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NUCLEAR REGULATORY COMMISSION
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SUBJECT: TRIP REPORT, WEST VALLEY, AUGUST 13-15, 1990

Enclosed is our trip report to the West Valley Site and a copy of the letter sent to the WVDP describing the types of data needed to run VAM2D. Generally we thought that the trip and meeting with the WVDP staff went very well. The WVDP personnel were forthcoming with all the FDA data they had, some of which we did not know existed. The WVDP personnel expressed some concern that the results of the FDA modeling might lead them to conduct more studies on the FDA than they had otherwise anticipated. If you would like further details on any of our observations, please let us know.

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Enclosures: As stated

ENCLOSURE 1

Trip Report of Site Visit to West Valley Site August 13-15, 1990
By Jack D. Parrott and Thomas J. Nicholson

NRC Staff and Contractor Trip Participants -
R. Davis Hurt, IMNS, NMSS
Tom Nicholson, RES
Jan Kool, HydroGeologic, Inc.
Jack Parrott, LLWM, NMSS

The meeting commenced after lunch on the 13th with DOE, WVDP and NYSERDA personnel present. The status of the solvent recovery activities in the Facility Disposal Area (FDA) were discussed. The ongoing construction of interception trenches and collector sumps was discussed in detailed using figures and diagrams. A two hundred feet V-shaped interceptor trench has been completed (i.e., 100 feet extending from either side of the central sump). Work is continuing to complete the remaining 700 feet of the trench.

While excavating the southern extension of the trench a single "leached hull" was encountered buried in the disturbed shallow subsurface (i.e., Lavery Till). It was detected after the soil had been placed in large steel boxes and surveyed for radioactivity. It appears that the source area for the leached hull was approximately 90 feet from the nearest "hull hole". Site personnel theorized that the leached hull was spilled from a bucket (i.e., the type that was used for emplacement of leached hulls in the hull holes) on to the ground and subsequently moved out of the boundaries of the FDA during regrading activities. During the excavation of the interception trench, much of the soil removed has been found to be contaminated with low-levels of activity. Because of the leached hull discovery, continuing excavation of the trench is performed by carefully removing thin layers of soil and surveying each layer to detect any radiologically contaminated material.

No radiation has been detected in the water flowing into the completed portion of the interception trench. A water treatment facility for the trench water is being constructed. The location of this facility will be in the large tent structure located in the FDA.

Later in the afternoon, a discussion of previous modeling efforts by the USGS, WVNS and SAIC preceded a presentation by Jan Kool, HydroGeologic, Inc. Attempts have been made by both Dames & Moore and the USGS to model the FDA. Reference documents of the USGS modeling were provided to Dr. Jan Kool prior to the meeting. He discussed the assumptions that went into the previous modeling efforts. He went on to present the type of model he will use, and the types of data he would need to run his model (i.e., VAM2D). It was concluded that much of the data that he needs could be found in the published reports on the site. Dames & Moore personnel revealed the existence of some unpublished data from test pits that were dug in the FDA area. They also provided NRC personnel with some new data gathered from the completed portion of the interception trench.

ENCLOSURE 1

Some concern was expressed by WVDP personnel as to what the NRC modeling effort would reveal about the site and how these findings might impact the WVDP's work on the site.

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During the morning of the 14th, NRC staff and contractor, and WVDP personnel took a walking tour of the FDA and state burial area. The FDA cover appeared to be in much better shape than it was during the previous NRC staff trip in February of this year. Due in part to NRC staff comments on the condition of the FDA cover, it appeared that WVDP made many improvements, for example surface depressions and areas of standing water have been removed. WVDP also recontoured and riprapped the drainage ditch located adjacent to the interception trench. New monitoring wells were observed around the FDA and the state burial area which were recently installed in response to EPA RCRA characterization requirements.

In mid-morning the meeting reconvened in the WVDP office to discuss available FDA information that may be useful in modeling ground-water flow and transport. WVDP provided NRC staff with the unpublished data collected during FDA site studies and modeling efforts discussed earlier. Of particular interest was the information being collected on daily flows into the interceptor trenches and coincident daily rainfall and well data. It was agreed that the following information would be provided to the NRC staff to assist in their modeling efforts; (1) well location maps, (2) topographic map, (3) information on burial horizon contours from the "Sampling and Analysis Plan" (SAP), (4) information on mapped fractures in the Lavery Till from earlier research trench studies of the FDA, and (5) information on hydrologic parameter values used in the FEMWATER modeling of the FDA by WVNS. Davis Hurt received much of this information at the site or had copies of earlier reports which contained this information. The remaining data would be obtained by Davis Hurt through the DOE site management. Robert Blickwedehl, WVNS, mentioned that much of their sources of information came from NRC NUREG/CR's (e.g., NUREG/CR-1566 and NUREG/CR-0644 written by the NYSGS).

