UNITED STATES
NUCLEAR REGULATORY COMMISSION
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MEMORANDUM FOR: William R. Ott, Section Leader
Facility Performance Section
Waste Management Branch, RES

FROM: Robert Kornasiewicz, Meteorologist
Earth Sciences Branch, RES

SUBJECT: REVIEW OF DOE DRAFT ENVIRONMENTAL ASSESSMENT FOR BWIP (CLIMATOLOGY AND METEOROLOGY)

This review covered the following portions of the Draft Environmental Assessment:

In Chapter 2.0, BACKGROUND SUMMARIES, under Section 2.5 HANFORD ENVIRONMENT,

Subsection 2.5.4, Climatology

In Chapter 3.0, EVALUATION OF STATUATORY REQUIREMENTS, under Section 3.1 SUITABILITY OF THE HANFORD SITE FOR SITE CHARACTERIZATION,

Subsection 3.1.1.1, Performance Before Permanent Closure,
Subsection 3.1.3.2.2, Hydrologic Modeling, and
Subsection 3.1.5.5.3, Meteorology and

under Section 3.4 COMPARATIVE EVALUATION WITH OTHER SITES

Subsection 3.4.4.2, Hydrologic Modeling, and
Subsection 3.4.9.3, Meteorology

The major problem identified in the review is related to the subject of future climatic impacts on the hydrology of the site (Subsections 3.1.3.22, Hydrologic Modeling and Subsection 3.4.9.3, Meteorology).

In Subsection 3.1.3.3.2.2 Hydrologic Modeling, a potential for adverse changes in hydrologic conditions resulting from reasonably foreseeable climatic changes is acknowledged to be a Potentially Adverse Condition. Information previously provided by the applicant in the BWIP SCR indicate that such a potential exists with regard to glaciation.

Although DOE states (on page 3-29) that they intend to add the effects of climatic variation to the current list of plausible scenarios, no information has apparently yet been developed in this area. Since the impact of such an occurrence on the site hydrology could be of major importance, this ommission could seriously compromise the findings of this Assessment.

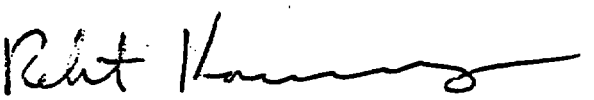
In a related area, in Subsection 3.4.4.2 Hydrologic Modeling the discussion concerning the comparative evaluation with other sites does not contain any information on the potential for changes in hydrology related to climatic changes. No information is provided as to whether the potential for such changes are greater or less than at the Hanford site. Again, this omission could prove to be significant.

The review of the other sections listed above, while not identifying any potentially major problems, nevertheless has uncovered some areas where the Draft Environmental Assessment could be strengthened.

In Subsection 2.5.4, Climatology, the information in Figures 3.1 and 3.2 make it clear that meteorological conditions at the site are not favorable, since the prevailing wind directions under all stability conditions is toward Richland and Pasco. This is not brought out explicitly in the discussion. It is true that the long distance from the site to the population centers, and the low magnitude of any potential releases, serves to mitigate against any significant doses to the population. However, the impression obtained from reading the discussion and then reviewing the Figures is that the discussion is not completed with respect to the prevailing wind directions. It might be better to explicitly state that meteorological dispersion conditions with respect to prevailing winds at the site are unfavorable, but that distances to population centers and low source terms mitigate against unacceptable population doses.

This contention would also be strengthened if DOE had already performed the quantitative evaluation of the combined effects the releases from the Hanford facilities and the projected releases from the BWIP facility rather than just stating that the effects are expected to be below the EPA limits. At present, DOE apparently does not have the data to demonstrate that the releases will not exceed the EPA guideline, either for the repository alone or from the combined releases from the Hanford facilities.

Subsection 3.4.9.3, Meteorology, addresses severe weather conditions such as lightning, convective storms, high precipitation rates, and sustained high-wind speeds in addition to tornadoes, while Subsection 3.3.3.5.5.3 Meteorology is silent on the occurrence of these phenomena at the Hanford site, although it is stated in the following section that such occurrences will be considered for the design and operating bases. Similarly, the occurrence of dust storms and information on prevailing wind directions and dispersion conditions are presented in Subsections 2.5.4, Climatology and 3.1.3.5.5.3, Meteorology but not in Subsection 3.4.9.3, Meteorology in the Comparative Evaluation with Other Sites. The information presented should be consistent in all these subsections.



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Comments from Don Alexander on BWIP EA 3/25/83

The following provides comments on section 3.1.3.2 Geohydrology and 3.1.3.3 Geochemistry.

General Observation: Results reported in this document are often not consistent with those reported in the BWIP SCR.

Section 3.1.3.2.1: Methods for establishing the past groundwater environment should include isotopic studies and fluid inclusion studies. The fluid inclusion studies of fracture filling materials may provide direct evidence of past groundwater environments and groundwater evolution.

Section 3.1.3.3.1: The ranges of pH and Eh data provided in the EA, Table 3-2, are not in agreement with data provided in the SCR. Reported Eh values (measured) in the SCR range from -0.22v to +0.21v as compared to -0.45 in the EA. Reported pH values in the SCR range from 8.8 to 10.6 as compared to 9.5 + .05 in the EA. These values need to be accurately determined since the results of both solubility and sorption data will vary by orders of magnitude over these ranges of Eh and pH. Therefore, estimated radionuclide release rates will be highly uncertain.

Section 3.1.3.4.1.1: The volume changes (dehydration/rehydration) in the clay minerals resulting from changes in near field temperatures may have a major deleterious impact on the waste package since such changes could allow an increased flux of fluid or vapor to attack the canister.

Section 3.1.3.4.1.2: Significant long term thermal-mechanical-hydrological-geochemical interactions may significantly affect the performance of the system. For example, considerable dissolution of silica may be anticipated in the near field (based on RHO data SCR) thus increasing near field flow rates. Increased flow rates could adversely affect waste package performance and increase the flux of nuclides to the accessible environment.

Comments from Clark Prichard on WBIP EA 3/25/83

Page 3-49 and 3-50

o 3.1.3.5.4.1.1 Natural Resources

The conclusion that no mineral or other natural resources which might lead to future mining seems a bit premature. The fact that Shell oil considers prospects for gas to be good enough to warrant exploratory drilling seems to indicate otherwise.

Page 3-59 and 3-60

o 3.1.3.5.6.2 Transportation

Despite a statement here that, "the cost... of transporting radioactive waste... shall be considered..." the conclusion on page 3-60 doesn't mention cost but concentrates on risk.

Page 3-94 Socioeconomic Effects and Page 3-120 Regional and Local Impact

o The discussion in these sections is good. Very complete

Comments from Tom Schmitt on BWIP EA 3/25/83

I have only reviewed the geology and geomechanics aspects. There are two issues that may be "sticky".

Section 3.1.3.4.2

Wrt the Rock Conditions: The rock conditions may be somewhat more severe than implied, particularly we do not know the extent of vertical fractures. The stress levels are high and the directions of stress are not favorable.

Secion 3.1.3.5.1 Faulting and Seismicity and Section 3.1.3.5.3 Uplift Subsidize, and Folding

The tectonic environment is complex. We do not know what is going on there in terms of causitive mechanisms. It is far more complicated than they maintain.