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Hydrogeology • Mineral Resources Waste Management • Geological Engineering • Mine Hydrology

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Mr. Jeff Pohle
Division of Waste Management
Mail Stop 623-SS
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

RE: BWIP

Dear Jeff:

This letter contains the detailed comments we compiled based on the information obtained during the NRC/DOE consultation meeting (December 9-11, 1985) in Richland, Washington.

1) Water level responses to drilling related perturbations (mud and water loss or water removed) demonstrate the feasibility of pursuing hydraulic testing of the site as recommended in STP 1.1, but with the possibility that a very complicated conceptual model will result. The test proposed in the Rocky Coulee flow top, as described in the December, 1985, meeting, is unlikely to shed much light on the complex hydrogeologic characteristics of the site. The water level responses are the effects from drilling activities at boreholes DC-23, RRL-14 and RRL-2B. The characteristics of some of the responses described below are particularly important with respect to the probability of site heterogeneities.

   a) The DC-19C Cohassett flow top responded to DC-23W water losses in the Wanapum. The DC-20C Rocky Coulee and Cohassett flow tops possibly responded to DC-23W water losses in the Wanapum. These water level responses indicate a Wanapum-Grande Ronde interconnection, possibly near DC-23W. This possible interconnection is very important with respect to continued evaluation of the conceptual model of the site as well as numerical modeling.

   b) The magnitude of Wanapum response in DC-19C, -20C and -22C from DC-23W water losses in the Wanapum suggests a rapid transmittal of perturbations in the RRL area.

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c) The Grande Ronde response in DC-20C and -22C to mud losses in the Grande Ronde in RRL-14 and the lack of such response in DC-19C may be indicative of heterogeneities.

d) The magnitude and timing of water level responses in the Umtanum and Cohassett flow tops and the lack of response in the Rocky Coulee flow top in DC-22C from mud losses in RRL-14 suggests relative transmissivity values for these flow tops that are markedly different than proposed for the RRL-2 area in the test plan (RHO-BWI-TP-040).

e) The @15 psi response in the Rocky Coulee flow top in RRL-2C (r=@250 ft) and the @0.8 psi response in this flow top in RRL-2A (r-@500 ft) from drilling with water in this flow top in RRL-2B may indicate heterogeneities in the immediate RRL area.

f) The lack of water level response in the Rocky Coulee flow top in RRL-2A from mud losses in RRL-14 suggests that the RRL-2 area may not be representative of the larger RRL area.

2) The schedule for the Rocky Coulee LHS test, presented as the preferred schedule, includes concurrent drilling activities that have the potential to create perturbations that will make interpretation of test created water level changes difficult or impossible.

3) The period of quiescence in drilling and testing activities initiated in April, 1984, for the establishment of water level baseline data ceased in May, 1985, with activities in RRL-2B and DC-14. The drilling of DC-23W in September through November, 1985, further perturbated the hydrologic system, particularly in the Wanapum.

4) Measurement of effective thickness, as presented in the meeting, is not defensible as state of the art. Consequently effective porosity may not be a state of the art measurement.

5) The test proposed in the Rocky Coulee flow top will not comply with STP 1.1 because the hydraulic conductivity of the flow top may be too low and the proposed length of the test is too short. The results of this proposed test may not be transferrable to other flow tops because most of the other flow tops appear to be more permeable than the Rocky Coulee flow top. The results may not be representative of the other flow tops in the Grande Ronde.

6) Head measurements at the site may not be reliable because of confusion concerning the characteristics of water in the

piezometer tubes. Some of the water is Hanford system water and some is formation water.

7) A criteria should be developed to guide the establishment of an acceptable new pressure/water level trend in the Rocky Coulee flow top after the first tracer injection before the transducer is pulled in the second tracer injection well. In addition RRL-2A and RRL-2C are the only close observation wells to the pumping well RRL-2B. The pulling of the injection apparatus will cause an additional perturbation on the system; furthermore, the transducer replacement operation will produce a 24 hour data gap.

8) The discussion about hydrochemical sampling revealed that the positive displacement pump possibly would be pulled as soon as pumping ceases. This activity would cause a perturbation on the recovery rate of water levels/pressures because of casing storage effects. It would be preferable if the pumping unit is not pulled prior to the termination of data acquisition for water level recovery.

9) The Westbay installation in borehole RRL-14 is providing valuable information about the usefulness of the Westbay equipment for site characterization. The site visit revealed that extended periods of time are required for obtaining pressure profiles in the borehole. Approximately 8 hours are currently required for a complete profile. A significant portion of this time is required for the transducer to reach thermal equilibrium. The transducer requires about 30 minutes to reach thermal equilibrium upon connection to a pressure port and about 20 minutes to reach thermal equilibrium when disconnected from the pressure port. At the current time, the Westbay pressure probe-transducer must be tripped out of the hole and then lowered in the hole before making another pressure profile. The probe cannot be moved up and down between selected pressure ports; the usefulness of the Westbay equipment for multilevel or multiflow top and flow interior monitoring during LHS testing is limited because of these operating procedures. The equipment appears to be very useful for pressure profiling where time constraints do not exist.

Please call if you have any questions concerning our detailed comments.

Sincerely,

Gerry Winter

Gerry V. Winter
Hydrogeologist