

Technical Review:

**Environmental Characterization Report
For The Paradox Basin Study Region
Utah Study Areas**

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ONWI-144

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Summary

Overall, the DOE should be commended for preparing an objective, comprehensive and well-written report. Even though the DOE is only at the study area phase of site screening, the E.C.R. gives a level of detail which is comparable to many environmental impact statements.

The Environmental Characterization Report For The Paradox Basin Study Region Study Areas (ECR) has uncovered some significant environmental issues which are bound to impact the repository program. Briefly, these issues are:

1. Inconsistencies in land use (building a repository in a recreational/wilderness area).
2. Potential elimination of an endangered species or archeological site.
3. Competition for a limited supply of water.
4. Precluding mining in or near the repository site.
5. Degradation of air quality.
6. Lack of transportation corridors into the study areas.

Of the above issues, transportation was the most neglected and could be the most significant. The DOE should begin mapping routes by which HLW would be transported from its source to the Paradox Basin. In many

states, hazardous material cannot be carried through urban areas, over bridges or through tunnels. Long circuitous transportation routes would increase risks and escalate disposal costs. It would be best to consider these impacts early in the repository program.

I have indicated in the background review that the E.C.R. is a product of DOE site screening using the host-rock approach. The land use approach, which is being used at Hanford and Nevada Test Site, has not produced an environmental document that is comparable to this one. Consequently, one could argue that a repository site in the Paradox Basin would automatically be superior to one at Hanford or Nevada Test Site because it has benefited from more intensive screening. An opposing argument could also be made. By revealing so many environmental issues at the Paradox Basin, the E.C.R. tacitly supports a repository site where these issues have not been documented (i.e., Hanford or NTS).

The DOE could offer only one rebuttal to either argument. It must demonstrate, through an EIS or a SCR, that the same site screening efforts were applied, without prejudice, to all candidate repository sites.

Background:

In February, 1982, the DOE published a National Plan for Siting High-Level Radioactive Waste Repositories and Environmental Assessment (DOE/NWTS-4 and DOE/EA-151). The National Siting Plan explained how the DOE will screen successively smaller land areas within the United States until a repository site is selected.

The plan uses two approaches for selecting and evaluating candidate repository sites. The land use approach would limit site screening to DOE land which has already been committed to nuclear activities (i.e., Hanford and Nevada Test Site) and the host rock approach would be applied to non-DOE land. The Environmental Characterization Report For The Paradox Basin Study Region Utah Study Areas is one of the products of DOE's site screening investigations using the host rock approach.

The host rock approach begins by identifying regions which could provide a suitable host rock for a geologic repository. Regions encompass large land areas which may extend across several states. As site screening proceeds, explorations would focus on progressively smaller land areas. Regions would be reduced to areas (1,000 square miles), then to locations (30 square miles) and finally to the site. At each phase of the screening process (region selection, area selection, location selection), the DOE will publish two reports; one would characterize the geology at that particular phase and the other would characterize the environment.

The Paradox Basin in Utah is one of the regions which the DOE is investigating. So far, the DOE has completed an Overview of the Regional Geology of the Paradox Basin Study Area (ONWI-92) and a Regional Environmental Characterization Report for the Paradox Basin Salt Region and Surrounding Territory (ONWI-68). These regional geologic and environmental characterization reports were summarized and recommendations for study areas were made in Summary Characterization and Recommendation of Study Areas for the Paradox Basin Study Region (ONWI-36).

The screening investigations for the Paradox Basin are now at the study area phase. The Environmental Characterization Report For The Paradox Basin Study Region Utah Study Areas, which is the subject of this review, describes the surface water, atmosphere, background radiation, natural ecosystems, agricultural systems and social environment of four study areas within the Paradox Basin. These areas are:

- Salt Valley in the northern section of the Paradox Region
- Lisbon Valley in the central portion of the Paradox Region
- Gibson Dome in the west central portion of the Paradox Region
- Elk Ridge in the southwest portion of the Paradox Region

After a geologic characterization report has been completed for the same four study areas, the DOE will publish a summary report that will recommend locations in the Utah Study Area(s) for study during the location characterization phases of the NWTs program.

Review:

Although the Environmental Characterization Report For The Paradox Basin Study Region Utah Study Areas (E.C.R.) will contribute to site screening, it does not recommend any area for future consideration nor does it evaluate the impacts of building a repository. The E.C.R. can be compared to the affected environment section of an environmental impact statement. It simply describes an area's environmental features but does not evaluate the impacts caused by the proposed action.

