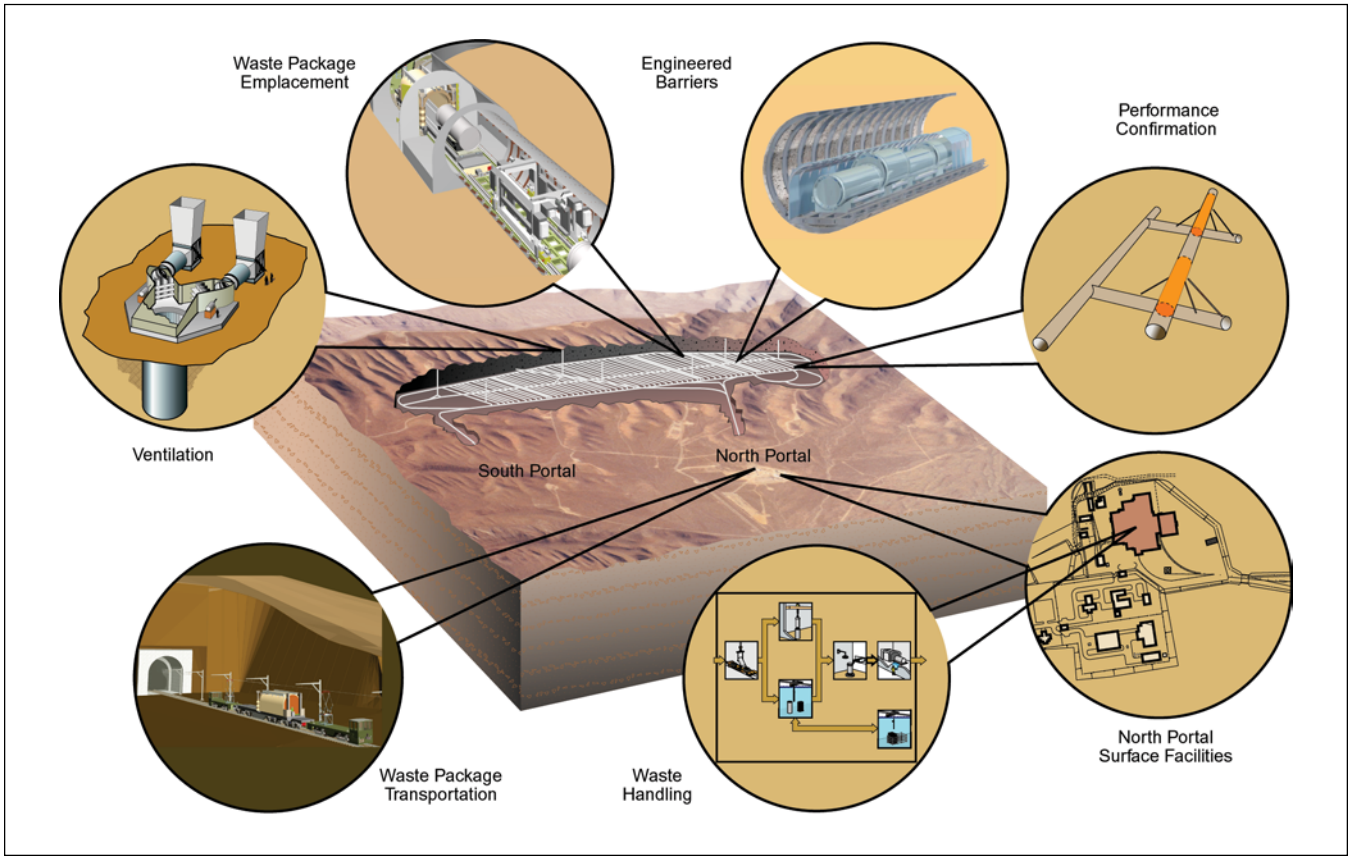
Yucca Mountain site-scale geology

remains consistent with the radiation limits prescribed in the proposed rule for the three public health and environmental standards for disposal: an individual protection standard (15 mrem/year); a groundwater protection standard (4 mrem/year); and a human intrusion standard (15 mrem/year). The compliance location is, effectively, a point 18 km (11 miles) in the direction of the predominant groundwater flow. More information is available at the EPA's website: http://www.epa.gov/radiation/yucca/.

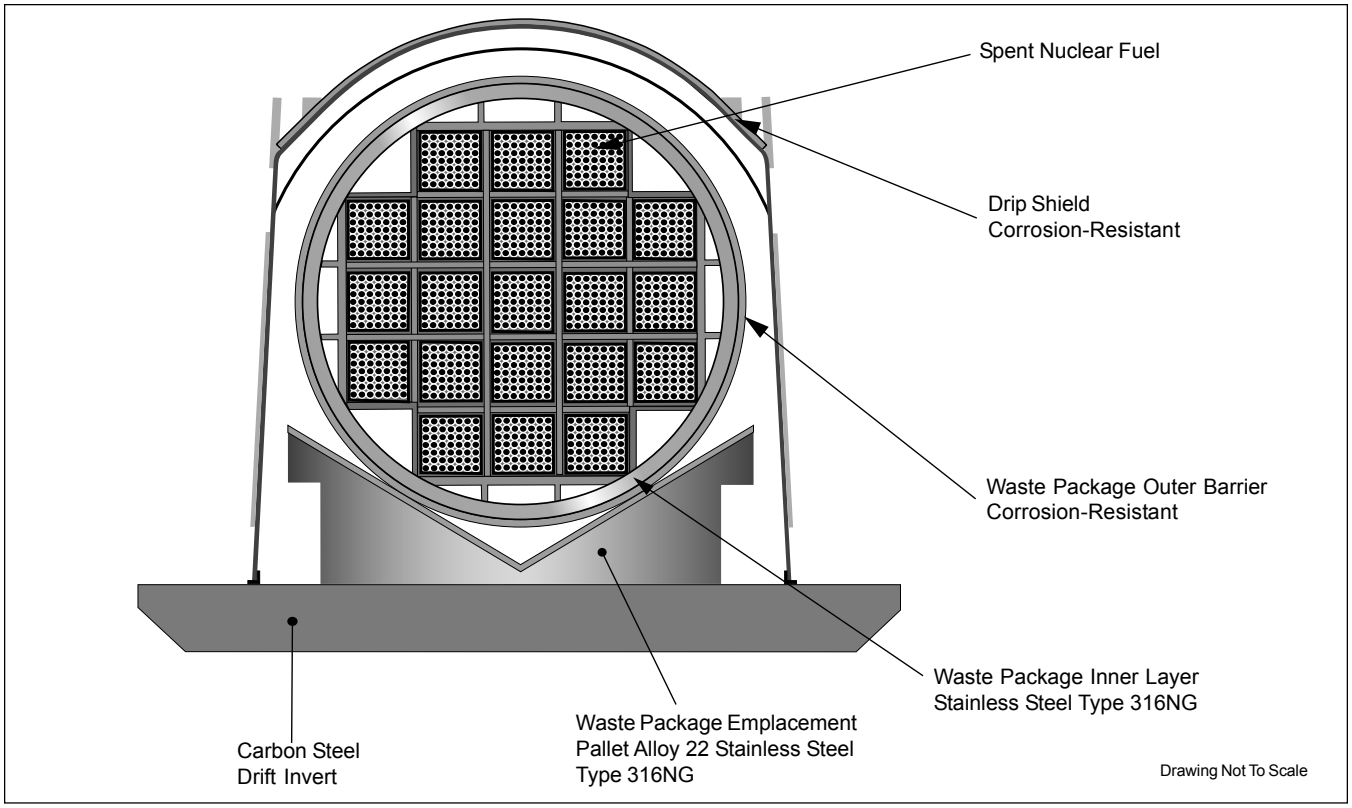
The standards are designed to protect the residents closest to a potential repository by establishing maximum levels that are within EPA's acceptable risk range for environmental pollutants. Following the release of the rule, Energy Secretary Abraham stated that the standards are "tough and challenging," but DOE believes it can "meet the requirements."

NRC licensing regulation

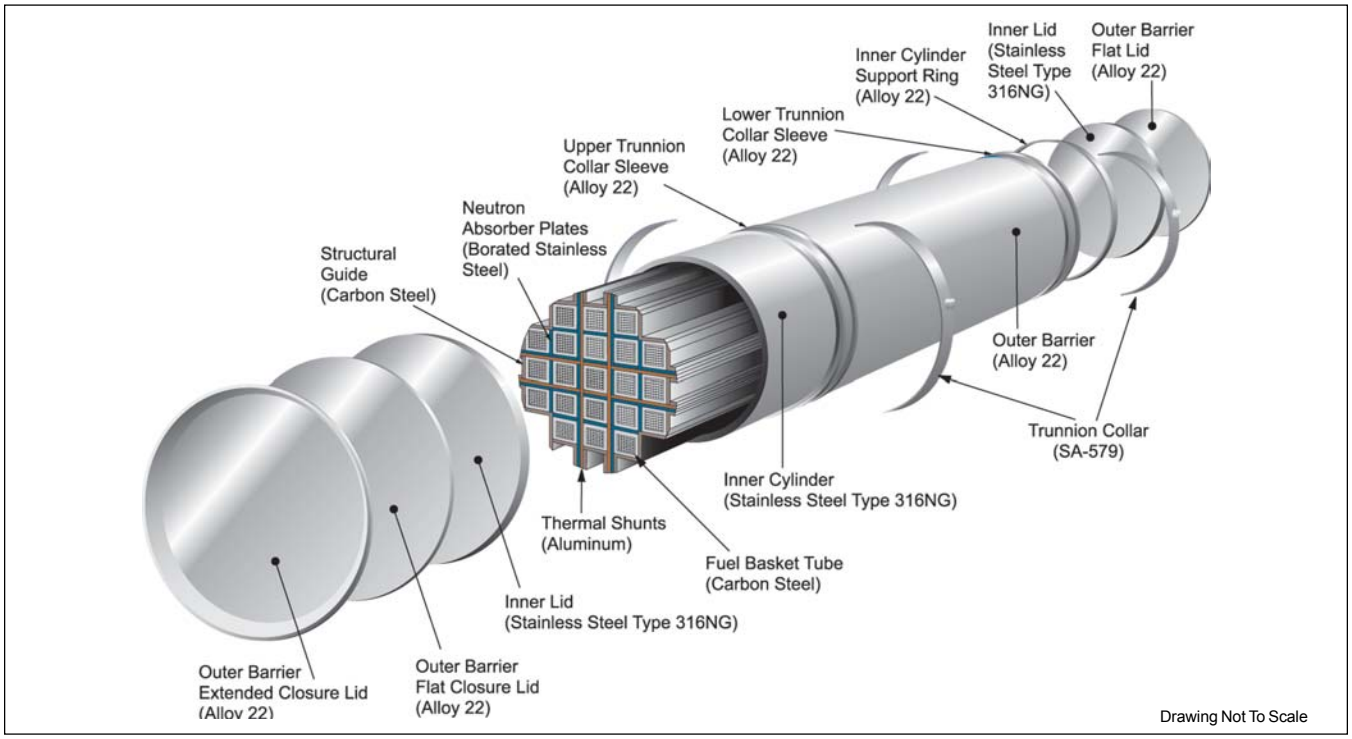
As directed by the Energy Policy Act, NRC's role is to implement the public health and safety standard established by EPA in any licensing process NRC may conduct for a repository at Yucca Mountain. NRC published its proposed licensing criteria in February 1999. NRC finalized these licensing criteria and published them in the final 10 CFR Part 63 on November 2, 2001. NRC incorporated EPA's public health and environmental standards in its final rule. NRC also clarified descriptions and incorporated definitions, where necessary, and added standards which were not addressed in NRC's proposed rule, such as the separate groundwater protection standard and the associated requirements for calculating radionuclide releases to the groundwater. More information is available at the NRC's website: http://www.nrc.gov/.



Proposed monitored geologic repository facilities at Yucca Mountain



Cross-sectional illustration of an emplaced alloy 22 and stainless steel dual-metal waste package



21-PWR absorber plate waste package design

DOE siting guidelines

DOE issued repository siting guidelines at 10 CFR Part 960 in 1984, when multiple sites were under consideration for a repository, and proposed a revision to them in 1996 that focused on evaluating the suitability of the Yucca Mountain site. After a supplemental notice of proposed rulemaking in November 1999, and further public comment, the final guidelines, *General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories; Yucca Mountain Site Suitability Guidelines,* 10 CFR Parts 960 and 963, were published on November 14, 2001. The amendment of 10 CFR 960 and promulgation of 10 CFR 963 completed the regulatory framework the Secretary used to evaluate whether the Yucca Mountain site is suitable for development as a repository. The Department's repository siting guidelines are available on the OCRWM website at http://www.rw.doe.gov.

Project Management

In Fiscal Year 2001, we produced or revised several technical baseline documents that define our understanding of the natural and engineered components of a repository system and ensure their thorough integration. Systems studies were completed to support decision-making on technical changes.

In Fiscal Year 2001, the most significant change was the incorporation of a broader repository temperature range into the technical baseline documents, providing for a more flexible repository operating mode that could address a wider range of thermal management options. In our modifications, we continued to upgrade web-based information management tools to support integrated technical, cost, and schedule planning. We established a comprehensive data base of environment, safety, and health requirements to clearly articulate, for ourselves and for oversight agencies, the tasks and responsibility assignments for the activities we conduct to ensure the health and safety of the public and our workers.

Project schedule planning

The Yucca Mountain Site Characterization Project uses a "rolling-wave" schedule that has more detail in the early years and less detail in the later years. Each year, the Project updates its planning and then schedules the next increment of work in detail; this allows managers to perform their work against a detailed plan and to identify the skill mix and hours needed to perform future work. During the Fiscal Year 2001 update of the multiyear plan, the Project planned all work activities that would be necessary for a license application.

Protecting Workers, the Public, and the Environment

Fostering a nuclear safety culture

The framework for environment, safety, and health across the DOE complex is based upon a set of written policies, rules, orders, and standards. The implementation of these directives establishes a safe workplace for the protection of workers, the public, and the environment, and provides a documented means of performing work safely. We have continued to maintain an outstanding safety record. In Fiscal Year 2001, our safety performance indicators have demonstrated that our Recordable Injury/Illness Case Rates and Lost Workday Injury/Illness Case Rates are consistently better than industry standards.

In Fiscal Year 2001, we implemented our Zero Accident Philosophy (ZAP), which establishes the framework and the responsibilities for a project goal of zero incidents and accidents. OCRWM recognizes that workplace accidents are costly, preventable, and unacceptable. With the implementation of the ZAP approach, OCRWM is committed to the goal of eliminating all workplace injuries and illnesses, overexposures to hazardous substances, and hazards to the environment.

OCRWM continued to implement and improve the Condition/Issue Identification and Reporting/Resolution System to centralize tracking, trending, and reporting of

Desert research archaeologists at work on Bare Mountain site near Crater Flat

safety and health conditions/issues and opportunities for improvement. The system provides for problem identification and resolution and supports an integrated safety management core function by providing feedback and continuous improvement. The system is available for use by all employees, and more than 2,100 conditions/issues/resolutions have been entered into the system since its inception.

Environmental protection

Throughout Fiscal Year 2001, OCRWM continued its commitment to minimizing adverse environmental impacts while complying with all applicable Federal, State, and local environmental statutes and regulations and DOE orders. In support of work both above and below ground, our environmental staff continued to meet responsibilities that ranged from training new employees to be aware of their environmental obligations to reclaiming approximately 13 acres of disturbed areas at which scientific studies had been completed.

Environmental compliance

Obtaining and maintaining the required environmental permits was critical to every activity undertaken to characterize Yucca Mountain. These permits cover activities such as those associated with air quality; underground injection of tracers for scientific studies; drinking water, wastewater discharge, and water use; and land management. In Fiscal Year 2001, we maintained compliance with more than 40 environmental permits, plans, and procedures; and our environmental program continued to evolve to address new regulatory requirements. As required to maintain these permits, we continued to submit quarterly and annual compliance reports to the Nevada Division of Environmental Protection and other regulating agencies.

An area of particular interest within the environmental compliance program is historic preservation. In compliance with the Programmatic Agreement between DOE and the Advisory Council on Historic Preservation, consultation and interactions with 17 Native American Tribes and organizations continued. OCRWM met with Tribal representatives twice during Fiscal Year 2001 to discuss preservation of Native American cultural resources and provide information on the scientific studies and reports we issued.

Compliance verification

To ensure that the conditions and requirements of all environmental permits, plans, and procedures are being fulfilled and applicable regulations are met, staff from DOE's Office of Environment, Safety, and Health conduct frequent, unannounced surveillance field checks.

Functioning in concert with the permitting process, pre-activity land access surveys are undertaken to inventory and protect ecological and cultural resources in areas proposed for surface-disturbing activities. Specially trained personnel thoroughly examine these areas before work begins to identify important plant and animal species, such as the desert tortoise, and items of archaeological significance (primarily Native American artifacts in the Yucca Mountain vicinity). In Fiscal Year 2001, eight pre-activity land access surveys were conducted.

Under Secretary of Energy Robert Card visited Yucca Mountain on July 26, 2001

Data collection and monitoring

As stewards of the environment and in compliance with the conditions of our permits, we monitor air quality, meteorology, water quality, terrestrial ecosystems, and cultural resources (archaeological and Native American) to determine potential impacts from site characterization activities. To date, no significant adverse environmental impacts have been detected.

In Fiscal Year 2001, data collection continued to support repository design, biosphere modeling, TSPA, and response to comments on the draft environmental impact statement. We also maintained land access and land withdrawal agreements and right-of-way reservations with the Bureau of Land Management, the U.S. Air Force, the National Park Service, and the U.S. Forest Service as scientific studies continue at Yucca Mountain and remote sites in southern Nevada and California.

Additional information on these and other environmental program activities can be found in the Site Environmental Report, which is published annually and is available upon request.

External Oversight

NRC establishes regulations for the licensing of nuclear waste facilities including OCRWM. The Nuclear Waste Technical Review Board (NWTRB) has responsibility for evaluating the validity of our scientific and technical work. Meetings held in Fiscal Year 2001 with NRC and the NWTRB are listed in Appendix E. Publications the NWTRB issued in Fiscal Year 2001 are listed in Appendix F.

Interactions with NRC

NRC plays a statutory role in the Civilian Radioactive Waste Management Program: it is responsible for licensing the potential repository and for issuing criteria to govern the licensing process.

Under the NWPA, one of the documents that was required to accompany the Secretarial recommendation of the Yucca Mountain site was preliminary comments from NRC on whether our site characterization and proposed waste form analysis appear sufficient to serve as the foundation for a license application. Based on

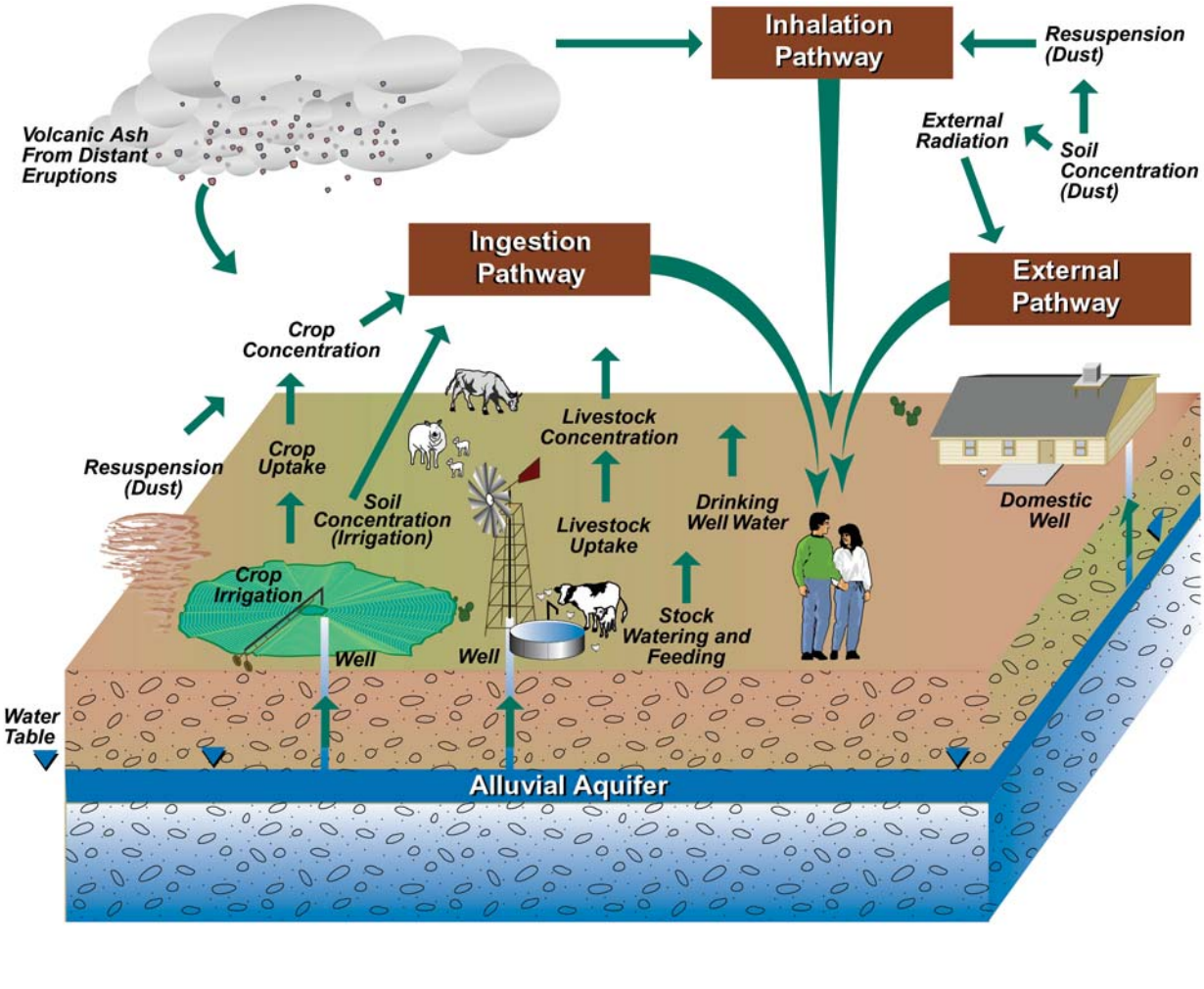


Illustration of the natural transport pathways and processes contributing doses to biosphere

the work OCRWM documented in Fiscal Year 2001 and information NRC gained from many years of pre-licensing interactions, NRC provided its sufficiency comments on November 13, 2001. The sufficiency letter stated, "The NRC believes that sufficient at-depth site characterization analysis and waste form proposal information, although not available now, will be available at the time of a potential license application such that development of an acceptable license application is achievable."

This sufficiency statement does not draw conclusions concerning the actual licensability of the Yucca Mountain site. NRC emphasizes that "NRC's licensing decisions, in terms of a potential repository at Yucca Mountain, will not occur until DOE submits a high-quality license application, the staff completes its independent safety review and issues a safety evaluation report, NRC provides an opportunity for a hearing, and NRC makes its final determination of whether the DOE license application meets NRC regulations. Any NRC licensing decision will be based on all the information available at the time of decision."

NRC's strategic planning calls for early identification and resolution of issues at the staff level before a license application is submitted. To provide feedback on key issues, NRC has developed nine issue resolution

status reports that define criteria for resolving each issue and report on its status, including areas of agreement and NRC staff comments.

