

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

DATE: June 28, 1991
IN REPLY REFER TO: EES-14:L-91-130
MAIL STOP: K-485
TELEPHONE: (505) 867-2415
(FTS) 843-2415

Robert Kaiser
DOE-AL
P.O. Box 5400
Albuquerque, NM 87115

Dear Mr.Kaiser

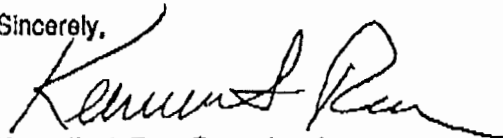
RE: Technical Review: "Compliance Activities Workplan for the Mixed Waste Landfill" - Sandia National Laboratory - June 1991

Two of my program specialists (a health physicist and a geophysicist) have reviewed the subject report. Attached are their review comments. The report was well written and informative. However, I suggest that you schedule a meeting with the authors and reviewers to discuss and resolve the technical issues.

Our major concern is that the existing data for this site does not appear to have been analyzed (or perhaps has not been presented as justification for a new well) and that an additional deep well that has been proposed may not be needed. We suggest a thorough analysis of the existing borehole and monitoring well data along with remeasurement of the depth to water in the existing wells to determine the aquifer gradient.

We hope that the comments and suggestions are informative and conducive to productive dialog. If you have any questions please do not hesitate to contact myself, Jay Wenzel (505-865-2603 or FTS 855-2603) or Michael Gerety (505-865-5310 or FTS 855-5310).

Sincerely,



Kenneth H. Rea, Group Leader
Environmental Restoration Technical Support Office

KR/JWA/1

Cy: Rich Sena, DOE AL
Jay Wenzel, ER TSO
Michael Gerety, ER TSO
EES-14 File

Review of: Technical Review: "Compliance Activities
Workplan for the Mixed Waste Landfill" Sandia National Laboratory -
June 1991
Prepared For: DOE AL
Prepared By: ER TSO
Reviewers: M. T. Gerety and W.J.Wenzel

COMMENTS

- 6/1/5 The text indicates that the hydrologic data obtained from the current monitoring well system fails to indicate if the placement of wells allows for adequate downgradient coverage. However, data presented in this document (Appendix A, Water Level Elevations) consistently show that the monitoring well network has only one well downgradient and three wells, none of which could be considered up-gradient (see Attachment 1). They could however, be considered background wells.
- 8/-/- The entire Facility Setting section in great
- 9/-/- Figure 1 should credit the authors, if it comes from another source.
- 11/1/5 This is a nice description of the geologic structure of the area. Could we be seeing some of the effects of the fault system stepping down to the west in the water table information presented in Appendix A?
- 12/2/4 It is stated that the KAFB production wells "appear" to have a large effect on the hydraulic gradient of the area and are creating a cone of depression in the northern portion of the region. Would it be possible to indicate on Figure 2 (page 13) where this effect is shown and explain its effect on the groundwater flow at TA 3?
- 12/3/- The text indicates that the regional groundwater flow is toward the west and northwest. Figure 2 (page 13) shows this to be the case. A comparison between the July 1990 data from the MWL and the July 1990 regional data (Figure 2) shows the "local perturbation of the flow lines to be about 20 degrees (Attachment 1). This kind of a variation is well within the normal for water table variations and is less than the variations presented on the regional map. Please indicate why this is considered "anomalous".

