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Report to Congress Concerning Negotiations  
with the State of Washington  
as Required by  
Section 117(c) of the  
Nuclear Waste Policy Act of 1982  
U.S. Department of Energy  
December 1986



THE SECRETARY OF ENERGY  
WASHINGTON, D.C. 20585

September 26, 1984

Honorable George Bush  
President of the Senate  
Washington, D. C. 20510

Dear Mr. President:

Section 117(c) of the Nuclear Waste Policy Act of 1982 (the Act), directs the Department of Energy (DOE) to submit to Congress a report on the status of negotiations of Consultation and Cooperation Agreements with States and affected Indian tribes, if those agreements are not completed within the time specified by the Act. This report must also include the reasons why such Agreements have not been completed. In accordance with the Act, I am submitting the reports relating to the negotiations with the State of Washington and the Yakima Indian Nation.

Pursuant to the requests of the Yakima Indian Nation and the State of Washington, negotiations leading to Consultation and Cooperation Agreements were initiated with the Yakima Indian Nation on July 15, 1983, and with the State of Washington on July 27, 1983.

Although essential agreement has been reached with the State of Washington negotiating team on most of the provisions pertaining to such an Agreement, for the reasons stated in the enclosed report, negotiations were not concluded by January 7, 1984, as contemplated by section 112(f) of the Act. Negotiations have also not been concluded with the Yakima Indian Nation. They have requested that negotiations with them proceed only after negotiations have been concluded with the State of Washington.

Pursuant to the terms of the Act, attached to the report are the comments of the Governor of the State of Washington, the Chairman of the State of Washington Senate Energy and Utilities Committee, and James B. Hovis, Tribal Counsel to the Yakima Indian Nation.

Sincerely,

A handwritten signature in dark ink, reading "Donald Paul Hodel", is written over the typed name.

DONALD PAUL HODEL

Enclosures

**Congress of the United States**  
**House of Representatives**  
**Washington, D.C. 20515**

**JOHN BRYANT**  
5TH DISTRICT, TEXAS

November 26, 1986

COMMITTEE ON  
ENERGY AND COMMERCE  
  
COMMITTEE ON  
THE JUDICIARY  
  
COMMITTEE ON  
VETERANS' AFFAIRS

The Honorable Donald Hodel  
Secretary  
Department of Energy  
Washington, D.C. 20585

Dear Mr. Secretary:

The Department of Energy chose three locations to investigate as possible nuclear waste disposal sites in three western states: Washington, Nevada and Texas. When the Nuclear Waste Policy Act was passed by Congress, an agreement was reached to have repositories created in both the eastern and western regions of the country. However, when the Department of Energy (DOE) announced this year its selection of three sites in the West, it stated that it would postpone indefinitely the search for a nuclear waste repository in the eastern United States.

This delay is an abrogation of the Congressional agreement which established the Nuclear Waste Policy Act to deal with such waste disposal problems. I think that the postponement is a violation of the terms of the Nuclear Waste Policy Act, as a study undertaken by the General Accounting Office concluded.

The Congress, which passed the Safe Drinking Water Act earlier this year, included provisions which protect the wellheads of drinking water wells from contamination.

The Safe Drinking Water Act contains a section which allows states to voluntarily participate in a program which would permit them to determine wellhead protection areas based on available hydrogeologic information. The Act would permit participating states to restrict the siting or operation of activities that may contaminate groundwater around an area surrounding a public well system.

Federal entities can only get an exemption from the provisions of the Act by stating that their actions are in the paramount interest of the United States. The Safe Drinking Water Act would allow the State of Texas to define the area to be used as the waste site as part of a wellhead and, consequently, protected from adverse development.

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Page 2

This is only one weapon in an arsenal to keep Texas free of nuclear waste. At present, I am a party to a court suit to stop the state from being chosen as a disposal site. I supported an amendment which would withhold funds for the site characterization process which would have to be completed before a site could be selected. Though it failed during this Congress, similar legislation could be reintroduced in the next Congress, with my strong support.

I believe our state was chosen as a waste disposal site for political reasons, not scientific ones. I also believe that the federal government has not worked with the state in a good faith effort to resolve some of the problems selection of this site would generate.

I believe that working in conjunction with the Texas state government to block the choice, along with strong citizen support, Deaf Smith County will not become the nation's nuclear waste dump.

Sincerely,

  
John Bryant  
Member of Congress



Department of Energy  
Washington, DC 20585

JAN 13 1987

Honorable Ken Eikenberry  
Attorney General  
State of Washington  
Olympia, Washington 98504-0521

Dear Mr. Attorney General:

Thank you for your letter of November 17, 1986, to Secretary Herrington regarding the Department of Energy's administration of the Nuclear Waste Policy Act of 1982 (the Act).

As you indicated in your letter, the repository program involves significant issues of national importance. Accordingly, the Department welcomes and is committed to being attentive to comments and concerns raised regarding the administration of the program, particularly those such as yours which address compliance with the statutory requirements of the Act.

As you are aware, in addition to the lawsuit you have filed on behalf of the State of Washington against this Department, several other lawsuits have been filed in the recent months also challenging the decision on the second repository program. Inasmuch as this matter is currently the subject of litigation, it would be inappropriate to comment further on this action at this time.

Sincerely,

A handwritten signature in cursive script that reads "Ben C. Rusche".

Ben C. Rusche, Director  
Office of Civilian Radioactive  
Waste Management



# OFFICE OF THE ATTORNEY GENERAL

November 17, 1986

Honorable John Herrington  
Secretary  
United States Department of Energy  
Washington, D.C. 20500

Dear John:

I fear that you have not received adequate and accurate information with respect to the Department's decision to "suspend" work necessary to recommend candidate sites for a second high-level nuclear waste repository. As you know, I filed an action against the Department because it is my legal opinion that the decision brings the agency in violation of the Nuclear Waste Policy Act.

In a recent visit to the State of Washington, the President, in a speech, personally committed the Department to follow the letter of the law. I felt compelled, in light of his comments, to bring the acts of the Department and the reasons for the same to the direct attention of the President. Enclosed is a copy of the letter I have sent the President.

I invite your immediate attention to this matter. I am confident the Justice Department will confirm my legal opinion. I feel compelled to note that the process has become so tainted at this point that there exists no public confidence in the Department.

Very truly yours,

  
KEN EIKENBERRY  
Attorney General

je  
Enclosure

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Ken Eikenberry Attorney General  
Temple of Justice, Olympia, Washington 98504-0521



# OFFICE OF THE ATTORNEY GENERAL

November 17, 1986

Honorable Ronald Reagan  
President  
The White House  
Washington, D.C. 20500

Dear Mr. President:

I was pleased and encouraged by your comment (when recently visiting Spokane, Washington) that you would personally see to it that the letter of the law is followed by the United States Department of Energy in choosing a nuclear waste repository.

Regretfully, I must say your comment made clear to me that you have not been informed about the gross disregard of the Nuclear Waste Policy Act already committed by the Energy Department. By way of immediate example, I invite your attention to the actions of the Department in bulldozing past the lawful requirement of a second repository. I am firmly convinced the Department's actions are in clear violation of the Act and I expect to eventually prevail in the Courts.

The Nuclear Waste Policy Act requires the Secretary of the Department to recommend sites for two regionally distributed repositories with the second candidate sites to be nominated and recommended no later than July 1, 1989. This is the clear language and mandate of this federal law. The following points will demonstrate the flagrant disregard of this mandate by the Department.

1. On May 28, 1986, the Secretary of the Department announced the decision to suspend all site-specific work leading to the site for the second repository. In the words of the Secretary, "site specific work for a second repository has been postponed indefinitely."
2. On June 16, 1986, before Congress, the Secretary testified that "when and whether" the second repository process would be resumed would not be decided until the mid-1990's.

Ken Eikenberry Attorney General  
Temple of Justice, Olympia, Washington 98504-0521

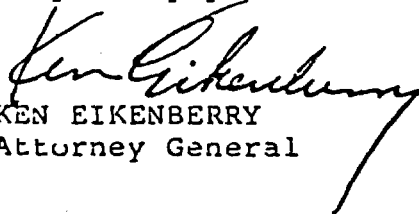
November 17, 1986

3. In a May 28, 1986 news release, the Department declared the eastern and midwestern states were "no longer under active consideration."
4. In a letter dated June 12, 1986 to Representative Broyhill, the Secretary stated, "Our search for a second repository site has been discontinued."
5. In its Mission Plan dated June, 1985, the Department stated that it would require five years of work to recommend candidate sites.
6. General Counsel for the Department, on September 5, 1986, advised that the requirement to make a recommendation regarding the second repository in 1989 "remain(s) intact until repealed, amended or supplanted by new legislation."

The foregoing clearly demonstrates the Department's determined violation of the Nuclear Waste Policy Act. I believe it is also important for you to personally know the criteria used by the USDOE in taking this action. This is best represented in notes of a meeting of May 21, 1986 (one week before the announcement) between high-ranking officials in the Department. In deciding whether to terminate the search for the second repository, a list of the pros and cons was created. First on the list of the pros was "immediate political relief from CRP states", and first on the list of the cons was "obvious political ploy." It is this kind of information which has lead to a total lack of confidence in the process by the citizens of the State of Washington. In the recent election they voiced this concern by passing an initiative with an 85 percent majority objecting to the process used in the selection of a site.

The foregoing serves to demonstrate not only violations of law by the United States Department of Energy but highlights the politically motivated reasons for the violations. I ask for your assistance and action in addressing this issue of far-reaching implications for the citizens of the entire country and the State of Washington, in particular.

Very truly yours,

  
KEN EIKENBERRY  
Attorney General

jf  
cc: John Herrington

OFFICE OF THE ATTORNEY GENERAL



## Department of Energy

Washington, DC 20585

JAN 28 1987

Honorable John Bryant  
House of Representatives  
Washington, D.C. 20515

Dear Mr. Bryant:

I am pleased to respond to the several points in your letter of November 26, 1986, to the Secretary of Energy concerning the implementation of the Nuclear Waste Policy Act of 1982 (the Act), which requires the Department of Energy (DOE) to site a repository for disposal of high-level radioactive waste.

On May 28, 1986, the Department announced that sites in Yucca Mountain, Nevada; Deaf Smith County, Texas; and Hanford, Washington, have been selected for site characterization as candidates for the Nation's first geologic repository for permanent disposal of spent nuclear fuel and high-level radioactive waste.

The Department has postponed indefinitely site-specific work for the second high-level radioactive waste repository program. However, DOE intends to continue studies of a second repository program as required by the Act. These studies will be technical in nature and not site specific. The enclosed statement by the Secretary of Energy, and a related press announcement, provide further information on this decision.

You expressed concern about the basis for selecting the Deaf Smith site for characterization. Determination of the three sites for characterization was based on more than 10 years of exhaustive, scientific evaluation, and even more detailed technical analysis will be undertaken over the next five to six years before the process narrows to a site for possible construction of a repository. Moreover, the Act requires the Department to apply to the Nuclear Regulatory Commission (NRC) for approval to build such a repository. NRC licensing will require additional extensive technical scrutiny. Further, the Act provides for considerable involvement to the affected parties under the auspices of a possible Consultation and Cooperation Agreement.

To resolve site-selection impacts about which you also expressed concern, the Department is committed to close consultation and cooperation, in the general sense, with affected States and communities. The Act provides several interactive means for reaching such resolution, including the possibility of a written, binding agreement with the State and a detailed site characterization plan for studies designed to evaluate and select a site.

The Department also will work with State and local officials and interested parties in developing regulatory compliance plans and socioeconomic and environmental monitoring plans.

Finally, you made reference to the recent amendments to the Federal Safe Drinking Water Act. The amendments indeed do require Federal agencies to comply with State programs for protecting water wells from contamination. We are keenly aware of the values of groundwater resources in the site area. More than 40 wells will be drilled around the major surface and subsurface facilities to provide constant monitoring of groundwater quality and prevent any reduction in quality. All surface activities will be designed to protect water quality. For example, salt storage areas will utilize double-lined, diked, monitored pits to prevent infiltration of leachate or spillage of accumulated liquids. All waste water will be either treated on site to meet water quality standards or trucked offsite for disposal in licensed facilities. Let me emphasize that protecting underground water is of prime importance to us all. Public health and safety will be safeguarded above all other considerations in this program.

This country, including the current as well as future citizens of Texas, have a vital stake in safe disposal of high-level radioactive waste. It best can be accomplished, I believe, through a shared responsibility mandated by Congress in the Act. I most certainly welcome your continued involvement in this rigorous, step-by-step process. The Department is committed to a high-quality technical program and to a consultative and cooperative process with the affected parties. I look forward to the opportunity to review our program and its technical merit with you.

Sincerely,



Ben C. Rusche, Director  
Office of Civilian Radioactive  
Waste Management

Enclosures



## Announcement...

May 28, 1986

### DOE ANNOUNCES DECISIONS ON HIGH-LEVEL WASTE REPOSITORY PROGRAM

The U.S. Department of Energy (DOE) announced today that sites in Nevada, Texas and Washington have been selected for site characterization as candidates for the Nation's first geologic repository for permanent disposal of spent nuclear fuel and high-level radioactive waste.