Fiscal Year 2001 technical exchange meetings with NRC addressed thermal effects on groundwater flow, evolution of the near-field environment, repository design and thermal-mechanical effects, and improvements to the key technical issues meeting process. In addition, through management and quality assurance meetings, we kept NRC informed of our overall progress and ensured that issues needing management attention were addressed.

As we move closer to potential licensing, quality assurance issues become more important as discussion topics with NRC. In Fiscal Year 2001, both OCRWM and NRC identified quality assurance issues and technical discrepancies. We have focused intensively on resolving concerns about quality assurance and NRC has continued to closely monitor our progress. More information on our quality assurance program is presented in Chapter 4.

Interactions with the NWTRB

The NWTRB was created by Congress and is composed of distinguished experts nominated by the National Academy of Sciences and appointed by the President. It acts as a full board and through five panels organized around site characterization; the repository; the waste management system; the environment, regulations, and quality assurance; and performance assessment. Pursuant to the NWPA, as amended, the NWTRB must report its findings, conclusions, and recommendations to Congress and the Secretary of Energy at least twice a year. In April 2001, the Board released its *Report to the U.S. Congress and the Secretary of Energy,* summarizing its calendar year 2000 activities.

In its report, the NWTRB identified four priority areas for the technical evaluation of Yucca Mountain: meaningful quantification of conservatisms and uncertainties in performance assessments; understanding of the processes involved in predicting waste package corrosion; comparison of the base-case repository design with a low-temperature design; and development of multiple lines of evidence to support the safety case for the repository. This report echoed earlier, similar comments by the NWTRB. OCRWM conducted additional analyses in Fiscal Year 2001 to address lower temperature design and the Board's other concerns.

In Fiscal Year 2001, the full NWTRB held four meetings. Two of these meetings addressed a range of scientific and technical issues, and one focused on development of multiple lines of evidence. The fourth meeting, in September 2001, was a special three-day meeting to review Yucca Mountain site characterization activities. In addition, the NWTRB's Performance Assessment and Repository Panels held a joint meeting to review the Supplemental Science and Performance Analyses, and the Repository Panel held an International Workshop on Long-Term Extrapolation of Passive Behavior.

More information about the NWTRB and the text of correspondence between the NWTRB and OCRWM's Director are available on the NWTRB's web site at http://www.nwtrb.gov.

Relations with Affected Parties

Under the NWPA, the State of Nevada and the affected units of local government are entitled to exercise oversight of site characterization activities and to receive financial assistance for this purpose. Affected units of local government (AULG) include Nye County and nine contiguous counties, including Inyo County in California. In Fiscal Year 2001, Congress continued to provide financial support to oversight efforts by the 10 affected counties and the State of Nevada; Congress provided $6 million to the counties and $2.5 million to Nevada.

The NWPA also gives the State and Nye County the authority to conduct independent investigations and to receive funding for an onsite representative. The State has not designated such a representative, but Nye County has, and its representative continued to oversee our work in Fiscal Year 2001. Nye County implemented its Fiscal Year 2001 initiative to drill boreholes near Amargosa Valley, Nevada. Continued sampling and data collection are yielding information about water flow and fault structure in the saturated

zone. OCRWM provided Nye County an additional $5,859,000 in Fiscal Year 2001 for this program. Information about Nye County's oversight program can be found through its web site at http://www.nyecounty.com.

During Fiscal Year 2001, we continued interactions with the 10 AULG counties and the State. On April 11, 2001, OCRWM staff held a teleconference with the representatives of the AULGs to provide information on the Fiscal Year 2002 budget request to Congress. OCRWM staff hosted a meeting with county representatives in Las Vegas, Nevada on May 4, 2001. We also provided Project updates to the county commissions, boards of supervisors, and State and local government committees. We conducted 15 site tours for community, county, and State officials.

We continued funding our PETT agreement with the State of Nevada, and Nye and Clark Counties. Under Section 116(c)(3)(A) of the NWPA, these payments are intended to compensate for taxes that affected entities would have collected on site characterization and the development and operation of a repository if they were authorized to tax Federal Government activities. A total of $10.9 million was provided in Fiscal Year 2001, of which $10 million went to Nye County, $785,000 went to the State of Nevada, and $115,000 went to Clark County.

In Fiscal Year 1998, OCRWM and the University and Community College System of Nevada entered into a cooperative agreement for conducting scientific studies that could augment our own studies of the Yucca Mountain site. Under this agreement, up to $40 million may be applied to such studies through Fiscal Year 2003; through Fiscal Year 2001, $20 million had been approved for 34 tasks. Subjects of the studies include rain accumulation in the Yucca Mountain area, fluid inclusion in rock fracture fillings, water infiltration through the site, and seepage into drifts and onto potential waste packages. Studies will also contribute geochemical data for development of the single regional groundwater model described above.

Yucca Mountain Site Characterization Project Outreach

In Fiscal Year 2001, OCRWM completed and released to the public many significant documents that have been described throughout this report, beginning the first steps in the statutorily defined consideration process supporting a national decision on whether to go forward with developing a geologic repository. In connection with those developments, we conducted briefings for AULG and Tribal representatives. OCRWM maintained an active communications program to provide timely and accurate information about the Yucca Mountain Site Characterization Project to stakeholders, interested groups, and members of the public.

Exterior view of the Yucca Mountain Science Center and Information Office, Las Vegas, NV

We promoted two-way communications with technical audiences and the general public through a tour program, speakers' bureau, and exhibits at key events. In Fiscal Year 2001, we conducted 222 tours of Yucca Mountain, briefing more than 4,478 visitors about the status of activities there. More than 8,540 people at 22 conferences and events held throughout the United States visited our exhibit. Through our speakers'

bureau, we made 84 presentations to civic, educational, and professional groups, reaching more than 6,480 people.

Our Internet site remained an important communications tool in Fiscal Year 2001. Various sections of the web site were accessed more than 9,760,000 times by visitors during 336,589 user sessions.

We answered more than 10,600 phone calls on our toll-free information line, and shipped 18,896 documents to 943 requestors worldwide. Our three Nevada Science Centers provided information to 8,211 visitors.

Through our educational activities in Nevada, we reached more than 12,926 students, teachers, and parents. The activities they participated in included workshops on energy, geology, and environmental studies; field trips to Yucca Mountain; geology merit badge workshops for Girl and Boy Scouts; science discovery days; classroom presentations; and participation in the JASON Project, a nationwide, interactive science program.

Fiscal Year 2001 in Context

During Fiscal Year 2001, the Yucca Mountain Project helped move the Program significantly closer to a site recommendation decision. We completed the TSPA-SR to assess the long-term performance of the potential repository; we published documents that the NWPA requires to accompany the President's recommendation; and we held extensive public hearings in the vicinity of the site to inform and solicit the opinions of local residents.

OCRWM believes that waste acceptance in 2010 remains an ambitious, but achievable, target. Accomplishing this goal will require careful planning and phasing of project activities, timely decision-making, and adequate funding. We are preparing the license application and are currently developing and evaluating alternative scenarios to identify the most effective approach for initial surface facility and repository construction. Long-lead activities, such as construction of a rail line to the site, will also need to begin soon.

Public open house visitors tour the crest of Yucca Mountain, fall 2001

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Chapter Three

Waste Acceptance, Storage, and Transportation Project

Background

It is the primary responsibility of the Waste Acceptance, Storage, and Transportation Project to provide for the legal and physical transfer of commercial spent nuclear fuel and Department of Energy (DOE)-owned nuclear material from their owners and generators to DOE. The materials that are destined for a potential repository are now stored at 131 sites in 39 States.

Due to budgetary shortfalls during the past four years, the activities of this project, especially transportation planning, were severely curtailed while the Program focused its resources on Yucca Mountain in preparation for the decision on whether to recommend the site for development as a repository. In particular, we deferred transportation logistical and institutional planning activities. Now that Yucca Mountain has been designated as the repository site, we must resume preparations necessary to implement a transportation system to support the movement of spent nuclear fuel and high-level radioactive waste.

Funding

The Office of Civilian Radioactive Waste Management (OCRWM) allocated $2.7 million from its Fiscal Year 2001 appropriation to the Waste Acceptance, Storage, and Transportation Project. In preparation for waste acceptance activities, OCRWM maintains the core capability to implement a private sector-based national transportation system for waste acceptance and transportation, to resolve institutional issues with stakeholders, and to prepare for implementation of funding and assistance to train emergency response personnel as required by Section 180(c) of the Nuclear Waste Policy Act (NWPA).

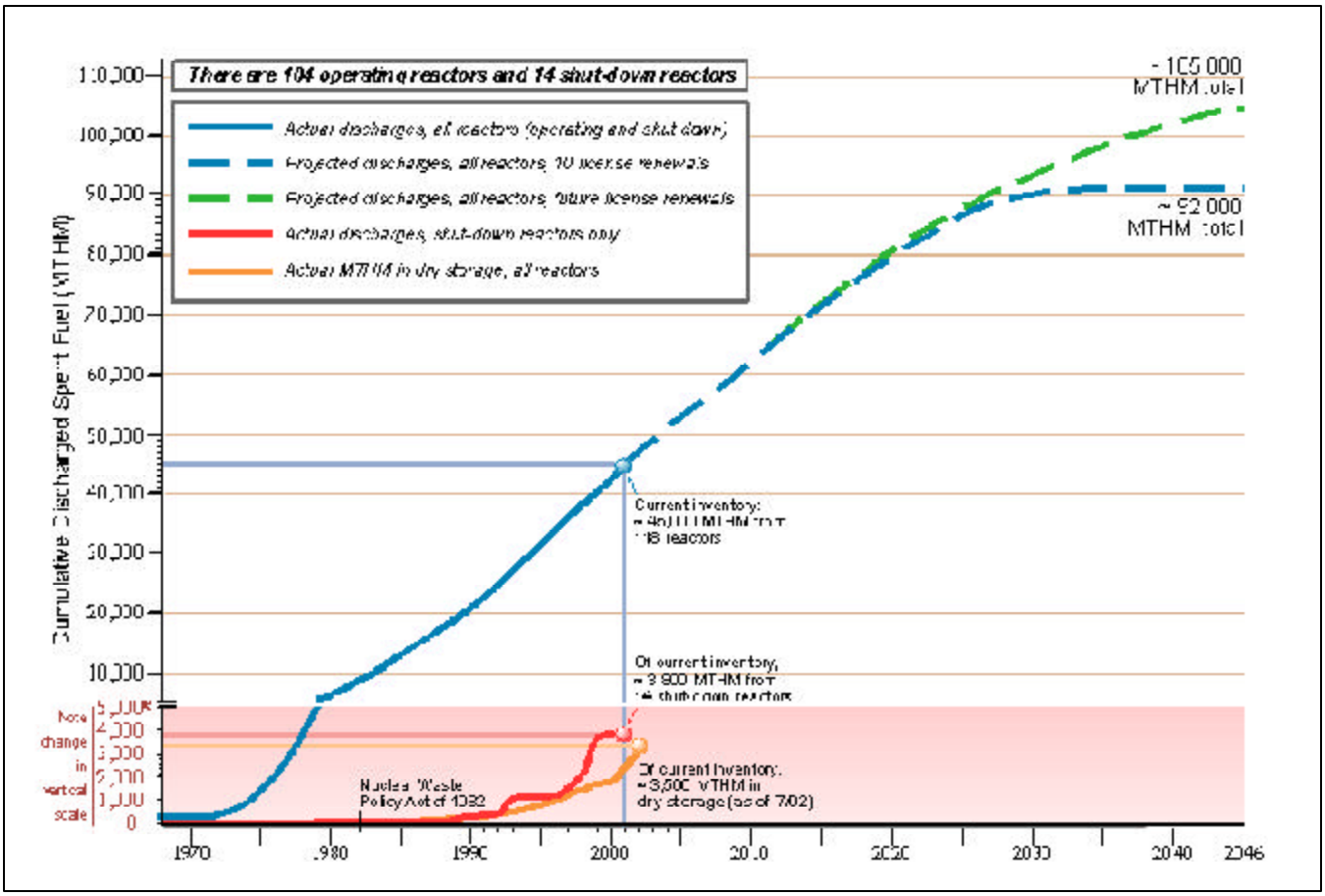
Major Fiscal Year 2001 Activities and Results

In Fiscal Year 2001, we used Energy Information Administration data to update our discharge projections for commercial spent nuclear fuel. In addition, we continued to integrate acceptance criteria and schedules for DOE-owned spent nuclear fuel, high-level radioactive waste, and surplus plutonium managed by the Office of Environmental Management, the Office of Fissile Materials Disposition, and the Naval Nuclear Propulsion Program. Following a request from the Assistant Secretary for Environmental Management that OCRWM assume responsibility for the supply of transportation equipment and services for DOE-owned spent nuclear fuel, we began integrating this activity with our other transportation planning.

Acceptance of Commercial Spent Nuclear Fuel

The NWPA authorized the Secretary to enter into contracts with the owners and generators of commercial spent nuclear fuel and high-level radioactive waste. Our interactions with them on matters concerning receipt, shipment, and disposal of their spent nuclear fuel are governed by the *Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste*, 10 CFR Part 961, promulgated as a Federal rule in 1983. Under terms of the standard contract, OCRWM was to start accepting spent nuclear fuel from utilities in 1998.

With no Federal facility yet available to receive the material, a number of utilities are pursuing litigation to seek relief from hardships they allege as a consequence of DOE's inability to accept waste. In addition, in



Historical and projected commercial spent nuclear fuel discharges

Fiscal Year 2001, a number of utilities initiated litigation challenging the Department's authority to use fee adjustments in funding settlements.

During Fiscal Year 2001, we used the latest projections from the Energy Information Administration to update our estimates of the amount of spent nuclear fuel to be disposed of in a potential repository. Changes reflected extended burnup of fuel, but did not reflect recently announced license extensions.

Dry transfer system for spent nuclear fuel

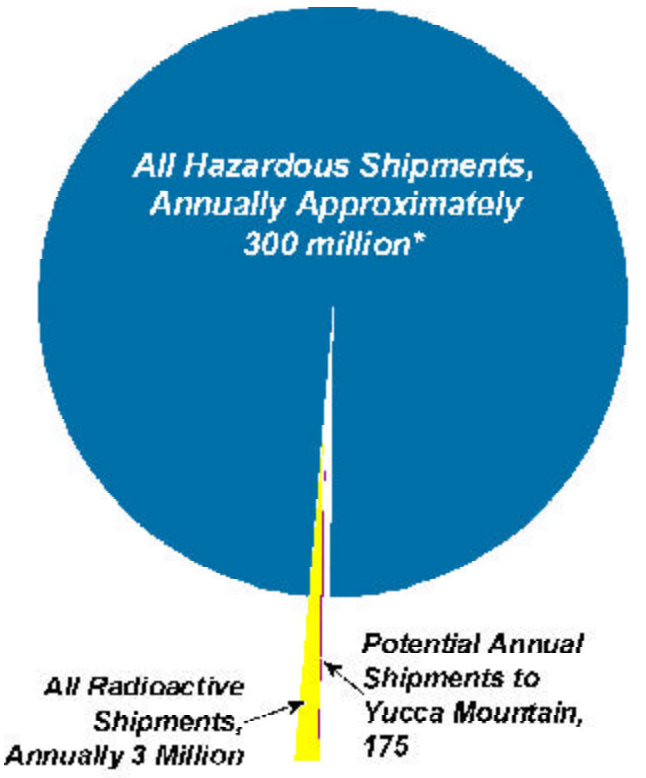
Development of the spent nuclear fuel dry transfer system continued in Fiscal Year 2001. The Nuclear Regulatory Commission (NRC) completed its review of the *Topical Safety Analysis Report* and issued a draft *Safety Assessment Evaluation Report*. We reviewed the *Safety Assessment Evaluation Report* and provided comments to NRC.

The dry transfer system has the potential to assist utilities and DOE in future spent fuel management activities by enabling the transfer of individual spent fuel assemblies between a conventional top-loading cask and a multi-purpose canister in a shielded overpack, or by accommodating spent fuel transfers between two conventional casks.

Acceptance of DOE-Managed Materials

Integrating DOE-managed nuclear materials into the Program

Three offices within DOE manage materials destined for geologic disposal. The Office of Environmental



*Based on U.S. Department of Transportation Office of Hazardous Materials Safety Estimate. "Hazardous" shipments include materials such as explosives, flammable gases, solids and liquids, and poison gas.

A comparison of annual shipments

Management maintains custody of high-level radioactive waste, DOE-owned spent nuclear fuel, and surplus nuclear materials and prepares for their transfer to OCRWM for disposal. The Office of Fissile Materials Disposition plans for the disposition of surplus weapons-usable plutonium. Naval spent nuclear fuel is managed by the Naval Nuclear Propulsion Program, which represents both DOE's Office of Nuclear Energy, Science, and Technology and the Department of the Navy.

OCRWM continued to integrate acceptance criteria and schedules for the various waste forms into OCRWM's memoranda of agreement with these offices. When these memoranda are finalized, the integrated waste acceptance criteria and schedule will fulfill important commitments and will provide an annual waste acceptance rate for use in repository planning and design.

In July 2001, the Assistant Secretary for Environmental Management requested that OCRWM assume responsibility for the supply of equipment and services for the transport of DOE-owned spent nuclear fuel and high-level radioactive waste, which had previously been the responsibility of the Office of Environmental Management. We have begun integrating this activity with our other transportation planning.

Fiscal Year 2001 in Context

During Fiscal Year 2001, the Waste Acceptance, Storage, and Transportation Project focused on maintaining the capability to implement a national transportation system for waste acceptance and transportation, to resolve institutional issues with stakeholders, and to implement the funding and assistance for emergency response training required by the NWPA.

Now that the Congress has designated Yucca Mountain as the repository site, the pace of transportation planning activities will need to increase to ensure that the transportation system is ready to move waste when the repository is ready to accept it.

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Chapter Four

Program Management Center

Background

The Program Management Center consists of the Office of Quality Assurance, the Office of Program Management and Administration, and the Systems Engineering and International Division of the Office of Acceptance, Transportation, and Integration. The first of these organizations is located in Las Vegas, Nevada, and the latter two are in Washington, D.C.

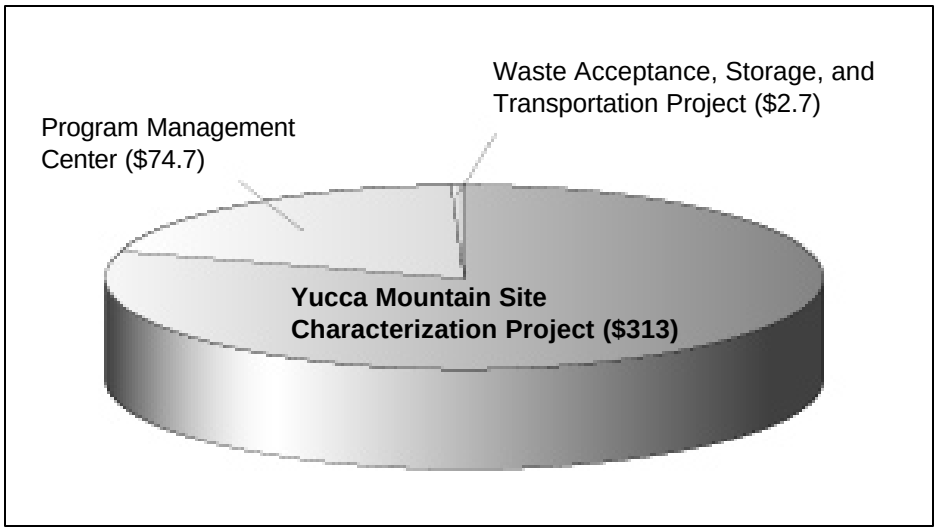
The Program Management Center provides guidance and support to the two business centers in implementing the Program's mission. The Program Management Center's activities supported the Office of Civilian Radioactive Waste Management's (OCRWM) implementation of the President's management initiatives, a set of guidelines launched by the President in August 2001 to measure and improve Federal agencies' performance and to link Federal spending to program performance and effectiveness. Five broad initiatives apply to all agencies: strategic management of human capital, competitive sourcing, improved financial performance, expanded use of electronic government (E-government), and budget and performance integration.

Funding

OCRWM's Fiscal Year 2001 appropriation of $390.4 million was $39.2 million more than our Fiscal Year 2000 appropriation, but $40.2 million less than the President's budget request. We focused our resources on the Program's current priorities, allocating roughly 80 percent to the Yucca Mountain Site Characterization Project, 1 percent to the Waste Acceptance, Storage, and Transportation Project, and 19 percent, or $74.7 million, to the Program Management Center. Program Management Center funding is used primarily for Federal staff salaries and technical support services, and approximately half of the funds supported staff and activities at the Yucca Mountain Site Characterization Project.

Major Fiscal Year 2001 Activities and Results

The Program Management Center was directly responsible for meeting the Program's fourth performance target in the Department's Annual Performance Plan for Fiscal Year 2001 and led OCRWM's implementation of the Presidential management initiatives.



Distribution of Fiscal Year 2001 budget
(dollars in millions)

Performance Target #4: Complete and issue Total System Life Cycle Cost and Fee Adequacy reports

In May 2001, the Program issued the *Analysis of the Total System Life Cycle Cost of the Civilian Radioactive Waste Management Program* and *Nuclear Waste Fund Fee Adequacy: An Assessment.* In addition to fulfilling OCRWM's final performance target, completing these reports met the requirement, in Section 302 of the Nuclear Waste Policy Act, that the Department of Energy annually review and evaluate whether the ongoing fee of 1 mil/kilowatt-hour (kWh) is adequate to offset the civilian share of program costs. The updated total system life cycle cost estimate (TSLCC) reflects the new design and operating modes described in the *Yucca Mountain Science and Engineering Report* and the *Supplement to the Draft Environmental Impact Statement.* An independent cost estimate review was completed in January 2001. Other documents supporting the site recommendation provide additional cost information for alternative low-temperature repositories. The fee adequacy assessment concluded that the 1 mil/kWh fee continues to be adequate to pay for the estimated civilian costs of the Program under the assumptions used in the analysis.

Supporting the President's management agenda

OCRWM has long had management systems and processes in place that support the President's initiatives. We continued to use these systems during Fiscal Year 2001 to strengthen our human resource, financial, information, and performance management capabilities and prepare the Program for expected changes.

Strategic management of human capital

We continued to build on previous years' efforts to develop strategies that will reshape the workforce to meet our mission requirements and organizational needs. In addition, in line with the President's management initiatives, a more in-depth effort was launched to evaluate and improve our human capital management strategies to ensure our ability to achieve the Program's mission and goals; to hire, develop, and retain employees; to reduce the time it takes to make decisions, and to use performance management systems to link performance to results.

During Fiscal Year 2001, OCRWM provided input for the Department's Five-Year Workforce Restructuring Plan, which outlines the organization's strategy to further streamline and de-layer its management structure, broaden the span of control, eliminate excess supervisory positions, and reassign those resources into front-line positions in support of the President's management initiatives. OCRWM continued to use available human capital management tools, including support for internal and external training, and buyout and early retirement authority, in developing, retaining, and recruiting a talented and diverse workforce.

