

2/13/85

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USDOE-USNRC MEETING SUMMARY

CH/SAPD

and CH/CPO

Representatives from the Office of Civilian Radioactive Waste Management, USDOE, and representatives from the Office of Nuclear Materials Safety and Safeguards, USNRC, met February 13, 1985 to discuss the USDOE proposed Annotated Outline (AO) for preparation of Site Characterization Plans (SCP). The AO will be used as the DOE baseline for preparation of project-specific SCPs by RL/BWIP, ~~SRPO/OWI~~, and NV/NNWSI. The AO was provided to NRC staff on January 24, 1985. The staff performed a best-level of effort review of this document, and during the course of the meeting provided comments on the AO. NRC staff also provided clarification related to the intent of Regulatory Guide 4.17. DOE responded to questions raised by NRC staff about the AO. The DOE proposed wording to accommodate the NRC comments. The DOE and NRC staff representatives reached agreement that the DOE AO as modified in the attachments represents an acceptable interpretation of Regulatory Guide 4.17, will provide an acceptable framework for preparation of SCPs, and could be used by DOE to prepare those Plans, with the understanding that the content of Regulatory Guide 4.17 is the principal concern.

In several important instances as noted in the attachments, there is a need for rapid follow-up to resolve open issues. These relate to:

1. allocation of performance requirements to subsystems of the repository system and
2. conceptual design information needs.

NRC also recorded the need to lay out what other interactions are needed to avoid a situation where NRC is unnecessarily holding up DOE schedules (see letter from E. Miller to W. Purcell dated January 25, 1985).

*Ralph Stein*  
 \_\_\_\_\_  
 USDOE  
 February 13, 1985

*W. Purcell*  
 \_\_\_\_\_  
 USNRC  
 February 13, 1985

WM Record File 109 WM Project 1  
 Docket No. \_\_\_\_\_  
 PDR  \_\_\_\_\_  
 LPDR \_\_\_\_\_

Distribution: \_\_\_\_\_  
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(Return to WM, 623-SS)  
*Given to OCC by S. Caplan*

Comment: 1, Section 1.1

Section 1.1 Reg. Guide 4.17, Section 1.1 (Geomorphology), states that the SCP should discuss the application of geomorphology to site screening and selection for characterization. DOE's Annotated Outline (AO) for geomorphology Section 1.1 omits the need for such a discussion.

Discussion: It is not the purpose of the SCP to restate the history of the site selection process. There is a voluminous database discussing how geologic factors were applied in site selection. This history has been summarized in the Environmental Assessments, and will be referenced in the Introduction to the SCP.

Revision: None

Comment: 2, Sections 1.2.1 and 1.2.2

Sections 1.2.1 and 1.2.2 The inclusion of surficial geologic maps, isopachs, and structure contour maps should be specifically acknowledged.

Discussion: Surficial geologic maps are called for in Section 1.1.2 (topographic maps showing geomorphic units). Section 1.2.2 will contain a map of geologic units. Isopach maps, structure contour maps and other possible data presentation formats are implicitly called for in the list of items under Section 1.2.2.

Revision: Revise "bullet" item 7 under Section 1.2.2 to read:

- Thickness and spatial extent (using isopach maps, structure contour maps, or other appropriate presentation formats).

Comment: 3, Section 1.2.2

Section 1.2.2 If not covered elsewhere, this would be a good location for the needed summary of each unit, i.e., correlation of all geologic, hydrologic, petrographic, geochemical, etc., data for each unit.

Discussion: All of this information is presented in detail elsewhere—geologic data in Sections 1.2.2 and 1.3; hydrologic data in Section 3.6.1, petrographic data in Sections 1.2.2, 4.1.1.1, 4.1.1.3; and geochemical data in Section 4.1.1.3.