The DOE prepared the E.C.R. to ensure that data on environmental values required by the National Environmental Policy Act (NEPA) of 1969 are

available. Although some of the environmental information in the ECR may appear in the DOE Site Characterization Report, the E.C.R. is primarily a NEPA-related document and does not reference 10 CFR Part 60.

Only a short section of the E.C.R. (pp. 23-31) relates to the proposed NRC technical criteria (10 CFR 60). Here, the E.C.R. discusses conceptual repository design, construction and operation. The discussion serves as background for the environmental analysis which follows and should not be taken as a definitive source. Nevertheless, there are some inconsistencies between what the NRC expects of a repository and what the E.C.R. relates.

The E.C.R. describes two methods by which spent fuel canisters are placed within a repository. In the first method, the canister is placed in a predrilled hole which is lined so that the canister could be retrieved during the first five years of emplacement. Using the second method, a gap is left between the canister and the salt to allow for creep. The canister is then covered with salt. Presumably, the canister would be irretrievable if the second emplacement method were used. Neither emplacement method would comply with proposed 10 CFR 60's criteria for retrievability.

TRU wastes, solidified in drums, would also be placed in the E.C.R.'s conceptual repository. Although proposed 10 CFR 60 has no criteria for TRU waste, the proposed packaging method may raise some concerns.

The E.C.R. states that when the repository is full, the retrievability period would end and the surface facilities would be decommissioned. If a performance confirmation program extended beyond a repository's

operational life, the surface facilities would not be decommissioned and a retrieval option would be kept open.

The remainder of the E.C.R. describes a range of environmental aspects peculiar to the Paradox Basin. This review will summarize only those aspects which I feel will have the greatest impact on the repository program. My explanation for making an issue out of a particular environmental concern is based upon my opinion. To avoid confusion over what part of the review is fact and what is my opinion, I have placed my explanations in parenthesis (like this).

The four Utah study areas lie in the Southeast Colorado Hydrologic Area where current surface water requirements total 80,145,000 m³/yr. (Constructing a repository in salt would require 240,000 m³ of water (Management of Commercially Generated Radioactive Waste DOE/EIS-0046F, Oct. 1980.) or approximately .3% of Southeast Utah's current annual use.) The Utah Department of Natural Resources projects that new agricultural lands along the San Juan River will increase the area's water use by 400% in the year 2020. (With this increase a repository could compete with irrigated agriculture for the limited water available).

All four of the study areas lie in close proximity to National Parks. The Federal Clean Act Amendments of 1977 gives special protection to National Parks. Increases in sulfur dioxide or particulate matter must be restricted to very low percentages of the National ambient air quality standards. (The air pollutants emitted during the construction of a repository, particularly fugitive dust, could intrude into the National Parks and degradate air quality.)

There are at the present time five species of vertebrates on the federal endangered species list that are known to inhabit areas in Grand or San Juan counties, Utah. These are: the humpback chub, Colorado squawfish, bald eagle, peregrine falcon and the black-footed ferret. The Endangered Species Act of 1973 protects the above animals by preserving the ecosystems on which they depend. (It would be very difficult to build a repository in any area which is critical to the survival of an endangered species).

Seventy eight percent of the land in southeastern Utah belongs to the federal government. For the most part, this land has been set aside for recreational, natural and cultural uses. Each year an estimated half million visitors enjoy backpacking, hiking, camping, skiing, snowmobiling and rafting throughout southeastern Utah. (Even if there are no adverse environmental impacts, the public may not welcome a high-level waste repository into one of its favorite vacation spots.)

There are significant mineral deposits, both actively mined and currently unexploited, within the Paradox Basin. Some of the resources include: uranium, oil, gas, geothermal water, vanadium, and coal. One of the world's largest sources of uranium is found beneath Mante-La Sal Forest which is located immediately north of the Elk Ridge Study Area. (The NRC technical criteria would disfavor repository sites which are rich in mineral deposits or show evidence of past drilling.)

Because of their remote location, there are limited transportation corridors into the study areas. Rail transportation serves only the Salt Valley Study Area. The remaining three must rely upon two-lane highways

and jeep trails. The E.C.R. does not discuss the problems associated with transporting high-level waste from its source to the Paradox Basin.

Cultural (pre-historic, historic, and architectural) resources are also important factors in San Juan County. The Bureau of Land Management conducted an archeological survey on land roughly encompassing the Gibson Dome and Lisbon Valley study areas. The survey projects that there is an average of 19 archeological sites per square mile giving both study areas a "medium-sensitivity" designation. The Elk Ridge Study Area lies in the heart of the richest archeological area in the United States. The E.C.R. projects that there are at least 4,880 archeological sites within this study area. (The National Historic Preservation Act of 1966 protects America's cultural resources and could eliminate a potential repository site from future consideration.)