DOE also announced that it has postponed indefinitely site-specific work for a second repository because of the progress in siting the first repository and the uncertainty of when a second repository might be needed. Areas previously identified for a possible second repository are no longer under active consideration. As required by the Nuclear Waste Policy Act of 1982 (NWPA), Secretary of Energy John S. Herrington nominated five sites and recommended three of them to the President for site characterization. The President has approved the recommendation. This decision was based on the development and public review of extensive geologic and environmental data gained from site studies which began before enactment of the NWPA. (Sites nominated and recommended are the same sites identified by DOE in draft Environmental Assessments issued for public review and comment in December 1984.)

The three candidate sites to undergo these studies, evaluations and comparisons are: Yucca Mountain in Nevada, Deaf Smith in Texas and Hanford in Washington. The Hanford site is near the lands of three Indian Tribes—the Yakima Indian Nation, the Confederated Tribes and Bands of the Umatilla Indian Reservation and the Nez Perce Tribe. Two sites nominated, but not recommended for site characterization, are Richton Dome in Mississippi and Davis Canyon in Utah.

DOE's decision to reassess the timing of its activities toward identification of areas for study as potential candidates for a second repository resulted from a number of factors. They include:

- The continuing progress in siting the first repository;
- The expectation of receiving Congressional authorization to proceed with the development of a Monitored Retrievable Storage facility;
- Projections of spent fuel generation are uncertain and have been declining;
- While there exists in the law the limitation for emplacing more than 70,000 metric tons of spent fuel in the first repository before a second repository is in operation, emplacement of that amount is very far into the future and Congress need not reconsider specifically a second repository until at least the mid-1990s or much later;
- A decision that spending hundreds of millions of dollars now on siting would be premature and unsound fiscal management.

(MORE)

Earlier this year, DOE identified, from among 17 States, crystalline rock bodies in Georgia, Maine, Minnesota, New Hampshire, North Carolina, Virginia and Wisconsin as potential candidates for a second repository. With the announced postponement, the 17 States are no longer under active consideration.

Under the NWPA, DOE is authorized to construct the first repository and conduct siting activities for a second. The NWPA does not authorize construction of a second repository. DOE intends to continue studies for a second repository as required by the NWPA, but those studies will focus only on technical issues.

DOE will concentrate its efforts on continued successful progress on the development of the disposal system including the first geologic repository, the associated transportation system and implementation of an MRS program. DOE believes a centralized MRS to receive, consolidate and package spent fuel for bulk transport to the repository will enhance the overall disposal system. Under contracts with utilities, DOE is obligated to begin receipt of spent fuel for disposal by 1998.

"Today's announcement is further confirmation of the priority the Administration has placed on ensuring that wastes produced from nuclear-generated electricity and U.S. defense activities are stored and disposed of in a safe and environmentally acceptable manner," said Ben C. Rusche, Director of DOE's Office of Civilian Radioactive Waste Management.

Nuclear power now provides more than 15 percent of the Nation's electricity and commercial and defense high-level waste now exists in about 30 states.

#### **OCRWM**

#### **Office of Civilian Radioactive Waste Management**

In 1982, Congress passed the Nuclear Waste Policy Act that established the Nation's nuclear waste program. The Office of Civilian Radioactive Waste Management was created by the act to fulfill the Congressional mandate. The program is funded by the generators and consumers of nuclear electricity and by the Nation's defense activities. For further information about the national program, write to:

U.S. Department of Energy  
Office of Civilian Radioactive Waste Management  
Mail Stop RW-40  
Washington, D.C. 20585  
(202) 252-5722

For additional information about specific site studies, write to:

#### Salt Project

Salt Repository Project Office  
U.S. Department of Energy  
305 King Avenue  
Columbus, Ohio 43201-2693  
(614) 424-3916

#### Tuff Project

Public Affairs Office  
U.S. Department of Energy  
Box 14100  
Las Vegas, Nevada 89114  
(702) 295-3321

#### Basalt Project

Public Affairs Director  
U.S. Department of Energy  
825 Jadwin Avenue  
P.O. Box 530  
Richland, Washington 99352  
(509) 376-7501

#### Crystalline Project

Crystalline Repository Project Office  
U.S. Department of Energy  
9800 South Cass Avenue  
Argonne, Illinois 60439  
(312) 972-2570

# DOE NEWS:

STATEMENT BY JOHN S. HERRINGTON  
SECRETARY OF ENERGY

NUCLEAR WASTE REPOSITORY  
May 28, 1986

The Administration today has selected three candidate sites for the first geological repository for spent nuclear fuel and high-level nuclear waste.

The Department of Energy will now undertake detailed study and characterization of the three sites in Yucca Mountain, Nevada, Deaf Smith, Texas, and Hanford, Washington.

This action carries out the requirements of the Nuclear Waste Policy Act of 1982, which lays out specific and detailed steps leading to the construction of a nuclear waste repository.

Today's decisions are the culmination of extensive evaluations of these and other potential sites during the past three years. The Department's work included the compilation of thorough environmental assessments and widespread public comment--more than 20,000 comments were received by the Department and incorporated into our decision.

We have reached an important milestone and taken a significant step forward.

It is a clear sign that this Nation will have the capacity for safely storing and disposing of high-level nuclear waste well into the twenty-first century.

Based on the progress we have made toward selecting a first repository site, I have reassessed the timing of the Department's activities toward identification of candidates for a second repository, and I have decided to postpone indefinitely plans for any site-specific work related to a second repository.

In January, the Department issued a draft Area Recommendation Report which proposed preliminary field work in the north central and eastern parts of the country. Other than cataloging the comments received by the Department, no further work is planned on this report. As a result of this postponement, the areas identified in the report are no longer under active consideration. No other sites are under consideration.

(MORE)

Several factors convince me that this is a prudent decision:

- studies for the siting of the first repository are proceeding satisfactorily
- we are hopeful that Congress will authorize development of a Monitored Retrievable Storage facility, which will be a vital part of the overall disposal system
- while projections are uncertain about the amount of spent fuel to be generated, it is apparent that the volume is growing more slowly than anticipated just even a few years ago.
- in light of these projections, the first repository, which the law permits to hold up to 70,000 metric tons of waste, will be adequate in the foreseeable future.

Based on our review of this information it is the Department's opinion that the Nation need not consider a second repository until at least the mid-1990's -- or much later. It is clear that to go ahead and spend hundreds of millions of dollars on site identification now would be both premature and unsound fiscal management.

The Department intends to continue studies of a second repository program as required by the NHPA. These studies will, however, be technical in nature and not site specific.

We have taken several important steps today. We believe these actions are in the best interest of the American people and represent the most effective course for implementing the NHPA.



**Washington  
State Senate**

Senator Al Williams  
Chairman  
Senator Margaret Hurley  
Vice Chairwoman  
Senator Max Benitz  
Senator W. H. "Bill" Fuller  
Senator H. A. "Barney" Golitz  
Senator Dick Hemstad  
Senator Mike McManus  
Senator Ray Moore  
Senator J. T. Oving

**Energy and Utilities Committee**

4th Floor, Senate Office Building • Olympia, Washington 98504 QW-41 • (206) 753-9107

March 5, 1984

Mr. Donald Paul Hodel  
Secretary of Energy  
Department of Energy  
Washington, DC 20585

Dear Mr. Hodel:

This letter is in response to your request for review and comment of the report to Congress required by section 117(c) of the Nuclear Waste Policy Act of 1982.

I believe the report stresses past working relationships between the state and the department at the expense of the current process created pursuant to RCW 43.200. Specifically, references to the state working group and the Governor's Task Force on High-Level Nuclear Waste Management are not necessary since these two bodies are no longer in existence.

It is important to note that it was not the state of Washington but the Governor who requested that negotiations for a written agreement begin on June 30, 1983. The Legislature did not participate in the request.

With respect to the legislative designees to the state negotiating team it must be noted that the designees were not empowered to bind the legislature as a body. Only the full legislature acting as a body can bind itself.

As of February 21, 1984 there have been seven, not six, formal negotiating sessions with the last session held on February 9, 1984.

I appreciate the opportunity to submit these comments on the written report required by the Nuclear Waste Policy Act.

Sincerely,

Al Williams, Chairman  
Senate Energy and Utilities Committee

AW:d4-8

Report to Congress Concerning Negotiations  
with the State of Washington  
as Required by  
section 117(c)  
of the  
Nuclear Waste Policy Act of 1982

U.S. Department of Energy

September 26, 1984

Section 117(c) of the Nuclear Waste Policy Act of 1982 (the Act), directs the Department of Energy (DOE) to submit to Congress a report on the status of negotiations of Consultation and Cooperation Agreements with States and affected Indian tribes, if those Agreements are not completed within the time specified by the Act. This report must also include the reasons why such Agreements have not been completed. Since a written Agreement with the State of Washington was not completed within the time (no later than January 7, 1984) required by section 112(f) of the Act, this report is being submitted.

Site characterization work on Hanford basalts near Richland, Washington has been ongoing since 1976 as part of the National Waste Terminal Storage Program. An informal process of consultation and cooperation with the State has been underway since 1979. A working group was established by the State and DOE in 1979, consisting of representatives from the Governor's office and members of the legislature. The working group was continued by Governor Spellman in 1981 when he designated Mr. David Stevens, Energy Advisor to the Governor; Mr. Nicholas Lewis, Chairman, Energy Facilities Site Evaluation Council; Mr. Richard Watson, Acting Director of the State Energy Office; State Senator Hayner; and State Representative Hastings to be on the State Working Group. On August 16, 1982, Governor Spellman issued an Executive Order which established the State's High Level Nuclear Waste Management Task Force, consisting of seven executive branch members and four members from the legislature. This Task Force was instructed to serve as a liaison body between the State and DOE.

Pursuant to requirements of the Act and Substitute Washington State Senate Bill No. 3273, which designated the State organizations to implement the requirements of the Act, the State requested, by letter dated June 30, 1983, that negotiations commence for the purpose of entering into a Consultation and Cooperation Agreement. By letter dated July 15, 1983, the Chairmen of the State Senate and House Energy and Utilities Committees named the legislative designees to the State negotiating team. By letter dated July 21, 1983, the Manager of DOE's Richland Operations Office designated the DOE negotiating team. Negotiations were initiated on July 27, 1983. There have been a total of twelve negotiating sessions to date, the latest being held on June 29, 1984. The negotiating teams have been able to reach essential agreement on all but two articles of the draft Agreement.

The two primary Articles on which agreement has not been reached involve issues dealing with: (1) liability; and (2) defense waste. With respect to liability, it is the policy position of the State that the United States should be strictly and absolutely liable, without regard to fault, and without any dollar limitation, for any nuclear incident at a repository site, or any incident associated with transportation of waste to the repository. The model used for the indemnity provisions proposed by DOE to the State is the Price-Anderson Act indemnity (section 170.d of the Atomic Energy Act of 1954, 42 U.S.C. section 2210(d)) included in the "Supplemental Stipulated

Agreement Resolving Certain State Offsite Concerns Over Waste Isolation Pilot Plant." That Agreement was negotiated between DOE and the State of New Mexico for the Waste Isolation Pilot Plant which is being constructed in the State of New Mexico. DOE also advised the State that the Secretary of Energy, by letter dated August 1, 1983, recommended to Congress that authority to provide Price-Anderson coverage be extended beyond August 1987, that the dollar limits be raised, and that the extraordinary nuclear occurrence feature be enlarged to include commercial and defense waste facilities. DOE has represented to the State that its authority to indemnify for a nuclear incident involving a repository, including transportation, is circumscribed by the Price-Anderson Act amendments to the Atomic Energy Act of 1954 (42 U.S.C. section 2210(d), et. seq.). DOE has proposed to include in the Agreement a provision to the effect that DOE will assist the State in presenting the State's views with respect to liability to Congress without any obligation that DOE would concur in any State recommendation for amendment of the Price-Anderson Act or any other law.

With respect to defense waste, the State has requested that a provision be included in the Agreement that would formally provide the State with an opportunity to comment and make recommendations on the disposal of existing defense waste at Hanford prior to the evaluation to be made under section 8 of the Act. DOE has advised the State that DOE will continue to discuss the relationship between DOE's current activities at Hanford, which includes the preparation of an Environmental Impact Statement on disposal of defense high level and transuranic wastes, and the decisions to be made under section 8 of the Act.