Federal staffing levels remained relatively stable from the end of Fiscal Year 2000 through Fiscal Year 2001. At the end of Fiscal Year 2001, 160 Federal employees were working in Las Vegas, Nevada, and Washington, D.C.

Competitive sourcing

The Program supported the President's management initiatives relating to competitive sourcing by completing its Federal Activities Inventory Reform (FAIR) Act personnel inventory and by successfully transitioning to a new management and operating (M&O) contractor.

The FAIR Act inventory classifies the work performed by Federal employees into either inherently Governmental or commercial (i.e., capable of being performed by contractors). Further study of commercial activities being performed by OCRWM Federal staff awaits Departmental guidance.

OCRWM has completed its transition to a new M&O contractor. After reviewing bids submitted by three companies, the Department competitively selected Bechtel SAIC Company, LLC, as the M&O contractor. The winner was announced on November 14, 2000, and the contract started on February 12, 2001. The contract award, estimated at $3.1 billion, is for a five-year period with options up to a total of five additional years. A transition management team developed a transition management plan, procedures for implementation, and an integrated data base to house

the numerous issues, resolutions, and costs associated with the transition. Approximately 1,600 people, working for one prime contractor, with 24 subcontractors and a host of laboratories, were successfully transitioned into one M&O contract with six subcontracts and support from the national laboratories.

Improving Financial Performance

In August 2001, the Program published *Alternative Means of Financing and Managing the Civilian Radioactive Waste Management Program.* The Program requires a stable and predictable funding profile to succeed. It is, therefore, an OCRWM priority to work with Congress in making the Nuclear Waste Fund available to the Civilian Radioactive Waste Management Program for its intended purpose by November 2002.

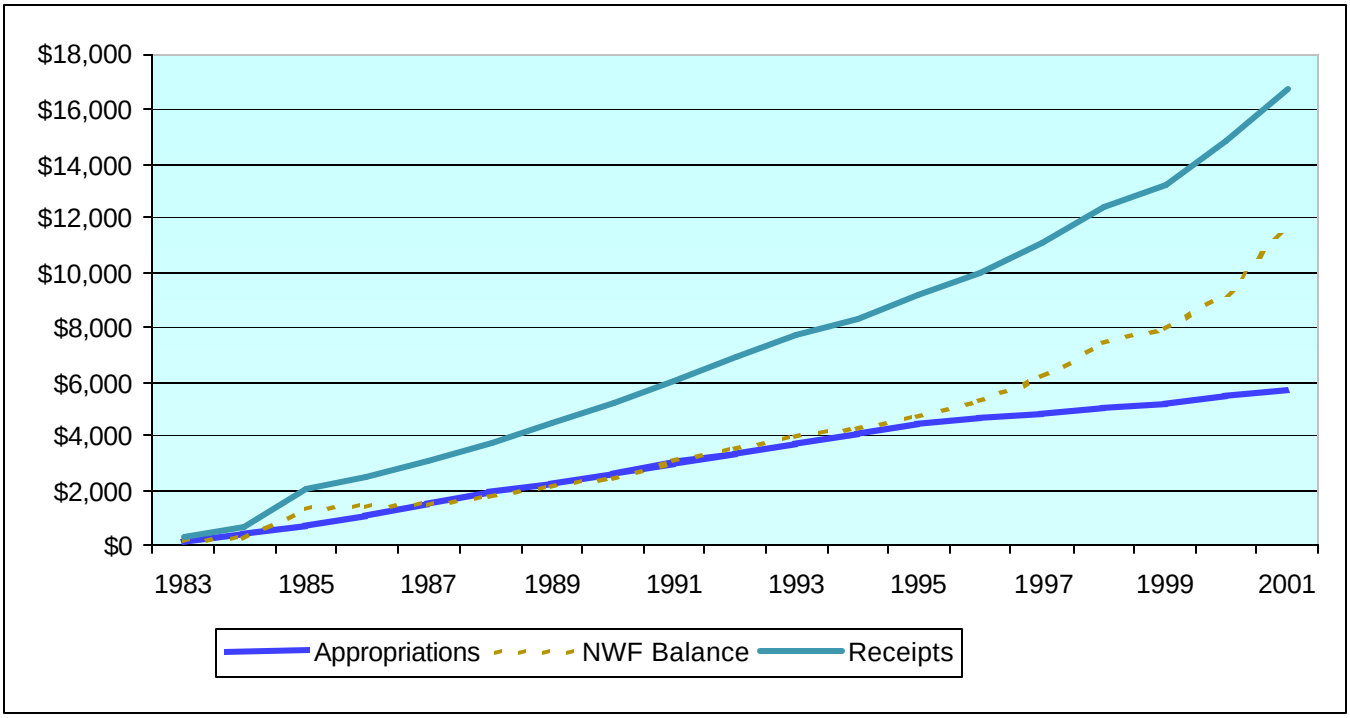
Because of its special fiduciary responsibility for the fees paid by nuclear utilities into the Nuclear Waste Fund, OCRWM has, since inception of the Program, engaged the services of a "Big-5" public accounting firm to perform an independent audit of OCRWM's financial statements. OCRWM has received a "clean" (unqualified) opinion from its auditors every year. OCRWM continued to employ the services of an independent auditor during Fiscal Year 2001.

OCRWM utilizes a major Wall Street investment firm to provide monthly investment advice regarding the Treasury securities held in and/or to be purchased for its Nuclear Waste Fund portfolio. OCRWM continued to use an independent investment advisor during the Fiscal Year.

Expanding Electronic Government

Information management (IM) involves the strategic application of information technology (IT) to enhance productivity, facilitate process improvement, promote information exchange and system interoperability, and reduce overall Program costs.

Our IM activities supported the President's management initiative relating to increased use of E-government so as to strengthen information sharing within the Federal Government and to provide a single access point for citizens seeking information about the Program. In Fiscal Year 2001, IM actions focused on



Approximately 40 percent of the Program's cumulative income has been appropriated; the remainder is saved for future use

supporting site recommendation activities and preparing for a possible license application and the licensing process.

An Architectural Review Board, composed of members of OCRWM's IM team, evaluated current and future information systems, eliminated duplicative and outdated data base functionality, established a goal for future growth and consolidation of OCRWM systems, and developed a Program-wide information architecture. The Program information base was consolidated into a normalized, distributed data base with a standardized data dictionary.

OCRWM's IT Investment Review Board, established pursuant to the Clinger-Cohen Act in Fiscal Year 1999 to plan and manage IT investment decisions, met in Fiscal Year 2001 to implement new investment review thresholds, procedures, and criteria used in decision-making. We are addressing a number of improvements derived from the lessons learned that were discussed at that meeting.

The processing and indexing of more than 115,700 records and re-indexing of documents in the Records Management System were completed this year, thereby increasing document and record retrievability. Also, the Program's data, voice, and video telecommunications network was updated.

We developed, and are implementing, a Licensing Support Network (LSN) in anticipation of the license application requirements we will face. On May 31, 2001, the Nuclear Regulatory Commission (NRC) issued a final rule, clarifying the time at which the Department of Energy (DOE) must certify that the initial LSN requirements have been met, adding minimum design standards for the network. In Fiscal Year 2001, we procured a server and connected it to NRC's LSN server.

OCRWM has also implemented electronic comment/ issue management and tracking systems to support the President's management initiative goals of reducing the time it takes to respond to stakeholder requests and to make decisions.

Budget and performance integration

OCRWM has implemented a suite of good business management practices designed to link planning, budgeting, and performance and to ensure that milestones are met and costs are managed effectively. OCRWM's Program Plan contains strategic objectives, performance goals, and performance measures for a five-year planning period. Performance goals and initial performance targets for each fiscal year are included in OCRWM's budget request to the Office of Management and Budget and the Department's Annual Performance Plan. These targets are finalized upon enactment of each fiscal year's appropriations bill. Strategic performance goals and associated performance measures are assigned to OCRWM project managers and office directors, who are accountable for their achievement. Resource allocation is tied directly to performance targets and is personally reviewed and approved by the OCRWM Director and issued in the final annual work plan for each fiscal year. Progress is reviewed quarterly by the OCRWM Director and tracked semiannually in the Department's commitments database. Final fiscal year results are included in OCRWM's Annual Report to the Congress and in the Department's Performance and Accountability Report.

Quality Assurance

One of the most important areas in which the Program must be successful is quality assurance. NRC, in making licensing decisions, wants to ensure that licensees will be able to construct and operate facilities in a reliable and consistently safe manner. Fiscal Year 2001 quality assurance activities focused on tasks related to site recommendation and, in particular, on activities supporting a total system performance assessment. OCRWM's Office of Quality Assurance regularly interfaces with NRC to discuss our progress in completing corrective actions for deficiencies and to address any concerns or issues NRC may have.

The Office of Quality Assurance took steps to ensure that appropriate quality assurance requirements were in place and that they were fully understood and implemented. Through audits, surveillance, observations, and reviews, quality assurance personnel continued to examine the full range of quality-affecting activities performed by OCRWM, its contractors, and the high-level radioactive waste and spent nuclear fuel organizations within DOE's Office of Environmental Management (EM) whose wastes will be disposed of by OCRWM. Audits and monitoring were used to evaluate how well quality assurance requirements were being met and whether documentation was sufficient to demonstrate compliance. Quality assurance personnel ensured that any deficiencies identified were evaluated, and that adequate investigations, where warranted, were conducted. For each deficiency identified, a corrective action plan was developed, reviewed, and approved. All such plans are tracked through to completion, and the adequacy of the corrective action is verified by quality assurance personnel when all corrective actions are complete. Quality assurance audit and surveillance schedules and reports were posted on the OCRWM web site.

OCRWM quality assurance personnel also provided classroom training to EM personnel on the quality assurance audit process. The purpose of this training was to ensure that EM personnel are qualified to perform audits in accordance with OCRWM quality assurance requirements and to ensure appropriate approaches are used for activities that could impact OCRWM's acceptance and disposal of EM materials.

Program Management, Administration, and Integration

As the Program continues to gather, analyze, and document information about the site and repository and surface facility designs, we update various planning documents so that our stakeholders will have an accurate picture of how the waste management system will operate and the steps we are taking to ensure safety, fiscal responsibility, and effective performance.

We continued to monitor how effectively budget resources were being used for Program activities and, assuming the site would be recommended, to plan for the next phase of the Program.

Program planning

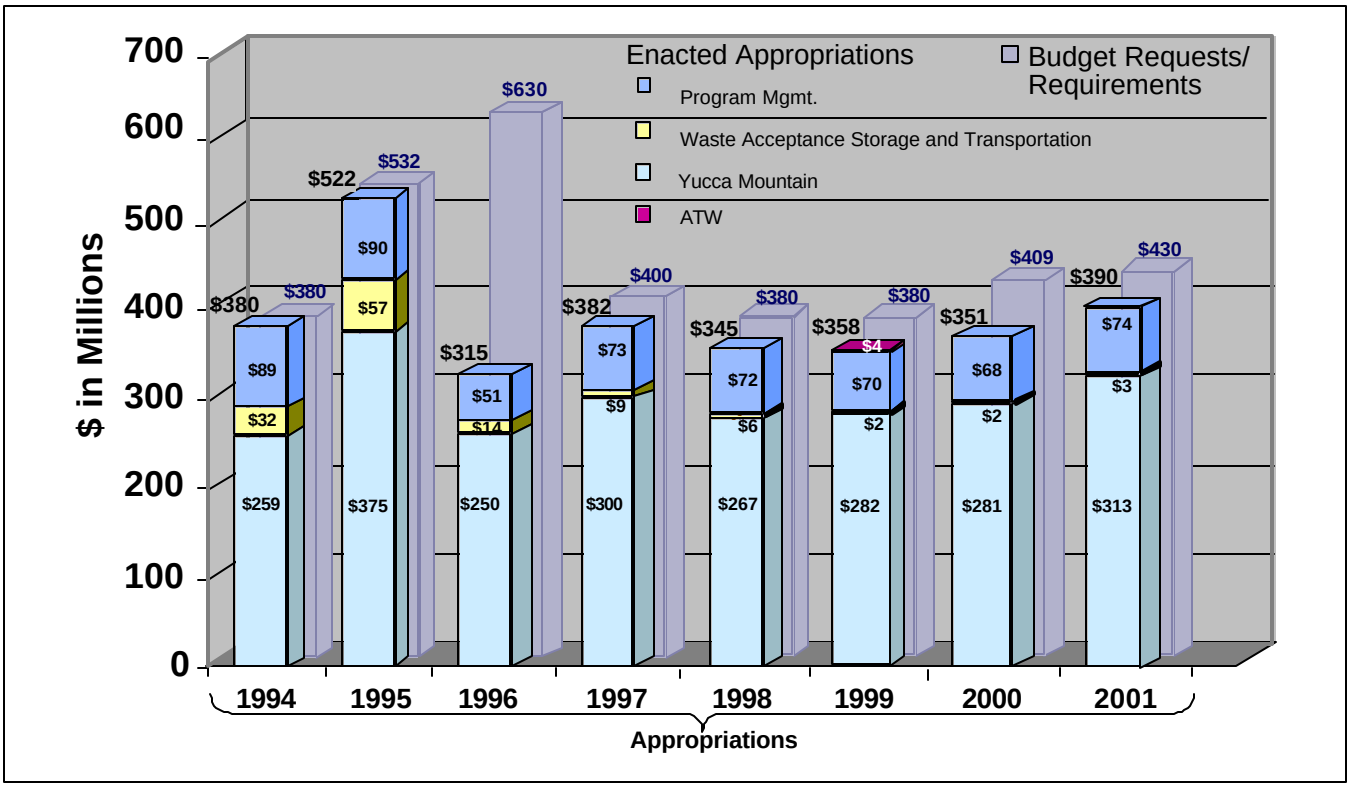
During Fiscal Year 2001, OCRWM began replanning the site characterization and pre-licensing activities and planning the repository design and licensing work that must be completed before license application. Replanning was necessary because Congressional appropriations over the past five years were approximately $224 million short, in the aggregate, of Program requirements. Work that was not essential to the site recommendation was deferred. In addition, we needed to integrate new work necessary to reduce uncertainty in meeting regulatory requirements and to respond to recommendations from oversight groups such as the Nuclear Waste Technical Review Board. This replanning/planning effort will be completed in Fiscal Year 2003. At that time, OCRWM intends to revise its Program Plan. Until the new plan is issued, OCRWM continues implementing the general planning approach described in Revision 3 of the *Civilian Radioactive Waste Management Program Plan*, which was issued in March 2000. The Program Plan contains strategic objectives, performance goals, and performance measures for a five-year planning period.

We held three OCRWM planning workshops: on November 28-30, 2000, and on January 16-18, 2001, in Baltimore, Maryland, and on August 21-23, 2001, in Mesquite, Nevada. Fiscal Year 2001 meetings focused particularly on our strategy for addressing the completion of technical work and on documentation supporting the site recommendation.

Program-level systems studies

Systems studies serve to ensure that changes evolving from a major decision about one component of the national waste management system are technically integrated with all other components. This ensures that resources will be available for planned work and that all efforts will be directed toward achieving Program goals.

In May 2001, we issued Revision 3 of the *CRWMS Modular Design/Construction and Operation Options Report*. This report provides an updated analysis of alternative Civilian Radioactive Waste Management System (CRWMS) architectures, system operations, and implementation strategies. The report



Annual funding levels have been less than the Administration's request

includes various scenarios to respond to Program uncertainties, including uncertainties in funding levels to be expected during the period of the repository construction and initial operations. Creation of a mechanism for predictable, adequate funding during the initial repository construction and operations period could reduce uncertainty and total Program cost.

Program-level baseline control

Integrated technical, cost, and schedule baselines are the foundation of our Program management system and support budget and performance integration. Baselines are managed through system-level documents. The *Civilian Radioactive Waste Management System Requirements Document* (CRD) defines the basic technical requirements for a national waste management system. We issued CRD Revision 5 Document Change Notice (DCN) 2 in December 2000 and Revision 5 DCN 3 in February 2001. These two important DCNs reflected updates to the inventory of nuclear materials used as a design basis for the site recommendation; recognition of the request by the Naval Nuclear Propulsion Program for faster and earlier receipt of naval spent nuclear fuel; and clarification that the receipt rate schedule contained in the document represents only target rates and does not create any binding legal obligation on DOE.

Revision 02 of the Program's *Total System Description* was issued in September 2001. This document provides a top-level system description and its concept of operations. Revision 02 incorporates site recommendation designs for the waste package and the potential repository. It also incorporates a flexible design concept that may allow the repository to operate over a wide range of thermal loads.

During Fiscal Year 2001, we continued to update the 1999 *Integrated Interface Control Document* (IICD), which was released in early Fiscal Year 2002. The IICD specifies the physical and operational interface agreements among the components of the national waste management system, which includes the waste acceptance, transportation, and repository systems, and

DOE offices whose materials OCRWM will accept. These interfaces determine how waste handling facilities and equipment must be designed to accommodate different shipping casks and waste forms. Major changes include: (1) modifying the transportation system development responsibilities for shipping DOE spent nuclear fuel from EM to OCRWM; (2) specific inclusion of the high-level radioactive waste canister interfaces (previously only spent nuclear fuel canisters were included); (3) updates to reflect recent canister designs; and (4) evolving design solutions that were determined to be interface agreements instead of waste acceptance criteria.

The Program's cost and schedule baseline will be updated when the Program replanning effort that is currently under way is completed in Fiscal Year 2003.

Integrated safety management

The Department requires that safety be systematically integrated into management and work practices at all levels so that missions are accomplished while protecting the public, workers, and the environment. The integrated safety management system implementation annual review for Fiscal Year 2001 was conducted from July 23 to August 3, 2001. The review identified one deficiency and seven opportunities for improvement. To address the deficiency and opportunities for improvement, management has developed and initiated implementation of both short-term mitigation actions and long-term corrective actions to ensure safety, quality, and efficient operation of the facility.

As part of our efforts to improve our integrated safety management strategy in Fiscal Year 2001, we issued Addendum 1, titled *Integrated Safety Management Quality Assurance Program*, to the OCRWM Quality Assurance Requirements and Description document. This addendum established the minimum quality assurance requirements for the performance of work governed by the *OCRWM Integrated Safety Management Plan*.

External Interactions

Outreach

Each milestone on the path to operating a potential repository presents opportunities for public outreach. To participate effectively, stakeholders seek information about our work. In turn, we request their views as we formulate our plans and assess our performance. Our external interactions include Congress, the Office of Management and Budget, the State of Nevada, and other affected jurisdictions, industry, regulatory agencies, other Federal agencies, and public interest groups. Appendix E presents an overview of the formal interactions in which we are engaged. Although some of our external interactions have been curtailed in recent years because of funding cuts, we continue to provide public information and actively solicit their views.

Major public outreach activities in Fiscal Year 2001 occurred in the context of the site recommendation consideration process, described in detail in Chapter 2. In addition, OCRWM's Acting Director, Lake Barrett, made extensive efforts to meet the numerous individuals and organizations with which OCRWM interacts to address their concerns and to meet the challenges ahead. The Acting Director and staff, both in Washington, D.C., and Las Vegas, Nevada, met with representatives of more than 20 Federal agencies, environmental groups, technical and professional organizations, policy groups, and international organizations. These meetings helped our stakeholders build an understanding of our work and enabled us to understand their views.

We rely heavily on our web site as the most efficient and cost-effective means of making Program documents, announcements, and other materials available to the general public. The OCRWM home page at www.rw.doe.gov presents current Program and budget plans, major documents, congressional testimony, *Federal Register* notices, speeches, news releases, and photographs of the Yucca Mountain site. An interactive mailbox facilitates responses to individual questions and solicits comments. The site is linked to the web sites of other agencies and organizations with which OCRWM regularly interacts, including NRC, the Environmental Protection Agency, the Nuclear Waste Technical

Review Board, and the State of Nevada. Web site visitors came from more than 30 countries and represented a variety of government, commercial, academic, and private organizations. The web site supports the President's E-government goal of providing a single point of access for information about the Program.

International cooperation

The United States is the leader in efforts to characterize a geologic repository site. OCRWM's international activities promote cooperation with other countries and international organizations to exchange information, develop consensus on common issues, prevent nuclear proliferation, and foster safe radioactive waste management around the world.

Our international program focuses on areas of technical exchange that will benefit the U.S. civilian radioactive waste management program and further nonproliferation objectives. The United States maintains bilateral agreements with Canada, France, Japan, Switzerland, Sweden, and Spain, and participates in a memorandum of understanding with the Russian Federation's Academy of Science. Bilateral agreements are still in the process of being developed with the United Kingdom, Finland, and the Russian Federation's Ministry of Atomic Energy (Minatom). Senior OCRWM managers presented briefings and participated in technical exchanges throughout Fiscal Year 2001.

An important step toward international information exchange and consensus building occurred with the DOE's sponsorship of the 2001 International High-Level Radioactive Waste Management Conference. The conference, which was held from April 29 through May 3, 2001, in Las Vegas, Nevada, discussed the critical issue of high-level waste management as it relates not only to the United States, but also to the global community. Participants with broad interests related to high-level radioactive waste — from governmental to technical — convened at the conference to share information and discuss issues. The event theme this year was "Back to the Future, Managing the Back End of the Nuclear Fuel Cycle to Create a More Secure Energy Future." Discussion topics included the management, storage, transportation, and disposal of spent nuclear fuel, as well as key scientific, technical, regulatory, and institutional issues surrounding the waste topic.

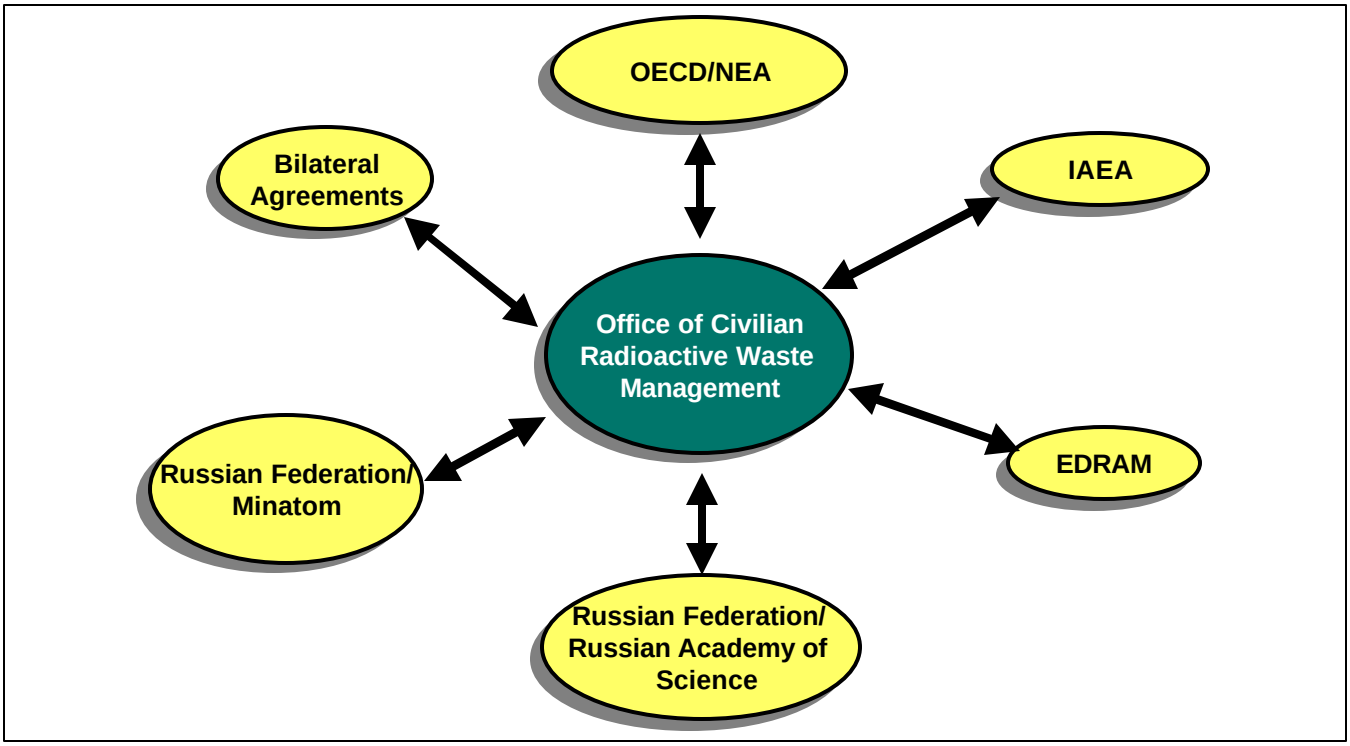
During Fiscal Year 2001, OCRWM continued to participate in collaborative activities with international organizations. Our collaboration with these organizations enables us to reduce Program costs by benefiting from the results of their research and experiences. In exchange, we share our information.

