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NUCLEAR REGULATORY COMMISSION  
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April 7, 1986  
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Hildenbrand

MEMORANDUM: Robert E. Browning, Director  
Division of Waste Management

FROM: F. Robert Cook, Senior On-Site Licensing  
Representative, Basalt Waste Isolation  
Project (BWIP)

SUBJECT: OBSERVATIONS, COMMENTS AND RECOMMENDATIONS  
FOR THE PERIOD FEBRUARY 22, THROUGH MARCH 28,  
1986

TECHNICAL ITEMS

1. Waste Package--

a. DOE requested information from RHO concerning completion of various prerequisite for work on waste package research and development, as well as other areas of design for a repository, per a letter to the General Manager, RHO, from O. L. Olson, Attachment A. The letter addresses new work and ongoing work. I will report on the outcome of RHO's evaluations, their recommendations and DOE's actions in my next report, if DOE makes this information available to me.

b. A review of the BWIP waste package activities for DOE/RL and the SRPD was scheduled for the Week of March 30, 1985 in conjunction with a similar review of SRPD waste package activities. T. Verma and I expect to attend the review sessions. I will report on the results in my next report.

2. Repository Engineering--

a. I attended the 90% design review of the advanced conceptual repository design noted in my February 28, 1986 memorandum. View graphs provided to me during this review were forwarded to the Staff, Greeves/Buckley by separate correspondence.

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b. The most significant aspect of this design review was the results of a sensitivity analysis identifying the importance of the in-situ stress level to the design. The study indicated that a 10% increase in horizontal stress at depth or a 10% decrease in rock strength results in a 38% increase in waste package spacing. On the other hand a 10% decrease in stress or a 10% increase in strength translates into a 19% decrease in spacing.

The changes in spacing effect corresponding volume changes in the repository itself. The cost associated with the volume increase or reduction is great. It appears obvious to me that in-situ stress is a key parameter required to make design and siting decisions. This conclusion was emphasized to me in a discussion with the former BWIP Director, E. Ash, just prior to his retirement in August of last year. This issue was discussed in a RHO letter to DOE recommending additional testing in September and again in another recent letter requesting action on the first letter.

To date it is not clear to me that siting decisions have adequately and objectively considered this parameter and it appears that DOE has in effect tabled the resolution of the issue considering their inaction on the RHO proposals.

Based on knowledge of discing and spalling, both qualitatively indicative of high stresses, and stresses deduced from hydro-fracturing tests, I believe the present location of the RRL is undesirable compared to locations further away from the Cold Creek Syncline axis and the fault which is associated with the hydraulic barrier to the West. Maps which have been prepared by the RHO staff indicating "isostress" contours in various basalt flows based on discing and spalling in cores and boreholes respectively clearly suggest the influence of the geologic structural discontinuities--structures--noted above on the stress pattern.

It is my conclusion that Staff should carefully evaluate the justification for siting the RRL where it is in light of the stress situation noted above in conjunction with review of the final EA's and the site recommendations, if the BWIP site is recommended for characterization.

Pertinent documents dealing with the in-situ stress conditions and RHO recommendations are RHO-BWI-ST-73, RHO Change Requests 528 and 529 of September 23, 1985 and RHO letter Fitch to Olson recently issued requesting action on the two change requests. In addition draft maps referred to above are pertinent, although it is doubtful that DOE would release these items to me.

### 3. Geology--

a. Seismic events continued to occur in the area south of the RRL, at the location reported in my memorandum of February 28, 1986. The events were reported to be shallow.

b. B. Hurley of DOE's Geosciences Group informed me that he plans to leave DOE and go to work for SAI in Las Vegas.

### 4. Performance Assessment--

a. The manager of the performance assessment group for RHD, Bob Baca, has been transferred to a defense activity in RHD and will no longer work on BWIP.

### 5. Geochemistry--

a. I have reviewed activities to determine whether or not any investigations address the geochemistry of selenium. I do not believe that BWIP is assessing the hazards of selenium. However, various isotopes of selenium are produced in the fission process in significant quantities--similar to the quantities of Kr-85 produced. Selenium is not only a hazardous metal, it also presents a relative long half life in the isotope, Se-79. Selenium may have properties similar to S in the geochemical environment and may be relatively mobile.

If staff has not investigated the importance of this element, it may warrant review.