Revision: None. (*DOE will consider attractive ways of summarizing characteristics of stratigraphic units.*)

Comment: 4, Section 1.2.2

Section 1.2.2 Reg. Guide 4.17 (Stratigraphic Framework of Site), requires that representative photographs and geophysical logs for the lithostratigraphic units be provided when available. For wells that have been cored, representative driller logs, lithologic and geophysical logs, and core photographs should be provided. The equivalent section in DOE's AO (Section 1.2.2) does not include these requirements. This information will be required in the SCP.

Discussion: In order to support the discussions called for in Section 1.2.2, a variety of graphic displays may be used to illustrate salient features of the stratigraphic section (e.g. outcrop photos, core photos, portions of geophysical logs). <sup>For wells that have been cored,</sup> Detailed information <sup>regarding representative driller logs,</sup> ~~on core or borehole geophysical~~ lithologic and geophysical logs, and ~~core~~ photographs will be ~~available through references.~~ available through references

Revision: Add the ~~first sentence of the discussion (above)~~ <sup>above statement in the discussion</sup> to the end of paragraph 1 of Section 1.2.2 of the Annotated Outline.

~~NRC agrees to modified revision.~~

Comment: 5, Section 1.6

Section 1.6 Reg. Guide 4.17, section 1.6 (Subsurface Drilling and Mining) requires the SCP include: (1) documentation related to calibration procedures and data-massaging techniques, and (2) a discussion of the adequacy of the historical record in determining the liklihood of undiscovered wells, boreholes, and excavations in the volume of rock and their possible effects on the site. These two requirements appear to be omitted from the equivalent section (Section 1.6) of the AO. The SCP will need to address these requirements.

Discussion: Considerable uncertainty exists over the meaning of the requested statement (1), "documentation related to calibration procedures and data-massaging techniques." Calibration procedures for geological/geophysical tests not run for this program are not likely to exist; techniques used to interpret this data will be discussed as appropriate in the specific section of Chapter 1.

Determination of the likelihood of undiscovered wells expected in an area is not a very useful exercise. More appropriate is to describe the completeness of the historical record relative to a site.

Revision: Add two sentences to the AO

- Insert after Sentence 1, Section 1.6: "The completeness<sup>and accuracy</sup> of the historical record examined in making this tabulation will be discussed."
- Insert after Sentence 5, Section 1.6: "The techniques employed in collecting this data will be described."

For critical or representative well information used in site evaluation, available information regarding instrument calibration, and data reduction techniques ~~organization~~ will be provided or referenced

for critical or representative tests

For critical or representative well tests used in the evaluation of the s

Comment: 6. Section 1.7

Section 1.7 The SCP should contain the additional information on resource values requested in R.G.4.17 but not mentioned in the AO. Reg. Guide 4.17, Section 1.7 (Mineral Resources), requires that the SCP provide a tabulation of total resources, and for each substance described include the method of assessment. Two of the five requirements outlined in this section are omitted from the equivalent section of the AO.

Discussion: All of the information requested in RG 4.17 will be derived in the discussion required in Section 1.7.1 of the AO. The AO calls for estimation of total resources, quantity of each specific resource, and value of each resource. Implicit in this discussion is a description of the resource assessment methodology.

Revision: Add a sentence to the end of Section 1.7.1: "For each resource assessment, the assessment method will be described."

and value (gross, net, and unit)

### 1.7.1 Mineral Resources

In this section, the resources of the site will be compared to the resources in comparable areas. A tabulation of the total resources will be provided, including the quantity of resource, the cutoff values used in estimating the quantity, and the value (gross, net, and unit) of each resource. For each resource assessment, the assessment method will be described.

Comment: 6, Section 1.7

Section 1.7 The SCP should contain the additional information on resource values requested in R.G.4.17 but not mentioned in the AO. Reg. Guide 4.17, Section 1.7 (Mineral Resources), requires that the SCP provide a tabulation of total resources, and for each substance described include the method of assessment. Two of the five requirements outlined in this section are omitted from the equivalent section of the AO.