Representing the United States on the Organization for Economic Cooperation and Development/Nuclear Energy Agency (OECD/NEA) 27-nation Radioactive Waste Management Committee, we participated in a number of technical projects. OCRWM is an active member of subgroups that:

- implement repository development for long-lived radioactive waste,
- focus on public perception and confidence,
- develop a comprehensive and quality-assured international thermodynamic data base for five transuranic elements, and
- exchange information and conduct in-depth discussions on approaches to acquiring field data, as well as on testing and modeling the transport of radionuclides in geologic formations.

At OCRWM's request, the NEA led a joint NEA-International Atomic Energy Agency (IAEA) international peer review of the *Yucca Mountain Total System Performance Assessment* document, using international experts in radioactive waste management.

Our work with the IAEA continued to focus on the development of overall radioactive waste management system technical issues, such as spent fuel burnup credits and spent fuel storage. During Fiscal Year 2001, OCRWM participated in several IAEA Consultant and Advisory Group Meetings held in Vienna, Austria. In addition, the IAEA and OCRWM were involved in a peer review on biosphere modeling.



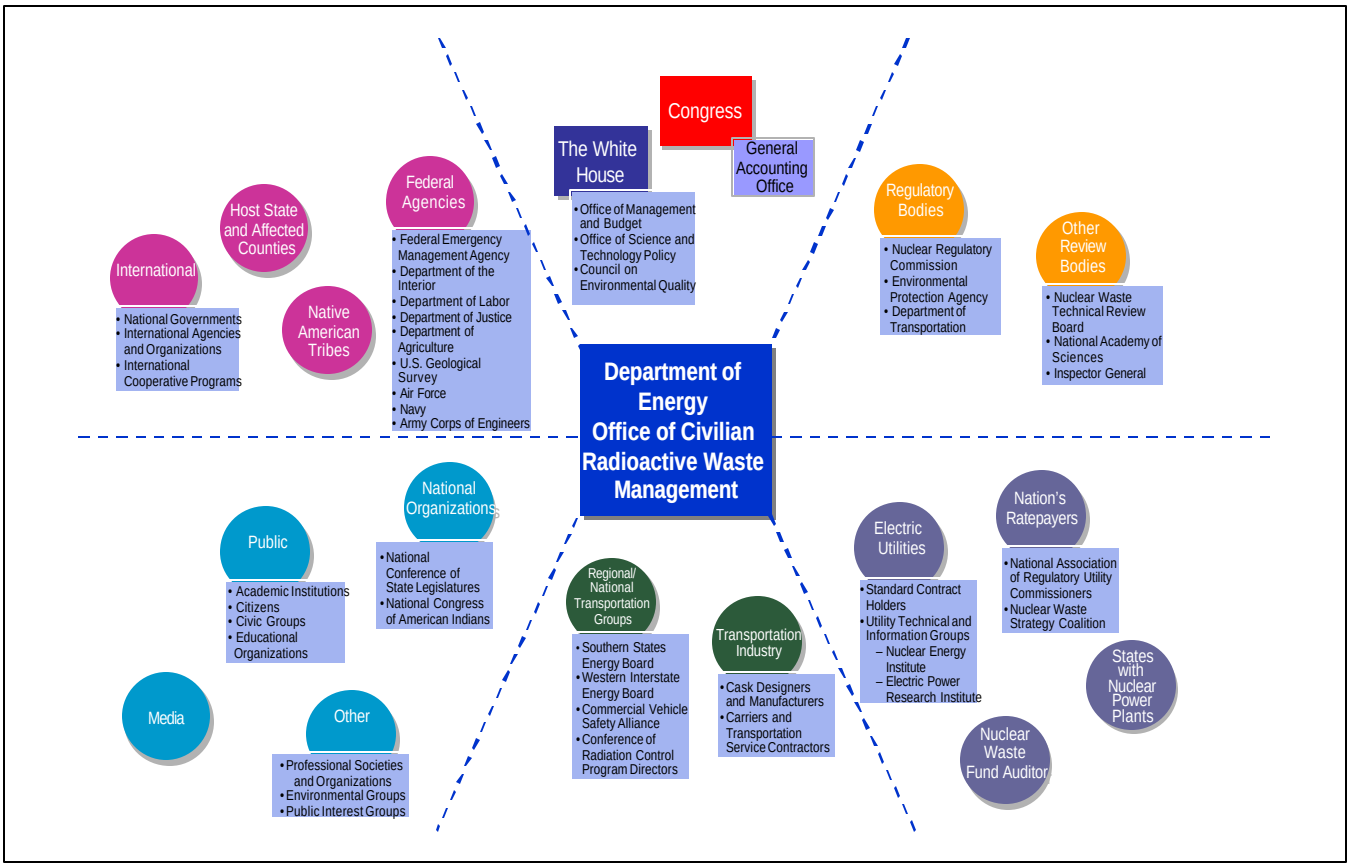
OCRWM works collaboratively with other nations to address the need for final disposition of nuclear materials and promote our nonproliferation policy objectives

During Fiscal Year 2001, OCRWM participated in the second year of the DECOVALEX project, which facilitates international cooperation on modeling and validation of coupled thermo-hydromechanical models. The Project will model data from the drift-scale heater test at Yucca Mountain, and several other participating nations will use these data in their own thermo-hydromechanical models.

In Fiscal Year 2001, OCRWM continued to work directly with the Russian Federation in cooperative programs to support our Nation's nonproliferation objectives. We work with two Russian organizations responsible for waste management – Minatom and the Russian Academy of Sciences. DOE and Minatom are formalizing a bilateral agreement on isolation of radioactive materials in geologic repositories. OCRWM and the Russian Academy of Sciences are also collaborating in the area of repository development. Projects in this area include research into the interaction of actinides and fission products, actinide speciation in the environment, and the modeling of contaminant transport processes in unsaturated rocks.

Scholarship and Fellowship Programs

Through its Radioactive Waste Management Graduate Fellowship Program and the Historically Black Colleges and Universities Undergraduate Scholarship Program, OCRWM seeks to ensure that competent staff will be available to meet future Program needs. The Graduate Fellowship Program provided fellowships to eight graduate students pursuing advanced degrees in disciplines directly related to high-level radioactive waste management at the Nation's top colleges and universities. Fellows complete a research-oriented practicum assignment either at the Yucca Mountain Site Characterization Project or with Program participants. Ten undergraduate scholars received scholarships through the Historically Black Colleges and Universities Undergraduate Scholarship Program. Recipients are chosen by a panel consisting of representatives from historically black colleges and universities and experts in civilian radioactive waste management from the Department's national laboratories, academia, and private industry. The Undergraduate Scholarship Program is designed to encourage students to consider



OCRWM benefits from the participation of many organizations

a career in high-level radioactive waste management by providing support to academically superior juniors and seniors pursuing degrees in related fields. Undergraduate scholars are encouraged to apply to OCRWM's Radioactive Waste Management Graduate Fellowship Program to increase the diversity of OCRWM's future workforce.

Fiscal Year 2001 in Context

During Fiscal Year 2001, the Program Management Center completed a revised TSLCC and the statutorily required annual fee adequacy assessment. The latter concluded that the 1 mil/kWh fee remains adequate under the assumptions used in the analysis. These documents were required to support the President's site recommendation to Congress.

We also took actions to strengthen our implementation of the President's management initiatives. These actions position the Program for the transition from primarily scientific research to the more engineering-focused activities of licensing and construction. We launched an effort to evaluate and improve our human capital management strategies to ensure a smooth transition to new activities. We completed the transition to a new M&O contractor that is well suited to the needs of licensing, construction and operations. We published the *Alternative Means of Financing and Managing the Civilian Radioactive Waste Management Program* report, which suggested ways to improve the Program's funding mechanism and provide long-term management alternatives for the construction and operating phases of the Program. We continued processing records and installing and testing equipment for the Licensing Support Network that is required to support the NRC licensing process. And we continued managing to and achieving the performance targets in the Department's Annual Performance Plan. We have a flexible and effective management structure that can continue to accomplish the Program's mission.

Chapter Five

Financial Management

In Fiscal Year 2001, we continued to carry out our primary financial management functions: accounting for the Program's assets, liabilities, and cash flows; quantifying the Program's long-range financial needs; and managing the investment of civilian revenues so that they are available to meet Program requirements.

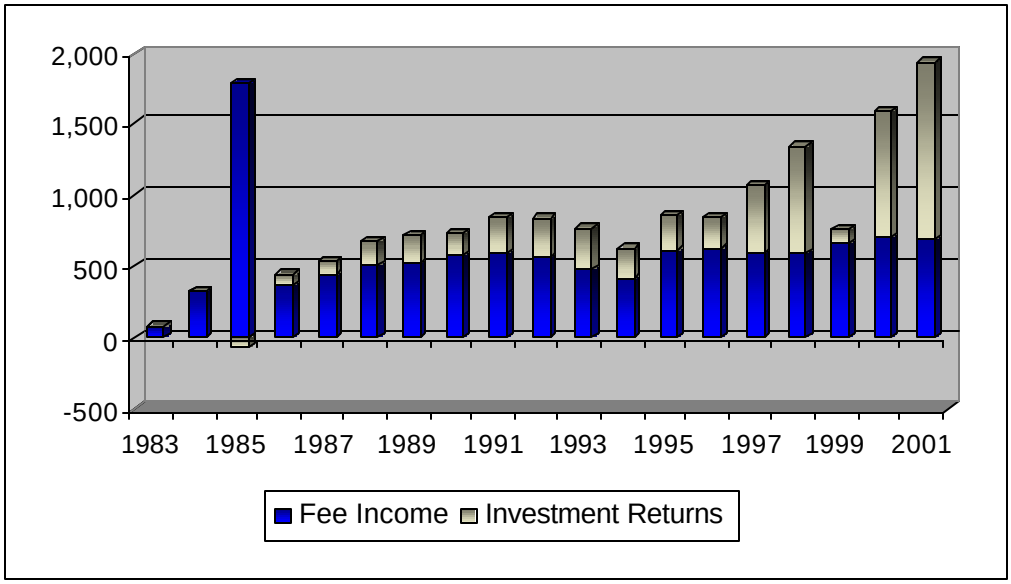
Program Funding

The Nuclear Waste Policy Act (NWPA) provides that the costs of disposing of spent nuclear fuel and high-level radioactive waste be borne by the parties responsible for the generation of these wastes. OCRWM's obligation, under the NWPA, to accept spent nuclear fuel and high-level radioactive waste for disposal is limited to those wastes whose disposal costs are fully paid by their owners and generators.

The NWPA left it up to the President to determine whether civilian and defense-related waste should be emplaced in the same repository. On April 30, 1985, President Reagan issued a decision that they should be, with each party paying its proportional share of the full cost. To implement that decision, public rulemaking was used to develop a methodology for allocating defense and civilian costs. The result was published in the *Federal Register* in August 1987. The Program's accounting system is consistent with this methodology.

Program revenues: civilian utility fees for civilian waste

The NWPA provides for two types of fee to be levied on the owners and generators of civilian spent nuclear fuel: an ongoing fee of 1.0 mil (one tenth of one cent) per kilowatt-hour (kWh) on nuclear electricity generated and sold after April 7, 1983, and a one-time fee for all nuclear electricity generated and sold prior to that date. The fees are defined in the *Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste*, which was promulgated in 1983 and executed between the Department of Energy (DOE) and the owners and generators of the waste. Nuclear power producers make quarterly payments of the ongoing fee. For the one-time fee, the contract allowed owners to choose to pay immediately or defer payment and incur interest. Through FY 2001 $1,458 million in one-time fees has been paid and $880 million has been deferred.



Investments contribute an increasing share of civilian income

Fees for spent nuclear fuel disposal are deposited in the Nuclear Waste Fund, a separate account in the U.S. Treasury that is managed and administered by DOE. Amounts not appropriated by the Congress for current Program expenses are invested in U.S. Treasury securities. The Office of Civilian Radioactive Waste Management (OCRWM) manages these investments strategically to ensure that the long-term costs of waste disposal can be met. The total market value of the Nuclear Waste Fund as of September 30, 2001, was approximately $11,674 million.

OCRWM earns civilian revenue when nuclear power plants generate and sell power, when OCRWM earns interest or realizes capital gains on U.S. Treasury investments, and when interest is charged on the utilities' unpaid fee balances. During Fiscal Year 2001, OCRWM earned $1,539 million in civilian revenue. Fiscal Year 2001 civilian revenue consisted of $716 million in ongoing 1 mil/kWh fees, $129 million in interest on and adjustments to one-time fees, and $694 million in investment earnings. The cumulative civilian revenue, as of September 30, 2001 (shown in Table 5-1), was $19,700 million, of which $16,784 million had been paid and $2,916 million remained unpaid. Civilian revenue includes $5,662 million in earnings on U.S. Treasury investments, of which $5,592 million has been paid and $70 million was due with the next semiannual interest payment.

Program revenues: defense dollars for defense waste

The Department's Office of Environmental Management and the Office of Nuclear Energy, Science, and Technology's Naval Nuclear Propulsion Program are the custodians of the Department's inventory of high-level radioactive waste and spent nuclear fuel.

In Fiscal Year 2001, we continued to work to implement the terms of the memoranda of agreement that we

	CIVILIAN					DEFENSE			Grand Total
	1 mil/kWh Fee	One-Time Fee	Interest on Fees	Return on Investment	Civilian Total	Fees	Interest on Fees	Defense Total	
FY 2001[1]	716	0	129	694	1,539	114	61	175	1,714
Cumulative through FY 2001	9,881	2.338	1,819	5,662	19,700	1,899	896	2,795[2]	22,495
Paid by Waste Owners[3]	9,705	1,458	29	5,592	16,784	1,435		1,435	18,219
Receivable[4]	176	880	1,790	70	2,916	1,360[2]		1,360	4,276

1 From Note 14 to the Financial Statements (Appendix A).

2 From Note 2 to the Financial Statements. Defense payments include the $12.5 million paid by the Department into the Nuclear Waste Fund, Defense Nuclear Waste Disposal appropriations, and credits to the Government for use of the Nevada Test Site facilities. Because payments are credited against the balance due and not separated into interest and principal, only one number is shown on the Paid and Receivable lines.

3 Paid amounts are calculated by subtracting the Receivable amount from the cumulative total.

4 From the Balance Sheet in the Financial Statements.

Table 5-1
Cumulative Program Revenue as of September 30, 2001
(in millions of dollars)

executed with the Office of Environmental Management and the Naval Nuclear Propulsion Program in Fiscal Year 1998. The memoranda establish a process for determining waste acceptance and fee payment schedules.

Table 5-1 also shows OCRWM accrued revenue from defense sources. Defense revenue is earned when the Program incurs costs related to defense waste disposal and when interest is charged on unpaid defense balances. In Fiscal Year 2001, accrued defense revenue was $175 million, which included $114 million in accrued fee revenue and $61 million in accrued interest on deferred fees. OCRWM's cumulative accrued defense revenue as of September 30, 2001, consisted of $1,899 million in accrued fees and $896 million in accrued interest, for a total of $2,795 million. Of the total, $1,435 million had been paid and $1,360 million (including interest) remained unpaid.

Program expenditures

Congress makes two separate appropriations for the Program, one from the Nuclear Waste Fund, the other through a Defense Nuclear Waste Disposal appropriation. These appropriations are recorded in separate internal accounts; however, they are consolidated in the OCRWM financial statements.

Appropriations for the Program are subject to the Federal budget process. They are considered part of the discretionary portion of the budget and thus compete for resources with other discretionary spending programs. As a consequence, although the Nuclear Waste Fund is composed of dedicated utility fee payments, plus the investment earnings on the balance in the Fund, appropriations from it are included in the total spending limits imposed on general Federal programs. Historically, this has resulted in constraints on Program funding. In August 2001, the Program published a report, *Alternative Means of Financing and Managing the Civilian Radioactive Waste Management Program*, that suggested several ways of overcoming these constraints.

As shown in Table 5-2, cumulative Program expenditures were $7,207 million, of which $5,309 million was allocated to civilian and $1,898 million to defense waste disposal activities. Through Fiscal Year 2001, Congress had appropriated a total of $7,087 million for the Program and related activities under the NWPA.

The OCRWM financial statements for Fiscal Year 2001 and the report of OCRWM's independent auditors are at Appendix A.

Managing Investments

The objectives of OCRWM's investment strategy are to: (1) ensure that investment income is available when needed; (2) support the adequacy of the fee paid into the Nuclear Waste Fund by waste owners and generators; and (3) hedge against uncertainty and unplanned funding requirements. To achieve these objectives, the Nuclear Waste Fund is managed as two portfolios: a contingency portfolio and a match portfolio.

The purpose of the contingency portfolio is to hedge against reasonable contingencies, such as unexpected near-term expenditures. The purpose of the match portfolio is to provide reliable funding for expected program expenditures. It serves to bring into balance the Program's assets and liabilities and to maintain that balance. The contingency portfolio is highly liquid and consists of U.S. Treasury securities, the average maturity of which does not exceed three years. The match portfolio consists of a mix of U.S. Treasury bills, notes, bonds, and zero-coupon bonds. The duration and present values of these investments are matched, or will be matched, to the durations and present values of OCRWM's projected liabilities. Matching investments to planned spending reduces the sensitivity of the fee adequacy balance to changing interest rates.

Each month, near-term cash flow expectations and current asset and liability values are reassessed and used as the basis for investment selection. The portfolio is rebalanced, as required, upon completion of each new total system life cycle cost analysis or when

	CIVILIAN	DEFENSE	TOTAL
FY 2001[1]	312	113	425
Cumulative through FY 2001[2]	5,309	1,898	7,207
Paid by Program[3]	5,279	1,887	7,166
Payable[3]	30	11	41
Appropriations[4]	5,674	1,413	7,087

1 Total Program expenditures for FY 2001 are from Note 14 to the Financial Statements, which states that kWh and defense fees are recognized as revenue to the extent of expenses incurred and recognizes earned revenue of $425 million. The total is divided into civilian and defense portions based on the May 2001Total System Life Cycle Cost (TSLCC) defense share of 27 percent.

2 Cumulative total expenditures are from Note 9 to the Financial Statements. Cumulative defense expenditures are based on the difference between the total defense share to date and interest on defense arrears in Note 2. Cumulative civilian expenditures are the difference between total expenditures and defense expenditures.

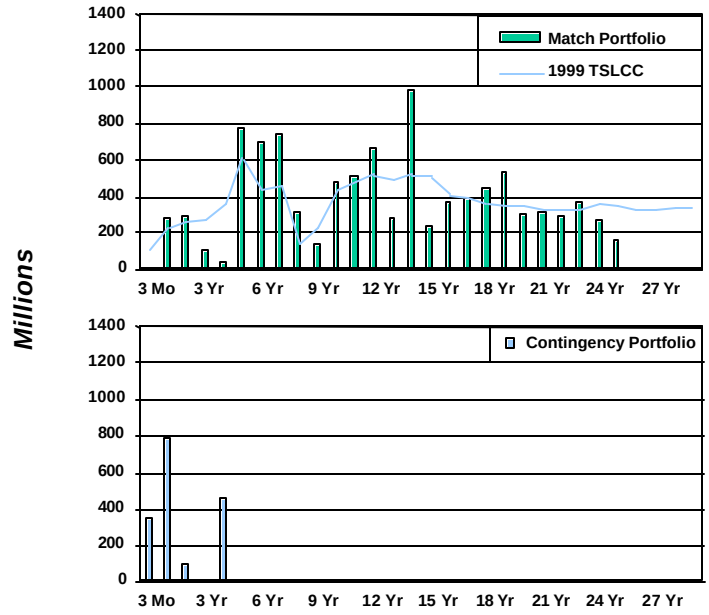
3 The Paid amount is the difference between total expenditures and payables. (Payables are shown in the Balance Sheet of the Financial Statements and are amounts owed by the Program that have not yet been paid. The total amount of payables is divided into civilian and defense portions based on the TSLCC defense share of 27 percent.)

4 Appropriation totals are based on historic appropriation legislation and are not discussed in the Financial Statements. Total appropriations are not equal to total expenditures because: 1) civilian expenditures include $135 million in interest on utility overpayment, most of which was funded through fee credits, i.e., not through appropriations; 2) capital expenditures are amortized in the Financial Statements; and 3) some appropriated funds were carried over into FY 2002 from FY 2001. Civilian appropriations include $300 million appropriated from the Nuclear Waste Fund to the Nuclear Regulatory Commission, the Nuclear Waste Technical Review Board, and the now-defunct Office of the Nuclear Waste Negotiator.

Table 5-2
Cumulative Program Expenditures as of September 30, 2001
(in millions of dollars)

changes in Program assumptions warrant. During Fiscal Year 2001, the average of the contingency portfolio's month-end balances was $1.8 billion; and the average of its month-end maturities was 2.0 years. The May 2001 the Total System Life Cycle Cost (TSLCC) estimate increased program spending projections in virtually all years. We are in the process of rebalancing the match portfolio to these new projections.

On September 30, 2001, the market value of Nuclear Waste Fund investments was approximately $11,674 million, compared with $9,777 million at the end of Fiscal Year 2000. The increase in market value was due to the addition of new investments of surplus fee income and to changes in market conditions. The impact of market conditions varies from year to year. Declining interest rates increase investment value and rising rates lower values. This year, near-term interest rates fell sharply and long-term rates rose slightly. The effect of declining near-term rates was greater and produced a substantial gain. Standard accounting practices require that we report the market value of the Nuclear Waste Fund because we occasionally sell securities before maturity to adjust investments to



Match Portfolio

- Match investments to expected program costs.
- Maintain asset-liability balance regardless of interest rate fluctuations.

Contingency Portfolio

- Hedge against reasonable contingencies, such as unexpected expenditures.
- Approximately $2 billion in highly liquid short-term notes.

The Nuclear Waste Fund is managed as two portfolios

Program spending plans. However, most of the securities will be held to maturity and would earn the return that was expected when they were purchased.

