





**Department of Energy**

Office of Civilian Radioactive Waste Management    QA: N/A  
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MAR 31 1995

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MINED GEOLOGIC DISPOSAL SYSTEM LICENSE APPLICATION ANNOTATED  
OUTLINE, REVISION 0 (SCPB: N/A)

This letter transmits the Mined Geologic Disposal System License Application Annotated Outline (MGDS LA AO) (YMP/94-05), Revision 0, dated March 31, 1995. We are enclosing 25 hard copies plus 1 electronic copy of the MGDS LA AO. Receipt of comments or questions you may have on MGDS LA AO, Revision 0, by June 30, 1995, will enable the U.S. Department of Energy (DOE) to evaluate them for incorporation into Revision 1, scheduled for distribution to the U.S. Nuclear Regulatory Commission (NRC) on January 31, 1996.

Although Revision 0 marks the transition of the MGDS LA AO to a DOE document, it directly builds on and enhances the information presented in the previous submittals. Because this transmittal is issued as a Revision 0 document, change bars are not provided. However, to facilitate your review of the document, Enclosure 2 of this letter contains a list of specific chapters, sections, and subsections that have been significantly revised from the previous document. In addition, editorial and consistency changes have been made throughout the document, including the removal of planning package materials to eliminate duplication.

As in the past, this document was developed using the format and content guidance provided in the NRC Draft Regulatory Guide DG-3003, "Format and Content For The License Application For The High-Level Waste Repository" (FCRG). Future revisions will not only implement the systems-based approach in DG-3003, but will also follow the guidance provided in NUREG-1323, "License Application Review Plan for a Geologic Repository for Spent Nuclear Fuel and High-Level Radioactive Waste" (LARP). (The LARP was not received early enough to be factored into the preparation of MGDS LA AO, Revision 0.)

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MAR 31 1995

The current status of your comments on the LA AO is provided in Enclosure 3. We are tracking the resolution of these comments using the same database and terminology used in the resolution of Site Characterization Analysis open items. Our intent is to report the status of future MGDS LA AO comment resolutions in the Site Characterization Progress Reports, beginning with Progress Report 13, which will be delivered in the time frame of LA AO, Revision 1.

As we have discussed at previous meetings, future revisions of the MGDS LA AO are scheduled for delivery to the NRC in January of each year to facilitate NRC and DOE planning processes. If you have any questions, please contact April V. Gil at (702) 794-7622.



Stephan J. Brocoun  
Assistant Manager for  
Suitability and Licensing

AMSL:AVG-2698

Enclosures:

1. MGDS LA AO, Revision 0
2. List of Revised MGDS LA AO  
Chapters, Sections, and  
Subsections
3. MGDS LA AO Comment Resolution  
Status

*bound on shelf*

MAR 31 1995

Joseph J. Holonich

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cc w/encls:

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R. V. Barton, YMSCO, NV  
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## Enclosure 2

### Mined Geologic Disposal System License Application Annotated Outline, Revision 0

#### List of Revised Chapters, Sections, and Subsections

Chapter 3	The Natural Systems of the Geologic Setting
3.1.1.1.3.2	Regional Volcanic Features
3.1.1.1.3.2.1	Silicic Volcanism
3.1.1.1.3.2.2	Basaltic Volcanism
3.1.1.2.3.5	Volcanism at Yucca Mountain
3.1.1.2.3.5.1	Silicic Volcanism
3.1.1.2.3.5.2	Basaltic Volcanism
3.1.1.2.3.5.2.1	Basalt of the Silicic Episode
3.1.1.2.3.5.2.2	Postcaldera Basalt of the YMR
3.1.1.2.3.5.2.5	Petrologic and Geochemical Constraints on Basaltic Volcanism
3.1.2.2.7	Regional Paleohydrology
3.1.2.3	Site Hydrogeology
3.1.2.3.1	Baseline Monitoring Network
3.1.2.3.2	Site Flow System Boundaries and Hydrogeologic Units
3.1.2.3.2.1	Unsaturated Zone Hydrogeologic Units
3.1.2.3.2.2	Saturated Zone Hydrogeologic Units
3.1.2.3.3	Potentiometric Levels, Matric Potentials, and Gradients
3.1.2.3.3.1	Unsaturated Zone Potentials
3.1.2.3.3.2	Saturated Zone Potentials
3.1.2.3.4	Characteristics of Hydrogeologic Units
3.1.2.3.4.1	Unsaturated Zone Hydrologic Units
3.1.2.3.4.2	Saturated Zone Hydrogeologic Units
3.1.2.3.5	Site Groundwater Recharge
3.1.2.3.6	Site Groundwater Discharge
3.1.2.3.7	Age of Site Groundwater
3.1.2.3.8	Site Pathway Analysis
3.1.2.3.9	Local Groundwater Use
3.1.2.3.10	Site Paleohydrology
3.3.2.1.1	Nature and Rates of Hydrogeologic Processes
3.3.2.1.3	Pre-Waste-Emplacement Groundwater Travel Time
3.3.2.2.1	Potential for Flooding
Chapter 4	Geologic Repository Operations Area: Physical Facilities
Chapter 5	Engineered Barrier Systems
Chapter 6	Overall System Performance Assessment
Chapter 7	Conduct of Repository Operation