Discussion: All of the information requested in RG 4.17 will be derived in the discussion required in Section 1.7.1 of the AO. The AO calls for estimation of total resources, quantity of each specific resource, and value of each resource. Implicit in this discussion is a description of the resource assessment methodology.

Revision: Add a sentence to the end of Section 1.7.1: "For each resource assessment, the assessment method will be described."

*In section 1.7.1, replace "value of each resource" with "value (gross, net, and unit value) of each resource."*

Comment: 7, Section 6.3.8

Section 6.3.8 The discussion of repository system performance requirements presented in Section 8.3.5 will not adequately provide the information requested in Reg. Guide Section 6.7. The AO should be changed to specifically include the requested in Reg. Guide 4.17 Section 6.7.

Discussion: The DOE agrees that additional information should be added to the AO to clarify what will be presented in the SCP on this subject.

Revision: Replace the text of 6.3.8 with the following:

"Preliminary numerical values for the performance goals design criteria for the repository systems will be provided to assure that the repository as a whole meets the overall regulatory requirements. As the design evolves, these goals will be subdivided to the component level and will evolve into system and component requirements.

Early assignment at numerical goals for systems and components cannot be accomplished with a high degree of accuracy.

The general nature of the design and performance assessment will establish what site data needs to be obtained. The specific analytic tools used in the design process and performance assessment will establish the accuracy requirements on the data collection and analysis systems. Tentative values for acceptable ranges of site properties can be established using an assumed design. If the measured site data falls within the initially assumed values

only modest design changes are required. If the measured site values fall outside the initially assumed values more extensive design changes may be required to continue to meet the overall repository performance requirements."

In Section 7.2 of the AO, replace the fourth sentence of the first paragraph with the following:

"Preliminary numerical values for the performance goals and design criteria for the waste package system will be provided to assure that the waste package as a whole meets the overall regulatory requirements. As the design evolves, these goals will be subdivided to the component level and will evolve into system and component requirements."

<sup>Section</sup>  
Revise 8.3.5.2 as indicated on the following page

Comment 7: Performance Allocation

*Additionally,*

1. ~~We propose that the following footnote be added to 8.3.5.2:~~

Revision: Add to the text in 8.3.5.2 the following: ... describe the performance goals\* for the system ...

- \* Preliminary performance goals will be provided in the SCP.

NOTE: [After considerable discussion we conclude that your concerns about performance allocation are with respect to postclosure performance.]

2. With the proposed footnote we propose that no change would be necessary in Sections 6.3.8 and 7.2.

Additional NRC Comment:  
discuss in

The responses to NRC comments regarding the need to specify in the SCP how DOE intends to allocate performance among subsystems and components of the repository system ~~is~~ ~~the~~ potentially ~~address~~ ~~staff~~ comments. ~~The~~ If ~~it~~ by ~~the~~ "repository systems" in the proposed paragraph insert to AD section 6.3.8 means such things as the following, the DOE response would be

acceptable (illustrative only):

Engineered System

waste form  
waste container  
packaging  
backfill

Natural System

hydrologic system  
geochemical system  
"near-field" &  
"far-field" &

(Note DOE has <sup>shown how the</sup> been ~~lead~~ <sup>robust</sup> ~~broken~~ <sup>broken</sup> down. The important thing is that the "breakdown" carries the findings that must be made on 10CFR60 performance objectives)

~~It was agreed that~~ interaction at an early

Time is essential in reaching agreement on what "breakdowns" might be most appropriate

Comment: 8, Section 8.3.5.2

Section 8.3.5.2 This Section of the AO is to contain plans (or the approach) for assigning and assessing various subsystem and component performance goals. The actual tentative goals should also be presented. Further, as requested in Reg. Guide 4.17 Section 8.1, the relationship between the site characterization program and the system performance requirements should be described. That is, there should be a description of how the testing will be used to assure that the performance goals will be met.

Discussion: The DOE agrees with the NRC comment.