In addition to the two unresolved issues, the Agreement could not be concluded by January 7, 1984, as required by the Act, because of a request for State legislative review of the Agreement. The State legislature formally convened on January 9, 1984, and subsequently passed Engrossed Substitute House Bill No. 1637, which was signed by Governor Spellman on March 8, 1984. The Bill re-established a Nuclear Waste Board as the initial point of contact in the State with DOE on high-level radioactive waste matters. The Bill also prescribes the procedure for State review and approval of a Consultation and Cooperation Agreement, including approval by the legislature. On July 20, 1984, the State negotiating team presented the draft Agreement to the Nuclear Waste Board. The draft Agreement is being reviewed by the Board members, who will submit their recommendation to the State negotiating team in August 1984. DOE is ready at the State's request to discuss further the two unresolved issues, and any concerns conveyed by the Board.



## State of Washington

JOHN SPELLMAN, Governor

March 12, 1984

OFFICE OF THE GOVERNOR

The Honorable Donald Hodel, Secretary  
U. S. Department of Energy  
Washington, D.C. 20585

Dear Secretary Hodel:

Thank you for your letter of January 27 outlining your department's proposed report to Congress on the status of the negotiations between the state and the U.S. Department of Energy (DOE) on a proposed Consultation and Cooperation Agreement. Since your letter was not received in my office until after the suggested date for review and comment, I hope that you will, nevertheless, be willing to transmit my comments on the draft material.

I think basically the report accurately describes the background and negotiation activities. I am aware of the hard work by members of both negotiating teams, and I am satisfied that substantial progress has been made in many areas that the agreement proposes to cover.

I would, however, like to add a clarification to the language in the last paragraph of the first page of your draft report where it indicates that the negotiating teams "have been able to reach essential agreement on all but two articles of the proposed agreement." The two major items that have yet to be fully resolved are further described by your report. Those issues, i.e., liability and existing defense wastes at Hanford, must be adequately dealt with prior to the conclusion of any negotiations.

It should also be stated for the record that, while the negotiating team for the state feels confident that we have made significant progress in the development of an agreement, we still may well have additional items for discussion and negotiation with the Department of Energy that have been identified during the public review period, as well as issues arising during current legislative review. It is the state negotiating team's position that all issues will have to be looked at in the context of final negotiations.

Nevertheless, I am pleased with the work accomplished to date, and I continue to feel that having a satisfactory and binding agreement with the Department of Energy will enable the state to carry on a comprehensive and independent review of DOE's repository siting efforts as called for in the Federal legislation. It is, of course, essential that the state have a means of adequately judging the activities under the Nuclear Waste Policy Act of 1982 which can have significant impacts on our environment and the health and safety of our citizens.

The Honorable Donald Hodel

March 12, 1984

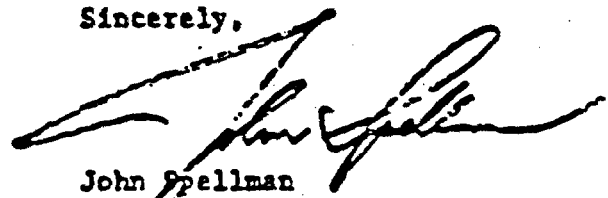
Page 2

I am confident that, upon completion of the legislative review process and after full consideration of other issues raised since the distribution of the draft agreement, we will be able to complete a document fully protecting state interests.

Thank you for the opportunity to review your draft report.

With best wishes,

Sincerely,

A handwritten signature in dark ink, appearing to read "John Spellman", written over the printed name and title.

John Spellman  
Governor

Section 117(c) of the Nuclear Waste Policy Act of 1982 (the Act) directs the Department of Energy (DOE) to submit to Congress a report on the status of negotiations leading to Consultation and Cooperation Agreements, if such agreements are not completed within six months after notification that sites have been approved for site characterization by the President for a nuclear waste repository. The report must also include the reasons why such agreements have not been concluded. In accordance with the Act, the Department must seek to enter into these agreements not later than 60 days after Presidential approval of a site for site characterization, or at the written request of the State or affected Indian Tribe within any State notified as having a potentially acceptable site under Section 116(a) of the Act, whichever occurs first.

On July 27, 1983, the State of Washington initiated consultation and cooperation negotiations with the Department. These negotiations, which were suspended by the State of Washington pending resolution of several issues, were described in the enclosed report transmitted to Congress on September 26, 1984. This report provides an update on the status of consultation and cooperation negotiations since that report.

On May 28, 1986, President Reagan approved the Department's recommendation that sites in three States - Nevada, Texas, and Washington - be selected for site characterization. On July 25, 1986, Mr. Lee Olson, director of the Basalt Waste Isolation Division at DOE's Richland Operations Office, wrote to Mr. Terry Husseman, program director, Washington Office of High-Level Nuclear Waste Management, to invite the State to renew the process of developing a Consultation and Cooperation Agreement with a meeting of representatives of all States, within which recommended sites are located, and all three affected Indian Tribes. Mr. Husseman replied in a telephone conversation with DOE Headquarters staff on August 19, 1986, that the State did not see the need for the consultation and cooperation process to be a joint effort, and that the State of Washington wanted only direct negotiations with DOE. The State of Washington requested an informal meeting to discuss negotiation procedures in a letter sent to Mr. Mike Lawrence, Richland Operations Office, on August 25, 1986. Such a meeting was held between DOE and the State on October 9, 1986.

In response to the State's interest in individual negotiations, on November 19, 1986, a letter was sent to Governor Booth Gardner of Washington to renew the Department's offer to negotiate a Consultation and Cooperation Agreement, this time directly between DOE and the State of Washington. On December 18, 1986, the Governor and the Director of the Office of Civilian Radioactive Waste Management met and among the topics discussed were Consultation and Cooperation. The Governor indicated a reluctance to participate in consultation and cooperation negotiations unless certain conditions were met. He indicated that he would make a more specific proposal shortly.

Pursuant to the Act, enclosed are the comments of Governor Gardner on this report. In addition to the previous report to Congress, the Department is enclosing copies of the July 25, 1986, letter to Mr. Husseman and the November 19, 1986, letter to Governor Gardner.

Enclosures

**Department of Energy**

Richland Operations Office  
P.O. Box 550  
Richland, Washington 98352

86-BWI-19

JUL 25 1986

Mr. Terry Husseman, Program Director  
Office of High-Level Nuclear  
Waste Management  
Washington State Department  
of Ecology, MS PV-11  
Olympia, WA 98504

Dear Mr. Husseman:

**CONSULTATION AND COOPERATION AGREEMENT**

On May 28, 1986, the Department of Energy's recommendation of three sites in Nevada, Texas, and Washington was approved for detailed site characterization for a deep-mined geologic repository for high-level waste and spent nuclear fuel.

In accordance with Section 117(c) of the Nuclear Waste Policy Act of 1982, the Department wishes to continue the process that would eventually lead to a signed Consultation and Cooperation (C&C) Agreement.

As a starting point, the Department would like to meet with representatives from the States and three affected Indian Tribes to discuss C&C activities to date, review the scope and parameters of C&C agreements, and talk about provisions that might be in common in all such agreements.

We will be contacting you in the near future to arrange for a time and place that would be acceptable to each of the States and Indian Tribes. Should you desire to discuss this matter with me, please do not hesitate to give me a call.

Sincerely,

O. L. Olson, Director  
Basalt Waste Isolation Division

BWI:OLO



**Department of Energy**  
Washington, DC 20585

NOV 19 1986

Honorable Booth Gardner  
Governor of Washington  
Olympia, Washington 98504

Dear Governor Gardner:

On May 28, 1986, President Reagan approved the Department of Energy's (DOE) recommendation of three sites in Nevada, Texas, and Washington for detailed site characterization for a deep-mined geologic repository for high-level radioactive waste and spent nuclear fuel.

In accordance with Section 117(c) of the Nuclear Waste Policy Act of 1982 (the Act), not later than 60 days following such approval the Department was required to seek to enter into negotiations leading toward consummation of a written binding consultation and cooperation agreement. The provisions of such an agreement are defined by the Act.

On July 25, 1986, Mr. Lee Olson, director of the Basalt Waste Isolation Division at DOE's Richland Operations Office, wrote to Mr. Terry Husseman of your staff recommending that in the case of the State of Washington we renew the process of developing consultation and cooperation agreements with a meeting of representatives of all States, within which recommended sites are located, and of all three affected Indian Tribes. Similar letters were sent by our project offices to the other two States and to the three affected Indian Tribes.

We learned from the States and Indian Tribes that negotiations between the Department and the individual State and Tribal nuclear waste offices might prove more fruitful than a general meeting. Therefore, I am renewing the offer to begin negotiations once again for a consultation and cooperation agreement, this time between DOE and the State of Washington.

To facilitate the commencement of negotiations, the Office of Civilian Radioactive Waste Management has designated a team to negotiate with your State. This team will be led by Mr. John Anttonen, an assistant manager of the Richland Operations Office. Mr. Anttonen will be contacting your office shortly to discuss appropriate arrangements.

-2-

We look forward to the participation of the State of Washington in this important statutory process.

Sincerely,

A handwritten signature in cursive script, reading "Ben C. Rusche".

Ben C. Rusche, Director  
Office of Civilian Radioactive  
Waste Management

SAMPLE



The Secretary of Energy  
Washington, DC 20585

December 15, 1986

Dear Mr. Markey:

This is in response to your letter of October 29, 1986, in which you raised questions as to the Department of Energy's high-level radioactive waste management program. Enclosed are the responses to the three specific questions you asked.

Regarding your concern about the status of the second repository program, I would like to stress that the Department's position remains the same as announced on May 28, 1986. There is a second repository program in which the site-specific work has been postponed indefinitely.

Yours truly,

A handwritten signature in dark ink, reading "John S. Herrington", is written over the typed name.

John S. Herrington

Enclosure

Honorable Edward J. Markey  
House of Representatives  
Washington, D.C. 20515

Question 1: Is the Department of Energy considering the possibility of placing all the nation's waste in one repository?

Answer: No. Under the Nuclear Waste Policy Act of 1982, the only foreseeable case where all waste would go in one repository is if the total quantity were less than 70,000 metric tons of heavy metal, which we do not expect to be the case.

Question 2: Was the potential for expansion of the Hanford site a factor in the Department's decision to select that site?

Answer: No. The expansion of the Hanford site was not a factor in the Department's decision to select that site.

**Question 3:** Section 302(d) of the Nuclear Waste Policy Act of 1982 provides that the Secretary may make expenditures from the Waste Fund "only for purposes of radioactive waste disposal activities under titles I and II" of the Act. The studies and options papers, on the other hand, appear to consider options not permitted under the Act. Please cite the specific authorization in title I or II of the Act that permits you to make expenditures from the Waste Fund for these studies.

**Answer:** Studies and planning activities concerning alternatives (including the viability of those alternatives) for the conduct of the program pursuant to the NWPA constitute administrative activities that are authorized to be funded under Section 302(d)(3) of the NWPA.

# Congress of the United States

House of Representatives

Washington, D.C. 20515

October 29, 1986

The Honorable John S. Herrington  
Secretary  
U.S. Department of Energy  
1000 Independence Avenue, S.W.  
Washington, D.C. 20585

Dear Mr. Secretary:

In the course of our investigation of the high-level radioactive waste program, several internal Department of Energy documents came to our attention which raise questions as to the Department's plans for the first repository program.

The first document contains briefing materials prepared on May 13, 1986, which explore various options for modifying the high-level waste program. Among the options listed is the following:

## "Strategy Option - Redesign First Repository:

### Pros

- Concentrate on first repository as primary waste disposal facility
- Enhance systems optimization
- Accomodate reactor on-site storage problems
- Maintain legislated goals and planned receipt rates

### Cons

- Increase potential for higher near-term costs
- Increase pressure for rise in NWF [Nuclear Waste Fund] Fee
- Continue to face institutional problems."

The clear and unmistakeable implication of this option is that the Department of Energy was considering the possibility of enlarging the first repository in order to accommodate all of the nation's waste.

In addition, a second document entitled "Considerations Bearing on the Timing for a Second Repository," dated May 16, 1986, explores in detail the potential for expanding the three sites chosen for the first repository. A table in this document projects the total potential capacity of the three sites: Hanford, Washington -- 668,000 metric tons of uranium (MTU); Yucca Mountain, Nevada -- 78,000-136,000 MTU; and Deaf Smith County, Texas -- 107,000 MTU. At one point, this study states that "[I]f adequate capacity is indeed available, considerations of system costs would argue for opening only a single repository site."

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The Honorable John S. Herrington  
Page Two  
October 29, 1986


The study goes on to compare the costs of a single repository system versus a two repository system.

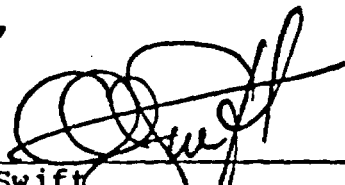
We request that you provide answers to the following questions by November 10, 1986:


- 1) Is the Department of Energy considering the possibility of placing all the nation's waste in one repository?
- 2) Was the potential for expansion of the Hanford site a factor in the Department's decision to select that site?
- 3) Section 302(d) of the Nuclear Waste Policy Act of 1982 provides that the Secretary may make expenditures from the Waste Fund "only for purposes of radioactive waste disposal activities under titles I and II" of the Act. The studies and options papers, on the other hand, appear to consider options not permitted under the Act. Please cite the specific authorization in title I or II of the Act that permits you to make expenditures from the Waste Fund for these studies.