### 6. Site/Environmental--

a. DOE/RL's defense waste DEIS was recently issued and includes environmental information pertinent to the BWIP site. Its review by staff is recommended. It does not appear that the information concerning contamination of confined aquifers, for example data concerning I-129 levels in the confined aquifers, is reported. In addition the recent release of many documents (19,000 pages) pertaining to releases and levels of radio isotopes does not contain all the information the Staff previously requested concerning levels of radio isotopes in the ground water, on and off the reservation. A list of the documents making up the 19,000 pages was forwarded separately to Staff for their information.

b. The states of Oregon, Washington and the affected Indian tribes have organized a panel to manage the review of the information contained in the recently released documents, noted above. It is expected that it will take a year to review the content of these documents. The review should indicate whether or not releases from Hanford over the years caused degradation of the public health. The review will create a group expert in the radiological environment around Hanford. It would appear prudent

for staff to stay abreast of this review and learn from their activities.

#### 7. Hydrology--

a. RHO has instituted reverse circulation drilling procedures at DC-23 using water as the drilling fluid. The speed of the drilling is significantly increased because of the higher loads on the bits when compared to loads using drilling mud.

b. Procedural control of the operations during hydrologic drilling and testing, including hydrochemical sampling, is gradually becoming a reality as a result of the combined efforts of the RHO Drilling and Testing Group and the Site Analysis Group.

#### B. Quality Assurance--

a. Activities in the area of QA have drastically increases in the last two months at DOE and the contractors. There are 18 new contractor personnel working directly for DOE under P. Saget, the new manager for DOE/BWIP QA. He reports to the manager BWIP (Olson) which in my opinion does not provide the independence required by 10CFR50 appendix B for the QA organization.

b. During the Week of March 23, 1986 the DOE QA contractor, (MAC) conducted an audit of RHO's auditing program. The audit was observed by D. Hedges and myself. The DOE QA group headed by Saget was very open during this audit and greatly facilitated OR observations. Although the MAC audit team attempted to accomplish a sound audit, it was hampered by not being familiar with the BWIP audit procedures and project personnel performing audit functions. In addition the MAC auditors seemed to audit to NQA-1 requirements instead of the requirements of Appendix B as it applies to repository QA. An example was MAC's review of raw data taken by RHO auditors in performing their audits. There appeared to be no attempt to confirm that raw data supported final audit report findings, and that the raw data appeared credible.

The definition of records considered appropriate by the MAC auditors did not include notes of observations taken on standard forms filled out during the audit per procedure. Such raw data did not appear necessary to MAC personnel to establish credibility of the audit process for future review during licensing. This belief, consequently, limited the raw data from RHO audits that they reviewed to verify audit findings' credibility.

I conclude that the Staff should prepare a comprehensive definition of the term RECORD and include it in the glossary of terms used in the staff technical positions and the QA review

plan. Such a definition is key to the preparation of procedures which typically identify records that must be retained. I consider many of the procedures currently being invoked by BWIP are inadequate in this respect in that they do not require the retention of raw data records.

I consider that the scope of the definition in 10CFR2.4 for NRC records should be incorporated into any prepared definition and that the purpose of the records be contained in the definition. It should be made clear that records and their retention are needed to establish the credibility of all activities, the quality of which can be subject to review during licensing. In particular raw data concerning decision making during design is important to keep.

Such a definition is also needed to establish the scope of the information to be made available for OR review per the agreements of Appendix 7.

#### MISCELLANEOUS ITEMS

1. In reviewing the definitions recommended in my report of February 28, 1986, I noted a significant mistake in the definition I provided for the term DESIGN. In the part of the definition covering the use of DESIGN as a verb I left out acts which produce research and development data. The definition should be as follows:

The term DESIGN means (1) specifications, plans, drawings, blueprints, and other items of like nature; (2) the information contained therein; or (3) the research and development data pertinent to the information contained therein. When used with reference to an activity or as a verb, DESIGN means, respectively, the activity or act itself as inferred from the context, involved in producing information listed under (1), (2) and (3) herein.

As can be seen from the discussions accompanying the definitions in my February memo, It was my intent to include research and development within the context of the term design.

b. DOE issued a letter, dated March 27, 1986 to RHO formally notifying RHO (and subcontractors via RHO) to comply with Appendix 7 DOE/NRC agreements concerning the On-Site Representatives activities. This letter is Attachment B to this memorandum. Comments which DOE has included in the letter to RHO significantly alter the agreements which were intended by the signers of Appendix 7, based on the language in Appendix 7 and my understanding of the NRC's intent.

My comments on the DOE letter are contained in Attachment C to this memorandum and are in way of justifying the conclusion noted above.