Over the last year, the Nuclear Waste Fund investments earned a market value return of 13.94 percent and a book value return of 7.97 percent. Book value returns reflect the accrued income received from investments and realized capital gains. They are much more stable than market returns. Over many years, average book and market value returns will be approximately equal. Since the first investments were made in 1985, the market value return and the book value return have averaged about 8.36 and 8.00 percent, respectively.

Civilian Radioactive Waste Research and Development Account

We also administer the Civilian Radioactive Waste Research and Development account, which, like the Defense Nuclear Waste Disposal appropriation, is supported by general taxpayer revenues. It pays for generic research, development, and demonstration activities authorized by Title II of the NWPA. There was no appropriation to this account for Fiscal Year 2001; only funds carried over from prior years were spent.

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Appendix A

Financial Statements

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OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

ACCOUNTABILITY REPORT

SEPTEMBER 30, 2001

UNITED STATES DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

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UNITED STATES DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

OVERVIEW

Reporting Entity

The Nuclear Waste Policy Act of 1982 (Public Law 97-425) established the Office of Civilian Radioactive Waste Management (OCRWM) within the Department of Energy (Department). OCRWM's mission is to manage and dispose of the nation's spent nuclear fuel (SNF) and high-level radioactive waste (HLW). The Office provides leadership in developing and implementing strategies to accomplish this mission that ensure public and worker health and safety, protect the environment, merit public confidence, and are economically viable.

The Nuclear Waste Policy Amendments Act of 1987 (Title V, Public Law 100-203) directed the Secretary of Energy to characterize only the Yucca Mountain site in Nevada to determine if it is suitable for a repository for SNF and HLW.

As of September 30, 2001, OCRWM employed 2,147 people. This included 160 OCRWM Federal staff, 17 Federal full-time equivalents (FTEs) at other Headquarters offices, 6 Federal FTEs at the DOE Nevada Operations Office, 99 U.S. Geological Survey employees, and 1,865 contractor employees, including employees of national laboratories.

OCRWM carries out its mission through two business centers -- the Yucca Mountain Site Characterization Project and the Waste Acceptance, Storage and Transportation Project and a Program Management Center.

The Yucca Mountain Site Characterization Project, located in Las Vegas, Nevada, oversees the scientific and technical investigation of Yucca Mountain, including:

- Addressing the major unresolved technical questions about the site,
- Operating the exploratory studies facility,
- Developing repository and waste package design elements that are critical to determining the feasibility of the engineered barrier system,
- Preparing a final environmental impact statement to accompany the Secretarial site recommendation, should the site be found suitable,
- Preparing a site recommendation report for the Secretary of Energy's submittal to the President should the site be found suitable, and
- Preparing and submitting a license application for repository construction to the Nuclear Regulatory Commission, should the President recommend and the Congress approve the Yucca Mountain site.

The Waste Acceptance, Storage and Transportation Project, located in Washington, D.C., focuses on the development of processes for the legal and physical transfer of commercial SNF to the Federal Government; establishment of a waste acceptance process for Department-owned SNF, including naval SNF, HLW, and immobilized surplus plutonium; creation of a national transportation capability for waste acceptance, and the resolution of institutional issues with Civilian Radioactive Waste Management Program (Program) stakeholders.

OCRWM's Program Management Center (Center) provides program integration and management support to the Director, OCRWM, and to the two business centers. The Center is comprised of the Office of Program Management and Administration and the Systems Engineering and International Division of the Office of Acceptance, Transportation and Integration, in Washington, D.C. and the Office of Quality Assurance in Las Vegas, Nevada. The Center is responsible for quality assurance, program planning and administration, program management, technical and regulatory integration, international waste management activities, institutional activities, and management of the Nuclear Waste Fund (NWF).

Fiscal Year 2001 Technical Performance

Although OCRWM's appropriation for fiscal year 2001 was lower than expected, OCRWM met all four performance targets in the Department's revised *Fiscal Year 2001 Annual Performance Plan*.

Performance Target One. Complete the scientific and technical documents that will provide the technical basis for a possible site recommendation.

Results: The *Yucca Mountain Science and Engineering Report*, released in May 2001, and the *Yucca Mountain Preliminary Site Suitability Evaluation*, released in July 2001, provided the initial technical basis for a possible site recommendation.

Performance Target Two. Conduct statutory hearings in the vicinity of Yucca Mountain to inform the residents that the site is under consideration and to receive comments regarding a possible site recommendation.

Results: OCRWM conducted a public hearing in Las Vegas on September 5, 2001. The hearings originally scheduled for September 12 and 13 in Amargosa Valley and Pahrump, NV, respectively, were postponed due to the September 11 terrorist attacks and held on October 10 and 12, 2001.

Performance Target Three. Update all process models and conduct a total system performance assessment (TSPA) for use in a possible site recommendation.

Results: The TSPA for site recommendation was completed in early fiscal year 2001.

Performance Target Four. Complete and issue Total System Life Cycle Cost and Fee Adequacy reports.

Results: The *Analysis of the Total Life Cycle Cost of the Civilian Radioactive Waste Management Program* and *Nuclear Waste Fund Fee Adequacy: An Assessment* were published in May 2001.

Fiscal Year 2002 Technical Performance

The following OCRWM technical performance targets have been identified for fiscal year 2002:

- Issue a Final Environmental Impact Statement, as required by the Nuclear Waste Policy Act (NWPA).
- Finalize a Site Recommendation Report for the Secretary of Energy to submit to the President, and then to the Congress.
- Issue Nuclear Waste Policy Act Section 180(c) Notice of Revised Proposed Policy and Procedures for public comment.
- Begin development of updated Total System Life Cycle Cost and Fee Adequacy reports.
- Issue a draft request for proposals for waste acceptance and transportation services.

Fiscal Year 2001 Financial Performance

OCRWM is required by the NWPA to recover the full cost of the Program. The Program's total cost was estimated in *Analysis of the Total Systems Life Cycle Cost of the Civilian Radioactive Waste Management Program* (TSLCC), dated May 2001.

Program funding for the NWF comes from the Nuclear Waste Fund Appropriation (NWFA) and the Defense Nuclear Waste Disposal Appropriation (DNWDA). The NWF consists of fees paid by the owners and generators of SNF from commercial reactors, in accordance with provisions of their contracts with the Department for disposal services. NWF assets in excess of those appropriated to pay current Program costs are invested in U.S. Treasury securities. The DNWDA was established by the Congress in lieu of direct payment of defense fees by the Department into the NWF, to pay for the disposal costs of the HLW resulting from atomic energy defense activities and other Department-managed nuclear materials. As of September 30, 2001, cumulative revenue from fees, including the DNWDA, totaled approximately $14.098 billion, and cumulative interest earnings and other revenue totaled approximately $8.376 billion. Cumulative expenditures from appropriations, including direct appropriations to the Nuclear Regulatory Commission, the now defunct Office of the Nuclear Waste Negotiator, and the Nuclear Waste Technical Review Board, totaled approximately $7.209 billion.

As of September 30, 2001, the U.S. Treasury securities held by OCRWM had a market value of $11.674 billion, compared to $9.777 billion at the end of fiscal year 2000. Investment income for fiscal year 2001 was $694.3 million, including $638.1 million in interest earnings and $56.2 million in net gains on the sale of securities.

OCRWM's primary financial management goal is to ensure that future spending needs can be met. Therefore, OCRWM relies on the asset-liability matching approach to investing used by pension funds and insurance companies. By matching investments to anticipated funding requirements, OCRWM reduces the risk that changes in interest rates will adversely affect the fee adequacy balance, ensures that identified spending projections will be met, and makes investments at the most favorable rates currently available.

In its fiscal year 2000 Overview, OCRWM established the following financial performance measures for fiscal year 2001:

1. To maintain an adequate liquid reserve of approximately $2 billion in short-term Treasury securities with an average duration not to exceed 3 years to meet unexpected spending needs.

   Results: The month-end balances in the contingency fund were between $1.8 billion and $2.0 billion, and the average duration at each month end was less than 3 years.

2. Invest any surpluses to match anticipated Program spending through at least the year 2026.

   Results: By May 31, 2001, the cumulative spending profile was matched through 2025, and it was anticipated that, by year-end, the cumulative spending profile would be matched through 2026. However, a new Program spending profile was established in the May 2001 *Analysis of Total System Life Cycle Cost of the Civilian Radioactive Waste Management Program* (TSLCC). The May 2001 TSLCC significantly increased near- and intermediate-term spending needs, and the Program focused on meeting these earlier needs first, deferring matching longer-term spending projections, including 2026.

FY 2002 Financial Performance Measures

The following have been identified as financial performance measures for OCRWM in fiscal year 2002:

1. To maintain an adequate liquid reserve of approximately $2 billion in short-term Treasury securities, with an average duration not to exceed 3 years, to meet unexpected spending needs.

2. To reallocate existing investments and invest any additional surpluses to match the Program's cumulative spending profile through 2026.

The accompanying financial statements were prepared to report the financial position, net cost, changes in net position, budgetary resources, and reconciliation of net costs to budgetary obligations of the NWFA and the DNWDA, pursuant to the NWPA, as amended. While the statements have been prepared from the books and records of the NWFA and the DNWDA, in accordance with the formats prescribed by the Office of Management and Budget, the statements are different from the financial reports used to monitor and control budgetary resources, which are prepared from the same books and records.

The statements should be read with the realization that they relate to the NWFA and the DNWDA; that unfunded liabilities reported in the financial statements cannot be liquidated without the enactment of an appropriation; and that the payment of all liabilities, other than those resulting from contractual obligations, can be abrogated by the Department.

2001 M Street, NW
Washington, DC 20036

Independent Auditors' Report on Financial Statements

United States Department of Energy
Office of Civilian Radioactive Waste Management:

We have audited the accompanying balance sheets of the Office of Civilian Radioactive Waste Management (OCRWM), a component of the Department of Energy (Department), as of September 30, 2001 and 2000, and the related statements of net cost, changes in net position, budgetary resources, and financing for the years then ended. These financial statements are the responsibility of OCRWM's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with auditing standards generally accepted in the United States of America; the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States; and Office of Management and Budget (OMB) Bulletin No. 01-02, *Audit Requirements for Federal Financial Statements*. Those standards and OMB Bulletin No. 01-02 require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of OCRWM, as of September 30, 2001 and 2000, and its net costs, changes in net position, budgetary resources, and reconciliation of net costs to budgetary obligations for the years then ended, in conformity with accounting principles generally accepted in the United States of America.

As discussed in note 11 to the financial statements, OCRWM is involved as a defendant in several matters of litigation relating to its inability to accept waste by the January 31, 1998 date specified in the Nuclear Waste Policy Act of 1982, as amended. The Court of Appeals for the District of Columbia Circuit has ruled that the contracts the Department has executed with individual owners and generators of spent nuclear fuel and/or high-level radioactive waste (Standard Contracts) (1) imposes an unconditional obligation on the Department to initiate waste acceptance by January 31, 1998, and (2) offers a potentially adequate remedy for the failure of the Department to meet this obligation. Management believes it is too early to evaluate the ultimate impact on OCRWM of these claims because the decisions in these cases and resolution of such claims will involve highly fact-specific and individualized decisions about the costs incurred by each contract holder as a result of the delay of the Department in meeting its obligation under the Standard Contracts. However, the Department has estimated possible damages to be between $2 billion and $3 billion, if all utilities file claims. Some utility representatives have estimated damages totaling $50 billion. OCRWM has recorded an estimated liability of $2 billion relating to these matters in the financial statements as of September 30, 2001 and 2000.

The information in the Overview and Required Supplementary Stewardship Information for Research and Development sections is not a required part of the financial statements but is supplementary information required by the Federal Accounting Standards Advisory Board or OMB Bulletin No. 97-01, *Form and Content of Financial Statements,* as amended. We have applied certain limited procedures, which consisted principally of inquiries of management regarding the methods of measurement and presentation of this information. However, we did not audit this information and, accordingly, we express no opinion on it.

In accordance with *Government Auditing Standards*, we have also issued reports dated January 31, 2002, on our consideration of OCRWM's internal control over financial reporting and its compliance with certain provisions of laws and regulations. Those reports are an integral part of an audit performed in accordance with *Government Auditing Standards*, and should be read in conjunction with this report in considering the results of our audit.

KPMG LLP

January 31, 2002

UNITED STATES DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

Balance Sheets

As of September 30, 2001 and 2000

(Dollars in thousands)

	2001	2000
Assets		
Intragovernmental:		
Fund Balance with Treasury (note 3)	$ 10,098	$ 98,355
Investments (note 4)	11,674,214	9,777,385
Accounts receivable:		
Receivable from Department of Energy (notes 2 and 9)	1,359,871	1,394,889
Kilowatt hour fees (note 5)	11,101	10,499
Accrued investment interest (note 4)	70,149	81,662
Other assets	101	412
Total intragovernmental assets	13,125,534	11,363,202
Accounts receivable (note 5):		
Kilowatt hour fees	164,986	155,490
One-time spent fuel fees	880,489	880,489
Interest from one-time spent fuel fees	1,789,382	1,660,989
General property, plant, and equipment, net (note 6)	17,106	18,574
Other assets	2,193	1,283
Total Assets	$ 15,979,690	$ 14,080,027
Liabilities		
Intragovernmental:		
Accounts payable (note 9)	$ 1,646	$ 2,028
Deferred revenue (note 13)	900,620	839,914
Other liabilities	35	29
Total intragovernmental liabilities	902,301	841,971
Accounts payable	39,239	37,355
Deferred revenue (note 13)	14,376,400	13,147,716
Pension and other actuarial liabilities	352	3,812
Contract holdback	513	437
Other liabilities	9,363	7,805
Estimated liability for waste acceptance obligation (note 11)	2,000,000	2,000,000
Total Liabilities (note 10)	17,328,168	16,039,096
Commitments and contingencies (notes 11 and 12)		
Net position:		
Unexpended appropriations	8,573	93,428
Cumulative results of operations	(2,000,000)	(2,000,000)
Total net position before unrealized gain (loss)	(1,991,427)	(1,906,572)
Unrealized gain (loss) on investments available for sale	642,949	(52,497)
Total Net Position	(1,348,478)	(1,959,069)
Total Liabilities and Net Position	$ 15,979,690	$ 14,080,027

The accompanying notes are an integral part of these statements.

UNITED STATES DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

Statements of Net Cost

For the years ended September 30, 2001 and 2000

(Dollars in thousands)

	2001	2000
First repository costs (Notes 7 and 8):		
Intragovernmental	$ 39,141	$ 33,722
With the public	387,064	368,888
Total first repository costs	426,205	402,610
Less: earned revenue (note 13)	(425,112)	(401,528)
Net first repository costs	1,093	1,082
Cost not assigned to first repository:		
Contingent liability cost (note 11)	—	1,500,000
Net cost of operations	$ 1,093	$ 1,501,082

The accompanying notes are an integral part of these statements.

UNITED STATES DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

Statements of Changes in Net Position

For the years ended September 30, 2001 and 2000

(Dollars in thousands)

	2001	2000
Net cost of operations	$ (1,093)	$ (1,501,082)
Imputed financing	1,093	1,082
Net results of operations	—	(1,500,000)
Change in unrealized gain (loss) on investments	695,446	300,226
Increase (decrease) in unexpended appropriations	(84,855)	5,765
Change in net position	610,591	(1,194,009)
Net position - beginning of the period	(1,959,069)	(765,060)
Net position - end of period	$ (1,348,478)	$ (1,959,069)

The accompanying notes are an integral part of these statements.

UNITED STATES DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

Statements of Budgetary Resources

For the years ended September 30, 2001 and 2000

(Dollars in thousands)

	2001	2000
Budgetary resources:		
Budgetary authority	$ 391,074	$ 348,500
Unobligated balance:		
Brought forward October 1	87,430	96,556
Adjustments:		
Temporarily restricted pursuant to Public Law	(420)	(85,000)
Permanently not available pursuant to Public Law	(75,275)	(1,325)
Total budgetary resources	$ 402,809	$ 358,731
Status of budgetary resources		
Obligations incurred	$ 395,188	$ 356,301
Unobligated balances available:		
Apportioned, balance currently available	7,368	2,430
Unobligated balances not yet available:		
Other unobligated balances not yet available	253	—
Total status of budgetary resources	$ 402,809	$ 358,731
Outlays		
Obligations incurred	$ 395,188	$ 356,301
Obligated balance net, beginning of period	83,203	100,476
Less: obligated balance net, end of period	(96,036)	(83,203)
Total outlays	$ 382,355	$ 373,574

The accompanying notes are an integral part of these statements.

UNITED STATES DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

Statements of Financing

For the years ended September 30, 2001 and 2000

(Dollars in thousands)

	2001	2000
Obligations and budgetary resources		
Budgetary resources obligated for orders and delivery of goods and services to be received or benefits to be provided to others	$ 395,188	$ 356,301
Financing imputed for cost subsidies	1,093	1,082
Less: earned revenue	(425,112)	(401,528)
Appropriations transferred-out	24,452	17,746
Total resources used to finance activities	(4,379)	(26,399)
Resources that do not fund net cost of operations		
Deduct resources used to fund items not part of the net cost of operations:		
Increase or (decrease) in budgetary resources obligated to order goods and services not yet received or benefits not yet provided	(10,837)	16,868
Resources that finance the acquisition of assets or liquidation of liabilities	(2,186)	(809)
Total resources used to fund items not part of the net cost of operations	(13,023)	16,059
Resources Used to Finance the Net Cost of Operations	(17,402)	(10,340)
Costs that do not require resources		
Components of net cost of operations that do not require or generate resources during the reporting period:		
Expenses or exchange revenue related to the disposition of assets or liabilities, or allocation of their costs over time:		
Expenses related to use of assets	3,286	4,077
Losses from revaluation of assets and liabilities	368	524
Subtotal	3,654	4,601
Other net cost components that do not require or generate resources during the reporting period	(2,084)	1,502,487
Total components of net cost of operations that do not generate resources during the reporting period	1,570	1,507,088
Financing sources yet to be provided	16,925	4,334
Net cost of operations	$ 1,093	$ 1,501,082

The accompanying notes are an integral part of these statements.

(1) Legislative Background

The Nuclear Waste Policy Act of 1982 (NWPA) was signed into law on January 7, 1983. The NWPA establishes a framework for the financing, siting, licensing, operating and decommissioning of one or more mined geologic repositories for the Nation's spent nuclear fuel (SNF) and high-level radioactive waste (HLW) which is to be carried out by the Department of Energy's (Department) Office of Civilian Radioactive Waste Management (OCRWM). In addition, the NWPA contains other provisions including:

Assigning responsibility for the full payment of disposal costs to the owners and generators of SNF and HLW and creating a special Nuclear Waste Fund (NWF) within the Treasury of the United States for the collection of fees related to such costs.

Providing for contracts between the Department and the owners and generators of SNF and HLW pursuant to which the Department is to take title to the SNF or HLW as expeditiously as possible, following commencement of repository operations and, in return for payment of fees established by the NWPA, to begin disposal of the SNF or HLW not later than January 31, 1998.

Requiring evaluation of the use of civilian disposal capacity for the disposal of HLW resulting from atomic energy defense activities (defense waste). In April 1985, the President notified the Department of his determination that a separate defense waste repository was not necessary and directed the Department to proceed with arrangements for disposal of such waste. Fees, equivalent to those paid by commercial owners, must be paid for this service by the Federal Government to the NWF.

On December 22, 1987, the President signed into law the Budget Reconciliation Act, Subtitle A of Title V of which contained amendments to the NWPA. The legislation directed the Department to characterize only the Yucca Mountain site in Nevada as a candidate site for the first repository.

The legislation also provided for the termination of site-specific activities at all candidate sites other than the Yucca Mountain site, within 90 days of enactment, and for phasing out, not later than 6 months after enactment, all research programs in existence designed to evaluate the suitability of crystalline rock as a potential repository host medium. In the event that the Yucca Mountain site proves unsuitable for use as a repository, the legislation requires the Department to terminate site-specific activities and report to Congress.

Further, the legislation authorized the Department to pay interest on overpayments of kilowatt hour (kWh) fees consistent with the December 5, 1985 ruling of the United States Court of Appeals. Interest on these overpayments of kWh fees was fully paid or credited as of September 30, 1990.

Additionally, the legislation annulled and revoked the Department's Monitored Retrievable Storage (MRS) proposal, submitted to Congress on March 31, 1987, to construct an MRS facility in Oak

Ridge, Tennessee. However, the legislation authorized the Department to site, construct, and operate one MRS facility subject to certain conditions.

Although the NWPA prohibits the selection of an MRS site through a Department-directed site-survey process until the repository site is recommended to the President, it allowed for expedited siting to proceed via a Nuclear Waste Negotiator, authorized to negotiate a proposed agreement with a State or Indian Tribe that would agree to host a repository or MRS facility. The Negotiator was to submit to Congress proposed agreements. No volunteer hosts were identified, and the Office of the Nuclear Waste Negotiator expired in January 1995.

(2) Significant Accounting Policies

Basis of Presentation – These financial statements have been prepared to report the financial position and results of operations of OCRWM and include all activity related to OCRWM, including the Nuclear Waste Fund Appropriation (NWFA) and the Defense Nuclear Waste Disposal Appropriation (DNWDA), used for the disposal of SNF and HLW. They have been prepared from the books and records of the Department for OCRWM in accordance with accounting principles generally accepted in the United States of America as applicable to Federal entities.

Basis of Accounting – OCRWM's financial statements are prepared using the accrual method of accounting. Under the accrual method, revenues are recognized when earned and expenses are recognized when a liability is incurred, without regard to receipt or payment of cash. OCRWM also uses budgetary accounting to facilitate compliance with legal constraints and to monitor its budget authority.

Revenue Recognition – Fees are recognized as exchange (earned) revenue to the extent of expenses incurred, subject to Congressional authorization as discussed below. Fees billed in excess of current expenses are deferred.

The NWPA requires the civilian owners and generators of nuclear waste to pay their share of the full cost of the Civilian Radioactive Waste Management Program (Program) and, to that end, establishes a fee for electricity generated and sold by civilian nuclear power reactors which the Department must collect and annually assess to determine its adequacy. A one-time fee (see note 5) was recorded by OCRWM as of April 7, 1983, related to the disposal of SNF generated prior to that date. kWh fees recognized by OCRWM are based upon kWh of electricity generated and sold by civilian nuclear reactors on and after April 7, 1983.

Fees associated with the disposal of the Department's SNF and HLW are also recognized as the related costs are incurred and allocated. To estimate the share of the total Program costs that should be allocated to the Department, the methodology announced by the Department in the Federal Register in August 1987 was used. The most recent cost estimate, *Analysis of the Total System Cost of the Civilian Radioactive Waste Management Program* (TSLCC), issued in May 2001, of the surrogate single repository system (without interim storage) established the amounts to allocate.

Financing – The NWPA provides that financing for the NWF consist of:

- Unexpended balances available on the date of enactment for functions or activities incident to the disposal of civilian SNF or civilian HLW;
- Funds appropriated by Congress;
- Fee payments; and
- Investment income from authorized investments.

Expenditures are made from the NWF subject to Congressional appropriation. Investments are made in U.S. Treasury obligations from funds in excess of current needs. If, at any time, monies available in the NWF are insufficient to discharge responsibilities under the NWPA, borrowings may be made from the U.S. Treasury. The NWPA limits the NWF from incurring expenditures, entering into contracts and obligating amounts to be expended, except as provided in advance by appropriation acts.

