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MEMORANDUM FOR: Leo B. Higginbotham, Chief
Low-Level Waste and Uranium
Recovery Projects Branch
Division of Waste Management

FROM: T. L. Johnson
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SUBJECT: MEETING SUMMARY - EROSION PROTECTION WORKGROUP

On July 24, 1985, a meeting of the erosion protection workgroup was held at the URFO office in Denver, Colorado. The purpose of the meeting was to work toward resolution of generic UMTRAP issues related to flooding and erosion protection.

Participants

R. Codell, NRC/WMGT
D. Gillen, NRC/WMLU
T. Johnson, NRC/WMGT
E. Hawkins, NRC/URFO
M. Bone, TAC
B. Keshian, TAC
J. Thiers, RAC

Discussion Items and Agreements Reached

1. Use of PMF for Design of Erosion Protection

The NRC staff further explained and reiterated that the PMF is considered to be an acceptable design basis for meeting the EPA longevity requirement of 1000 years. The NRC staff also explained that the PMF is not a requirement, and that in accordance with EPA standards, lesser floods could be adopted in those cases where the design features required to protect against a PMF were clearly impractical to implement. General guidance for determining an appropriate level of flood protection in such cases was not established, but several methods such as regional flooding analysis and use of statistically-derived floods were discussed as being potentially acceptable, if properly documented. TAC/RAC agreed that the burden of proof for determining the practicality of designing for the PMF and for determining the acceptability of a lesser design flood rests with them, and that in such cases, documentation will be provided for NRC review and approval.

2. Flow Concentrations

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The NRC staff explained that flow concentration resulting primarily from differential settlement continues to be a concern, due to the potential erosion problems and increases in rock size needed to account for this phenomenon. TAC/RAC staff explained that differential settlement and resulting flow concentration could be accounted for by proper construction practices. For each site, TAC/RAC agreed that one of several methods could be used to handle the flow concentration problem:

1) TAC/RAC will do an independent geotechnical analysis to document that differential settlement will be insignificant and will not cause flow concentration to occur.

2) If differential settlement is a potential problem, measures will be taken during construction to prevent future settlement. These measures include surcharge loading, overbuilding, or other techniques to cause settlement to occur prior to the end of construction.

3) If it is determined that construction measures would not be effective, flow concentrations will be considered in the design of the rock cover. A method for determining flow concentration will be developed by the group in the future, using either Dick Codell's draft report as general guidance or some other method acceptable to all members of the group.

3. Rainfall Intensities and Extrapolation of Rainfall Intensities for Short Durations

NRC staff reiterated that the rainfall intensities currently presented in the Hydrometeorological Reports (HMR) applicable to a given region must be used, in lieu of Staff Technical Position WM-8201, and that these rainfall intensities should be extrapolated at least to 5-minute durations. TAC/RAC presented a proposed rainfall duration curve for NRC consideration. NRC staff expressed concerns that the proposed curve did not fit the data well and was probably not acceptable. In order to resolve the problem, NRC staff agreed to hold a meeting with the National Weather Service (authors of the various HMR's) to get their recommendations on how to best extrapolate the published data to shorter durations. The results of the meeting would then be reported to the workgroup as soon as possible.

4. Use of Average Shear Stress for Channel Design

NRC staff indicated that the use of average shear stress for design of channel riprap is not acceptable where there is a large difference in localized shear stresses across the width of channel (such as a V-shaped channel). NRC

indicated that the local velocity should be used to design the rock. TAC/RAC were not sure of the implications of this requirement and requested additional time to conduct further evaluations.

5. Use of Safety Factors Method for Determining Riprap Requirements of Side Slopes

NRC staff expressed concern regarding the large discrepancies in the calculated riprap sizes resulting from use of the Safety Factors Method as opposed to the Stephenson Method. TAC/RAC indicated that they had no problems with using the Safety Factors Method, instead of the Stephenson Method, provided that the CSU flume studies indicated acceptable ways to calculate flow through rock voids.

6. Use of Vegetative Covers

TAC/RAC staff expressed a desire to use a vegetative cover, in lieu of a rock cover, at one or more UMTRAP sites. NRC staff indicated that it may be difficult to prove that a vegetative cover will be self-sustaining for very long time periods and that the embankment slopes at such piles would probably have to be very flat. NRC indicated that careful analysis and consideration must be given to such designs, but that such a design has been, and would be, considered at an UMTRAP site where rock was not readily available. NRC also indicated that such designs should consider other design factors such as the CSU gully erosion studies, maximum permissible soil erosion velocities, the potential for gullying in the site area, the existence of nearby earth slopes at least as steep as the designed slope and the existing vegetation in the site area.

7. Rock Durability

NRC indicated that the tests and methods that have been used in previous UMTRAP designs are generally acceptable, principally because the rock used has been of high quality and durable. For marginal rock which may be encountered in the future, NRC indicated that the CSU methodolgy is generally acceptable for determining minimum acceptable quality and for oversizing such rock. TAC/RAC agreed to review the CSU methods in detail.

8. Dam Failures

NRC expressed concern that dam failures due to flooding need to be considered in the design of UMTRAP projects. TAC/RAC indicated that most large upstream dams are federally-owned and, by law, will be upgraded to either store or pass a PMF. The following agreements were reached:

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1) If the dam will be upgraded to pass a PMF, DOE will make that determination by contacting the owner. Documentation will be provided in the RAP. No dam failure during a PMF will be assumed.

2) If the dam will not be upgraded to pass a PMF, TAC/RAC will perform necessary analyses to determine the effects of the dam failure at the site.

9. Next meeting

The workgroup tentatively agreed to hold the next workgroup meeting in Albuquerque, NM on August 27, 1985.

Original Signed By

T. L. Johnson
Hydrology Section
Geotechnical Branch
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cc: M. Bone, TAC
B. Keshian, TAC
J. Thiers, RAC

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