



U.S. Department of Energy
Washington, D.C. 20585

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'83 MAY 24 P156

May 20, 1983

WM Record File
101.2

WM Project WM-10
Docket No. _____
PDR
LPDR

Mr. John G. Davis
Director, Office of Nuclear
Material, Safety and Safeguards
Nuclear Regulatory Commission

Distribution:
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Mr. Davis -

With compliments of Michael Lawrence, Nuclear Waste Policy Act
Project Office, you will find the enclosed materials.

Easter J. Gorham
Easter J. Gorham
Secretary
Nuclear Waste Policy Act
Project Office

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PDR WASTE
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UNITED STATES
DEPARTMENT OF ENERGY

BRIEFING TO R. L. MORGAN

May 19, 1983

BASALT

WASTE ISOLATION

PROJECT

BWIP KEY ISSUES FROM SCR

- o WHAT IS THE TOTAL AMOUNT (ACTIVITY) OF RADIONUCLIDES POTENTIALLY RELEASABLE TO THE ACCESSIBLE ENVIRONMENT IN A 10,000 YEAR PERIOD, AND IS THIS AMOUNT IN COMPLIANCE WITH APPROPRIATE ENVIRONMENTAL PROTECTION AGENCY REGULATIONS?

(CAN A REPOSITORY IN BASALT MEET THE EPA REGULATIONS?)

- o CAN STABILITY AND ISOLATION CABABILITY OF THE REPOSITORY BE MAINTAINED IN THE PRESENCE OF COUPLED IN SITU, EXCAVATION-INDUCED, AND THERMAL-INDUCED STRESSES?

(WILL THE OPENINGS IN A REPOSITORY IN BASALT REMAIN STABLE DURING ITS OPERATING LIFE?)

- o CAN REPOSITORY SHAFTS, TUNNELS, AND EXPLORATORY BOREHOLES BE CONSTRUCTED AND SEALED WITHOUT CAUSING PREFERENTIAL PATHWAYS FOR GROUNDWATER OR INCREASING THE POTENTIAL FOR RADIONUCLIDE MIGRATION FROM A NUCLEAR WASTE REPOSITORY SUCH THAT COMPLIANCE WITH APPROPRIATE EPA REGULATIONS IS NOT POSSIBLE?

(CAN A REPOSITORY IN BASALT BE SEALED SO AS TO MEET EPA CRITERIA?)

THE PLANNED PRESENT AND FUTURE WORK AS LISTED IN THE SCR ARE ALL AIMED AT RESOLVING THESE VERY QUESTIONS.

BWIP ISSUES FROM DSCA AND PLANS FOR RESOLUTION

ISSUE

- I. SITE DATA IS INADEQUATE TO SUPPORT CONCLUSION THAT A REPOSITORY AT RRL WILL SATISFY EPA STANDARDS. SPECIFIC DEFICIENCIES INCLUDE:
 1. GROUNDWATER TRAVEL TIME
 - A. SPARSENESS OF TEST DATA
 - B. UNCERTAINTY OF HYDRAULIC HEAD MEASUREMENTS.
 - C. QUESTIONABLE USE OF POROSITY DATA
 - D. LACK OF DEFENSIBLE CONCEPTUAL GROUNDWATER FLOW MODEL
 2. SOLUBILITY OF RADIONUCLIDES
 - A. UNCERTAINTY ABOUT GROUNDWATER COMPOSITION AND THE GROUNDWATER ENVIRONMENT
 - B. UNCERTAINTIES IN CALCULATIONS
 - C. UNCERTAINTIES IN EXPERIMENTAL CONFIRMATION
 3. GEOLOGIC STABILITY
 - A. BASIS FOR PRELIMINARY QUANTITATIVE ASSESSMENT NOT EXPLAINED
 - B. INADEQUATE INTERPRETATION OF RATTLESNAKE-WALLULA FAULT ZONE
 - C. DISAGREE WITH CONCLUSION THAT MICRO-EARTHQUAKE SWARMS ARE NOT HAZARDOUS

PLAN FOR RESOLUTION

SCP TO BE RE-WORDED TO REFLECT MORE ADEQUATELY UNCERTAINTIES IN CURRENT DATA. ADDITIONAL DATA FROM THE ES AND SURFACE-BASED BOREHOLES AND SUBSEQUENT UNDERGROUND TESTING WILL ALSO BE DISCUSSED IN THE SCP. THIS ADDITIONAL DATA IS EXPECTED TO ADDRESS MANY OF THESE TECHNICAL CONCERNS. BWIP IS IN AGREEMENT WITH THE CONCERN.

