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MEMORANDUM FOR: Malcolm R. Knapp, Chief, WMGT
Division of Waste Management

Myron H. Fliegel, WMGT
Division of Waste Management

FROM: Michael F. Weber, WMGT
Division of Waste Management

SUBJECT: TELEPHONE CONFERENCE BETWEEN URFO AND WMGT REGARDING GROUNDWATER REVIEWS AT UMTRAP SITES

PARTICIPANTS:

Silver Spring, Maryland	Denver, Colorado
William Dam, WMGT	Edward Hawkins, URFO
William Ford, WMGT	Paul Hildenbrand, URFO
Giorgio Gnugnoli, WMLU	Kent Peterson, URFO
Mark Haisfield, WMLU	
Malcolm Knapp, WMGT	
Mark Larson, WMGT	
R. Dale Smith, URFO	
Michael Weber, WMGT	

On Wednesday, March 20, 1985, staff of the Division of Waste Management (WM) and the Uranium Recovery Field Office (URFO) participated in a telephone conference to discuss NRC's groundwater reviews at UMTRAP sites. The agenda for the teleconference is provided in the enclosure and describes the major discussion topics. Consensus was developed on most of the discussion topics except for the precise use of modeling in support of DOE's evaluations of groundwater contamination and restoration/protection. The general consensus on this topic was that modeling can be used to develop a semi-quantitative understanding about groundwater flow and contaminant transport. Modeling results must be expressed in light of uncertainties in the theoretical understanding of mass transport and characterization of the hydrogeologic system.

This memorandum describes the discussions held during the teleconference about groundwater reviews at UMTRAP sites and concludes with a recommendation for further action to resolve the issue regarding the use of contaminant transport modeling in regulatory decisions.

1) Generic Conclusions

WMGT staff indicated that it was hesitant to reach generic conclusions regarding the feasibility and practicality of groundwater restoration/protection. Both URFO and WMGT agreed that conclusions about groundwater restoration/protection must be developed on a site-specific basis.

2) "Safe" Levels of Contamination

The next topic of discussion was about "safe" levels of groundwater contamination, specifically how NRC would review a DOE proposal at a specific site that constituent concentrations will not pose a significant hazard to the public and the environment. It was agreed that for those constituents with primary drinking water standards (NIPDWR and State MCL's), the MCL's provide a good starting point for decisions about "safe" concentrations. For constituents without MCL's, State and Federal recommended MCL's and other appropriate recommendations (e.g., EPA and NAS Suggested-No-Adverse-Response-Levels), as well as considerations of water use category, may provide acceptable concentration limits. WMGT and URFO agreed that it is impractical to require aquifer restoration to concentrations that are less than background concentrations.

3) Need vs. Implementation

WMGT and URFO staff agreed to distinguish between the need for actions to protect the public and environment from groundwater contamination and actual implementation of such actions. For example, DOE could make a defensible case that they will protect the public from groundwater contamination by providing alternative water supplies, rather than restoring contaminated aquifers. The Gunnison and Lakeview UMTRAP sites were discussed to illustrate the distinction. Although relocation of the Gunnison tailings would not clean-up existing groundwater contamination at the site, it would remove the source of future groundwater contamination (except for potential contamination from contaminated sediments). WMGT and URFO staff agreed that DOE should evaluate various protective action alternatives in addition to aquifer restoration. At the Gunnison and Lakeview sites, the staff agreed that relocation of the tailings could constitute protective actions for groundwater.

4) Groundwater Flow and Contaminant Transport Modeling

Most of the discussion during the teleconference focused on groundwater flow and contaminant transport modeling in DOE's evaluation of groundwater contamination and restoration/protection. WMGT and URFO staff agreed that DOE needs to address the uncertainty in whatever modeling conclusions it develops.