*F. Robert Cook*

F. Robert Cook, Senior  
On-Site Licensing  
Representative, Basalt  
Waste Isolation Project  
(BWIP)

Attachments A, B and C as stated.

cf:  
JOBunting  
JJLinehan  
MRKnapp  
JMHoffman  
JTGreeves  
PHildenbrand  
PTPrestholt  
TRVerma  
FRCook  
OLOlson

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ATTACHMENT A



Department of Energy

Richland Operations Office  
P.O. Box 550  
Richland, Washington 99352

MAR 14 1986

General Manager  
Rockwell Hanford Operations  
Richland, Washington

Dear Sir:

BWIP WORK EVALUATION

BWIP has been an ongoing program since 1976. Until recently, the program has operated under a research and development environment with management processes and procedures consistent with such activities. The project is currently undergoing a transition to management processes and procedures consistent with the acquisition of a major DOE project and one that satisfies the requirements of the Nuclear Waste Policy Act (NWPA) and NRC requirements for establishing a licensing basis for a repository facility. Much of the ongoing or planned project work is intended to support site characterization as defined by the NWPA and an NRC license application if the site is selected for a repository. Therefore, to minimize our programmatic risk, it is imperative that the appropriate management and technical prerequisites are in place for the conduct of these activities. These prerequisites include such considerations as management and technical procedures to control the work; quality assurance programs and requirements to control the work; approved requirements traceable to project needs with appropriate performance allocation; personnel training and qualification; and equipment/facility records, checkout, qualification, and certification.

To assure that project work is being conducted with the proper controls and prerequisites, Rockwell is requested to assess the project's ongoing work, both engineering and testing, and work planned to be initiated this fiscal year relative to the status of controls and prerequisites. Additionally, based on this assessment, Rockwell is requested to recommend whether the work should be continued or stopped and the basis for the recommendation.

The requested assessment and recommendation should be completed within two weeks of receipt of this letter. New work is not to be initiated without my approval prior to our concurrence with your assessment and recommendations

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discussed above. These actions have been discussed with Larry Fitch, Rockwell BWIP Project Director, and I understand that the actions have been initiated.

If there are any questions relative to this direction, or if we can be of assistance in its implementation, please contact me.

Very truly yours,

ORIGINAL SIGNED BY  
O. L. OLSON

O. L. Olson, Director  
Basalt Waste Isolation Division

BWI:OLO

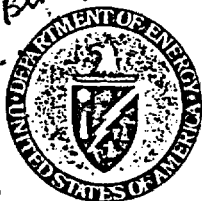
cc: L. R. Fitch, Rockwell

bcc: R. Stein, HQ  
BWI Record Cy  
BWI Rdg File  
RP Saget  
RE Rasmussen, AMO  
AMC Rdg File

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Charge	BWI	BWI	BWI	BWI	AMO/OPO	AMC	BWI
-7334	Olson:mbv	Higgins	Saget Mecca	Dahlem Nicolli	Rasmussen	Anttonen	Olson
SURNAME	Olson:mbv	Higgins	Saget Mecca	Dahlem Nicolli	Rasmussen	Anttonen	Olson
DATE	3/12/86	3/13/86	3/12/86	3/12/86	3/13/86	3/13	



**Department of Energy**

Richland Operations Office  
P.O. Box 550  
Richland, Washington 99352

MAR 27 1986

General Manager  
Rockwell Hanford Operations  
Richland, Washington

Dear Sir:

AGREEMENTS BETWEEN THE NUCLEAR REGULATORY COMMISSION (NRC) AND DOE (PROCEDURAL AGREEMENT, SITE-SPECIFIC PROCEDURAL AGREEMENT AND APPENDICES THERETO)

Recent discussions with the NRC Onsite Representative (OR), and Rockwell-BWIP have indicated that some clarification and guidance is in order regarding the above noted agreements.

The agreements made with the NRC, as noted above, are two: (1) A Procedural Agreement dated June 29, 1983, and (2) a Site-Specific Procedural Agreement dated September 18, 1984, and amended on June 14, 1985. Both are enclosed for your files and use.

The Site-Specific Procedural Agreement contains several appendices which from time to time may be amended or added to as the need arises. The attached Appendix 7 represents just such an amendment and concerns the activities and working relationship of the OR mentioned above. The intent of this letter is to provide you guidance in dealing with that appendix.

Appendix 7 has been negotiated and written to provide the OR as much access as is practical during the site investigation and characterization phase of the project, so that he can better perform his role as information facilitator and identify early any concerns that could relate to licensing issues. He is not chartered to generate or create independent official NRC positions or questions which would necessitate added technical work or impact program direction. All formal positions or questions must be originated through the NRC Project office directly to DOE, and in no case to contractors or sub-contractors directly.