Enclosure 3

MGDS License Application Annotated Outline  
 Comment Resolution Status

Section	Comment #	NRC Comment	Proposed Response:	Status
5.1.2	C1	The AO does not discuss the potential for disposal in the repository of waste forms other than spent fuel and high-level waste glass.	Agree. Appropriate discussion must be included in Section 5.1.2 for all waste forms accepted at and disposed of in the geologic repository. INN 5.1.2.1.3-1 was added to address DOE-owned SNF. There are no plans to dispose of wastes other than spent nuclear fuel and high-level waste glass in the first repository.	Open
5.1.5.2	C2	This section discusses potential impacts to the accessible environment from post-closure releases from the repository. However, Section 5.1.5 of the draft Format and Content Guide (DG-3003) is only intended to address radiation protection issues during the period of operations prior to closure.	Agree. Section 5.1.5.2 was revised to delete material describing post-closure releases and inserting new material addressing radiological safety during the operational period prior to closure.	Open

Enclosure 3

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Section	Comment #	NRC Comment	Proposed Response:	Status
5.2.2.2	C3	Section 5.2.2.2 includes a discussion of performance assessments to address the requirements of 40 CFR 191.13. However, Section 5.2.2.2 of DG-3003 is only intended to address the Engineered Barrier System (EBS) subsystem release rate requirement of 10 CFR 60.113(a)(1).	Agree. Section 5.2.2.2 was revised to address only the EBS release rate requirement.	Resolved  Per letter from J.J. Holonich (Office of Nuclear Material Safety and Safeguards) to J.P. Roberts (DOE) dated Jan 29, 1993.

Enclosure 3

MGDS License Application Annotated Outline  
 Comment Resolution Status

Section	Comment #	NRC Comment	Proposed Response:	Status
6.2.2 & 6.2.3	C1	<p>The AO does not appear to reflect appropriate consideration of a full range of possible occurrences of potential processes and events and their effects on post-closure overall repository system performance.</p>	<p>We agree with the NRC comment and with the basis for it, and have made the following changes to the AO.</p> <p>Tables 6.2H and 6.2S were modified by adding Information Needs INN 6.2-007 and INN 6.2-006, respectively to indicate that these tables are considered to be incomplete. Information Need INN 6.2-007 is called for by December 1994 between the second and third iterations of total system performance assessment. It is felt that at that time the performance assessment of Yucca Mountain will be mature enough to complete Table 6.H. Likewise, INN 6.2-006 is expected in December 1993 at the end of the second iteration of performance assessment and will be used to complete Table 6.2S. The information described above and the screening of processes and events and scenarios in Section 6.3 will be used to determine the location of processes and</p>	<p>Resolved</p> <p>Per letter from J.J. Holonich (Office of Nuclear Material Safety and Safeguards) to Dwight Shelor (DOE) dated July 30, 1993.</p>

Enclosure 3

MGDS License Application Annotated Outline  
 Comment Resolution Status

Section	Comment #	NRC Comment	Proposed Response:	Status
6.2.2 & 6.2.3	C2	Pre-closure concerns are offered as examples of potential effects of processes and events on post-closure performance of the overall repository system.	We agree that inappropriate examples had been provided in the Form 2 Planning Package. The modifications of the format of the AO presentation eliminated the Planning Packages (which corrected this error). We hope that these changes will make the AO easier to review.	Resolved  Per letter from J.J. Holonich (Office of Nuclear Material Safety and Safeguards) to Dwight Shelor (DOE) dated July 30, 1993.
9.1.1	C1	The AO does not appear to clearly define "planned area."	Section 9.1 was not revised during this revision, therefore, this comment will be tracked and an appropriate response will be generated in a future revision.	Open

Enclosure 3

MGDS License Application Annotated Outline  
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Section	Comment #	NRC Comment	Proposed Response:	Status
9.1.1.1	C2	Although it is clearly premature to have a complete legal description of the controlled area, the text that is provided only generally locates the controlled area, rather than approximating a legal description.	Section 9.1 was not revised during this revision, therefore, this comment will be tracked and an appropriate response will be generated in a future revision.	Open
9.1.1.3	Q1	Should the reference be to Figure 9.1B, Limits of the Underground Facility, rather than to Figure 9.1A?	Section 9.1 was not revised during this revision, therefore, this comment will be tracked and an appropriate response will be generated in a future revision.	Open
6.5	C1	Potentially adverse conditions may not be appropriately considered in demonstrations of compliance with the overall system performance objectives	Table 6.5.2-1 was added in conjunction with INN 6.5-2 to identify how the potentially adverse conditions discussed in section 6.5 are tied to the discussions in section 3.3. In addition, it will be made clear in the next revision, that section 6.5.2.2 includes a discussion of how potentially adverse conditions determined to be present should be examined in the context of other characteristics of the site and design.	

Enclosure 3

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Section	Comment #	NRC Comment	Proposed Response:	Status
6.5	C2	It appears that consideration of the effects of favorable conditions and potentially adverse conditions determined to be present may be inappropriately restricted to scenario development.	Tables 6.5.1.1-1 and 6.5.2-1 were added in conjunction with INNs 6.5-1 and 6.5-2 to identify how the favorable and potential adverse conditions are tied to the discussions presented in Section 3.3. In addition, INNs 6.5.1.3-2 and 6.5.2.3-2 were added to identify the need for a discussion of how these conditions are incorporated into conceptual models.	
6.5	C3	It is not clear how the favorable conditions and potentially adverse conditions identified in Section 6.5 of the AO are related to the favorable conditions and potentially adverse conditions of 10 CFR 60.122	Tables 6.5.1.1-1 and 6.5.2-1 were added in conjunction with INNs 6.5-1 and 6.5-2 to identify how the favorable and potential adverse conditions are tied to the discussions presented in Section 3.3.	
8.1.1	C1	The seismic network monitoring and geodetic leveling programs as identified in Section 8.1.1, Table 8.1A - Performance Confirmation Tests for the Geologic System - do not appear to include the controlled area.	Agree. The regional network identified in Table 8.1A (now Table 8.1.1-1) includes monitoring stations within the site area. This will be clarified in MGDS LA AO Revision 1.	