Revision: In Section 8.3 of the AO, first paragraph, the following sentence is added immediately after the second sentence:

"The relationship between the site characterization program and the system performance/design goals will be described. (System performance/design goals are defined in Section 8.3.5)."

Comment: 9, Section 8.3.5.3

Section 8.3.5.3 The words "guidelines on" should be replaced with "NRC performance objectives for".

Discussion: DOE agrees with the NRC comment.

Revision: In Section 8.3.5.3, the words "guidelines on" will be changed to "NRC performance objectives for." Additionally the title of the section will be changed to "Plans for Demonstrating Compliance with EPA Standards, NRC Preclosure and Postclosure Performance Objectives, and DOE Siting Guidelines;" to be consistent with the content of the section.

Comment: 10, Section 7.4

Section 7.4 The title of Section 7.4 should be changed to "Waste Package and Near-Field Geochemistry Research and Development Status" to reflect the inclusion in this section of some geochemistry information requested by Chapter 4 of Reg. Guide 4.17.

Discussion: DOE concurs in NRC suggestion to change the title of section 7.4.

Revision: The revised title will be "Research and Development Status-Waste Package Design and Geochemical Interactions."

Comment: 11, Section 7.4

Section 7.4 The correlation between the Reg. Guide and the AO indicates that several topics covered in Reg. Guide Section 4.2 will be covered in Section 7.4 of the AO. However, important details from Reg. Guide section 4.2 do not appear in AO Section 7.4. Thus the contents of Section 7.4 are not adequate to assure that information on near-field geochemistry specified in R. G. 4.17 will be present in either Section 4.2 or Section 7.4 of the AO. A format for Chapter 7 like the one used in Section 4.1 would help assure that the information requested will be provided.

Discussion: DOE agrees that the draft outline did not adequately reference the location of material removed from section 4.2. Geochemistry of the engineered barrier components are covered in the following sections:

Backfill - Section 6.3.3

Seals - Section 6.3.5

Waste Package/Emplacement Environment - Chapter 7

Planned Tests and Assessments - Chapter 8

The text in these section should be modified to reflect these changes.

DOE believes that the information requested in R G 4.17, Section 4.2 is contained in Outline as follows:

RG 4.17 Text

Location in AO

Chemical composition and form of the waste,	7.3.1
Solubility of the waste form in ground water under varying anticipated environmental conditions (e.g. temperature, oxidation states)	7.4
Species released by the leaching of the waste form under anticipated conditions.	7.4
Describe anticipated chemical and mineralogical composition of any barriers,	7.3.1, 6.3.3, 6.3.5
Solubility of these barriers under varying anticipated physico-chemical conditions,	7.4, 6.3.3, 6.3.5
Any changes in speciation imposed on radionuclides released from the waste, and	7.2, 7.4
Speciation of wastes crossing the engineered barrier/natural geological systems boundary	4.1.3.4 - far field 7.4 Waste package domain 8.3.1.4 tests and studies 8.3.4.5, 8.3.5 - modeling and PA
Describe anticipated ... on the radionuclide migration	4.2, 4.1.3.6, 4.1.3.7, 4.1.3.8

The DOE feels that the purpose of Chapter 7 is to integrate physical and geochemical processes in the design effort. The DOE feels that using a format similar to section 4.1 in the AO would over emphasize the geochemical aspects of the waste package R&D program.

Revision: The AO will be modified in response to the first part of this comment according to the following:

In Section 4.2, replace the second sentence with the following:

"Discussions of the interactions within the engineered barrier system will be presented in Chapter 6 (Backfill and Seals) and in Chapter 7 (Waste Package)."

In Section 6.3.3, in the last sentence, replace the words "and the nature of the backfill," with "on the" and delete the words "in Chapter 4 - GEOCHEMISTRY,".

In Section 6.3.5, add the following sentence immediately after the first sentence:

"The geochemical characteristics of the seal material will be described, as well as the anticipated chemical interactions among the seal materials, ground water, host rock and backfill, under assumed emplacement conditions."