Personnel assigned to the OR office have in the immediate past provided DOE some concern. The original intent of this sentence in the introduction to the appendix was to recognize that the work load in the OR's office might call for some additional assistance, or even interim assistance of specific technical nature when specific long term activities are taking place. Such activities might be the sinking of the shaft, activities associated with the Large Scale Pump test and possibly others. In those cases, it might be in the best interests of all concerned to have specific technical representation witness such activities. The intent of the wording was not for the purpose of circumventing specific requests for data reviews or to provide uncontrolled access to repository facilities as the NRC desired for their own purpose or

length of time. The addition of personnel to the OR's office should be for a specific purpose, and should only take place after notice and discussion with DOE.

In regard to the points 1 through 9 of the Appendix we have the following guidance to offer:

- (1) Item 1: The meetings paragraph was written to be as loose as possible, allowing the OR to attend as many technical meetings as he deems necessary to perform his duties; however, he does require Project permission to attend. It is also recognized that DOE and its contractors do require some closed sessions to deal appropriately with management problems, specific program strategies and possibly other problem areas. The OR can and does have the right to appeal those closed sessions he believes he should have access to through the BWI Division Director.
- (2) Item 2: Communications with project personnel was written with the understanding that interaction and discussion with the personnel is vital to the performance of the OR function. As indicated in Item 2, the contacts with project personnel should be for a reason and cleared with DOE or Rockwell supervisory staff. The OR should pursue his interviews in a highly professional manner and not interfere with project work or disrupt the normal duties of personnel. In this regard the OR is a visitor or guest who should be cooperated with to the fullest extent. On the other hand, the intent of this paragraph is not to provide free run of the facilities and hallways. He is not to remain in the facilities after hours alone unless invited to a meeting or for other similar good reason; also, he is not to possess keys to the facilities or laboratories.
- (3) Item 3: This paragraph deals with access to documentation as does the Procedural Agreement. The access to Quality Assurance (QA) assured and cleared data is for the most part reasonably well spelled out and deserves no added comment. It is to be remembered that the providing of, or release of, draft material of reports containing analysis of data, analysis of experimental results, special studies, and the like to the OR, either from the prime contractor, subcomponent technical disciplines or subcontractors not technically reviewed by the prime contractor and concurred in by DOE will not be released. DOE will if necessary, concur to provide complete review records of specifically requested documentation if requested after the formal release. It is acknowledged that the OR can review certain documents without copying or the retention thereof.
- (4) Item 4: This paragraph also relates directly to documentation, but of a regulatory or licensing nature. The drafts of these documents cannot be made available except by DOE itself.

MAR 27 1986

- (5) Item 5: This paragraph of the appendix is self explanatory. It is a statement for the record to emphasize that the OR excercises no managerial role over DOE or its contractors.
- (6) Item 6: This paragraph of the appendix is self explanatory and requires no clarification.
- (7) Item 7: This paragraph again as Item 2 relates to facility access. This item should be reviewed carefully. The paragraph does not allow the OR unannounced access to controlled facilities. Tours of all controlled facilities must be conducted by BWI Division. In carrying out discussions with personnel, as well as scheduling visits, the guidelines of Item 2 should be adhered to and observed by the OR.
- (8) Item 8: This paragraph indicates that the OR should make at least weekly contact with the local DOE office. The contents of this item require no clarification
- (9) Item 9: This paragraph deals with the distribution of Appendix 7 to all contractors and subcontractors which may have a reason to visit or deal with the OR.

In keeping with Item 9 above, you are hereby requested to distribute all of the enclosed NRC/DOE agreements to all appropriate Rockwell-BWIP managers, as well as other prime and subcontractors under your direction. This letter of clarification and guidance can also accompany those enclosures.

If there is a need to amend any of the agreements, the amendments will be forwarded to you for the same distribution. If there are any other clarifications regarding these documents and their appendices, please contact Mr. J. E. Mecca, Chief of Licensing, Environmental and Safety Branch at (509)376-5038, immediately.