The waste program has been caught in a web of contradictory statements and political manipulations which have thoroughly entangled the Department's credibility. For instance, on one hand, Secretary Hodel has pronounced the second repository program dead. At the same time, Waste Office Director Ben Rusche says the program continues. It is time to make clear your intentions and policies on these matters, and to tell the same story to audiences in both the East and the West.

Sincerely,

  
\_\_\_\_\_  
Edward J. Markey  
Member of Congress

  
\_\_\_\_\_  
Al Swift  
Member of Congress

  
\_\_\_\_\_  
James Weaver  
Member of Congress

  
\_\_\_\_\_  
Ron Wyden  
Member of Congress



Department of Energy  
Washington, DC 20585

JAN 28 1987

Dear Member of Congress:

Pursuant to Section 301 of the Nuclear Waste Policy Act (NWPAA) (Pub.L.97-425) the Office of Civilian Radioactive Waste Management in the Department of Energy submitted a Mission Plan to Congress in July 1985. Since that publication of the Mission Plan a number of specific actions and developments have taken place in the Civilian Radioactive Waste Management program and new information has become available. More recently, since the Department's decision on May 28, 1986, relative to the first and second repositories, three issues have emerged that warrant Congressional attention.

A draft amendment to the Mission Plan is being submitted to States and affected Indian Tribes and Federal agencies for their review prior to formal transmittal to Congress as provided for in Section 301 of the NWPAA. Following interaction with these parties, and the submission of their formal comments, the Mission Plan Amendment will be submitted to Congress.

The purpose of this letter and the draft amendment to the Mission Plan is to clearly articulate the three issues so that Congress may provide any statutory direction it believes is needed to conduct the program, and to apprise the Congress, the affected States and Indian Tribes, other Federal agencies, and the public, of significant developments and new information.

The issues that have emerged and which may warrant specific Congressional attention are:

1. Indefinite postponement of site-specific work for a second repository which would be required in endeavoring to meet the July 1, 1989 date for selecting sites for characterization (Section 112 of the NWPAA). The Department believes site-specific work should be reconsidered in the mid-1990s which would allow ample time to implement a second repository program prior to the first repository achieving its 70,000 metric ton capacity.

2. Extension of the date contemplated for operation of the first repository from January 31, 1998 to 2003 to allow time to carry out the necessary high-quality technical program. The extension is needed to carry out an extensive site characterization program, to prepare licensing documents to comply with Nuclear Regulatory Commission (NRC) requirements that have yet to be promulgated in their entirety and to provide additional opportunity for consultation and cooperation with affected States and Indian Tribes.

3. Inability to submit the Monitored Retrievable Storage (MRS) proposal to Congress required by Section 141 of the NWPA because of litigation. The Department is prepared formally to submit the proposal when these legal issues are resolved.

The significant developments and new information contained in the draft amendment to the Mission Plan are in five categories: (1) achievements in the first repository program including the nomination and recommendation of sites for detailed site characterization; (2) a five-year extension of the schedule for the first repository resulting from reevaluations of the work necessary to proceed; (3) new waste-generation data that, along with other considerations, indicated that it was prudent to indefinitely postpone site-specific activities for the second repository while continuing technical development activities; (4) developments concerning the submission to Congress of a proposal for a monitored retrievable storage (MRS) facility as an integral part of the waste management system; and (5) actions taken and progress made toward better defining the consultation and cooperation process with States and affected Indian Tribes.

#### First Repository

On May 27, 1986, the Secretary nominated five sites as suitable for site characterization and recommended to the President that three of these sites--the Yucca Mountain site in Nevada, the Deaf Smith County site in Texas, and the Hanford site in Washington--be characterized as candidate sites for the first repository. The President approved the recommendation on May 28, 1986. Each of the nominations was accompanied by comprehensive final Environmental Assessments that were issued after two years of preparation that included extensive public interaction.

To aid in identifying preferred sites for characterization, the Department developed and applied a formal decision-aiding methodology. The methodology and its application were subsequently reviewed and found appropriate by the National Academy of Sciences although the Academy did not review the site-recommendation decision or comment on the three selected sites. Given the thoroughness of the analyses in the Environmental

Assessments, the information base, the results obtained with the decision-aiding methodology, and other considerations, the Department considers that the set of sites recommended provides the most advantageous combination of characteristics and conditions for the successful development of a repository.

Site characterization began with the President's approval and will continue for 6 to 7 years. Site characterization includes laboratory investigations; surface based data-collection activities like geologic mapping and seismic surveys; studies conducted through the drilling of boreholes; and studies conducted in the proposed host rock in an exploratory-shaft facility. Although Congress, in the budget appropriation for the civilian waste program for fiscal year 1987, specified that no funds are to be used for drilling any exploratory shaft at any site in fiscal year 1987, site-specific work other than exploratory shaft drilling will be conducted at reduced funding levels.

Accordingly, the Department is proceeding with site characterization activities at the three sites. Before sinking the exploratory shafts, the Department will prepare a site characterization plan for each site. These plans will be submitted to the Nuclear Regulatory Commission (NRC), the Governors and legislatures of the States, affected Indian Tribes, and the public. At the site in Texas, the Department is proceeding with its plans for obtaining access to the land. At the Nevada site, land access is being pursued with other Federal agencies. And at the Hanford, Washington site, plans are proceeding for hydrologic investigations that will precede exploratory shaft drilling. Work will also be initiated on waste package and repository conceptual designs.

As discussed in the amendment, many important milestones have been achieved. However, based on the experience gained in achieving those milestones, advances in the technical planning of the program, an assessment of the current status of the program and recent budget decisions, the Department has revised the schedule for the first repository. The rebaselined schedule shows a 5-year extension of the date to begin operations at the first repository, from 1998 to 2003.

### Second Repository

The latest spent fuel projections show that a second repository will be required to accommodate all the expected waste. However, on May 28, 1986, the Secretary announced that he had reassessed the timing of the Department's activities toward identification

of candidates for a second repository and decided to postpone indefinitely plans for any site-specific work. Several factors suggested this decision was prudent. These included:

- o Approval by the President of three sites to be characterized as candidates for the first repository;

- o The expectation of receiving Congressional authorization to proceed with the development of a Monitored Retrievable Storage Facility;

- o Projections of spent fuel generation that are uncertain but generally declining;

- o The recognition that the limitation in the Act for emplacing no more than 70,000 metric tons of spent fuel in the first repository before the second is in operation will not be reached until well after 2020; consequently, Congress need not consider a proposal for a second repository until the mid-1990s or later; and

- o A decision that spending hundreds of millions of dollars now on repository siting would be premature and unsound fiscal management.

The Department intends to continue a program for, and remains committed to, a second repository, with studies that will focus on generic technical issues. This program will include non-site-specific studies of potential host rocks, the development of analytical approaches to evaluate long-term performance, and a continuation of the current program of international cooperation.

With regard to the indefinite postponement of the second repository, the Secretary and I have previously testified before the Congress that the basis for such actions and new program for the second repository would be described in an amendment to the Mission Plan and be provided to Congress for information and statutory direction. The Department's General Counsel has concluded that "...it is entirely appropriate, as a matter of law, for this office to have determined that significant matters, including new information, relating to the conduct of the second repository program should be presented to the Congress through an amendment to the mission plan." This amendment is intended to serve that purpose.

#### Monitored Retrievable Storage

As specified in the contracts entered into with utilities, DOE intends to start accepting waste for disposal in January 1998. The five-year extension for the first repository cited above requires a reevaluation of the acceptance strategy. The

Department believes that the most advantageous course is the development of a monitored retrievable storage facility that is an integral part of the waste-management system.

The Department had originally intended to submit a proposal to Congress in June 1985 but requested and received Congressional approval to delay the submission until January 1986. In August 1985, the State of Tennessee filed suit against the Department claiming that the Department failed to consult properly with the State of Tennessee prior to the identification of proposed sites for the MRS facility. On February 5, 1986, the United States District Court for the Middle District of Tennessee ruled in favor of the State and subsequently on February 7 issued an injunction prohibiting the Department from submitting the MRS proposal to Congress.

The decision and the injunction were appealed by the Department to the United States Circuit Court of Appeals for the Sixth Circuit. On November 25, 1986, the Court of Appeals ruled in favor of the Department's position in the dispute, indicating that the actions taken by the Department in identifying sites for the MRS and in consulting with the State of Tennessee did not violate the Act. Subsequently, the State of Tennessee filed a petition for stay or extraordinary writ of injunction and for a rehearing with a suggestion that the case be reheard en banc. On December 31, 1986, the Court denied the petition for a rehearing, but on January 7, 1987, granted a stay for 30 days to allow the State of Tennessee to seek review of the decision by the Supreme Court.

The intent of the Department regarding MRS is to fulfill its statutory obligations under the Act and submit the proposal on MRS to the Congress at the earliest date practicable.

#### Consultation and Cooperation

The Act requires the DOE to seek to enter into, and to negotiate, written consultation and cooperation (C&C) agreements with eligible States and affected Indian Tribes. This is to occur after the approval of a candidate site for characterization or earlier at the request of an eligible State or affected Indian Tribe. The Department has been involved in a number of informal and formal negotiations with the State of Washington since 1979, with the Yakima Indian Nation since 1983, with the Confederated Tribes of the Umatilla Indian Reservation since 1985, and with the Nez Perce Indian Tribe since 1986. No negotiations have taken place yet with the States of Nevada and Texas.

To date no formal C&C agreement has been concluded. Moreover, given the nature of the program and the reality that the perspectives of the States and affected Indian Tribes often differ from DOE's, we recognize that formal agreements may not be easy to reach.

The DOE also recognizes that the success of the waste-management program may depend largely on the success of institutional relations as well as interactions with the public. The DOE therefore plans to increase its efforts to improve productive institutional relations and to negotiate formal C&C agreements. To this end, the DOE recently invited the eligible States and affected Indian Tribes to meet for the purpose of arriving at a mutually acceptable definition of "consultation and cooperation." The participants in this meeting agreed that a mutually acceptable definition would be very useful but felt that it could not be developed in time for inclusion in this draft Mission Plan amendment.

#### Review Process

The availability of the draft amendment for public inspection is also being announced in the Federal Register. After the comment period of 60 days, the Department will revise the amendment as appropriate in response to the comments and formally submit the Mission Plan amendment to Congress.

During the comment period on the draft Mission Plan amendment, the Department anticipates meeting with representatives of the affected parties including the States and Indian Tribes, local government officials, utility, nuclear and transportation industry officials, environmental, energy and consumer organizations. The Department looks forward to this opportunity to answer questions to assist parties in formulating their formal comments.

Copies of the amendment are also being mailed to the approximately 7,000 parties on the Office of Civilian Radioactive Waste Management mailing list.

If I can be of any assistance, please do not hesitate to contact me.

Sincerely,



Ben C. Rusche, Director  
Office of Civilian Radioactive  
Waste Management

Enclosure

# DOE NEWS:

NEWS MEDIA CONTACT:  
GINGER KING, 202/252-2835

FOR IMMEDIATE RELEASE  
DECEMBER 9, 1986

RADWASTE

## DOE ISSUES DEFENSE NUCLEAR WASTE DISPOSAL FEE OPTIONS FOR COMMENT

The U. S. Department of Energy (DOE) is seeking public comment on different ways of charging fees for disposal of high-level radioactive wastes generated by defense activities. These include wastes currently stored at DOE's Hanford site in Washington, Savannah River Plant in South Carolina and the Idaho National Engineering Laboratory.

Under the Nuclear Waste Policy Act of 1982 (NWSA), the DOE has the responsibility for disposal of spent nuclear fuel and high-level waste but generators and owners of waste must pay the costs.

In 1985, under NWSA, the President found there was no need to establish a separate repository for defense wastes.

U.S. electric utilities pay DOE one mill (one-tenth of a cent) per kilowatt hour for commercially nuclear-generated electricity for development of a disposal system. However, since the federal government itself generates the high-level defense wastes, it must pay the disposal costs.

DOE has identified three options for funding the disposal of defense high-level waste. As stated in the Federal Register:

"Option I: A fee that equals the total cost of defense high-level waste by DOE, with common costs shared on the basis of areal dispersion (space required), piece count, and share of canisters processed by the facility. (This formula would provide full cost recovery based on facility usage and activities performed. Total costs of developing the disposal system would be shared proportionately between civilian sector [utilities] and the defense sector [DOE]).

(MORE)

"Option II: A fee based on one mill per kilowatt-hour electric-generation equivalent for the defense reactor operations that produce these wastes. (One mill electric generation equivalent fee)

"Option III: Defense and civilian waste producers fees equal to a fraction of the combined-repository program costs which is the same as that sector's fraction of the sum of the evaluated costs for separate repository programs. (Cost shares proportional to avoided costs)"

Preliminary estimates of the fee under Option I are \$2.60 billion to \$3.43 billion in 1985 dollars. Option II is estimated to yield about half as much as Option I since defense reactor operations are optimized for the production of defense materials rather than electricity generation.