In Section 7.1, add the words "including the host rock immediately adjacent to the waste package" to the end of the first sentence.

In Section 7.3.1, in the second bulleted item, add the word "chemical" before the word "compositions."

Comment: 12, Section 8.6.4.1

Section 8.6.4.1 This section of the AO currently states that only "general descriptions of the procedures" for QA during site exploration will be presented. R. G. 4.17 requires that detailed QA administrative procedures be referenced. It appears that DOE does not intend to reference these procedures as they apply to site exploration.

Since qualification of data collected during site exploration which will also be utilized in licensing is an important area, (see staff comments on the Mission Plan dated 7/31/84). Objection #1), detailed procedures for this process should be referenced.

Discussion: The comment identifies the need for detailed QA Administrative Procedures. These procedures, which are specified in the NRC QA Review Plan, refer to those procedures required by 10 CFR 50 Appendix B. Subpart G of 10 CFR Part 60 requires DOE to implement Appendix B <sup>beginning with</sup> ~~only for site~~ characterization activities. Subpart G does not specify that an Appendix B approach to QA is required for site screening activities. In several instances, prior to Site characterization, the administrative procedures required by Appendix B are not available. This does not mean that the data is not quality data or that it cannot be demonstrated that it is quality data. Rather, it does mean that the administrative QA paper trail may not be available for data collected prior to site characterization since Appendix B QA was not required. DOE interpreted Regulatory Guide 4.17 as acknowledging this point but also requested DOE to identify the QA procedures (both technical and administrative) that were in place when the data was collected.

✓

DOE will identify this type of information in Section 8.6.4.1 of the SCP. DOE realizes that if pre-site characterization data is used in a license application, the burden of proof in demonstrating that this type of data is of adequate quality rests with DOE.

Revision: Add "describe and reference" in first sentence of Section 8.6.4.1.

*Also delete "general" in the second sentence.*

Comment: 13, Section 8.6.6. ✓

Section 8.6.6 The AO currently addresses only 16 of the 18 QA criteria<sup>A</sup> in Appendix B of Part 50 and states that only the QA procedures for these areas will be described. The other two areas ("Organization" and "QA Program") from Appendix B should also be addressed.

Discussion: QA criteria 1 and 2 (Organization and QA Program) have been covered in Section 8.6.1, 8.6.2, and 8.6.3.

Revision: Revise second sentence of 8.6.6 as follows: "Since two of the 18 criteria of Appendix B have been previously covered, the remaining sixteen criteria will be <sup>discussed in this section. These include:</sup> considered."

Comment: 14, Section 8.6.4.3

Furthermore, the AO is unclear as to whether design QA will be addressed in detail in the SCP, as required by R. G. 4.17. Statements are made that detailed QA "during site characterization" will be defined, but it is not clear that design activities will be covered.

Discussion: Section 8.6.4.3 does discuss QA related to design.

Revision: Delete "general" in 1st sentence. If necessary add sentence "This section will describe how the QA criteria III (Design Criteria) will be implemented in the design process."

Comment: 15, Section 8.6.2

Section 8.6.2 In the AO, reference is made to ANSI/ASME NQA-1-1983 as a "regulatory requirement." This consensus standard has not been endorsed by the NRC as yet and should be deleted. Furthermore, it is undergoing modification by the ASME for use in the repository program.

Discussion: NQA-1 will not be used as a regulatory requirement. It will be used as a reference document.

Revision: Delete "regulatory" in heading and first sentence of Section 8.6.2.

Comment 16: Listing of Contractors (why deleted from the Introduction to the Associated Division

Discussion:

The lists of contractors beyond the prime contractors may change frequently, and it is therefore not practical to list all in the SCP. This information will be made available to NRC through their onsite representatives upon request. All subcontractors will be subject to the prime contractor QA program and, as appropriate, subject to audit.