Very truly yours,

**ORIGINAL SIGNED BY**

O. L. Olson, Director  
Basalt Waste Isolation Branch

BWI:JEM

Enclosures

cc w/encl:

L. R. Fitch, Rockwell

J. P. Knight, DOE-HQ

~~F. R. Cook, NRC-OR~~

ATTACHMENT C:

F. R. COOK'S COMMENTS ON DOE/RL'S LETTER TO RHO CONCERNING  
APPENDIX 7 AGREEMENTS

1. Page 1, P 4--The paragraph indicates that the OR is not chartered to generate "official" questions which would necessitate added technical work or impact program direction. The paragraph puts the creation of "official NRC positions" in the same category as "official NRC questions." I conclude that questions which the OR's may ask are within the scope of the agreement in Appendix 7, and, insofar as they are associated with concerns relating to potential licensing issues, are appropriate. I am not certain of what constitutes an "official NRC question". I do understand official requests for information or evaluations which are needed in NRC Staff's opinion to resolve issues (which may be phrased as questions) during licensing proceedings.

In summary, if DOE means by "official question", "Potential licensing issue documented in writing from NRC staff" I have no disagreement. This is consistent with the provision 5 of Appendix 7. However, it should be understood by DOE that all OR questions, even if they constitute concerns relating to potential licensing issues, and even if they would identify a valid need for work and impact direction, are informal and entirely appropriate for the OR to ask.

A good example of such a question is the one I raised concerning the design justifying the location of the repository considering in-situ stresses in the basalt horizon being considered. (See the discussion contained in the base report for this attachment under item (2), REPOSITORY.) I suspect that DOE's ambiguous reference to "recent discussions" in the first paragraph of their letter on Appendix 7 (Attachment B) refers to the questions I have asked related to this concern.

2. Page 1, P 5--This paragraph incorrectly attempts to delimit the scope of OR Office activities outlined in Appendix 7 by prescribing a limit on the NRC manpower to be assigned to the Office to carry out the Staff's goal of obtaining current information regarding site investigations. (This goal is consistent with the intent to expedite the identification of potential licensing issues and, hence, the licensing process itself.) Specifically, DOE suggests that only "long term activities" call for additional manpower assignments. I consider many of the ongoing activities are not adequately reviewed by the OR alone, given the extent of these activities. Activity and data reviews from time-to-time are appropriate and in my opinion are best determined by NRC management considering available funds and manpower.

The suggestion that "data reviews" are outside the scope of the activities covered by Appendix 7 and require "requests", apparently from NRC headquarters staff, is a position of DOE/RL's which is not supported by any provisions in the Site-Specific Procedural Agreements, except Appendix 7 itself. (See item 2 of Appendix 7 for timing for notification of areas to be reviewed.) It is the OR's intent to comply with these Appendix 7 provisions for staff personnel assigned to the site for all of the areas they review, including those which may have been specifically planned prior to their assignment. Insofar as such notification entails discussion with DOE, discussion suggested in \_ 5 is consistent with the Appendix 7 agreement.

Considering needs for security clearances DOE would routinely be informed of pending additions to the OR office when necessary 277 forms are forwarded to DOE. This should constitute adequate notice.

3. Page 2, P 1, item (2)--This item addresses access to facilities which is not the subject of item (2) of Appendix 7. Item 7 of Appendix 7 provides for access to facilities. The directions provided by DOE in item 2 of their letter defeat the intent of item 7 of Appendix 7 to provide access subject to the control measures for security, radiological protection and personnel safety. Specifically, the denial of keys to various facilities where most of the RHO personnel work (such keys have been provided heretofore) is inconsistent with the spirit and intent of the Appendix 7 agreement.

Based on discussions with DOE (Olson) the objective in restricting access to the facilities is to assure the OR does not view records available in the various facilities without contractor knowledge and supervision, considering some information may be loose, not pertinent to licensing and, hence, would be none of the OR's business. Olson indicated the change in DOE's position to restrict access by denying the necessary keys was agreed to by the DOE/RL management, suggesting it would be fruitless for me to negotiate this moderate operational aggravation at a higher level in DOE.

4. Page 2, P 1, item (3)--DOE has indicated that the OR "can review certain documents", but has not defined what is meant by "certain documents". (Emphasis added.) The words which DOE has added are inconsistent with those in Appendix 7 which apply to records and not documents. My comments on the control of records in the base memorandum for this attachment under the heading QUALITY ASSURANCE is pertinent to this issue. DOE should clarify that all records available to DOE as provided in their contracts with their prime contractors at any stage of completion are to be made available for OR review.

5. Page 3, item 7--DOE has interpreted this item to require notification of a desire to observe activities consistent with

the requirement of item 2 of Appendix 7 to provide notification when discussions and reviews with personnel were accomplished. I consider this is inconsistent with the provisions which allow for unannounced observations of testing and data gathering activities. I also consider the intent of this item is to allow the OR review of records pertinent to the activities.