In the afternoon, Davis Hurt, Tom Nicholson and Jack Parrott of the NRC and site personnel from Dames & Moore and NYSERDA took a walking tour of Buttermilk Creek to study the landslides and exposures of the Lavery Till and underlying lacustrine unit and deeper glacial till units.

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The morning of the 15th had a presentation about the sludge washing procedure given by WVDP personnel and attended by Davis Hurt and Jack Parrott. The washing technique was modeled by taking small samples of the sludge and simulating the washing technique on a laboratory scale. The most notable result of this sludge washing model was the observation that the plutonium in the sludge was much more soluble than previously thought. This could lead to a cement waste form containing much more than 100 nCi/g of transuranic elements. The WVDP proposes to reduce the solubility of the plutonium in the sludge wash water by adjusting the pH of the wash water upward, treating the wash water with ferrate and then running the wash water through titanium

coated zeolite. Also included in this presentation was a schedule for sludge washing operations including NRC review and concurrence periods.

The later half of the morning was devoted to a discussion of EIS issues, schedule for EIS completion, and what the WVDP expects from the NRC with respect to the EIS.

ENCLOSURE 2

OBJECTIVE: To model the NRC-Licensed Disposal Area (NDA) at the Western New York Nuclear Service Center, Cattaraqus County, New York, (West Valley) using the VAM2D code.

Attached is a list of the NMSS and RES-funded contractor reports (see Bibliography) and staff NUREG-1164 (Nicholson and Hurt) that will be used to initially set up the simulation studies. The hydrogeologic data sets as presented in USGS WRI's and Professional Paper and the "Geoscience Database" from PNL shall be reviewed and used where appropriate. The previous simulation studies and results from both USGS and PNL shall also be reviewed prior to modeling. The source term inventory to be modeled shall be developed from information in NUREG-1164 and consultations with NMSS staff.

An important consideration will be the examination of transport mechanisms and rates in the near-surface weathered zone, and the deep non-weathered fractured zone. The objective is to evaluate differences between transport conditions and rates in the near-surface advective-dominated and deeper diffusion-dominated systems. Further work may deal with investigating transient flow paths and transport rates for anticipated future conditions (e.g., local flooding, clay barrier erosion, and increased recharge rates) using site specific information on hydrologic conditions, waste disposal inventories and leach rates.

Hydraulic and transport parameters and site specific information of interest are:

For the near-surface disturbed material and shallow weathered and fractured Lavery Till:

vertical and horizontal components of saturated hydraulic conductivity values including anisotropy,

effective porosity,

saturated water content,

specific storage,

longitudinal and transverse dispersivities,

apparent molecular diffusion coefficient,

bulk density,

thickness of unit,

hydraulic gradients,

Constitutive relations for variably saturated flow (i.e., moisture content vs. pressure head, and effective hydraulic conductivity vs. pressure head) (provide if possible parameters from van Genutchen relations or Brooks-Corey relations.)

fracture aperature, density, orientation and extent for various depths.

For the deeper non-disturbed non-weathered and slightly fractured Lavery Till:

vertical and horizontal components of saturated hydraulic conductivity values including anisotropy,

effective porosity,

specific storage,

saturated water content,

longitudinal and transverse dispersivities,

bulk density,

thickness of unit,

hydraulic gradients,

fracture aperture, density, orientation and extent for various depths.

apparent molecular diffusion coefficient,

constitutive relations for variably saturated flow (i.e., moisture content vs. pressure head, and effective hydraulic conductivity vs. pressure head) (provide if possible parameters from van Genutchen relations or Brooks-Corey relations.)

Identification of the transition zone between the near-surface weathered unit and the deeper non-weathered Lavery Till.

Regional water-table levels, perched-water levels and location of ground-water seeps over time (i.e., hydrologic surveys) from both USGS and DOE/WVNS data bases.

Correlation of precipation records, snow melt data, and local recharge to water-table fluctuations.

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