BWIP ISSUES FROM DSCA AND PLANS FOR RESOLUTION (CONTINUED)

ISSUE

PLAN FOR RESOLUTION

II. PLANS AND PROGRAM FOR SITE CHARACTERIZATION ARE DEFICIENT IN THE FOLLOWING AREAS:

1. GROUNDWATER

- A. LARGE SCALE MULTIPLE WELL PUMP TESTS ARE NEEDED TO EVALUATE THE HYDROLOGIC CONDITIONS.
- B. HYDRAULIC HEAD MEASUREMENTS USING PACKER TESTS ARE QUESTIONABLE.

LARGE SCALE PUMP TEST IS BEING PLANNED, EVALUATION FOR ADDITIONAL TESTS TO BE DETERMINED AT CONCLUSION OF CURRENT TESTING. A NETWORK OF LONG TERM PIEZOMETERS IS PLANNED. PLAN FOR OBTAINING NECESSARY HYDROLOGIC HEAD DATA IS PRESENTLY BEING IMPLEMENTED.

2. GEOLOGIC STABILITY

PLANS TO DETERMINE IMPACT OF SEISMICITY ON REPOSITORY DESIGN ARE INCOMPLETE.

AGREE WITH CONCERN. SIGNIFICANT WORK HAS BEEN DONE SINCE SCR COMPLETION. WORKSHOP HELD WITH NRC. THIS RECENT WORK WILL BE DOCUMENTED IN SCP.

BWIP ISSUES FROM DSCA AND PLANS FOR RESOLUTION (CONTINUED)

ISSUE

PLAN FOR RESOLUTION

II. CONTINUED

3. GEOCHEMISTRY

PLANS FOR OBTAINING GEOCHEMISTRY DATA ARE NOT DETAILED ENOUGH TO ENABLE NRC TO ASSESS THE ADEQUACY OF THE APPROACH, THE ADEQUACY OF THE DATA, OR THE LEVEL OF CONFIDENCE IN THE DATA.

AGREE WITH CONCERN. DETAILED TEST PLANS ARE PRESENTLY BEING PREPARED. ADDITIONAL INFORMATION WILL BE INCLUDED IN SCP.

4. REPOSITORY DESIGN

A. SCR DOES NOT PROVIDE DETAILED INFORMATION CONCERNING CONSTRUCTION AND SEALING PROGRAMS FOR THE ES OR ASSOCIATED QA AND TESTING PROCEDURES.

AGREE WITH COMMENT. SEAL CRITERIA AND DEVELOPMENT TESTING ARE BEING ESTABLISHED. DETAILED TEST PLANS AND PROCEDURES ARE PRESENTLY BEING PREPARED. ADDITIONAL INFORMATION IS BEING INCLUDED IN SCP TO RESPOND TO THIS CONCERN.

B. THE SCR DOES NOT APPROPRIATELY SUPPORT DESIGN DECISIONS REGARDING RETRIEVABILITY OF WASTE, SEALING MATERIALS FOR USE IN DECOMMISSIONING, AND HORIZONTAL vs. VERTICAL WASTE EMPLACEMENT.

AGREE WITH COMMENT. ENGINEERING DEVELOPMENT PLANS TO ASSESS THESE DECISIONS ARE BEING PREPARED.