Estimates based on the separate repository systems under Option III are approximately \$5.3 billion. Based on the President's earlier decision that separate repositories for civilian and defense waste are not necessary, separate repositories are not under consideration.

DOE's Office of Defense Programs will pay defense fees into the Nuclear Waste Fund managed by DOE's Office of Civilian Radioactive Waste Management subject to the regular budgetary and appropriations process. After reviewing public comments, DOE will make appropriate refinements and use the resulting approach to support requests for appropriations to fund disposal of defense high-level waste.

(MORE)

DOE considers Option I to be fully consistent with the intent of the NWPA since it essentially provides for full-cost recovery from the users (civilian and defense) with neither subsidizing the other. Therefore, DOE identified Option I as the preferred option.

Copies of the Federal Register Notice of Inquiry and Request for Public Comment may be obtained from the U. S. Department of Energy, Office of Public Inquiries, Room 1E-206, Forrestal Building, Washington, D.C. 20585, telephone, 202/252-5575.

Comments must be received by February 2, 1987, and submitted in writing to:

Associate Director for Resource Management  
Office of Civilian Radioactive Waste Management  
Docket No.: OCRWM-NOI-86-101  
Department of Energy  
1000 Independence Avenue, S.W.  
Room GB-270  
Washington, D.C. 20585

-DOE-

R-86-187

# DOE NEWS:

FOR IMMEDIATE RELEASE  
January 15, 1987

## DOE ANNOUNCES RELOCATION OF PERSONNEL TO TEXAS PANHANDLE TO CONDUCT NUCLEAR WASTE REPOSITORY STUDIES

The U. S. Department of Energy (DOE) has announced that DOE and contractor personnel will begin moving to the Texas Panhandle in February as part of the studies to site a high-level nuclear waste repository. A site in Deaf Smith County, Texas, is one of three candidates for the first such repository.

The first contingent to move to Texas will be about 10 people who will work in temporary office trailers to be placed on land leased by DOE near the town of Vega. They will be available to answer questions about job and contracting opportunities for the local community and will be involved in locating permanent office facilities for the project. Their arrival begins the six-month process of relocating approximately 40-50 DOE technical and management personnel from their current DOE Salt Repository Project Office (SRPO) in Columbus, Ohio. In addition, up to 250 contractor support staff from the Columbus Battell Project Management Division will be moved to Texas.

-more-

The studies -- called site characterization -- to be conducted in Deaf Smith County are expected to require more than five years and an investment of approximately \$1 billion. The purpose of these studies is to determine the suitability of the bedded salt in the Panhandle for the location of a repository to be constructed about 2500 feet below surface. Parallel studies will be conducted in a geologic formation called tuff at Yucca Mountain in Nevada and in basalt at the Hanford reservation in Washington.

The proposed Deaf Smith County site is 20 miles north of Hereford and was selected as a candidate repository site after some nine years of scientific studies of geologic, environmental and socioeconomic factors.

Current requirements for land to conduct site characterization will involve leasing small acreages on the surface, purchasing approximately 60 acres and obtaining subsurface rights for nine square miles.

Surface studies during characterization will involve collecting environmental and socioeconomic information on land use and mineral resources, terrestrial and aquatic ecosystems and ecology, threatened and endangered species, air and water quality, soils, noise, background radiation, cultural, historical and archaeological resources, transportation and utility systems, population, economy, and industrial, educational, recreational, housing and community services.

Geologic information about the site will be obtained by topographic mapping, expanding the microseismic network, drilling boreholes, and playa studies. A meteorological tower will also be constructed and socioeconomic and public health monitoring programs will begin. Later, during characterization, two exploratory shafts will be constructed to the depth of a proposed repository. Congress did not provide funds for construction of exploratory shafts during this current (FY 1987) fiscal year. DOE's current plans are to begin exploratory shaft construction in fiscal year 1988.

Meetings with potentially affected landowners, local leaders and the public will be scheduled later in February. Exact dates, times and locations of the meetings will be announced. DOE staff are expected to be available on a daily basis at the temporary offices near Vega beginning March 2.

-more-

These activities are part of DOE's Office of Civilian Radioactive Waste Management, which is responsible for managing the Nation's high-level nuclear waste. The Nuclear Waste Policy Act of 1982 directs DOE to develop a waste disposal system for the permanent disposal of spent nuclear fuel and high-level radioactive waste.

DOE Media Contact: Brian J. Quirke (312) 972-2423 (Chicago)  
Ginger King (202) 586-2835 (Washington, D.C.)

-DOE-

RADWASTE

# DOENNEWS:

NEWS MEDIA CONTACT:  
Ginger King, 202/586-2835

FOR IMMEDIATE RELEASE  
January 28, 1987

## DOE RELEASES DRAFT AMENDMENT TO MISSION PLAN FOR DISPOSAL OF RADIOACTIVE WASTE

The U.S. Department of Energy (DOE) released today a draft amendment to its Mission Plan for the Civilian Radioactive Waste Management Program.

DOE said it was releasing the draft amendment at this time to articulate clearly three issues on which Congress may wish to provide direction to the department. The issues are:

1. Postponement of site-specific work for a second repository. DOE believes site specific work on the second repository can be postponed until the mid-1990s or later, based on current projections of when the first repository would reach its authorized limit of 70,000 metric tons.
2. A five-year extension, from January 31, 1998, to 2003, of the date for beginning operation of the first repository. The extension is needed to complete an extensive site characterization program, to meet Nuclear Regulatory Commission (NRC) licensing requirements that have not yet been fully promulgated and to consult further with affected States and Indian Tribes.
3. Pending litigation that prevents DOE from submitting a Monitored Retrievable Storage (MRS) proposal to Congress, as required by the Nuclear Waste Policy Act of 1982 (NWPA). DOE is prepared to submit the proposal when the legal issues are resolved.

(MORE)

The draft amendment is necessary, DOE said, to do a thorough and complete job of handling wastes generated by nuclear power plants.

In the draft amendment, DOE made the following points about various segments of the waste repository program:

Second Repository

New waste generation, along with other considerations, indicate the prudence of postponing site-specific activities for the second repository. The draft amendment discusses new spent fuel generation data, which along with other considerations, resulted in DOE's decision in May 1986 to postpone indefinitely site-specific activities regarding the second repository.

The law limits the first repository to no more than 70,000 metric tons of spent fuel before a second repository is in operation.

At present, there is about 14,000 metric tons of commercial spent fuel stored at the 100 reactors licensed to operate in this country. By the year 2000, it is estimated that there will be about 40,000 metric tons.

Based on these projections, and a maximum annual fill rate of about 3,000 metric tons, the statutory limit at the first repository will not be reached until well after 2020. Therefore, DOE believes that Congress need not consider a proposal for a second repository until the mid-1990s or later.

DOE intends to continue a program for a second repository with studies that will focus on generic technical issues. This program includes non-site-specific studies of potential host rocks, the development of analytical approaches to evaluate long-term performance and a continuation of current international cooperative activities.

(MORE)

### First Repository

Advances in technical planning of the program, reevaluation of the work necessary for a thorough and complete job and recent budget decisions indicate site characterization for the first repository will require six to seven years.

### Consultation and Cooperation

The draft amendment includes a report of actions taken and progress made toward better defining the consultation and cooperation (C&C) process with eligible States and Indian Tribes.

The NWPA requires DOE to negotiate C&C agreements with States and affected Indian Tribes after approval of candidate sites for characterization, or earlier, if an eligible State or Indian Tribe requests. No formal C&C agreements have been concluded at this time.

As presented in the draft amendment, DOE believes additional time is needed in the near term to collect needed technical information and to consult with States and affected Indian Tribes as well as provide for public participation in the process of developing a safe and environmentally acceptable waste disposal system for spent fuel and high-level waste.

### MRS

Development of a monitored retrievable storage should be an integral part of the whole system.

In the draft amendment, DOE says it believes an MRS facility could receive, consolidate and store temporarily limited quantities of spent fuel at a location central to its generation. DOE announced in spring 1985 that it would propose locating the MRS at Clinch River near Oak Ridge, Tennessee.

(MORE)

### Background

Under NHPA, DOE is responsible for the siting, design, construction and operation of deep, geologic repositories for disposal of spent nuclear fuel and high-level radioactive waste. Contracts with nuclear generating utilities entered into under the NHPA contemplate that DOE will begin receiving waste for disposal by January 31, 1998.

In May 1986 the Secretary of Energy recommended and the President approved three sites for detailed study, called site characterization, as candidates for the first repository. The three sites are Yucca Mountain in Nevada, Deaf Smith County in Texas and Hanford in Washington.

The NHPA requires DOE to submit to Congress an analysis of the need for and feasibility of one or more MRS facilities, as well as a plan for integrating such facilities with other storage and disposal facilities authorized by the law.

The NHPA also requires DOE to site a second repository but does not authorize construction.

### Comments

DOE's Office of Civilian Radioactive Waste Management is sending the draft amendment to the States, affected Indian Tribes, the Nuclear Regulatory Commission, and other Federal agencies for comment. The amendment is available for public inspection for a period of 60 days. After considering the comments, DOE will revise the amendment, as appropriate, and formally submit it to Congress.

(MORE)

Copies of the 60-page draft amendment may be obtained by writing:  
Office of Public Inquiries, Draft Mission Plan Amendment, U.S. Department of  
Energy, Room 1E-218, Forrestal Building, 1000 Independence Avenue, S.W.,  
Washington, D.C. 10585. Copies may be picked up in person at the same  
address.

Copies also will be available for public inspection after February 1,  
at the locations on the attached list.

-DOE-

R-87-007

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Monticello, Utah 84535  
(801) 587-2231, Extension 28

**STATEMENT BY**

**JOHN S. HERRINGTON  
SECRETARY OF ENERGY**

**before the**

**COMMITTEE ON ENERGY AND NATURAL RESOURCES  
UNITED STATES SENATE**

**JANUARY 29, 1987**

Mr. Chairman and Members of the Committee:

I appreciate the opportunity to appear before you today to review policy issues of interest to the Committee regarding the program being carried out under the Nuclear Waste Policy Act of 1982 (the NWPA). With me is Ben C. Rusche, my Director of the Office of Civilian Radioactive Waste Management.

We have prepared a draft amendment to the Mission Plan for the Civilian Radioactive Waste Management Program. In that document, which we are sending to States and affected Indian Tribes, the Nuclear Regulatory Commission and other Federal agencies for comment -- and will make available for public inspection -- we discuss significant developments and new information in the waste program.

The Mission Plan is intended to keep Congress fully informed on progress in the program and the amendment will ensure that the Plan reflects current program status. After a 60-day comment period, DOE will revise the amendment in response to the comments

as appropriate and will submit it formally to Congress for information and direction. We would expect this to occur in about 120 days from now. With your permission, Mr. Chairman, I would like at this time to submit a copy of the draft amendment for the record.

Today, I would like to give a brief status of the waste program and then focus on the substantive issues which I believe are of main interest to the Committee and which are addressed in the Mission Plan amendment.

Last May, I nominated five sites in Mississippi, Nevada, Texas, Utah and Washington as suitable for characterization and recommended to the President three of those sites for characterization as candidates for the first repository. The three sites are: the Yucca Mountain site in Nevada, the Deaf Smith County site in Texas and the Hanford site in Washington. The President approved my recommendation.

With the President's approval of the three sites to characterize, we have finally passed beyond the crucial decision of where to focus our repository siting efforts and that action formally marked the beginning of site characterization.

Site characterization will take five-to-seven years, depending on the site.

Although we had planned to begin exploratory shaft construction at one or two of the sites this fiscal year, Congress, in the appropriation for the waste program for Fiscal Year 1987, specified that no funds are to be used for drilling any exploratory shaft at any site in FY 1987. However, Congress did allow for site-specific work, other than exploratory shaft drilling, to be conducted at reduced funding levels; and we are proceeding with other allowable characterization activities.

Following the announcement of the President's approval of three sites for characterization as candidates for the first repository, I announced that based on the progress in selecting the first repository and other factors, DOE had reassessed the timing of the Department's activities toward identification of candidates for a second repository. I announced that DOE had decided to postpone indefinitely plans for any site-specific work related to a second repository.

We have not abandoned a second repository; we are continuing studies for a second repository, as required by the NWPA. Those studies are focusing on generic technical issues and analyses and a continuation of the current program of international cooperation.

We continue to believe that a Monitored Retrievable Storage (MRS) Facility should be an integral part of the waste management system. Although legally enjoined from submitting the proposal to Congress, we stand ready to submit it for consideration as soon as permitted.

As stated more than a year ago in review copies of a proposal we made available, we believe that an MRS centrally located to the majority of the spent fuel generated would enhance the disposal system by receiving and consolidating the spent fuel prior to shipping to the repository. DOE's intent regarding MRS is to fulfill its statutory obligations under the NWPA and to submit the proposal on MRS to Congress at the earliest date practicable.

