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NOTE TO: Joseph J. Holonich, Director
Repository Licensing & Quality Assurance Project Directorate
Division of High-Level Waste Management, NMSS

FROM: Ronald L. Ballard, Chief
Geology and Engineering Branch
Division of High-Level Waste Management, NMSS

SUBJECT: REVIEW OF DOE STUDY PLAN 8.3.1.15.1.8, REVISION 0 -
IN-SITU DESIGN VERIFICATION

This memorandum transmits the review results of DOE Study Plan 8.3.1.15.1.8, Revision 0. The review was conducted in accordance with the procedures in the "Review Plan for NRC Staff Review of DOE Study Plans, Revision 2, March 10, 1993". Based on this review, there are no objections to this study plan. Information accompanying the study plan provides specific information related to SCA open Comments 4 and 56. The information resolves those parts of the comments related to this study plan. However, the comments must remain open because some of the bases of the comments are related to other study plans. The evaluation of DOE's response is attached to this memo.

The conclusions of this review are based on findings for the five criteria of the specific approach given in Section 4.1 of the review plan, and the findings for the ten objectives of the review given in Section 2.2 of the review plan. The findings for the ten objectives are the following:

1. The level-of-detail in the study plan is substantively consistent with the NRC/DOE agreement.
2. The objectives of this study plan are consistent with the objectives of the In Situ Design Verification Study presented in the Site Characterization Plan (SCP) and are technically defensible. The four experiments of the study plan are "... intended to collect information related to the construction of the experimental facility that will be useful in plans for design and construction of the proposed repository." The information will be obtained by monitoring and observing the construction methods of the ESF, the long-term behavior of openings in a range of ground conditions, and the effects of ventilation.
3. The excavations proposed for this study (beyond the construction of the ESF itself, the effects of which are described in Section 8.4 of the SCP) consist of drilling short boreholes. Therefore, this study is not expected to have any significant additional impacts on the site, and the activities of this study plan should not affect repository performance and cause significant unmitigable adverse impacts on waste isolation.

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4. The activities of this study plan are expected to have minimal impact on other site characterization activities or construction of the Exploratory Studies Facility (ESF).
5. The study plan was developed under an OCRWM-approved and NRC-accepted Quality Assurance (QA) program. NRC staff observations of OCRWM QA audits provide a means to check that acceptable QA practices are being used.
6. It is not proposed to use radioactive materials in testing to obtain the information described in the study.
7. The staff did not identify any objections, comments, or questions, and it is likely that the plan enables DOE to obtain information for licensing. The staff did notice that it is not clear that procedures have been developed for all tasks (e.g., determinations of particulate concentrations and friction factors), but in Section 3.0 of the Study Plan it is stated that additional procedures may be required.
8. DOE provided information related to SCA open Comments 4 and 56, but did not ask for resolution of these comments. Both comments have bases that are concerned with activities other than those described in the reviewed study plan. The material presented in the study plan is sufficient to resolve the parts of the comments related to this study plan. However, because the comments are concerned with issues that cannot be addressed by this study plan, both comments will remain open until other study plans address the unresolved bases.
9. The results of the review are presented in this memo.
10. No new items were identified for the OITS.

The five steps of the specific approach given in Section 4.1 of the review plan are linked to the ten objectives described above. Because the ten objectives were satisfied, the five specific steps are satisfied also.

If you have any questions regarding this review, please contact William Boyle at 504-2547.


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**Section 8.1
Section 8.3.1.15**

**Rationale for the Site Characterization Program
Overview of thermal and mechanical rock properties
program**

SCA COMMENT 4

The rationale provided for the specification of information needs does not appear to ensure completeness of those needs. Furthermore, the integration of testing with design and performance assessment is lacking.

EVALUATION OF DOE RESPONSE

- **SCA Comment 4 refers to Section 8.3.1.15, of which Section 8.3.1.15.1.8 is a part. The response of DOE that accompanies this study plan points out that Study Plan 8.3.1.15.1.8 does not address the comment directly, but other study plans will, or do, address this comment.**
- **The NRC staff finds that Comment 4 is not particularly related to Study Plan 8.3.1.15.1.8, and it is acceptable that the study plan does not address the comment directly.**
- **The NRC staff considers this comment open, pending receipt of documents that do address the comment.**

Section 8.3.1.15.1

Investigation: Studies to provide the required information for spatial distribution of thermal and mechanical properties, p. 8.3.1.15-31

Section 8.3.5.20

**Analytical Techniques
Requiring Significant
Development**

SCA COMMENT 56

The validation of models should be a part of the overall test program. It is not clear that these aspects have been addressed by the test program.

EVALUATION OF DOE RESPONSE

- **SCA Comment 56 refers to Section 8.3.1.15.1, of which Section 8.3.1.15.1.8 is a part. The response of DOE that accompanies this study plan points out that Study Plan 8.3.1.15.1.8 does not address the comment directly, but other study plans will, or do, address this comment.**
- **The NRC staff finds that Comment 56 is not particularly related to Study Plan 8.3.1.15.1.8, and it is acceptable that the study plan does not address the comment directly.**
- **The NRC staff considers this comment open, pending receipt of documents that do address the comment.**