For fiscal years 2001 and 2000, Congress appropriated $191,074 and $236,500, respectively, from the Nuclear Waste Fund Appropriation (NWFA) to be used for nuclear waste disposal activities. Pursuant to the fiscal year 2001 Consolidated Appropriations Act, $420 of the $191,074 was rescinded from the NWFA. Pursuant to the fiscal year 2000 Consolidated Appropriations Act, $899 of the $236,500 was rescinded from the NWFA.

For fiscal years 2001 and 2000, Congress appropriated $200,000 and $112,000, respectively, from the DNWDA to be used for nuclear waste disposal activities. In fiscal year 2001, an additional $10,000 in funds previously restricted were made available. Pursuant to the fiscal year 2001 Consolidated Appropriations Act, $275 of the $200,000 was rescinded from the DNWDA. For fiscal year 2000, the Consolidated Appropriations Act rescinded $426 from the DNWDA.

Imputed Financing Sources – In certain instances, operating costs of OCRWM are paid out of funds appropriated to other federal agencies. For example, certain costs of retirement programs are paid by the Office of Personnel Management. When costs directly attributable to OCRWM's operations are paid by other agencies, OCRWM recognizes these costs in the Statement of Net Cost. In addition, these amounts are recognized as imputed financing sources in the Statement of Changes in Net Position.

Investments – Investments, which consist of U.S. Treasury securities, are classified as available-for-sale and are reported at fair value in accordance with Statement of Financial Accounting Standards (SFAS) No. 115, *Accounting for Certain Investments in Debt and Equity Securities*, with unrealized gains and losses excluded from earnings and reported as a separate component of net position. OCRWM uses the effective interest rate method in determining the fair value of investments.

General Property, Plant, and Equipment – Purchases of general property, plant, and equipment (PP&E) exceeding $25 are capitalized if they have a useful life greater than two years. PP&E is depreciated on a straight-line basis over the estimated useful lives of the assets which range from 5 to 30 years. Maintenance costs are borne by OCRWM for equipment either on loan from or shared with other programs.

Costs of construction are capitalized as construction work in process. Upon completion or beneficial occupancy, the cost is transferred to the appropriate property account.

Accounts Receivable – Payment of accounts receivable will not be complete until OCRWM starts accepting waste which is currently expected in the year 2010. Interest is accrued quarterly on the outstanding amount receivable including accrued interest. The interest rate used is the 13-week U.S. Treasury bill rate. An allowance for doubtful accounts related to one-time spent fuel fees has not been recorded as of September 30, 2001, as OCRWM is not obligated to accept waste without payment of fees.

Accrued Interest Receivable – Investment interest is accrued on the outstanding investment balance using the applicable interest rate for the investments.

Liabilities – Liabilities represent the amount of monies or other resources that are likely to be paid by OCRWM as the result of a transaction or event that has already occurred. However, no liability can be paid by OCRWM absent an appropriation. Liabilities for which an appropriation has not been enacted are therefore classified in these notes as liabilities not covered by budgetary resources and there is no certainty that the appropriation will be enacted. Also, liabilities of OCRWM arising from other than contracts can be abrogated by the Government, acting in its sovereign capacity.

Accrued Annual Leave – Federal employees' annual leave is accrued as it is earned, and the accrual is reduced annually for actual leave taken. Each year, the accrued annual leave balance is adjusted to reflect the latest pay rates and unused annual leave balances. To the extent that current or prior year appropriations are not available to fund annual leave earned but not taken, funding will be obtained from future financing sources. Sick leave and other types of nonvested leave are expensed as taken.

Tax Status – OCRWM, as a part of the Department of Energy, which is a Federal agency, is not subject to federal, state, or local income taxes.

First Repository Costs – For the years ended September 30, 2001 and 2000, first repository costs consist primarily of Yucca Mountain costs.

Reclassifications – Certain fiscal year 2000 amounts in the financial statements have been reclassified to ensure consistency with the presentation of fiscal year 2001 amounts.

(Dollars in thousands unless otherwise noted)

(3) Fund Balance with Treasury

A summary of fund balance with the U.S. Treasury for appropriated funds as of September 30, 2001 and 2000, is as follows:

	2001	2000
Unobligated budgetary resources		
Available	$ 7,368	$ 2,430
Unavailable	253	-
Obligated balance not yet disbursed		
Undelivered orders	51,460	40,623
Accounts payable and deposit fund liabilities	44,576	42,580
Other adjustments		
Appropriations not available pursuant to public law		
Defense Nuclear Waste Disposal	-	85,000
Budgetary resources invested in Treasury securities		
Nuclear Waste Fund	(93,559)	(72,278)
Total fund balance with Treasury	$ 10,098	$ 98,355

(4) Investments

For the years ended September 30, 2001 and 2000, the NWF received proceeds of $1,245,987 and $665,264, respectively, from the sale of securities. The realized gain on the sale using the specific identification method for the years ended September 30, 2001 and 2000, was $56,222 and $3,735, respectively. From September 30, 2000 to 2001, and from 1999 to 2000, the net unrealized gain on available-for-sale securities included in net position was $695,446 and $300,226, respectively.

Accrued interest receivable on investments as of September 30, 2001 and 2000, totaled $70,149 and $81,662, respectively.

The gross unrealized gain (loss) on available-for-sale securities was $642,949 and ($52,497) as of September 30, 2001 and 2000, respectively.

(Dollars in thousands unless otherwise noted)

Investments in U.S. Treasury securities held as of September 30 of each year consisted of the following:

	2001			
	Cost	Amortized (premium) discount, net	Investments, net	Investments at fair value
Intragovernmental securities available for sale:				
Due within 1 year	$ 771,649	$ (43,082)	$ 728,566	$ 741,572
Due after 1 year but within 5 years	1,077,988	(111,791)	997,578	1,061,207
Due after 5 years but within 10 years	2,326,240	101,021	2,427,261	2,541,197
Due after 10 years	6,176,732	701,127	6,877,859	7,330,238
	$ 10,352,609	$ 647,275	$ 11,031,264	$ 11,674,214

	2000			
	Cost	Amortized (premium) discount, net	Investments, net	Investments at fair value
Intragovernmental securities available for sale:				
Due within 1 year	$ 358,240	$ (25,090)	$ 333,150	$ 333,592
Due after 1 year but within 5 years	1,815,525	(128,234)	1,687,291	1,684,116
Due after 5 years but within 10 years	729,884	(15,656)	714,228	697,218
Due after 10 years	6,620,153	475,060	7,095,213	7,062,459
	$ 9,523,802	$ 306,080	$ 9,829,882	$ 9,777,385

(5) Receivables Due from Utilities

Owners and generators of civilian SNF and HLW have entered into contracts with the Department for disposal services and for payment of fees to the NWF.

The NWPA specifies two types of fees to be paid to the NWF for disposal services: (a) a one-time charge per kilogram of heavy metal in solidified SNF or HLW existing prior to April 7, 1983; and (b) a one mil per kWh fee on all net electricity generated and sold by civilian nuclear power reactors on and after April 7, 1983. The Secretary of Energy shall annually review the adequacy of the fees established. In the event the Secretary of Energy determines either insufficient or excess revenue is being collected, the Secretary of Energy shall propose an adjustment to the fee to ensure full cost recovery. The kWh fees are due when billed. The contracts between the Department and the owners and generators of the waste provide three options for payment of the one-time spent fuel

fee, one of which must have been selected by June 30, 1985, or within two years of contract execution. The options were:

1. Payment of the amount due, plus interest earned from April 7, 1983, in 40 quarterly installments, with the final payment due on or before the first scheduled delivery of SNF to the Department;

2. Payment of the amount due, plus interest from April 7, 1983, in a single payment, any time prior to the first delivery of SNF to the Department; or

3. Payment of the amount due, any time prior to June 30, 1985, or two years after contract execution, in the form of a single payment, with no interest due.

Under options (1) and (2), interest accrues from April 7, 1983, to date of first payment, at the 13-week U.S. Treasury bill rate compounded quarterly. Under option (1), beginning with the first payment, interest is calculated at the 10-year Treasury note rate in effect at the time. Two utilities selected option (1); neither has begun making payments.

During fiscal year 2001, $100 was credited to a utility to offset current quarterly fees. It was based upon an adjustment to its one-time SNF fee, which had been previously paid in its entirety. In fiscal year 2000, there were no payments or adjustments of one-time spent fuel fees by owners and generators of civilian SNF and HLW.

(Dollars in thousands unless otherwise noted)

Public and intragovernmental receivables from utilities at September 30 of each year were as follows:

	2001	2000
Current portion of accounts receivable:		
Kilowatt hour fees:		
Public	$ 164,986	$ 155,490
Intragovernmental	11,101	10,499
Total current portion of accounts receivable	176,087	165,989
Public one-time spent nuclear fuel fees:		
Option (1)	143,531	143,531
Option (2)	736,958	736,958
	880,489	880,489
Public interest on one-time spent nuclear fuel fees:		
Option (1)	292,574	271,427
Option (2)	1,496,808	1,389,562
	1,789,382	1,660,989
Total long-term accounts receivable from the Public	2,669,871	2,541,478
Total accounts receivable	$ 2,845,958	$ 2,707,467

(6) General Property, Plant, and Equipment, Net

General property, plant, and equipment and related accumulated depreciation consisted of the following at September 30, 2001 and 2000:

	2001	2000
General property, plant and equipment	$ 83,697	$ 83,642
Less accumulated depreciation	(66,591)	(65,068)
Net book value	$ 17,106	$ 18,574

(Dollars in thousands unless otherwise noted)

(7) Costs

A summary of First repository, other Program and Second repository costs and for the years ended September 30, 2001 and 2000, is as follows:

	2001	2000	Cumulative: Inception through 09/30/2001
Costs:			
First repository costs	$ 303,803	$ 301,419	$ 5,004,743
All other Program costs:			
Program support	77,933	75,884	1,319,843
Adjustment to charges	16,925	4,334	21,259
Transfer of appropriations	24,452	17,746	260,247
Waste acceptance, storage and transportation	1,999	2,145	360,142
Imputed and other costs	1,093	1,082	137,993
Total all other Program costs	122,402	101,191	2,099,484
Total cost of First repository and other Program costs	$ 426,205	$ 402,610	$ 7,104,227
Second repository costs	$ -	$ -	$ 108,896

During fiscal year 2000, the Department signed an agreement with a utility to address the Department's delay in accepting SNF generated by the utility company. The agreement allows the utility company to reduce the projected fees owed to and recorded by the NWF to reflect costs reasonably incurred by the utility company due to the Department's delay. The reduction in fees was $16,925 and $4,335 for the years ended September 30, 2001 and 2000, respectively and are recorded as an adjustment to charges.

(Dollars in thousands unless otherwise noted)

During fiscal years 2001 and 2000, Congress authorized certain funds to be transferred directly from the NWF to various entities to pay for necessary expenses of OCRWM. In fiscal year 2000, OCRWM received $4 previously transferred to another agency. Amounts transferred consisted of:

	2001	2000
Nuclear Regulatory Commission	$ 21,552	$ 15,150
Nuclear Waste Technical Review Board	2,900	2,600
Office of the Nuclear Waste Negotiator	-	(4)
Total	$ 24,452	$ 17,746

The Nuclear Waste Technical Review Board (Board) was established under the Nuclear Waste Policy Amendments Act of 1987 (Amendments Act). The Board, an independent establishment within the executive branch of the U.S. Government, was created to evaluate the technical and scientific validity of activities undertaken by the Secretary of Energy, under the Amendments Act, including site characterization activities and activities relating to the packaging or transportation of SNF or HLW.

(8) Pension Plan

Department of Energy employees working for OCRWM are covered by the Civil Service Retirement System (CSRS) or the Federal Employees Retirement System (FERS). As required by law, employees make contributions to the plans based on a percentage of their salaries with an amount contributed by OCRWM in accordance with the required retirement system regulations. Data regarding the CSRS and the FERS actuarial present value of accumulated benefits, assets available for benefits, and unfunded pension liability are not available to individual departments and agencies and therefore are not disclosed by OCRWM. As such, reporting is the responsibility of the U.S. Office of Personnel Management (OPM).

Under Statement of Federal Financial Accounting Standards (SFFAS) No. 5, *Accounting for Liabilities of the Federal Government*, an employer entity is required to recognize an expense for its employees' retirement benefits equal to the service costs for these employees for the year based on the plans' actuarial cost methods and assumptions. The difference between the retirement benefit expense and contributions made by the entity is reported as an imputed financing source as these costs will ultimately be funded by the OPM. As a result, OCRWM recognized total retirement expense for Federal employees of $1,093 and $1,082. OCRWM also recognized an imputed financing source of $1,093 and $1,082 to reflect the portion of 2001 and 2000 retirement expense to be paid by OPM, respectively. The retirement benefit expenses were computed in accordance with cost factors provided by OPM.

(9) Transactions With the Department and Other Government Agencies

The NWPA established OCRWM within the Department to carry out the provisions of the NWPA and created the Nuclear Waste Fund in the U.S. Treasury. The investment and borrowing powers of the NWF are limited to transactions with the U.S. Treasury. In discharging its obligations under the NWPA, the Department contracts for services with numerous contractors including other Federal Government agencies. Further, significant administrative services are provided by the Department.

As of September 30, 2001 and 2000, OCRWM owed other Federal Government agencies $1,646 and $2,028, respectively, for services and costs provided to OCRWM. For the years ended September 30, 2001 and 2000, OCRWM had incurred costs of $39,141 and $33,722, respectively, for services and costs provided by other Federal Government agencies.

OCRWM has entered into Memoranda of Agreement (MOA) with the Department's Office of Environmental Management and the Department's Office of Naval Nuclear Propulsion which establish the terms and conditions for acceptance of Department-owned SNF and HLW (DW) for disposal. Those estimated liabilities are included in the TSLCC that is used to calculate the estimate of the Department's share of total current and future Program costs. The total system life cycle cost in fiscal year 2000 dollars was $57,520,000. Based on the TSLCC, the Department’s share of the future system life cycle costs in fiscal year 2000 dollars was $13,266,000 for the reference repository design. The Department’s share of total Program cost cannot be determined finally until the Program is completed and final Program costs are known. However, the Department’s DW total cost share as of September 30, 2001, is estimated to be $2,776,023, including interest amounting to $895,860, based on the methodology published in the Federal Register in August 1987. As of September 30, 2001 and 2000, the NWF was due $1,359,871 and $1,394,889 from the Department, respectively. This receivable, as of September 30, 2001 and 2000, is comprised of current portions of $289,977 and $209,832 and long-term portions of $1,069,894 and $1,185,057, respectively.

(Dollars in thousands unless otherwise noted)

(10) Liabilities Not Covered by Budgetary Resources

A summary of liabilities not covered by budgetary resources as of September 30, 2001 and 2000, is as follows:

	2001	2000
Pensions and other actuarial liabilities	$ 352	$ 3,812
Other liabilities	3,993	4,044
Estimated liability for waste acceptance obligation	2,000,000	2,000,000
Total liabilities not covered by budgetary resources	2,004,345	2,007,856
Total liabilities covered by budgetary resources	15,323,823	14,031,240
Total liabilities	$ 17,328,168	$ 16,039,096

(11) Litigation

In accordance with the NWPA, the Department entered into contracts with more than 45 utilities, in which, in return for payment of fees into the NWF, the Department agreed to begin disposal of spent SNF by January 31, 1998. Because the Department has no facility available to receive SNF under the NWPA, and does not anticipate that there will be such a facility until at least 2010, the Department has been unable to begin disposal of the utilities' SNF as required by the contracts. Significant litigation has ensued as a result of this delay.

To date, that litigation has conclusively established that the Department's obligation to begin disposal is legally binding notwithstanding the lack of a facility to receive SNF, Indiana Michigan Power Co. v. Department of Energy, 88 F.3d 1272 (D.C. Cir. 1996); that the utilities' remedies for the Department's failure to begin disposal of their SNF are to be determined as a matter of contract law, Northern States Power Co. v. U.S., 128 F.3d 754 (D.C. Cir. 1997), cert. Denied, 119 S. Ct. 540 (1998); and that the Department cannot deny liability on the ground that its delay was unavoidable, Ibid. In addition, the Court of Appeals for the Federal Circuit has held that the Department is in partial breach of its contracts and that utilities are entitled to recover damages for that breach. Maine Yankee Atomic Power Company v. United States, 225 F.3d 1336 (Fed. Cir. 2000); Northern States Power co. v. U.S., 224 F.3d 1361 (Fed. Cir. 2000).

Currently, 18 utilities have filed suit in the Court of Federal Claims for breach of contract, in which they collectively seek $5.94 billion. The industry is reported to estimate that damages for all utilities with which the Department has contracts will be at least $50 billion. The Department,

however, believes that the industry estimate is highly inflated, and if the Department prevails on some key issues, the actual total damages suffered by all utilities as a result of the delay in beginning SNF disposal is more likely to be in the range of between $2 billion and $3 billion and has recorded a liability for the low end of that range.

Liability is certain in this matter and the managing judge for the Court of Federal Claims cases has directed the utilities to file dispositive motions on liability in those cases. Other than ascertaining the actual amount of damages, the only outstanding issue is how that liability is to be satisfied. At this time, it is uncertain whether damages will be paid from the Judgment Fund, the Nuclear Waste Fund, or some other source.

(12) Additional Waste

The allocation of Program costs to the Department is dependent on the amount of Department-owned waste requiring geological disposal. As additional waste requiring geological disposal is identified and incorporated into the technical Program baseline and MOA, OCRWM will update its cost estimate and cost share allocation to the Department. Certain wastes that may require geological disposal are described below.

The Department's Office of Environmental Safety and Health has identified additional waste owned by the Department, from both commercial and defense projects, that may require disposal in a repository for SNF and HLW. However, this waste has not been sufficiently characterized and quantified to be included in the MOA.

HLW owned by the State of New York and currently stored at the West Valley Demonstration Project site, is of a type that may be disposed of in a Federal repository if the State of New York were to enter into a contractual agreement with the Department, similar to the provisions of 10 CFR Part 961. To date, the State of New York has not entered into such an agreement. No amount has been recorded in the financial statements as of September 30, 2001, because, at this time, the Department is not legally required to take title to or dispose of the West Valley HLW, nor is the State of New York required to enter into a disposal contract with the Department if it does not plan to dispose of the HLW in a Federal repository.

(Dollars in thousands unless otherwise noted)

(13) Deferred Revenue

As described in note 2, all fees, both kWh fees and Defense high-level radioactive waste fees, as well as the related interest, are recognized as revenue to the extent of expenses incurred. Amounts in excess of current expenses are deferred.

Deferred revenue at September 30, 2001 and 2000 was as follows:

	2001	2000	Cumulative: Inception through 9/30/2001
Fees billed (credited):			
One-time spent nuclear fuel fees:			
Public (see note 5)	$ (100)	$ —	$ 2,174,803
Intragovernmental	—	—	162,098
kWh fees:			
Public	673,861	663,714	9,472,126
Intragovernmental	42,511	43,638	408,944
Defense high-level waste fees, intragovernmental	113,850	12,789	1,880,163
Interest on one-time spent nuclear fuel fees, public	129,203	137,634	1,819,150
Interest, intragovernmental:			
Income on investments	638,083	580,849	5,238,092
Defense high-level waste fees	60,712	1,857	895,860
Other revenue	56,382	3,794	422,944
Total revenues	1,714,502	1,444,275	$ 22,474,180
Less – earned revenue	(425,112)	(401,528)	
Change in deferred revenue	1,289,390	1,042,747	
Deferred revenue – beginning balance	13,987,630	12,944,883	
Deferred revenue – ending balance	$ 15,277,020	$ 13,987,630	

Other revenue primarily consists of net gains on sale of investments. The net gain on sale of investments was $56,222 and $3,735 for the years ended September 30, 2001 and 2000, respectively.

UNITED STATES DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

Required Supplementary Stewardship Information for Research and Development

September 30, 2001 and 2000

(Dollars in thousands unless otherwise noted)

	2001	2000	1999
Applied Research and Development			
Environmental Quality	$ 63,492	$ 58,662	$ 59,006

Applied research and development activities were conducted by national laboratories in direct support of OCRWM's Yucca Mountain Site Characterization Project.

2001 M Street, NW
Washington, DC 20036

Independent Auditors' Report on Internal Control over Financial Reporting

United States Department of Energy
Office of Civilian Radioactive Waste Management:

We have audited the balance sheet of the Office of Civilian Radioactive Waste Management (OCRWM), a component of the Department of Energy (Department), as of September 30, 2001, and the related statements of net cost, changes in net position, budgetary resources, and financing for the year then ended, and have issued our report thereon dated January 31, 2002. We conducted our audit in accordance with auditing standards generally accepted in the United States of America; the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States; and Office of Management and Budget (OMB) Bulletin No. 01-02, *Audit Requirements for Federal Financial Statements*.

In planning and performing our audit, we considered OCRWM's internal control over financial reporting by obtaining an understanding of OCRWM's internal control, determining whether internal controls had been placed in operation, assessing control risk, and performing tests of controls to determine our auditing procedures for the purpose of expressing our opinion on the financial statements. We limited our internal control testing to those controls necessary to achieve the objectives described in OMB Bulletin No. 01-02 and *Government Auditing Standards*. We did not test all internal controls relevant to operating objectives as broadly defined by the Federal Managers' Financial Integrity Act of 1982. The objective of our audit was not to provide assurance on OCRWM's internal control. Consequently, we do not provide an opinion on internal control over financial reporting.

Our consideration of internal control over financial reporting would not necessarily disclose all matters in the internal control over financial reporting that might be reportable conditions. Under standards issued by the American Institute of Certified Public Accountants, reportable conditions are matters coming to our attention relating to significant deficiencies in the design or operation of the internal control over financial reporting that, in our judgment, could adversely affect OCRWM's ability to record, process, summarize, and report financial data consistent with the assertions by management in the financial statements. Material weaknesses are reportable conditions in which the design or operation of one or more of the internal control components does not reduce to a relatively low level the risk that misstatements, in amounts that would be material in relation to the financial statements being audited, may occur and not be detected within a timely period by employees in the normal course of performing their assigned functions. Because of inherent limitations in any internal control, misstatements due to error or fraud may occur and not be detected.

As noted at the Department level, the Department has a certain matter involving internal control over financial reporting and its operation that is considered to be a reportable condition. Because OCRWM uses the Department's Information Technology (IT) systems to process financial transactions and generate reports, this weakness also affects the IT environment for OCRWM.

However, the reportable condition described below and in more detail in Exhibit I is not believed to be a material weakness.

We noted network vulnerabilities and access control weaknesses in the Department's unclassified computer information systems. Without adequate access and computer security controls, the integrity of essential financial management system data may be threatened.

Additional Required Procedures

As required by OMB Bulletin No. 01-02, we considered OCRWM's internal control over Required Supplementary Stewardship Information by obtaining an understanding of its internal control, determining whether these internal controls had been placed in operation, assessing control risk, and performing tests of controls. Our procedures were not designed to provide assurance on internal control over Required Supplementary Stewardship Information, and, accordingly, we do not provide an opinion on such controls.