.BWIP ISSUES FROM DSCA AND PLANS FOR RESOLUTION (CONTINUED)

ISSUE

PLAN FOR RESOLUTION

II. CONTINUED

5. WASTE FORM AND PACKAGE

INTERIM RELIABILITY STANDARDS TO GUIDE THE TESTING PROGRAM HAVE NOT BEEN DEVELOPED (I.E., PITTING, CORROSION, WIDE RANGE OF POSSIBLE REPOSITORY CONDITIONS, PERFORMANCE OF BOROSILICATE GLASS).

AGREE WITH CONCERN. QUESTION PROGRAM EMPHASIS. CONCERNS WILL BE COVERED IN THE BARRIER MATERIALS TEST PLAN. WASTE FORM CRITERIA ARE BEING PREPARED.

6. PERFORMANCE ASSESSMENT

DISCUSSION OF PERFORMANCE ASSESSMENT DOES NOT PROVIDE SUFFICIENT DETAIL OR DESCRIPTION TO ALLOW THE NRC TO REPLICATE RESULTS OR EVALUATE COMPLETENESS OF PERFORMANCE ASSESSMENT ACTIVITY.

AGREE WITH CONCERN. SIGNIFICANT AMOUNT OF WORK HAS BEEN COMPLETED SINCE SCR, THIS DATA WILL BE INCLUDED IN THE SCP.

7. QUALITY ASSURANCE

DETAILS ON THE IMPLEMENTATION OF THE QA PROGRAM WERE NOT PRESENTED.

AGREE WITH CONCERN. DETAILED DISCUSSION WITH NRC ON THIS SUBJECT IS PLANNED.

BWIP ISSUES FROM DSCA AND PLANS FOR RESOLUTION (CONTINUED)

III. GENERAL CONCLUSION:

AGREE WITH CONCERNS RAISED BY NRC IN DSCA. DISCUSSIONS BETWEEN DOE AND NRC ARE NEEDED TO CLARIFY AND RESOLVE DETAILS REGARDING IMPLEMENTATION PLANS NEEDED TO ADDRESS THESE CONCERNS. MANAGEMENT MEETING BETWEEN NRC AND BWIP SCHEDULED FOR MAY 27, 1983, TO KICK-OFF THIS DIALOGUE.

ISSUES FROM USGS REVIEW
OF SCR AND PLANS FOR RESOLUTION

ISSUE

AT THE REQUEST OF DOE, THE USGS REVIEWED THE BWIP SCR. THE USGS REVIEW REVEALED MANY OF THE SAME ISSUES RAISED BY THE NRC.

- I. ADDITIONAL DATA ARE NEEDED AS PART OF SITE CHARACTERIZATION.
- II. FUTURE PLANS MUST BE EXPANDED TO INCLUDE ADDITIONAL DETAIL.
- III. CONCERN ABOUT THE LEVEL OF SITE COMPLEXITY.

PLAN FOR RESOLUTION

RESOLUTION OF USGS CONCERNS WILL REQUIRE DISCUSSIONS DURING THE PLANNING STAGE BETWEEN USGS STAFF AND BWIP. USGS PARTICIPATED IN THE WORKSHOP TO DEVELOP THE EXPLORATORY SHAFT TEST PLAN, AND BWIP TECTONIC STUDIES AND IN THE HYDROLOGIC MODELING TASK FORCE. AN INITIAL MEETING TO DISCUSS USGS CONCERNS IS PLANNED FOR JUNE 7-9, 1983.

**BWIP ISSUES FROM WASHINGTON STATE
REVIEW OF SCR AND PLANS FOR RESOLUTION**

THE TASK FORCE IS CURRENTLY REVIEWING A DRAFT REPORT BY THEIR TECHNICAL CONSULTANT (GOLDER ASSOCIATES) CRITIQUING THE BWIP SCR. MOST ISSUES CITED IN THE DRAFT REPORT HAVE BEEN IDENTIFIED BY EITHER THE NRC OR THE USGS IN THEIR REVIEWS OF THE SCR. WHEN THE DRAFT IS FINALIZED, DOE WILL PROVIDE PLANS FOR RESOLUTION OF THE ISSUES.

5/17/83