Significant progress has been made regarding transportation -- another integral part of the waste disposal system. DOE has issued both a Transportation Business Plan and a Transportation Institutional Plan. The Business Plan presents strategies for procuring shipping casks and support services, and the Institutional Plan lays the foundation for interactions among interested parties for resolution of transportation issues. In addition, we have issued a request for proposals for design and engineering of shipping casks and fabrication of prototypes.

There have been many other achievements to date in the program, but instead of further discussion of those, I would like now to focus on the main points discussed in the draft Mission Plan amendment and which I believe are the principal policy issues of interest to the Committee:

1. Indefinite postponement of site-specific work for a second repository.
2. Extension of the date contemplated for start-up

operation of the first repository from January 31, 1998, to 2003 to allow time to carry out the necessary high-quality technical program.

3. Inability to submit the Monitored Retrievable Storage (MRS) proposal to Congress required by Section 141 of the NWPA because of litigation. And,
4. Interactions with States, affected Indian Tribes, and the public.

The experience gained in achieving the important milestone of approval of sites for characterization, and advances in the technical planning of the program, have led us to reassess the program and schedule for the first repository. The new schedule -- as presented in the draft Mission Plan amendment -- shows a 5-year extension of the date for the waste acceptance at the first repository, from 1998 to 2003. The table attached to my statement shows the current schedule as compared to the schedule contained in the 1985 Mission Plan.

There are several reasons for the near-term extension.

Among them are:

- o The recognition that more time should be provided in the future for consultation and interaction with the States, affected Indian Tribes, and other parties; and,

- o The recognition that more technical information is needed.

Since passage of the NWPA, many parties have insisted that, given the controversial nature of the program, the schedule specified in the Act was not realistic and not achievable. It has been pointed out on many occasions that the schedule and the siting process are not reconcilable -- that to achieve one, it would be necessary to sacrifice the other.

DOE has attempted to meet both objectives and developed an aggressive schedule that would have permitted the first repository to begin accepting waste in January 1998. At the same time, Mr. Rusche and I have insisted that the schedule would not be allowed to prevail at the expense of technical excellence and public participation.

We now recognize that more information, more consultation and more time is required in the near-term to ensure public confidence in and development of the first repository for long-term (permanent) disposal. We will remain optimistic in our planning, but realize that for many early actions, we underestimated the time required. Furthermore, DOE recognizes the potential for contingencies that are yet to appear.

The 5-year extension for start-up operations at the first repository, therefore, requires a reevaluation of the waste acceptance

strategy. Based on a reevaluation, we believe that the most advantageous course is the development of an MRS. And as presented in the draft amendment, DOE believes it can meet the 1998 commitment through the development of an MRS facility.

With an MRS capable of receiving waste in 1998, we can meet the contractual obligation with nuclear-generating utilities to begin receiving waste in 1998.

We are, therefore, hopeful that the legal impediment will be removed shortly and that we will be permitted to submit the MRS proposal to Congress for consideration.

With regard to the indefinite postponement of site-specific activities for a second repository, my decision last May was based on a number of factors, including declining projections of the rates at which spent fuel will be discharged from commercial nuclear powerplants; progress in siting the first repository and confidence in finding suitable sites among the three sites approved by the President for characterization; the advantages to be gained from the experience of the first repository; the expectation of Congressional approval for the MRS facility; and, responsible fiscal management.

I would like to point out, again, that we have not abandoned a second repository. In fact, even the lowest current projections of spent fuel generation indicate that the second repository will be needed. DOE, therefore, remains fully committed to a two-repository system.

The specific requirement related to the second repository is stated in the NWPA in terms of the maximum amount of spent fuel that the Nuclear Regulatory Commission can allow to be emplaced in the first repository until a second repository is in operation. The NWPA sets this figure at 70,000 metric tons of uranium.

Under the revised schedule for the first repository, this limit would be reached sometime after the year 2025 if the annual rate of waste emplacement is 3,000 metric tons. The actual schedule for the second repository, however, is yet to be determined; it will depend on more-refined estimates of spent fuel generation rates, the time needed for the first repository to reach the limit of 70,000 metric tons and the time needed to develop the second repository.

The experience of siting the first repository suggests that site-specific screening leading to the identification of potentially acceptable sites should start about 25 years before the start of waste acceptance for disposal. Therefore, to have the second repository available by about 2025, site specific studies need not start until the middle to late 1990s.

Another important issue is interaction with States and affected Indian Tribes and the public. The NWPA requires DOE to seek to enter into and negotiate written Consultation and Cooperation (C&C) agreements with States and affected Indian Tribes after approval of candidate sites for characterization, or

earlier, if an eligible State or Indian Tribe requests. Some formal as well as informal negotiations have occurred, but as yet no formal C&C agreements have been concluded.

Given the nature of the program and the reality that the perspectives of the States and affected Indian Tribes often differ from DOE's, we recognize that formal agreements may not be easy to reach. But we also recognize that the success of the waste-management program may depend largely on the success of institutional relations as well as interactions with the public.

We plan to increase our efforts to improve productive institutional relations and to negotiate formal C&C agreements. In this regard, we are considering a number of new initiatives to encourage these negotiations. For example, preliminary or partial agreements or memoranda of understanding might be useful.

### Conclusion

In conclusion, DOE has adopted the principle that its schedule would not be pursued at the expense of consultation and interaction with affected States and Indian Tribes and the public.

The revised schedule for both the first repository and site specific activities for a second repository allows more time for interactions with affected and interested parties and for acquiring additional information necessary to successfully develop the waste disposal system.

Furthermore, we sincerely hope that the amendment to the Mission Plan will provide a suitable vehicle for Congress to provide any statutory direction it believes is needed for our conduct of the program.

Mr. Chairman, this concludes my remarks. I would be happy to respond to any questions you may have and, with your permission, I may call on Mr. Rusche for more details.

#####

Schedule for the first repository<sup>a,b</sup>

Milestone	Current schedule	1985 Mission Plan schedule
Start of exploratory- shaft construction		
Tuff	Second quarter 1988	Third quarter 1986
Basalt	Third quarter 1988	Third quarter 1986
Salt	Fourth quarter 1989	Third quarter 1987
Start of in-situ testing		
Tuff	Fourth quarter 1989	Third quarter 1988
Basalt	First quarter 1992	Fourth quarter 1988
Salt	Fourth quarter 1991	Second quarter 1989
End of site characterization <sup>c</sup>		
Tuff	First quarter 1992	Third quarter 1989
Basalt	First quarter 1993	Third quarter 1989
Salt	First quarter 1993	Third quarter 1989
Draft environmental impact statement	Fourth quarter 1993	Third quarter 1990
Final environmental impact statement	Fourth quarter 1994	Fourth quarter 1990
Submittal of the site-selection report to the President	Fourth quarter 1994	First quarter 1991
Submittal of the license application to the Nuclear Regulatory Commission	First quarter 1995	Second quarter 1991
Receipt of a construction authorization from the Nuclear Regulatory Commission	First quarter 1998	Third quarter 1993
Start of construction	First quarter 1998	Third quarter 1993
Start of phase 1 operations	First quarter 2003	First quarter 1998
Start of phase 2 operations	Second quarter 2006	First quarter 2001

<sup>a</sup>The schedule is given in calendar-year quarters.

<sup>b</sup>This schedule is based on a budget requirement of \$725 million for fiscal year 1988.

<sup>c</sup>End of the testing necessary for the selection of the repository site and the preparation of the draft environmental impact statement.

# OCRWM Background

United States Department of Energy  
Office of Civilian Radioactive Waste Management  
Washington, D.C. 20585

DOE/RW-0124

January 1987

## SHIPMENTS OF SPENT NUCLEAR FUEL IN SUPPORT OF NUCLEAR WASTE POLICY ACT RESEARCH AND DEVELOPMENT PROGRAMS

The Nuclear Waste Policy Act of 1982 (NWPAA) assigns responsibility for development of a national system of nuclear high-level waste disposal to the U.S. Department of Energy (DOE). However, until the disposal system begins to operate (expected in 1998), the utilities are responsible for spent fuel storage. To accommodate the growing inventory of spent fuel prior to system operation, many utilities must increase their storage capacity or face the possibility of shutting down their nuclear electric plants.

To alleviate this problem, the NWPAA directs DOE to establish a demonstration program, in cooperation with the private sector, for the dry storage of spent fuel at civilian nuclear power reactor sites. The purpose of these research and development (R&D) projects is to collect data to assist utilities in obtaining Nuclear Regulatory Commission (NRC) approval of various dry-storage technologies. The demonstration programs may take place at nuclear power reactors or at Federal facilities. The NWPAA also tasks DOE to undertake a cooperative program with utility owners of nuclear power reactors to encourage development of the technology for spent nuclear fuel rod consolidation. Additionally, DOE will be conducting a repository-related program to characterize the spent fuel and test its behavior in various rock types.

DOE will be making a number of shipments over the next 5 years in support of these R&D programs. Approximately 50 shipments will be made from Virginia Power's Surry Power Station to DOE's Idaho National Engineering Laboratory (INEL). Initial shipping campaigns, involving 23 shipments, began in July 1985 and have been completed. It is anticipated that additional shipments (24 shipments or less) of consolidated fuel from the Surry Power Station to INEL could begin as early as the spring of 1987. Four spent fuel shipments to INEL were conducted in August 1986 from the Engine Maintenance

Assembly and Disassembly (EMAD) facility at DOE's Nevada Test Site. Spent fuel shipments to INEL from the Nuclear Fuel Services facility at West Valley, New York, are also planned, pending cask certification. Shipments of spent fuel were made to the Hanford facility in Richland, Washington: in September 1985 from the Calvert Cliffs Power Station in Maryland (two shipments), and in February 1986 from General Electric's facility in Morris, Illinois (one shipment). Finally, tentative plans are being made for shipments in the next several years from yet-to-be-determined power stations to Richland, Washington, in order to conduct laboratory tests of fuel and waste-package interactions, and to INEL to test prototype fuel-rod consolidation equipment.

Over the past 30 years, more than 6,000 spent fuel assemblies have been shipped in the United States. Federal policies and procedures regulating the shipment of spent fuel were established under authority of the Hazardous Materials Transportation Act and are implemented under regulations of the Department of Transportation (DOT). In addition, DOT and the NRC, by agreement, have established roles for regulating transportation and packaging of radioactive material. DOT has developed safety standards that encompass transportation activities such as regulating radiation exposure; placarding; labeling and marking transport packages; loading, unloading, and handling transport packages; driver training; and highway routing. All DOE shipments comply with DOT requirements, therefore, spent fuel shipped under the NWPAA, including these R&D shipments, will be conducted according to DOT requirements.

The NRC has developed safety standards for the design and performance of packages for shipment by NRC licensees of certain specified quantities of radioactive materials, including spent fuel. Under the governing DOT regulations, DOE also has authority to certify its own radioactive materials packages using standards that are

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equivalent to NRC requirements. Requirements for packaging and transporting radioactive materials are contained in 10 CFR 71 for the NRC and in DOE Order 1540.1 for DOE.

Consistent with the authority established under DOT regulations, both the NRC and DOE have implemented physical protection requirements to protect spent fuel shipments from acts of theft and sabotage. DOE requirements cover shipments made by DOE contractors, while similar NRC requirements apply to NRC licensees (generally involved in the operation of electric utilities).

Existing DOT, NRC, and DOE policies and procedures concerning nuclear materials shipments were established prior to enactment of the NWPA. When the disposal system is fully operational, the number of spent fuel shipments to repositories and other facilities developed under the NWPA is expected to increase significantly. This increase has prompted DOE's Office of Civilian Radioactive Waste Management (OCRWM) to begin a process of establishing procedures that will be uniquely applicable to shipments carried out under the NWPA. As an element of this process, OCRWM has announced their intent to comply with all DOT and NRC regulatory requirements that are in effect at the time of shipment to NWPA facilities [i.e., a geologic repository and if approved by Congress, a monitored retrievable storage (MRS) facility]. Pursuant to this intent, DOE and the NRC have signed a Procedural Agreement concerning certification of spent fuel and high-level waste transportation packaging under the NWP. This agreement states that DOE will use packaging that has been approved by the NRC in accordance with 10 CFR 71 (rather than DOE-certified packaging) for DOE shipments performed under the NWPA from NRC-licensed facilities to an NRC-licensed repository, MRS, or interim storage facility. In addition, OCRWM and DOE's Office of Defense Programs signed an interagency agreement on July 1, 1986, that provides that OCRWM ship defense waste to a repository in casks certified by the NRC. DOE has also determined that NRC-certified packages will be used for the R&D shipments to support NWPA programs.