Revision: None

Comment 17: Use of the Word "Definitive"

The word "definitive" was removed from the AO text because members of the working group felt that it would not be appropriate to classify the level of detail of all test plans as definitive. It is certainly recognized that the descriptions of the test programs must be explicit and detailed. However, it is also recognized (also in Reg. Guide 4.17) that all test plans and procedures will not be complete at the time of submittal of the SCP.

The word "definitive" is acceptable if it is intended to : (1) connote explicit descriptions of test procedures, suitable for prelicensing consultation between DOE and NRC; and (2) recognize the maturation processes of a phased approach to testing which reflects and responds to the results of ongoing system performance assessments (R.G. 4.17 p. 49, 50).

*Kenney: Add the word "definitive" and its definition to the AO (as given above in the discussion) to p. xiv, paragraph 3.*

Agree Comment: 18 - Additional guidance for Subsections of Section 8.3

Revisits: 56, 57, 59, 60

In Section 8.3, on pp. 56, 57, 59, and 60, add the following bullets

- limitations and uncertainties of test methods and data analysis
- representativeness, precision, and accuracy of proposed test methods and data analysis
- significant options or alternative test methods and data analyses to those proposed

These three bullets would be added to 8.3.1, 8.3.2 and 8.3.3, and 8.3.4 after existing first 3 bullets and before "in addition, discussion of Insitu tests will include:"

MEETING ATTENDEES

FEB. 12, 1985

<u>Name</u>	<u>Organization</u>	<u>Telephone</u>
Donald H. Alexander	DOE/HQ	252-1238
Carol L. Haulon	DOE/HQ	852-1224
Jeff Nelson	Weston	963-6800
CHARLES HEAD	DOE/RW-23	252-5625
Ralph Stein	DOE/HQ	252-5355
Tom Billieul	DOE-SRPO	976-5916
Jay Rhoderick	DOE-HQ	252-1462
Tim Meera	DOE-BWIP	FTS 444-5038
UEL S CLANTON	DOE-NNWSI	FTS 575-1589
Robert E. Jackson	WESTON	963-5211
Michael Revelli	NNWSI/LEUL	FTS 532-1982
Aldred L. Stevens	NNWSI/SNL	FTS 844-8273
Leo Scully	NNWSI/SNL	FTS 844-1849
R.W. KLINGENSMITH	BATTELLE-ONWI	614 424-7478 FTS 976-7478
M.O. Voegelé	NNWSI/SAIC	702-395-1460 FTS 575-1460
S.M. Coplan	NRC; WM	427-4728
H.J. MILLER	NRC	927 4177
F.P. Regnier	NRC	927 9781
James R Wolf	NAC/OELD	492-8694
Marc Rhodes	NRC	427-4491

Attendees

MRC / DOE Meeting

February 13, 1985

Jeff Kimball	WESTON	301-963-5232
Martha Penleton	WESTON	301-963-5217
Elaine Strass	WESTON	301-963-5200
Steve E. Ferguson	DOE	202-252-6947
J. Harvey Dove	PNL	FTS 444-8308
Ron Helgeson	ONWI	614 424-4494
Ken Cyscinski	WESTON	301-963-52
John Kovacs	DOE-BWIP	444-1291
Glen L. Faulkner	USGS / DOE HQ 13	(202) 252-1464
Ed Benz	WESTON	301-963-6855
DAN YOUNGBERG	DOE	202-252-1063
Carol Boynton	DOE	252-4600
Juan Nieto	NUS/(SRPO)	614-424-5916
SCOTT HINSCHBERGER	DOE/CPO	312-972-2143
Ray Polletier	DOE/PE	252-4610
Steve Frank	DOE/OEC	202/252-1979
Carole Curnin	DOE	202/252-6947
Allan Jelacic	DOE/HQ	202-252-9362
Mark Jui	DOE	202-252-9320
David Siefken	WESTON	301-963-6817
Carl Cooley	DOE	202-252-1239
ROBERT S. WELCENGA	BWIP	FTS 444-6620