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The Gunnison site was again discussed to illustrate modeling applications at UMTRAP sites. As a point of clarification, WMGT staff stated that it had never endorsed DOE's modeling approach for the Gunnison site. Both staffs agreed that essential water quality information is lacking between the immediate vicinity of the Gunnison tailings pile and domestic wells south of the site. WMGT staff agreed with URFO staff that a comparison of measured groundwater flux rates through the existing tailings pile with those predicted for the stabilized pile at Gunnison may demonstrate adequate protection of groundwater from future contamination at the site.

URFO staff consider that DOE invoked two invalid assumptions in developing its program to model groundwater flow and contaminant transport at the Gunnison site:

- that existing data are sufficient to model the site adequately, and
- that computer models can be used as quantitative predictive tools.

URFO staff described the utility of computer models as aids in understanding the behavior of the hydrogeologic system and as methods to compare different aquifer restoration and protection alternatives. URFO staff stated, however, that they believe that contemporary mass transport models cannot develop realistic ranges of predicted constituent concentrations. Actual concentrations predicted from such models commonly have uncertainty bands of several orders of magnitude and accordingly should not be used to determine compliance with specific limits. They further believe that results of such models should only be qualitatively considered in decisions about aquifer restoration and protection.

WMGT staff agreed that the results of groundwater flow and contaminant transport models must be viewed in light of their associated uncertainties, but disagreed with URFO's suggestions that models not be used for predictions of contaminant transport. Models may be used along with experience at other sites to gain insight into future groundwater contamination; the results of such models, where appropriate, may provide semi-quantitative predictions of contaminant concentrations and evaluations of aquifer restoration and protection alternatives. WMGT staff agreed with URFO staff, however, that the absolute numbers generated by such models should be viewed with caution.

The staffs realized that the apparent disagreement on the use of models for predictions may be attributed to differences in the definition of "prediction". WMGT and URFO staffs agreed that precise (i.e., rigorous quantitative) predictions are not currently possible using contaminant transport models but

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that relative predictions for various remedial actions alternatives can be achieved. Relative predictions can then be considered in evaluating environmental consequences and optimizing protective actions for water resources.

5) Characterization and Modeling

As the last topic of discussion, WMGT staff stated that DOE detected an apparent inconsistency between the thrust of WMGT comments on the Durango DEIS and the thrust of URFO comments. It appeared to DOE that WMGT comments focused on deficiencies in site characterization (i.e., field and laboratory programs that describe the hydrogeologic system and the analyses that evaluate the information developed by these programs), whereas the URFO comments focused on deficiencies in hydrologic modeling. URFO staff noted that they did not want to replicate WMGT comments about characterization. Both staffs agreed that proper characterization is a prerequisite for defensible modeling.

6) Recommendation

When the teleconference concluded, several members of WMGT, myself included, expressed concerns that we had not resolved the issue about appropriate uses of contaminant transport modeling in evaluating remedial/protective actions for groundwater. To address these concerns, I recommend that we consider developing a staff position regarding this issue, especially since its resolution may implicate other geoscience and engineering evaluations in the Division of Waste Management besides UMTRAP reviews.

This teleconference record was coordinated with Ed Hawkins of URFO and Giorgio Gnugnoli of WMLU. If you would like to discuss the teleconference in greater detail, please contact me to arrange a meeting at your convenience.

Enclosure:
Agenda of Teleconference

OFC	:WMGT MW	:WMLU GNG	:	:	:	:	:
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AGENDA*

TELECONFERENCE WITH URFO REGARDING
HYDROGEOLOGIC EVALUATIONS AT UMTRAP SITES

I. GROUNDWATER PROTECTION/RESTORATION PHILOSOPHY

- Site-specificity
- Feasibility vs. Practicality
- "Safe" levels of contamination
- Need vs. implementation

II. MODELING APPLICATIONS

- DOE's option
- Defensible conclusions
- Analytical vs. numerical models
- Expression of results

III. CHARACTERIZATION AND MODELING

- Site-specific objectives
- Defensible conclusions

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*Scheduled for 0930 (EST), Wednesday, March 20, 1985.