The procedures that will support transportation within the waste disposal system are in the formative stage. Several factors will influence the decisions on what these procedures will be and on what schedule they can be implemented. The NRC has released for comment proposed modifications to its current physical protection requirements. Any modifications will affect OCRWM's future procedures. In addition, OCRWM is committed to a program of involving the States, Tribes, utilities, industry, and other interested parties in its program

planning. Accordingly, the viewpoints of these groups will be considered in OCRWM decisions regarding appropriate procedures for NWPA shipping.

Prior to the time when new procedures for a fully operational system can be developed, DOE shipments of spent fuel in support of OCRWM R&D programs are being conducted under existing DOE procedures with some modifications. For example, all Surry-to-INEL shipments are being made exclusively in NRC-certified casks. It is the intent of OCRWM to make the transition to NRC requirements on an incremental basis for the R&D shipments as the new procedures are developed and approved.

— DOE —

# OCRWM Background

United States Department of Energy  
Office of Civilian Radioactive Waste Management  
Washington, DC 20585

DOE/RW-0122

January 1987

## TRANSPORTATION ROUTING ISSUES RELATED TO THE SHIPMENT OF HIGH-LEVEL NUCLEAR WASTE

### INTRODUCTION

In accordance with the Nuclear Waste Policy Act of 1982 (NWSA), the U.S. Department of Energy's (DOE's) Office of Civilian Radioactive Waste Management (OCRWM) is responsible for the transportation of spent nuclear fuel<sup>1</sup> and high-level radioactive waste<sup>2</sup> from various storage sites to a geologic repository or other facility. Spent nuclear fuel may be transported from commercial nuclear powerplants to a repository, or transported to a monitored retrievable storage (MRS) facility<sup>3</sup> for subsequent shipment to a repository. Under current planning assumptions, high-level radioactive waste from defense activities will be transported directly to a repository. OCRWM is developing plans for the transportation system that will be needed to handle radioactive shipments, scheduled to begin in the late 1990s. In providing for transportation, the NWSA requires OCRWM to contract with private industry to the fullest extent possible.

Three modes of transportation are being evaluated by OCRWM—highway, rail, and barge.<sup>4</sup> Routing issues related to these modes of transportation will be addressed by OCRWM in close cooperation with Congress, other Federal agencies, States, affected Indian Tribes, local governments, industry, utilities, and the public. The following discussion reviews major highway and rail routing issues identified by OCRWM and parties having an interest in the development of the NWSA transportation system. Further discussion of these issues is included in OCRWM's "Transportation Institutional Plan" (DOE/RW-0094, August 1986).

<sup>1</sup> Spent nuclear fuel refers to fuel that has been removed from a nuclear reactor core because it can no longer sustain an efficient chain reaction.

<sup>2</sup> High-level radioactive waste, generated from the reprocessing of spent nuclear fuel to extract plutonium and the remaining usable uranium, results largely from defense nuclear activities.

<sup>3</sup> If authorized by Congress, the MRS facility would serve as a centralized spent fuel and nuclear waste consolidation and packaging facility.

<sup>4</sup> The feasibility of barge transportation is currently being studied. If found to be an appropriate transport mode for NWSA shipments, specific barge routing issues will be addressed by OCRWM.

### HIGHWAY ROUTING ISSUES

In 1982, the U.S. Department of Transportation (DOT) established final routing regulations, commonly known as HM-164,<sup>5</sup> for highway transportation of specified types and quantities of radioactive materials, which include the spent nuclear fuel and high-level radioactive waste shipped to NWSA facilities. Under DOT regulations, carriers must use preferred highway routes selected to reduce time-in-transit. Preferred routes consist of (1) an interstate highway system route, using an interstate bypass or beltway around a city where available and (2) alternative routes selected by a "State routing agency." Indian Tribal authorities, having police powers to regulate and enforce highway routing requirements, are included within the definitions of "State routing agency." Routing designations by State and Indian Tribal governments must be preceded by substantive consultation with affected jurisdictions (including local governments).

#### *Understanding DOT Highway Routing Regulations*

Based on the responsibility placed with the State and Indian Tribal authorities in designating routes, participants at the OCRWM Transportation Institutional Plan Workshop held in Atlanta, Georgia, November 1985, noted that the States and Indian Tribes need to fully understand the requirements of DOT routing regulations and available options. Workshop participants recommended that OCRWM furnish financial support for an information program responding to the concerns expressed. DOT and OCRWM are evaluating a variety of mechanisms to disseminate such information.

<sup>5</sup> The Hazardous Materials Transportation Act of 1974 (HMTA) specifically grants DOT the authority to prescribe routing regulations by any mode of transportation. HM-164 is the docket number assigned to the rule making procedure.

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### *Reviewing Highway Route Selection Methodology*

When evaluating and then designating highway routes as alternatives to the interstate highway system for transportation of highly radioactive materials, DOT regulations require State and Indian Tribal routing authorities to apply a route selection methodology suggested in DOT guidelines, or an equivalent route selection methodology, that adequately considers overall risk to the public. Some participants at the Workshop recommended a careful review of DOT guidelines and suggested supplementing the methodology with additional guidelines that address such issues as high hazard areas, the need for detailed assessments of transportation risks, and the effect of transportation on environmentally sensitive areas. Workshop participants also suggested OCRWM take a lead role in developing a route selection methodology applicable to all routing decisions associated with NWPAs shipments.

OCRWM will participate with DOT, States, and Indian Tribes in a review of route selection methodologies for State and Indian Tribal alternative route designation. As an initial step, OCRWM will support the review of route selection methodology through financial arrangements with regional organizations. (Such activities are currently conducted through contractual arrangements with the Western Interstate Energy Board and the Southern States Energy Board.) Plans are for OCRWM to extend similar assistance to organizations of the northeastern and midwestern States and to Indian Tribes.

### *Assisting States and Affected Indian Tribes in Highway Route Designation*

Upon request, OCRWM will provide technical assistance to States and Indian Tribes for the evaluation and designation of routes under DOT regulations. Assistance will take the form of mechanisms such as:

- providing access to a highway routing model (HIGHWAY) that is maintained by Oak Ridge National Laboratory<sup>a</sup>
- providing access to computer codes that estimate the risk associated with waste transport (developed specifically for OCRWM)
- providing access to computer codes developed for OCRWM to derive transportation cost estimates (also developed for OCRWM)

OCRWM will work with States and Indian Tribes, on both an individual and regional basis, to provide access to future codes involving transportation analyses, and to determine other forms of technical assistance that may be appropriate.

<sup>a</sup>/ The highway network data base used in the model was developed by Logistics Systems, Inc.; user fees may be required.

States and Indian Tribes have requested that OCRWM provide financial as well as technical assistance for route evaluation and designation activities. Grants will be provided under the NWPAs to support route evaluation activities directly related to the siting of the repository within State borders or Indian Tribal lands. Financial arrangements with regional transportation organizations will support routing activities of non-host States and Indian Tribes affected by NWPAs transportation.

### *Routing Highway Shipments to NWPAs Facilities*

Other issues relate to whether OCRWM will develop the routing procedures for waste shipments to NWPAs facilities, and what degree of control OCRWM will exercise in determining the selection of specific highway routes.

Some comments to OCRWM have urged the development of NWPAs shipping procedures that would instruct carriers to use specific highways within the DOT system of "preferred routes." OCRWM's policy is that its oversight role must be balanced with the need to allow carriers to make routing decisions during individual shipments in order to avoid adverse transportation conditions (such as local weather conditions and traffic delays). To implement this policy, OCRWM will develop NWPAs route planning criteria that will conform to all DOT routing requirements. The criteria will further require the selection of routes that avoid operational delays (such as road construction and/or repair activities) and adverse weather conditions. Route planning criteria will also address such factors as:

- the preferred time of day for travel through urban areas
- the appropriate stopping places for rest, vehicle refueling, and vehicle repair

### *Applying Sanctions for Carrier Violations of Highway Routing Requirements*

As recommended by participants at the Workshop, contracts between OCRWM and carriers providing transportation Services will specify all OCRWM and DOT procedures and regulations, formally directing the use of preferred highway routes. Transportation service contracts will include incentives for performance, and will specify sanctions for routing violations. Such sanctions may include the suspension and termination of contracts.

### *Analyzing Highway Routing Factors in Future Transportation Studies*

Transportation cost and risk analyses will be conducted by OCRWM for the environmental impact statement (EIS) required in the selection of a repository site. To assist in determining what routing factors should be considered in such transportation analyses, OCRWM is considering the use of regional routing workshops.

### RAIL ROUTING ISSUES

The routing of rail shipments of radioactive materials differs from the routing of highway shipments.

- Federal rail routing regulations have not been promulgated, in contrast to established DOT regulations governing highway shipments of radioactive materials.
- Rail transportation offers fewer routing alternatives than does highway transportation since fewer alternative rail routes are available, and the condition of rail tracks can limit the number of acceptable routes.
- In contrast to the public highway system, rail lines are generally privately owned and maintained.

#### *Reviewing the Need for DOT Rail Routing Regulations*

When developing highway routing regulations, DOT considered whether routing rules should be established for other types of hazardous materials and other modes, including rail transportation. It was decided at that time not to proceed with development of additional routing rules. Now, OCRWM will work with DOT to review needs for Federal rail routing regulations for transportation of radioactive materials. OCRWM will also consult with the NRC, other affected DOE offices, railroad companies, and the Association of American Railroads during the review process. Mechanisms for addressing the potential need for Federal rail routing regulations may include the following:

- technical studies, to evaluate the need for rail routing regulations
- workshops specifically designed to solicit views and comments from the rail industry
- petitions to DOT for a formal rule making if, after review, OCRWM concludes that the routing of shipments of radioactive materials by rail requires regulation

#### *Analyzing Rail Routing Factors in Future Transportation Studies*

As with highway routing, the issue has been raised as to what routing assumptions and what data will be used in the rail transportation cost and risk analyses for the EIS. OCRWM will also consider the use of regional workshops on rail routing.

### *Developing Routing Procedures for NWPA Shipments by Rail*

Some comments received by OCRWM have urged development of NWPA shipping procedures under which OCRWM would direct the use of specific rail routes for shipments to NWPA facilities. Similar to the policy for highway shipments, OCRWM's role will involve balancing an oversight role with the need to allow carriers flexibility, necessary to avoid unique or adverse local conditions (track repair or train derailments). OCRWM plans to develop NWPA route planning criteria for rail shipments that will parallel certain features of highway shipment criteria. At a minimum, OCRWM's route planning criteria for rail shipments will (1) require the selection of rail routes that limit shipping costs and transit times, (2) avoid population centers (where possible), and (3) avoid adverse seasonal weather conditions.

— DOE —

# OCRWM Background

United States Department of Energy  
Office of Civilian Radioactive Waste Management  
Washington, DC 20585

DOE/RW-0121

January 1987

## TRANSPORTATION CASKS FOR SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE

### INTRODUCTION

The Nuclear Waste Policy Act of 1982 (NWPAA) assigns to the U.S. Department of Energy (DOE) responsibility for developing a system to safely and economically transport spent nuclear fuel<sup>1</sup> and high-level radioactive waste<sup>2</sup> from various storage sites to geologic repositories or other facilities that constitute elements of the waste management program. This transportation system will evolve from technologies and capabilities already developed.<sup>3</sup> Shipments of spent fuel to a monitored retrievable storage (MRS) facility could begin as early as 1996 if Congress authorizes its construction. Shipments of spent fuel to a geologic repository are scheduled to begin in 1998.

This background provides an overview of DOE's cask development program. Transportation casks are a major element in the DOE nuclear waste transportation system because they are the primary protection against any potential radiation exposure to the public and transportation workers in the event an accident occurs.

### CASK CHARACTERISTICS

Many types and sizes of casks have been used with long-term safety to transport spent fuel and high-level radioactive waste. Truck casks weighing between 25 and 40 tons are used to transport from 1 to 7 spent fuel assemblies. Railroad casks weighing up to 120 tons are capable of carrying up to 36 or more assemblies. Figure 1 is a conceptual drawing of a 75-ton rail cask.

<sup>1</sup> Spent nuclear fuel is defined as fuel that has been removed from a nuclear reactor core because it can no longer sustain an efficient chain reaction.

<sup>2</sup> High-level radioactive waste, generated from the reprocessing of spent nuclear fuel to extract plutonium and the remaining usable uranium, results largely from defense nuclear activities.

<sup>3</sup> U.S. Department of Energy, "Transporting Spent Nuclear Fuel: An Overview" (DOE/RW-0065), March 1986.

Transport casks typically have walls several inches thick that consist of shielding material sandwiched between outer and inner steel shells. The cask design provides for heat dissipation, containment, and radiation shielding.

Cask design is strictly regulated. The following section describes guidelines for their use.

### THE REGULATORY FRAMEWORK

Performance standards, testing conditions, and certification requirements for transportation casks have been established by the U.S. Nuclear Regulatory Commission (NRC) and are specified in 10 CFR 71 (Packaging and Transport of Radioactive Material). Although DOE is currently authorized by the Department of Transportation (49 CFR 173.7) to certify that the casks it uses in transporting DOE-generated nuclear waste comply with equivalent NRC standards, DOE has indicated its intent to use NRC-certified casks for shipment of nuclear waste to geologic repositories or other facilities falling under the provisions of the NWPAA.