As further required by OMB Bulletin No. 01-02, with respect to internal control related to performance measures determined by management to be key and reported in the Overview section of the annual financial statements, we obtained an understanding of the design of significant internal controls relating to the existence and completeness assertions. Our procedures were not designed to provide assurance on internal control over reported performance measures, and, accordingly, we do not provide an opinion on such controls.

We also noted other matters involving internal control and its operation that we have reported to the management of OCRWM in a separate letter dated January 31, 2002.

This report is intended solely for the information and use of OCRWM's management and the Department; the Department's Office of the Inspector General; OMB and Congress and is not intended to be, and should not be, used by anyone other than these specified parties.

KPMG LLP

January 31, 2002

We noted network vulnerabilities and weaknesses in access and other security controls in unclassified information systems.

Finding 1: Network Security

The Department maintains a series of interconnected unclassified networks and information systems. Security over unclassified information systems is an important issue facing government organizations. This issue has taken on greater significance as Federal agencies have migrated from mainframe environments with a closed architecture and limited access to web-based client/server systems. In addition, the U.S. General Accounting Office has designated information system security as a high-risk area.

Federal and Departmental directives require the establishment and maintenance of security over unclassified information systems, including financial management systems. Past audits identified significant weaknesses in selected systems and devices attached to the computer networks at some Department sites. The Department has implemented certain corrective actions to improve network security at the sites we reviewed in prior years. However, significant weaknesses at two sites reviewed in Fiscal Year 2001 were identified, and at three sites reviewed by other organizations. At all of these sites, network vulnerabilities similar to those found at other sites in previous years, including poor password management, weak configuration management, outdated software with known security problems, and firewall configuration problems were identified. In addition, many previously identified weaknesses have not been resolved.

The identified weaknesses and vulnerabilities increase the risk that malicious destruction or alteration of data or unauthorized processing could occur. However, compensating controls that mitigate their potential effect on the integrity of the Department's financial systems were identified.

Recommendation:

We recommend that the Department's Chief Information Officer take actions to improve network security throughout the Department. Detailed recommendations to address the issues discussed above will be included in a separate report to the Chief Information Officer.

Finding 2: Information Systems Access and Other Security Controls

The Department has mandated compliance with several Federal information security directives and public laws in DOE Notice 205.1, *Unclassified Computer Security Program*, dated July 26, 1999. The program, referred to as the "Cyber Security Program," also establishes policies for the protection of unclassified information and information systems. Within this security framework, the Department operates the financial management system that forms the basis for preparing its consolidated financial statements.

Weaknesses in access and other security controls at several sites were disclosed in the audit of the Department's consolidated financial statements. These weaknesses included unsecured network ports, inadequate monitoring of networks for questionable activity, and shortcomings in password security. Weaknesses in security planning, including outdated or nonexistent security certifications for major applications were also identified. Finally, inadequate planning for re-

establishment of computer operations following a disruption was noted too. For example, some sites had arranged for backup processing facilities, but had not tested those facilities, and others had not finalized or tested disaster recovery plans. The Department's Office of Inspector General also reported deficiencies in the Department's information system risk management, contingency planning, configuration management, and access controls in its evaluation report on *The Department's Unclassified Cyber Security Program*, dated August 30, 2001.

Without adequate access and computer security controls, the integrity of essential financial management system data may be threatened. However, compensating controls were identified that mitigate the potential effect on the integrity of the Department's financial systems due to those weaknesses.

Recommendation:

As recommended in the prior year, the Department's Chief Information Officer should follow up on the implementation of its Cyber Security Program throughout the Department, to ensure that the Federal information standards are met and that its information and information systems are adequately protected against unauthorized access. Detailed recommendations to address the issues discussed above will be included in a separate report to the Chief Information Officer.

2001 M Street, NW
Washington, DC 20036

Independent Auditors' Report on Compliance with Laws and Regulations

United States Department of Energy
Office of Civilian Radioactive Waste Management:

We have audited the balance sheet of the Office of Civilian Radioactive Waste Management (OCRWM), a component of the Department of Energy (Department), as of September 30, 2001, and the related statements of net cost, changes in net position, budgetary resources, and financing for the year then ended, and have issued our report thereon dated January 31, 2002. We conducted our audit in accordance with auditing standards generally accepted in the United States of America; the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States; and Office of Management and Budget (OMB) Bulletin No. 01-02, *Audit Requirements for Federal Financial Statements*.

The management of OCRWM is responsible for complying with laws and regulations applicable to OCRWM. As part of obtaining reasonable assurance about whether OCRWM's financial statements are free of material misstatement, we performed tests of its compliance with certain provisions of laws and regulations, noncompliance with which could have a direct and material effect on the determination of the financial statement amounts, and certain provisions of other laws and regulations specified in OMB Bulletin No. 01-02, excluding certain requirements with respect to the Federal Financial Management Improvement Act of 1996, which was evaluated at the Department level. We limited our tests of compliance to the provisions described in the preceding sentence, and we did not test compliance with all laws and regulations applicable to the OCRWM. However, providing an opinion on compliance with laws and regulations was not an objective of our audit, and, accordingly, we do not express such an opinion.

The results of our tests of compliance with the laws and regulations described in the preceding paragraph of this report disclosed no instances of noncompliance that are required to be reported herein under *Government Auditing Standards* or OMB Bulletin No. 01-02.

This report is intended solely for the information and use of OCRWM's management and the Department; the Department's Office of the Inspector General; OMB and Congress and is not intended to be, and should not be, used by anyone other than these specified parties.

KPMG LLP

January 31, 2002

Appendix B

Program Profile

Statutory Authorities and Mission

The Nuclear Waste Policy Act (NWPA) of 1982 (Public Law 97-425) established the Office of Civilian Radioactive Waste Management (OCRWM) within the Department of Energy (DOE). OCRWM's function is to develop and manage a Federal system for disposing of all spent nuclear fuel from commercial nuclear reactors and high-level radioactive waste resulting from atomic energy defense activities. The statute provided detailed direction for the scientific, technical, and institutional development of the system, and required that the Nuclear Regulatory Commission license waste management facilities.

The NWPA established a process to dispose of commercial spent nuclear fuel in a geologic repository. In 1985, under provisions of the NWPA, President Reagan determined that a separate repository for defense-related high-level radioactive waste would not be required; this radioactive waste could be disposed of along with commercial spent nuclear fuel in the geologic repository. The Nuclear Waste Policy Amendments Act of 1987 (Public Law 100-203) directed the Secretary of Energy to characterize only the Yucca Mountain site in Nevada as a potential location for a repository. Under OCRWM's current schedule, and given adequate funding, waste emplacement at Yucca Mountain could begin in 2010.

The NWPA authorized the Secretary to enter into contracts with the generators and owners of commercial spent nuclear fuel and high-level radioactive waste. A *Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste* was promulgated in 1983 at 10 CFR Part 961. Individual contracts based on the standard contract have been executed between DOE and those parties. The NWPA also directs OCRWM to develop a Nation-wide system for transporting commercial spent nuclear fuel to Federal facilities, utilizing private industry to the fullest extent possible.

The *Civilian Radioactive Waste Management Program Plan, Revision 3,* released in March 2000, covers the planning period of Fiscal Years 2001 through 2005. It describes the Program's mission, vision, and strategic objectives; establishes performance goals and performance measures; and identifies milestones and funding requirements to achieve the performance goals. The planned activities reflected an ongoing transition from predominately investigative science to data synthesis, model development, and performance assessment for an overall safety analysis, and finalization of repository and waste package designs in support of the potential site recommendation. The Program Plan will be revised following completion of Program replanning in Fiscal Year 2003.

Sources of Funding

The NWPA provides that the costs of disposing of spent nuclear fuel and high-level radioactive waste are to be borne by the parties responsible for their generation. Fees levied on the owners and generators of commercial spent nuclear fuel are defined in the standard contract. Fees paid are deposited in the Nuclear Waste Fund, a separate account in the U.S. Treasury that is managed and administered by DOE. OCRWM, however, can only expend monies from the Fund that are appropriated by Congress. Amounts not appropriated for current expenses are invested in U.S. Treasury securities and managed strategically to ensure that the long-term costs of disposal can be met.

Since civilian and defense materials would be emplaced in the same repository, each party must pay its proportional share of costs. DOE developed a methodology for allocating civilian and defense costs and published the result in the *Federal Register* in August 1987. Funding to meet the costs of disposing of defense materials in a repository is provided through a Defense Nuclear Waste Disposal appropriation from the general (taxpayer-supported) fund of the U.S. Treasury.

Program Organization

OCRWM is headquartered in Washington, D.C., in DOE's Forrestal Building. Its Director reports to the Secretary through the Under Secretary. OCRWM carries out its mission through two Projects and a management center:

- The Yucca Mountain Site Characterization Project, located in Las Vegas, Nevada, is responsible for all work leading up to and including licensing of a geologic repository.
- The Waste Acceptance, Storage, and Transportation Project, located at OCRWM Headquarters in Washington, D.C., is responsible for all work leading up to and including acceptance and transportation of spent nuclear fuel and high-level radioactive waste.
- The Program Management Center consists of the Office of Quality Assurance; the Office of Program Management and Administration; and the Systems Engineering and International Division of the Office of Acceptance, Transportation, and Integration. The first of these organizations is located in Las Vegas, Nevada, and the latter two are in Washington, D.C.

At the end of Fiscal Year 2001, OCRWM employed 2,147 people. This included 160 OCRWM Federal staff, 17 Federal full-time equivalents (FTE) at other Headquarters offices, 6 Federal FTEs at DOE's Nevada Operations Office, 99 U.S. Geological Survey employees, and 1,865 contractor employees, including employees of national laboratories.

Appendix C

Program Drivers: Materials Destined for Geologic Disposal

Spent nuclear fuel generated by commercial nuclear reactors constitutes by far the largest stock of nuclear materials destined for geologic disposal. However, a repository is also essential for the disposition of an array of other nuclear materials that are managed by the Department of Energy (DOE). This appendix summarizes current planning assumptions about how the disposal capacity of the repository would be allocated among all waste forms. It also consolidates some historical, technical, and policy information about these DOE-managed nuclear materials, and reports current and projected inventories of those materials and of commercial spent nuclear fuel.

Allocation of Repository Capacity: Current Planning Assumptions

Projected inventories and the statutory limit on the quantity of waste emplaced

The Nuclear Waste Policy Act (NWPA) of 1982 provides that the Nuclear Regulatory Commission (NRC) may approve the emplacement in the first repository of a quantity of spent fuel containing no more than 70,000 metric tons of heavy metal (MTHM) or a quantity of solidified high-level waste resulting from the reprocessing of such quantity of spent fuel. The 1987 Nuclear Waste Policy Amendments Act requires the Secretary to report to the President and to Congress on or after January 1, 2007, but not later than January 1, 2010, on the need for a second repository. The total inventory of commercial spent nuclear fuel and DOE-managed nuclear materials requiring geologic disposal, projected through 2035, exceeds 70,000 MTHM. Due to projected nuclear power reactor license renewals, the total may reach approximately 105,000 MTHM.

Based on a Presidential decision to use disposal capacity at repositories developed pursuant to the NWPA for disposal of high-level radioactive waste resulting from atomic energy defense activities, the Office of Civilian Radioactive Waste Management's planning basis allocates 7,000 MTHM of the 70,000 MTHM statutory limit to DOE-managed nuclear materials. Of that 7,000 MTHM, DOE has specified that two-thirds would be high-level radioactive waste and one-third would be DOE and naval spent nuclear fuel.

For planning purposes, we analyze a range of design and operational capacities. The lower bound of the proposed repository capacity for spent fuel is consistent with the 70,000 MTHM statutory limit. The upper bound is based on projections of the total quantity of spent nuclear fuel and high-level radioactive waste requiring disposal. Analyses of the upper bound enable us to evaluate the actual physical capability of a potential repository at the Yucca Mountain site to safely isolate these wastes. The analyses of lower and upper bounds support site characterization, design work, site recommendation, the environmental impact statement (EIS), possible preparation of a license application, and a definition of repository operations.

Description of Materials Destined for Geologic Disposal

This section provides background information on projected quantities of material destined for geologic disposal. The projections are subject to change as decisions on materials disposition are made and carried out.

Consistent with information presented in the draft EIS for the proposed repository at Yucca Mountain, this section divides the materials destined for geologic disposal into three groups: (1) commercial spent nuclear fuel, (2) DOE-managed spent nuclear fuel, and (3) DOE-managed high-level radioactive waste.

The table and figure at the end of this appendix provide an overview of the quantities of nuclear materials destined for geologic disposal and indicate the sources of data for information presented throughout this appendix.

Commercial spent nuclear fuel

Background

Commercial spent nuclear fuel is fuel that has been withdrawn from a nuclear reactor following irradiation. Nuclear power reactors store spent nuclear fuel using a combination of storage options licensed by the NRC: (1) under water in spent fuel pools and (2) above ground in dry storage in an independent spent fuel storage installation.

The final form of commercial spent nuclear fuel to be disposed of in the proposed repository would be reactor fuel assemblies as they are discharged from reactors. The proposed repository would receive spent fuel assemblies or spent nuclear fuel packaged in canisters. In its *Record of Decision for the Surplus Plutonium Disposition Final Environmental Impact Statement,* issued in January 2000, DOE decided that up to 33 of the up to 50 metric tons of surplus plutonium would be converted to a mixed oxide fuel that would subsequently be burned in commercial reactors and disposed of in a repository as spent nuclear fuel.

Current and projected inventories

By December 2001, spent nuclear fuel containing 42,700 MTHM was stored at 72 commercial power reactor sites and one independent storage site (this projection does not include DOE-owned sites). Those sites are located in 33 States. Of the 118 reactors at these 72 sites, 14 are no longer in operation. Fifteen reactor sites have added NRC-licensed (as per 10 CFR 72) onsite independent spent fuel storage installations utilizing above-grade dry storage to supplement their in-pool storage capacity; others are approaching full pool capacity and will require additional storage.

Based on projections made in Fiscal Year 2000, by 2035, when the last of the existing 118 commercial power reactors will have completed its initial 40-year license period, spent nuclear fuel containing a total of about 83,800 MTHM will have been generated. This inventory includes spent nuclear fuel resulting from burning approximately 33 MTHM of surplus weapons-usable plutonium in the form of mixed-oxide fuel in commercial nuclear reactors. The resulting spent nuclear fuel would be stored at the reactor sites until it was transported to a repository for disposal.

DOE-managed spent nuclear fuel

Background

DOE stores most of its spent nuclear fuel at three locations: (1) the Hanford site in Washington State, (2) the Idaho National Engineering and Environmental Laboratory (INEEL), and (3) the Savannah River site in South Carolina. A relatively small amount is stored at the Fort St. Vrain dry storage facility in Colorado. Small quantities remain at other locations. The inventory of spent nuclear fuel created by the Department of the Navy from propulsion of its submarines and surface vessels is included in DOE's spent nuclear fuel inventory.

Over the past 40 years, DOE and its predecessor organizations have generated more than 200 varieties of spent nuclear fuel from weapons production, nuclear propulsion, and various research endeavors. Because there are so many varieties of DOE spent nuclear fuel and to facilitate total system performance assessments, fuel was grouped into 16 categories. To define the categories, regulatory requirements were used to identify the parameters that would affect the performance of DOE spent nuclear fuel in a repository and that would support analyses needed for a license application. A list of these 16 categories is included in Appendix A of the draft EIS for the proposed geologic repository at Yucca Mountain.

Current and projected inventories

Through the year 2035, the total inventory of DOE spent nuclear fuel is projected to be approximately 2,500 MTHM. The following paragraphs provide an overview of the materials and their respective quantities that constitute the total inventory.

- ***Hanford Site***. Most of the DOE inventory of spent nuclear fuel, 2,100 MTHM, is now at the Hanford site in Washington State, where spent nuclear fuel was generated in the N-Reactor for use in the weapons program. DOE plans to continue with efforts to move this fuel, which is metallic-based, from wet storage to dry storage at the Hanford site.

- ***Idaho National Engineering and Environmental Laboratory***. DOE spent nuclear fuel stored at this site originated in activities to promote the peaceful uses of atomic energy, beginning with the passage of the Atomic Energy Act of 1954. (The naval spent nuclear fuel stored at this site is discussed below.) The approximately 240 MTHM inventory, projected to remain essentially unchanged through 2035, includes spent nuclear fuel from demonstration reactors, from research and development activities, and from activities to demonstrate storage technologies and characterization for disposal. The research reactor fuel stored at this site is not aluminum-based; it will include 1.0 MTHM of foreign research reactor spent nuclear fuel. Debris from the Three Mile Island reactor in Pennsylvania is also stored at this site. Under a consent agreement between DOE, the Department of the Navy, and the State of Idaho, DOE shall commence removal of spent nuclear fuel stored in Pennsylvania by January 1, 2035.

- ***Savannah River Site***. Spent nuclear fuel from production reactors has been stored at this South Carolina site, and some of it has been converted to high-level radioactive waste for disposal. The 44 MTHM of spent nuclear fuel in storage includes remaining unprocessed production reactor fuel and some domestic research reactor fuel. This inventory is projected to remain unchanged through the year 2035. DOE has also designated this site for storage of aluminum-clad spent nuclear fuel from domestic and foreign research reactors. The uranium in foreign reactor fuel was originally exported by the U.S. Government under the Atoms for Peace Program. In keeping with nuclear nonproliferation policies, foreign research reactor fuel is being returned to this country and placed under DOE's management. Up to 16 MTHM is projected to be returned, of which approximately 15 MTHM will be stored at the Savannah River site.

- ***Naval Spent Nuclear Fuel.*** The Department of the Navy fabricates its own nuclear fuel for its nuclear-powered vessels using highly enriched uranium. For many years, naval spent nuclear fuel was shipped to the Idaho Chemical Processing Plant, where DOE reprocessed it to recover the uranium. Following DOE's termination of reprocessing activities in 1992, an agreement was reached in October 1995 between the Federal Government and the State of Idaho to allow the temporary storage of naval spent nuclear fuel at INEEL. Under the consent agreement, naval spent nuclear fuel will be among the early shipments to a repository. In 1996, the Navy decided that it would store its spent nuclear fuel in dual-purpose canisters in Idaho prior to shipping it to a geologic repository for disposal. The current inventory consists of approximately 14 MTHM and is projected to total approximately 65 MTHM by 2035.

The total projected inventory of DOE's spent nuclear fuel includes approximately 15 MTHM stored at other sites, including some commercially irradiated spent nuclear fuel now under DOE management. In addition to the quantities of DOE-managed spent nuclear fuel discussed above, 60 metric tons of sodium-bonded spent nuclear fuel, most of it stored at INEEL and Argonne National Laboratory-West in Idaho, are being evaluated to determine whether it requires treatment to make it suitable for disposal. DOE is preparing an EIS for proposed disposition of this spent nuclear fuel, as required by the National Environmental Policy Act. If the fuel is treated, it could be disposed of as high-level radioactive waste.

High-level radioactive waste

Background

High-level radioactive waste inventories have resulted from past reprocessing of spent nuclear fuel to recover plutonium and uranium. DOE originally intended to reprocess most of its spent nuclear fuel, and reprocessing began at a number of Federal sites as early as the 1940s. In 1985, when President Reagan decided that high-level radioactive waste resulting from atomic energy defense activities could be disposed of in the civilian repository, DOE and naval spent nuclear fuel were still being reprocessed. Reprocessing continued until 1992, when the Administration discontinued the practice.

In the January 2000 *Record of Decision for the Surplus Plutonium Disposition Final Environmental Impact Statement*, DOE decided that up to approximately 17 metric tons of the up to 50 metric tons of surplus plutonium would be immobilized in a ceramic form to be disposed of in canisters containing vitrified high-level waste.

Current and projected inventories

Radioactive wastes from reprocessing are stored as aqueous solutions, sludges, and calcines at the INEEL and the Hanford and Savannah River sites. If the decision is made to send these wastes to the repository, DOE will solidify them as borosilicate glass in canisters prior to transport. The canisters will be safely stored near the vitrification site until they are transported to a repository for disposal. At the Savannah River site, the production of borosilicate glass canisters has already begun. A total of 21,847 canisters of high-level radioactive waste are projected to be produced at DOE sites through 2035. In addition, the West Valley Demonstration Project in New York State, a facility now managed by DOE, is vitrifying high-level radioactive waste that resulted from commercial reprocessing of spent nuclear fuel. It is projected that 300 canisters of vitrified commercial high-level waste will be produced at West Valley.

Overview of Nuclear Materials Inventory[1]

Waste Type	*TOTAL Quantities Projected Through 2035*			*Planning Allocation for Repository under the 70,000 MTHM Statutory Limit*		
	MTHM	*Canisters*	*Disposal Containers Required*	*MTHM*[2]	*Canisters*	*Disposal Containers Required*
Commercial Spent Nuclear Fuel [4]	83,800	N/A	10,000	63,000	N/A	7,600
DOE Spent Nuclear Fuel	2,500	4,000[3]	300 for Naval Spent Nuclear Fuel 2,400 for High Level Waste only 1,300 in Co-disposal	2,333	3,800[3]	290 for Naval Spent Nuclear Fuel 910 for High Level Waste only 1,300 in Co-disposal
High-Level Radioactive Waste	12,000[3]	22,000[5]		4,667	8,300	

Sources of data for this table:

Basis for the Viability Assessment and Total System Life Cycle Cost Estimate Operational Waste Stream, June 1998, Civilian Radioactive Waste Management & Operations: A80-01717-1710-0002, Rev. 00

Drawn from references to Appendix A of the Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada

Notes:

[1] All values, unless otherwise noted, are based on the best available data and are rounded to 2 significant figures.

[2] Calculated allocations based on the statutory limit.

[3] Calculated using DOE-accepted method for determining MTHM equivalence.

[4] Figures for commercial spent nuclear fuel assume no new reactor construction and no license extensions or renewals.

[5] Includes projected number of canisters of both defense and commercially generated high-level waste.

Materials intended for geologic disposal

Other nuclear materials no longer essential to national security needs

Through the work of its Nuclear Materials Stewardship Initiative, DOE is examining whether certain nuclear materials no longer essential to national security needs should be maintained as a national resource or disposed of, possibly in the geologic repository that OCRWM would develop.

These materials include curium and americium, now in solutions; metals and oxides of neptunium-237 at the Savannah River site; and uranium-233-rich materials at Oak Ridge, Tennessee, and INEEL. If DOE determines that disposal in a repository is warranted, total system performance assessment analyses would evaluate the impacts on repository system performance of disposing of these materials in a repository.

Summary of Quantities of Materials Intended for Geologic Disposal

The information in the table on the previous page is based on references that support both the Yucca Mountain repository viability assessment and the draft EIS for the proposed repository at Yucca Mountain. They identify quantities of materials requiring geologic disposal that are projected through 2035 and quantities allocated to the first repository for planning purposes. The map in the introduction to this report indicates the location of these materials.

In the table on the previous page, quantities of spent nuclear fuel are expressed in MTHM. Other measures are also important for expressing quantities of spent nuclear fuel and high-level radioactive waste: the table expresses quantities of high-level radioactive waste in terms of canisters of vitrified high-level radioactive waste, and it identifies the number of waste packages that would be required for spent nuclear fuel and high-level radioactive waste.