NRC standards require that shipping casks prevent the loss or dispersion of their radioactive contents, provide for shielding and heat dissipation, and prevent nuclear criticality<sup>4</sup> under a range of accident conditions. Applicants for cask certification must demonstrate to the NRC, through analysis and/or testing, that casks can withstand the normal and accident conditions specified in 10 CFR 71.

For certification, the NRC requires that casks be evaluated or tested using the following hypothetical accident conditions: a free drop of 30 feet onto an unyielding surface (which is equivalent to a drop

<sup>4</sup> Nuclear criticality refers to the point at which a nuclear chain reaction becomes self-sustaining.

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from much greater heights onto hard surfaces such as concrete or hard packed soil); a free drop of 40 inches onto a 6-inch-diameter steel bar of at least 8 inches in length; exposure to a fire of 1,475° Fahrenheit that engulfs the cask for 30 minutes; and immersion in water for 8 hours.

### THE OCRWM CASK DEVELOPMENT PROGRAM

The NWPA assigns to DOE's Office of Civilian Radioactive Waste Management (OCRWM) responsibility for the design, development, and testing of casks used for the transportation of spent fuel and high-level radioactive waste. OCRWM activities related to certified cask development are described in the "Transportation Business Plan" (DOE/RW-0046, U.S. Department of Energy, Office of Civilian Radioactive Waste Management, January 1986).

OCRWM is currently determining the numbers and types of casks that will be needed to transport waste and is establishing the criteria needed to satisfy the requirements of the mandated transportation system. OCRWM's cask design objectives include minimizing the number of different casks required within the NWPA transportation system (through standardizing cask interfaces), maximizing cask payloads, and enhancing overall transportation system safety. Rail and truck casks based on new generation design concepts will be used to ship spent fuel and high-level radioactive waste. The new casks will be designed to ship spent fuel that has been removed from the reactor core for 5 to 10 years or more, and is, therefore, thermally cooler and less radioactive than fuel just removed from the reactor core. One advantage of new generation designs is that significant quantities of spent fuel and high-level radioactive waste can be shipped per cask, resulting in fewer shipments and a corresponding reduction in the potential for both radiological and nonradiological accidents.

Four types of casks are to be developed: (1) casks for moving spent fuel from reactors to either a repository or an MRS facility (if approved by Congress); (2) casks for moving spent fuel from an MRS facility to a repository; (3) casks for transporting nonstandard fuel and nonfuel components;<sup>2</sup> and (4) casks for transporting defense high-level waste.

<sup>2</sup>/ Nonstandard fuel and nonfuel components include control spiders, burnable poison rod assemblies, control rod elements, thimble plugs, fission chambers, and neutron sources.

### "FROM-REACTOR CASK" DEVELOPMENT INITIATIVE

Cask design activity is focusing on the "from-reactor casks" that will constitute the major part of the cask fleet. These casks could be used for shipping either to an MRS facility or to a geologic repository. All surface modes of transportation (truck, rail, and barge) will be considered in designing the "from-reactor cask." Both overweight and legal weight truck cask designs will be evaluated. Rail casks will be designed with either a 100-ton gross weight limit (to ensure unrestricted rail travel), or with weight limits of 125 tons (for casks that could be used for both storage and transportation). Since not all reactors are accessible by rail, cask designs that facilitate intermodal transfer from trucks to railcars will be considered.

#### *"From-Reactor Cask" Procurement Activities*

In support of the "from-reactor cask" initiative of cask design, OCRWM issued an information package in February 1986 (Information Package for the "From-Reactor Cask" Program, U.S. Department of Energy, Idaho Operations Office, Idaho Falls, Idaho, 1986) that contained material supporting the preparation of a request for proposals (RFP) for cask design and development.

To facilitate the review of OCRWM's plans for both cask procurement and the development of an RFP, OCRWM held a conference in Salt Lake City, Utah, in March 1986 with attendance open to all interested parties. Comments provided by conference participants were considered in developing the RFP that was released on July 31, 1986.

### "FROM-MRS CASK" DEVELOPMENT INITIATIVE

The second cask development initiative will concentrate on the design of a "from-MRS cask." This design may embody features to accommodate MRS and repository interface requirements. The primary mode of transport for "from-MRS casks" will be by rail. Design features for rail casks could include cask weights of up to 150 tons, integration of the cask into the rail car, and potential waste capacities of 25 metric tons.

### NONSTANDARD CASK DEVELOPMENT INITIATIVE

The third cask design initiative will involve the procurement of casks for transporting nonstandard spent fuel and nonfuel materials destined for a Federal repository. Development of these casks will depend on whether or not these materials can be efficiently transported by casks developed under earlier cask development initiatives.

## DEFENSE WASTE CASK DEVELOPMENT INITIATIVE

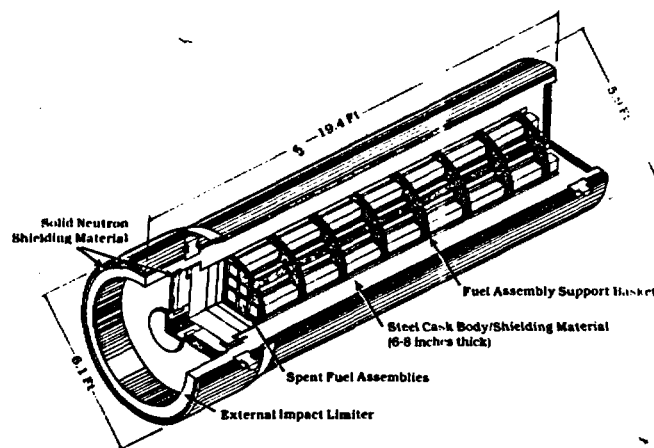
In the fourth cask design initiative, OCRWM will direct the design and development of casks for shipment of defense high-level waste (currently stored at DOE facilities) to a repository. OCRWM has begun preliminary planning and a review of strategy options for this design effort.

## CASK TESTING AND CERTIFICATION

Engineering testing, design verification testing, acceptance testing, operational testing, and demonstrations will be included in the cask development program. (These tests are described in Table 1.) DOE will either perform or supervise the necessary tests and will assist its cask development contractors, when requested, by conducting engineering and design verification tests at the national laboratories. All testing results will be used to determine which of the prototype designs could be qualified under NRC certification requirements to become fleet casks.

Cask designers will be responsible for obtaining a valid certificate of compliance from the NRC for each type of cask before the cask is finally accepted by OCRWM.

Figure 1. Conceptual Drawing of a 75-Ton Rail Cask



Source: U.S. Department of Energy, "Transporting Spent Nuclear Fuel: An Overview" (DOE/RW-0065), March 1986.

Table 1. Cask Development Program Tests

Type	Responsible Organization	Test	Hardware	Schedule	Test Location
Engineering Testing	Cask Development Contractor	Materials and cask components as determined by contractor according to plan approved by DOE	Material specimens and cask components	Through final design	Any shop or lab meeting QA test requirements
Design Verification	Cask Development Contractor	Structural tests on models and thermal tests on component sections as determined by contractor according to plan approved by DOE	Scale-models and components	Upon completion of preliminary design	DOE-approved independent test facility
Acceptance Testing	Cask Development Contractor	Postfabrication inspections and nondestructive acceptance tests as specified by contractor in (Chapter 8) of Safety Analysis Report	Prototype cask	After prototype fabrication	DOE-approved independent test facility
Operational Testing	DOE/Utilities (Using Cask Development Contractor Consultants)	Facility interface and handling, transport operations, and intermodal transfer tests	Prototype cask	After prototype fabrication, prior to fleet unit procurement	Reactor, MRS facility, or repository sites
Confirmatory Demonstrations	DOE	Scenarios and test environments (to be defined)	Prototype cask	To be determined	To be determined

Source: U.S. Department of Energy, "Transportation Business Plan" (DOE/RW-0046), January 1986.

# OCRWM Background

United States Department of Energy  
Office of Civilian Radioactive Waste Management  
Washington, DC 20585

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## ADDRESSING CONCERNS ABOUT WATER THROUGH REPOSITORY SITING AND DESIGN

### INTRODUCTION

The U.S. Department of Energy's (DOE's) siting guidelines<sup>1</sup> are designed to ensure the selection of repository sites that will safely isolate high-level nuclear waste from the accessible environment. The accessible environment is the atmosphere, the land surface, surface water, oceans, and the lithosphere outside the repository-controlled area. The objective of several repository siting and design requirements, developed to meet these final guidelines, is the protection of water from all sources: surface, ground, and precipitation. U.S. Nuclear Regulatory Commission (NRC) licensing procedures<sup>2</sup> require protection of water resources. The NRC mandates a minimum waste emplacement depth of 300 meters (about 1,000 feet) to protect surface water and precipitation from the repository. Subsurface water or ground water occurring within the repository setting is given primary consideration for protection when siting and designing a repository.

### GROUND WATER

Ground water is water that occupies spaces between rock grains or in fractures in rocks. Such openings tend to be larger and more abundant near the land surface; at depth, the openings (pore spaces) tend to be smaller and fewer due to the greater pressure of overlying material. The source of ground water is the fraction of rain and snowmelt or seepage from streams and lakes that percolates down through the soil and rock. Plants consume much of the water that enters the soil, and a small amount is held on the soil grains by capillary forces; any surplus percolates downward to the "zone of saturation" (rock in which every available space is filled

with water). The top of the zone of saturation is the "water table." Candidate repository sites both above and below the water table are being evaluated.

Ground water is usually in motion, flowing under the force of gravity to lower areas. The volumetric rate of ground water flow is determined by the "hydraulic gradient" (inclination of the water table or the pressure surface) and the "permeability" (ease of conducting water). Flow rates of ground water have a wide range. For example, rock salt has an absence of, or extremely low rate of, ground water flow. On the other hand, a permeable sandstone "aquifer" (rock that contains sufficient saturated permeable material) will yield significant amounts of water to wells or springs (e.g., thousands of gallons per minute) and will not be considered for a repository.

### REPOSITORY SITING AND GROUND WATER CONDITIONS

The study of ground water (geohydrology) is of primary importance in siting a repository since ground water has the potential for transporting radionuclides from the repository to the accessible environment. The "geohydrologic setting," defined as a composite description of all the major geologic and hydrologic factors that affect and control ground water movement into, through, and out of an area, requires thorough investigation before site recommendation and NRC licensing of a repository. Repository siting with respect to water is addressed in both the preclosure and postclosure siting guidelines. Surface water and ground water are preclosure considerations under technical guideline section 960.5-2-10 (hydrology). The ease and cost of siting a repository is directly influenced by the presence of water. Therefore, surface and ground water evaluations will be conducted when comparing sites under the preclosure guidelines. The presence of surface-water systems will be investigated with respect to potential flooding of the repository during construction, operation,

<sup>1/</sup> U.S. Department of Energy, 10 CFR 960, "General Guidelines for the Recommendation of Sites for the Nuclear Waste Repositories; Final Siting Guidelines," 1984.

<sup>2/</sup> U.S. Nuclear Regulatory Commission, 10 CFR 60, "Disposal of High-Level Radioactive Wastes in Geologic Repositories; Licensing Procedures," 1983.

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and closure. Ground water aquifers between the land surface and the repository depth will be examined with respect to conditions that could require complex engineering measures beyond reasonably available technology for repository construction, operation, and closure.

Ground water is also a postclosure consideration in repository siting. The geohydrologic setting must permit compliance with requirements as specified by the NRC and the U.S. Environmental Protection Agency (EPA). The existence, therefore, of ground water (in saturated or unsaturated rock), the "porosity" (percent of void space in rock), permeability, hydraulic gradient, and ground water flow direction will be evaluated during site characterization. The first favorable condition in the postclosure siting guidelines under geohydrology is that the pre-waste emplacement ground water travel time along any path of likely radionuclide travel from the repository to the accessible environment would be more than 10,000 years. This is in compatible with the EPA release rates noted in the Environmental Standards for Disposal (40 CFR 191, Subpart B).

#### **REPOSITORY DESIGN AND GROUND WATER CONSIDERATIONS**

One of the factors addressed in repository design is ground water saturation or resaturation of the repository after closure. The isolation qualities of the "engineered barrier system" (i.e., the manmade components of a disposal system designed to prevent the release of radionuclides from the underground facility into the geohydrologic setting), including the waste packages and the repository seal system, will be designed to deter ground water from coming in contact with the waste. In the event that ground water contacts the waste package during postclosure, the waste package will be designed to deter ground water from contacting the radioactive materials within the waste package. The NRC specifies that the waste package must substantially contain the waste for 300 to 1,000 years. Additionally, the engineered barrier system and the repository seals will be designed to inhibit radionuclide transport away from the repository. In total, the combined isolation requirements of repository siting and design will, in principle, ensure that releases of radioactive materials to the accessible environment are within EPA limits for 10,000 years.