In addition, the table reflects DOE's current plans to dispose of 50 metric tons of surplus weapons-usable plutonium by both immobilizing it in ceramic, to be disposed of in containers of vitrified high-level radioactive waste, and irradiating it in mixed oxide fuel that would become part of the commercial spent nuclear fuel inventory. Accordingly, the table identifies the number of canisters containing immobilized plutonium and high-level radioactive waste, and it counts the spent mixed oxide fuel as part of the inventory of commercial spent nuclear fuel.

Appendix D

Key Federal Laws and Regulations

The Office of Civilian Radioactive Waste Management (OCRWM) must comply with the requirements of the Nuclear Waste Policy Act (NWPA) and other laws. OCRWM must also comply with the regulations of other Federal agencies, including the Nuclear Regulatory Commission (NRC), the Department of Transportation (DOT), and the Environmental Protection Agency (EPA), and with State laws and regulations. This appendix summarizes the most important Federal requirements. OCRWM's Program Plan presents a much fuller account of statutory requirements, as well as a history of the Program.

Key Federal Laws

The NWPA established basic policies to govern development of a Federal radioactive waste management system.

- **Development of geologic repositories.** The NWPA established a framework for siting, characterizing, constructing, operating and monitoring, and closing two permanent geologic repositories for disposal of spent nuclear fuel and high-level radioactive waste.

- **Storage.** It provided the authority for the Federal Government to contract for a limited amount of emergency Federal interim storage; that authority has expired. It also provided for development of a proposal to site and construct a monitored retrievable storage facility on a firm schedule.

- **Intergovernmental relations.** It established requirements for interactions between the Federal Government and States, local governments, and Native American Tribes.

- **Other Federal responsibilities.** It assigned other Federal agencies responsibility for facilitating the radioactive waste management mission. Most notably, it required that radioactive waste management facilities be licensed by the NRC.

- **Nuclear Waste Fund.** It provided for the owners and generators of radioactive materials to be disposed of in a repository to cover the costs of disposal, and it established a fund into which utilities operating nuclear reactors pay fees on electricity generated by those reactors and sold by them.

- **Office of Civilian Radioactive Waste Management.** It established OCRWM within the Department of Energy.

The Nuclear Waste Policy Amendments Act of 1987

This act retained the basic policies set forth in the 1982 NWPA regarding Federal responsibilities, the Nuclear Waste Fund, and OCRWM. However, it significantly modified the original act.

- **Site characterization.** The Amendments Act directed DOE to characterize only the Yucca Mountain site in Nevada as a potential repository site and to postpone consideration of the need for a second repository until no sooner than 2007 and no later than 2010. It established a process that would lead to a determination by the Secretary of Energy on whether to recommend that the President approve Yucca Mountain for development as a geologic repository.

- **Monitored retrievable storage.** It subjected the siting, construction, and operation of a monitored retrievable storage facility to certain conditions that link the construction and operation of the facility to construction and licensing of a repository. It also prohibited siting it in a State in which a site has been approved for repository site characterization or repository construction.

- **State and Tribal involvement.** It provided financial incentives for States and Native American Tribes on whose land a repository or monitored retrievable storage facility is sited. It authorized States, Native American Tribes, and units of local government within whose jurisdictions a candidate site is located to designate onsite oversight representatives, and it provided that the reasonable expenses of those representatives be paid from the Nuclear Waste Fund.

- **Local government involvement.** It also authorized the Secretary to designate other units of local government as affected and, therefore, entitled them to exercise oversight of site characterization activities and to receive financial assistance to cover the costs of that oversight.

- **External oversight.** It increased external oversight of OCRWM's work by establishing the Nuclear Waste Technical Review Board.

- **Nuclear Waste Negotiator.** It established the Office of the Nuclear Waste Negotiator and directed the Negotiator to attempt to reach an agreement with a State or Native American Tribe willing to host a repository or monitored retrievable storage facility. These provisions have expired.

The Energy Policy Act of 1992

This act includes key elements of the National Energy Strategy proposed by the Administration in 1990. Section 801 of the act directed EPA to contract with the National Academy of Sciences (NAS) to provide "findings and recommendations on reasonable standards for protection of the public health and safety" that would govern the long-term performance of a high-level radioactive waste repository at the Yucca Mountain site. Within one year of receiving NAS recommendations, EPA was to promulgate public health and safety standards that "shall prescribe the maximum annual effective dose equivalent to the individual members of the public from releases to the accessible environment from radioactive materials stored or disposed of in the repository." NRC is also required to modify its technical requirements and criteria to be consistent with EPA standards.

Key Regulations

Federal regulations are published in the Code of Federal Regulations, which is divided into volumes organized by Title and Part. For example, 10 CFR 60 refers to Title 10, Code of Federal Regulations, Part 60.

10 CFR 2 (NRC) Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders. Specifies the licensing process and requires an electronic record-keeping system to preserve data needed for licensing.

10 CFR 50, Appendix B (NRC) Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants. Establishes quality assurance requirements.

10 CFR 63 (NRC) Disposal of High-Level Radioactive Wastes in a Proposed Geological Repository at Yucca Mountain. NRC promulgated the final 10 CFR Part 63 on November 2, 2001, in the *Federal Register* (66 FR 55733).

10 CFR 71 (NRC) Packaging and Transportation of Radioactive Material. Defines requirements for packaging and transporting spent nuclear fuel and high-level radioactive waste.

10 CFR 72 (NRC) Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste. Sets forth technical requirements for licensing private storage facilities to receive, transport, and store spent nuclear fuel, and outlines procedures for licensing DOE to receive, transport, and store spent nuclear fuel at a temporary facility.

10 CFR 73 (NRC) Physical Protection of Plants and Materials. Prescribes requirements for physical protection systems to protect against radiological sabotage of special nuclear materials.

10 CFR 74 (NRC) Material Control and Accounting of Special Nuclear Material. Establishes requirements for control and accounting of special nuclear material, including documentation of transfer of material.

10 CFR 75 (NRC) Safeguards on Nuclear Material—Implementation of US/IAEA Agreement. Establishes a system to implement the agreement between the United States and the International Atomic Energy Agency (IAEA) on the application of safeguards.

10 CFR 960 (DOE) General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories. Establishes guidelines to compare candidate sites; used as the basis for the 1988 Site Characterization Plan for the Yucca Mountain Site Characterization Project. In 1996, DOE issued proposed amendments to these rules. In 1999, DOE issued a revised proposal, which included site-specific guidelines for Yucca Mountain as 10 CFR 963.

10 CFR 961 (DOE) Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste. Outlines DOE's contract with utilities to receive, transport, and dispose of spent nuclear fuel and high-level waste.

10 CFR 963 (DOE) General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories; Yucca Mountain Site Suitability Guidelines. DOE's siting guidelines, which use a total system performance method to evaluate suitability of the Yucca Mountain site were published in the *Federal Register* on November 14, 2001 (66 FR 57298).

40 CFR 197 (EPA) Environmental Radiation Protection Standards for Yucca Mountain, Nevada, for site-specific health and safety standards. Establishes limits on doses received by individual members of the

public from repository releases and establishes standards for groundwater contamination and limits doses from releases from human intrusion. EPA finalized the standards and issued the final 40 CFR Part 197 in the *Federal Register* on June 13, 2001 (66 FR 32074).

40 CFR 191 (EPA) Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes. Originally issued in 1985 pursuant to the NWPA, the regulations were remanded in 1987. The disposal section does not apply to Yucca Mountain. Pursuant to Section 801 of the Energy Policy Act of 1992, the EPA has proposed a site-specific radiation protection standard applicable to the Yucca Mountain site.

49 CFR 171-179 (DOT) Hazardous Materials Regulations. Specifies DOT requirements for the transportation of radioactive materials.

Appendix E

Relations with External Parties

Because of the unprecedented nature of the mission of the Office of Civilian Radioactive Waste Management (OCRWM), Congress designed the Civilian Radioactive Waste Management Program to be one of the most closely scrutinized in the public arena, subject to exceptionally broad and intensive review, regulation, and oversight. This appendix presents an overview of the formal interactions in which we are engaged.

Review, Regulation, and Oversight

Parties that regulate, formally review, and oversee our Program are identified below, followed by a list of the hearings, briefings, and meetings they held in Fiscal Year 2001 and the topics discussed at each. Appendix F includes a list of selected publications issued by some of these parties in Fiscal Year 2001.

- ***Congress –*** Congress defines our statutory basis, appropriates funds, and monitors our progress. The congressional committees that exercise primary oversight of our work are the Senate Committee on Energy and Natural Resources, Subcommittee on Energy Research, Development, Production, and Regulation; the House Committee on Commerce, Subcommittee on Energy and Power; and the Energy and Water Development Subcommittees of the House and Senate Appropriations Committees.

- ***General Accounting Office (GAO) –*** The Nuclear Waste Policy Act (NWPA) directs GAO to conduct an annual audit of OCRWM. GAO also reviews and reports on Program activities in response to specific congressional inquiries and requests.

- ***Nuclear Regulatory Commission (NRC) –*** NRC exercises a statutory role under the NWPA. It implements regulatory standards for the protection of the public and the environment from radioactive releases associated with storage and disposal of high-level radioactive waste and spent nuclear fuel. It is responsible for certifying and licensing the components of the radioactive waste management system, including the repository, facilities for storing spent nuclear fuel, and transportation casks. NRC mandates quality assurance requirements and content requirements for license applications.

  We also provide information to NRC's Advisory Committee on Nuclear Waste, which reviews the work of NRC staff and makes recommendations to NRC regarding the adequacy of that work.

- ***Nuclear Waste Technical Review Board (NWTRB) –*** The NWTRB exercises a statutory and independent role established in the Nuclear Waste Policy Amendments Act of 1987. It evaluates the technical and scientific validity of activities related to site characterization and the packaging and transportation of high-level radioactive waste and spent nuclear fuel. The NWTRB is required to report its findings, conclusions, and recommendations to Congress and the Secretary of Energy at least twice a year. The NWTRB's meetings provide the public with an opportunity to observe and comment on technical exchanges between the NWTRB, Program and contractor staff, and other scientists.

- ***National Academy of Sciences (NAS) –*** The NAS Board on Radioactive Waste Management reviews our Program on an as-requested basis, offering technical expert review and advice on Program issues.

- ***Environmental Protection Agency (EPA) –*** The Energy Policy Act of 1992 directs the EPA to promulgate a site-specific radiation protection standard for the management and disposal of spent nuclear fuel and high-level radioactive waste at the Yucca Mountain site.

- ***Department of Transportation (DOT) –*** DOT regulates transportation of highly radioactive materials, including spent nuclear fuel. Its regulations govern handling of shipping containers, labeling of containers and placarding of transport vehicles for identification purposes, driver training and certification, and highway routing.

- ***State of Nevada and affected units of local government –*** Under the NWPA, the State of Nevada and Nye County, the county within which the Yucca Mountain site is located, are entitled to exercise oversight of site characterization activities and to receive financial assistance for this purpose. Pursuant to the Amendments Act of 1987, the Secretary of Energy designated nine counties contiguous to Nye County (including Inyo County in California) as affected units of local government and, therefore, eligible to receive Federal financial assistance to review and monitor site characterization activities.

  The Amendments Act also gave the State and Nye County the right to designate onsite representatives to oversee site characterization and to receive funding for associated "reasonable expenses." The State has never designated such a representative; Nye County has.

  In Fiscal Year 2001, by congressional direction, $2.5 million was provided to support the State's oversight functions and $6 million was designated for affected units of local government.

Fiscal Year 2001 Congressional Testimony and Meetings with Regulators and Oversight Bodies

Joint congressional briefings/hearings

Date	Topic
None	

U.S. Senate

Date	Committee/Subcommittee	Witness(es)
May 15, 2001	Appropriations/Energy and Water Development	Lake Barrett, Acting Director, OCRWM
January 18, 2001	Energy and Natural Resources	Secretary Abraham

U.S. House of Representatives

Date	Committee/Subcommittee	Witness(es)
May 9, 2001	Appropriations/Energy and Water Development	Lake Barrett, Acting Director, OCRWM

NRC meetings

Date	Topic
September 18-19, 2001	DOE/NRC Repository Operating Temperatures
September 7, 2001	Quarterly Management Meeting
September 6, 2001	Quarterly Quality Assurance Meeting
August 28-30, 2001	129th Advisory Committee on Nuclear Waste
August 6-10, 2001	DOE/NRC Total System Performance Assessment
August 5-6, 2001	Licensing Support Network Advisory Review Panel
July 24, 2001	Preclosure Issues
July 20, 2001	NRC Public Meeting

July 17-19, 2001	128th Advisory Committee on Nuclear Waste
July 16, 2001	Naval Fuel Safety Evaluation Meeting
June 21-22, 2001	Igneous Activity
June 19-21, 2001	127th Advisory Committee on Nuclear Waste
June 13, 2001	Quarterly Management Meeting
June 12, 2001	Quarterly Quality Assurance Meeting
June 4-5, 2001	Naval Fuel Safety Evaluation Meeting
May 24, 2001	NRC Licensing Workshop
May 22-23, 2001	NRC Public Hearing Workshop
May 18, 2001	Igneous Activity Appendix 7
May 15-17, 2001	126th Advisory Committee on Nuclear Waste
May 15-17, 2001	Features, Events, and Processes
May 10, 2001	Site Recommendation Performance Assessment
April 19, 2001	NRC Tour of Nye County Wells
April 18, 2001	Quarterly Management Meeting
April 17, 2001	Quarterly Quality Assurance Meeting
March 21-23, 2001	125th Advisory Committee on Nuclear Waste
March 1, 2001	NRC Regulatory Conference Panel Discussion
February 23, 2001	NRC Conference
February 6-8, 2001	Repository Design Thermal and Mechanical Effects
January 31, 2001	Data Qualification
January 16-18, 2001	124th Advisory Committee on Nuclear Waste
January 8-12, 2001	Evolution of Near Field Environmental/Thermal Effects on Flow
December 20, 2000	Quarterly Management Meeting
December 19, 2000	Quarterly Quality Assurance Meeting
December 13, 2000	NRC/OCRWM Program Briefing
December 5-7, 2000	Radionuclide Transport
November 28-30, 2000	123th Advisory Committee on Nuclear Waste

Oct. 31-Nov. 2, 2002	Unsaturated Zone and Saturated Zone Under Isothermal Conditions
October 23-25, 2000	Criticality
October 17-19, 2000	122nd Advisory Committee on Nuclear Waste
October 11-13, 2000	Structural Deformation and Seismicity Key Technical Issue Technical Exchange

NAS
National Research Council: Board on Radioactive Waste Management (BRWM)

Date	**Topic**
August 17, 2001	NAS Staging Meeting
August 7, 2001	NAS Meeting
June 29, 2001	BRWM Meeting on Repository Staging
June 27, 2001	BRWM Panel Meeting
December 14, 2000	BRWM Winter Meeting

State and Local Governments

Date	**Topic**
April 11, 2001	Affected Units of Government meeting
May 4, 2001	County representatives meeting in Las Vegas

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Appendix F

Publications from OCRWM and Other Organizations

This appendix lists publications released by the Office of Civilian Radioactive Waste Management (OCRWM) that are relevant to work discussed in this Annual Report. The appendix also lists selected publications issued by other parties whose work bears on the Program, as well as a number of trade publications that report on OCRWM's work and related activities on a regular basis. Those publications were identified in the course of a limited survey; the list is not intended to be comprehensive.

OCRWM Publications

Alternative Means of Financing & Managing the Civilian Radioactive Waste Management Program, August 2001 (DOE/RW-0546) [www.rw.doe.gov/progdocs/progdocs.htm]

Analysis of the Total System Life Cycle Cost of the Civilian Radioactive Waste Management Program, May 2001 (DOE/RW-0533) [www.rw.doe.gov/progdocs/progdocs.htm]

Nuclear Waste Fund Fee Adequacy: An Assessment, May 2001 (DOE/RW-0534) [www.rw.doe.gov/progdocs/progdocs.htm]

Yucca Mountain Science and Engineering Report, Rev 1, February 2002 (DOE/RW-0539, Rev. 1) [www.ymp.gov/documents/ser_b/index.htm]

Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada, February 2002 (DOE/EIS-0250D) [www.ymp.gov/documents/feis_a/index.htm]

Yucca Mountain Site Suitability Evaluation, February 2002 (DOE/RW-0549) [www.ymp.gov/documents/sse_a/index.htm]

The OCRWM Enterprise, July 2001 (DOE/RW-0542) [www.rw.doe.gov/pdf/7-01ent.pdf]

OCRWM Fiscal Year 2000 Annual Report to Congress, September 2001 (DOE/RW-0543) [www.rw.doe.gov/progdocs/progdocs.htm]

Civilian Radioactive Waste Management Program Plan, Revision 3, February 2000, (DOE/RW-0520) [www.rw.doe.gov/pprev3.pdf]

Civilian Radioactive Waste Management Major System Management Policy, Revision 1, August 2000 [www.rw.doe.gov/progdocs/msmp/msmp.htm]

Publications from other organizations

Note: OCRWM makes no warranty, express or implied, concerning the authenticity, accuracy, completeness, or usefulness of the information in any of the publications listed below.

Nuclear Waste Technical Review Board

U.S. Nuclear Waste Technical Review Board Strategic Plan for FY 2001-2006, revised March 2001 [www.NWTRB.gov/plans/plans.html]

U.S. Nuclear Waste Technical Review Board FY 2002 Performance Plan, revised March 2001 [www.NWTRB.gov/plans/plans.html]

Report to the Secretary of Energy and the Congress, April 2002 [www.NWTRB.gov/reports/reports.html]

Environmental Protection Agency

Final Public Health and Environmental Radiation Protection Standards for Yucca Mountain, Nevada, June 6, 2001 [www.epa.gov/radiation/yucca/docs/yucca_mtn_standards_060501.pdf]

Public Health and Environment Radiation Protection Standards of Yucca Mountain, Nevada (40 CFR Part 197) Final Rule, Response to Comments Document, June 2001 (EPA 402-R-01-009) [www.epa.gov/radiation/yucca/docs/rtc/yucca_rtc_061801_cvr.pdf]

Nuclear Regulatory Commission

Information Digest 2001 Edition, June 2001 (NUREG-1350, Vol. 13) [www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1350/v13/index.html]

Fiscal Year 2000-2005 Strategic Plan, February 2000 (SR 1614 Vol. 2, Part 1 and Vol. 2, Part 2, Appendix) [www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1614/v2/part1/] and [/part2/]

Budget Estimates and Performance Plan Fiscal Year 2003, February 2002 (NUREG 1100, Vol. 18) [www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1100/]

Office of the Inspector General, Semiannual Report to Congress – October 1, 2001 to March 31, 2002, April 2002 (NUREG-1415, Vol. 14, No. 2) [www.nrc.gov/NRC/reading-rm/doc-collections/nuregs/staff/sr1415/]

Letter from the Chairman, ACNW, to the Chairman, U.S. Nuclear Regulatory Commission – *Advisory Committee on Nuclear Waste 2001 Action Plan and Priority Issues*, September 18, 2001 [www.nrc.gov/reading-rm/doc-collections/acnw/letters/2001/1250168.html]

Letter from the Chairman, ACNW, to the Chairman, U.S. Nuclear Regulatory Commission – Subject: *ACNW Comments on NRC Staff's Issues Resolution Process for Risk-Informing its Sufficiency of DOE's Technical Basis Documents for the Yucca Mountain Site Recommendation*, September 18, 2001 [www.nrc.gov/reading-rm/doc-collections/acnw/letters/2001/1290176.html]

Letter from the Chairman, ACNW, to the Chairman, U.S. Nuclear Regulatory Commission – Subject: *Total System Performance Assessment-Site Recommendation (TSPA-SR)*, September 18, 2001 [www.nrc.gov/reading-rm/doc-collections/acnw/letters/2001/1290175.html]

Letter from the Chairman, ACNW, to the Chairman, U.S. Nuclear Regulatory Commission – Subject: *Review of Chemistry Issues and Related NRC Staff Capability for the Proposed High-Level Waste Repository at Yucca Mountain*, August 13, 2001 [www.nrc.gov/reading-rm/doc-collections/acnw/letters/2001/1280174.pdf]

General Accounting Office

Nuclear Cleanup: DOE Should Reevaluate Waste Disposal Options Before Building New Facilities, May 25, 2001 (GAO-01-441) [www.gao.gov/]

State of Nevada

Earthquakes in the Vicinity of Yucca Mountain [www.state.nv.us/nucwaste/yucca/seismo01.htm]

Nye County Nuclear Waste Repository Project Office, Independent Scientific Investigations Program Final Report, Fiscal Years 1996 - 2001, August 2001 (NWRPO-2001-04) [www.nyecounty.com/Reports.htm]

Nye County Nuclear Waste Repository Office Update [www.nyecounty.com/Newsletters.htm]

March 2001, Vol. III, Issue 6

October 2000, Vol. III, Issue 5

Final Comments of Nye County, Nevada, on Environmental Protection Agency's Proposed Radiation Protection Standards for Yucca Mountain – 40 CFR Part 197, (RIN 2060-AG14) [www.nyecounty.com/Reports.htm]

Nuclear Waste Update, Eureka County Yucca Mountain Information Office, Fall 2001 [http://www.yuccamountain.org/newslet.htm]

Eureka County Nevada, Testimony — Comments presented by Donna Bailey, Vice-Chairman of the Eureka County Board of Commissioners, at the U.S. Department of Energy Public Hearing on the Possible Site Consideration of Yucca Mountain as a High-Level Radioactive Waste Repository, October 10, 2001 [http://www.yuccamountain.org/pub.htm]

Impact Assessment Report on Proposed Shipments of Spent Nuclear Fuel and High-Level Radioactive Waste through Eureka County, Nevada — Prepared for the Board of Eureka County Commissioners, August 2001 [http://www.yuccamountain.org/pub.htm]

Organizations with which the Department has Cooperative Agreements

Directory of Personnel Responsible for Radiological Health Programs, January 2002 [www.crcpd.org/publications_other.asp]

Other Offices within the Department of Energy

Long-Term Stewardship Study, Volume I - Report, October 2001 [lts.apps.em.doe.gov/center/reports/pdf/SS_Voli.pdf]

EM Progress Newsletter, Vol. 11, No. 1, Winter/Spring 2002 (www.em.doe.gov/emprog/)

Annual Energy Outlook 2001 with Projections to 2021, December 2000 (DOE/EIA-0383(2002)) Energy Information Administration (www.eia.doe.gov/oiaf/aeo/index.html)

Trade publications

A number of trade publications report on OCRWM and related activities on a regular basis.

Arms Control Today [www.armscontrol.org/act/]

Energy Daily [www.kingpublishing.com/publications/ed] - by subscription only

Greenwire [www.nationaljournal.com/pubs/greenwire] - by subscription only

Inside Energy with Federal Lands [www.platts.com] - by subscription only

Inside NRC [www.platts.com] - by subscription only

National Radioactive Waste Management Exchange - by subscription only [www.exchangemonitor.com/newsorder.htm]

NuclearFuel [www.platts.com] - by subscription only

Nuclear News Flashes [www.platts.com] - by subscription only

Nuclear Waste News [www.bpinews.com/enviro/pages/nwn.htm] - by subscription only

Nuclear Weapons & Materials Monitor [www.exchangemonitor.com/newsorder.htm] - by subscription only

Nucleonics Week [www.platts.com] - by subscription only

Science [www.sciencemag.org]

Weapons Complex Monitor: Waste Management & Cleanup [www.exchangemonitor.com/newsorder.htm] - by subscription only