- 13/-/ Figure 2 needs a coordinate system(e.g. Latitude/longitude or New Mexico State Plan)
- 15/-/ Section 2.4, Mixed Waste Landfill Description and History is great!
- 17/1/4 Suggest adding an interim measure to fix the cement caps and locate the pits. Surveillance and maintenance of ER sites is an important aspect of preventing environmental degradation.
- 17/3/6 Phased RFI programs are not encouraged by DOE AL. The ER Program management policy is to minimize repetitious documents inherent in tiered and phased programs by writing one workplan and referencing subsequent work by using addendum to the workplan. This prevents redundant reviews and distribution of boilerplate and streamlines the program. It is particularly important for Sandia to remain in the mainstream of regulatory guidance and DOE policy until a regulatory driver has been established such as a 3008h consent order, permit B, or other compliance agreement negotiated between Sandia, the state, and EPA.
- 19/1/1 It is stated that "three additional wells were installed, two downgradient and one upgradient..." It would be appropriate to mention here that data from these wells indicated that this network has in fact only one downgradient well and no wells that are definitively upgradient.
- In addition we suggest that you analyze the borehole contaminant data and present a summary here in context with the monitoring well data. This may give you a technical justification for your proposed new monitoring well.
- 21/-/ The Scope of Work section is well presented.
- 21/1/5 Could the adequacy of the present well network be established without this additional well? The data from the present monitoring well network indicates that there is only one downgradient and no upgradient wells. This in itself establishes the inadequacy (under RCRA) of the present well network. The presence of this additional well (neither downgradient nor upgradient) will still not meet RCRA monitoring criteria.
- 25/3/- The water table is approximately 453 ft below the surface of the ground. A 1 degree deviation of the well from an intended 15 degrees would result in the water table measurement being +/- 2

ft. A 5 degree deviation from vertical will result in a 1.7 ft error in water table elevation. Any errors in collar elevation propagate as well. The maximum variation in the water table elevation of all the measurements (July 1990) at the MWL is only 1.83 ft. Could you please elaborate on the precision and final accuracy of the water table elevation and gradient values for the present monitoring network and the accuracy that is to be expected with the additional well.

- 29/1/2 Will the drillhole orientation surveys be done on all the monitoring wells or just on the proposed well? Please refer to comment 25/3/-.
- 39/3/3 Could you please elaborate on the types of horizontal and vertical variability that one would expect in an alluvial environment such as exists at the MWL. How much will the planned pumping tests help to constrain our understanding of the movement of fluid in this environment?
- 40/2/- Great assessment methodology!
- 40.2/- The assessment methodology provided here does not mention the need for any additional monitoring wells. Would it be useful to assess the performance of the present well network now and use the results to position the proposed additional well? A 2:1 difference in horizontal to vertical transmissivity could easily result in the contaminant and/or pulse of water reaching the groundwater displaced by 900 ft. Is there any reason to believe (from available literature) that the alluvial environment in the vicinity of the MWL is isotropic? If this is the case, then none of the wells as currently located would ever record any contamination.
- 41/2/5 "Where possible, pdf's will be constructed for the parameters of interest..." What are the criteria that would make this possible? Are the measurements being planned so as to make this possible?
- 42/2/- Excellent section! Could you please discuss how the measurement uncertainty, as discussed in comment 25/3/-, will be addressed in assessing the monitoring well configuration.
- 45/-/- Figure 11 is good. Could you please explain how these measurements will constrain the likely flowpaths through the unsaturated zone? Flow will have both horizontal and vertical components. How will these measurement determine likely

horizontal directions, or even the propensity to move horizontally and thereby determine a likely flowpath?

- 47/-/ The Data Quality Objective section gives qualitative information on the data to be collected but it does not give quantitative information about the level of accuracy that the data must have in order to meet the objectives. Comment 25/3/- indicates that there might be a problem with the accuracy of the data provided. Please provide a quantitative estimate of the precision necessary to obtain the necessary accuracy required for the stated objectives.
- 48/1/1 It is stated that there is some uncertainty in the direction of groundwater flow. However there is no indication upon which this conclusion is based. The data presented in this document indicates a 20 degree (not 90 degree as is indicated) divergence between "regional" values and what has been measured in the vicinity of the MWL. Please refer to comment 12/3/-.
- 48/2/- Please include a discussion on the overall requirements for accuracy in the entire well network. Please refer to comment 25/3/-. There may be a problem here.
- 51/1/1 It is unlikely that the proposed monitoring well will be able to establish the presence or absence of a "groundwater mound" due to the 270,000 gal of coolant water. If the data do not indicate the presence of a "mound", it could mean that the coolant water did not flow vertically down. It is likely that in an environment such as this there will be some horizontal component to movement and that the flow would be through a series of "fingers" If the data do show an "elevation" in the water table it could easily be attributable to the geometry of the basement rock (there are no constraining data to the east). The only way that one can establish the coolant water had migrated to the water table is finding water that can be chemically linked to the coolant.

Axis of possible step fault - downdropped block to the west.

Compliance Activities Work Plan
Revision 2.0

DRAFT

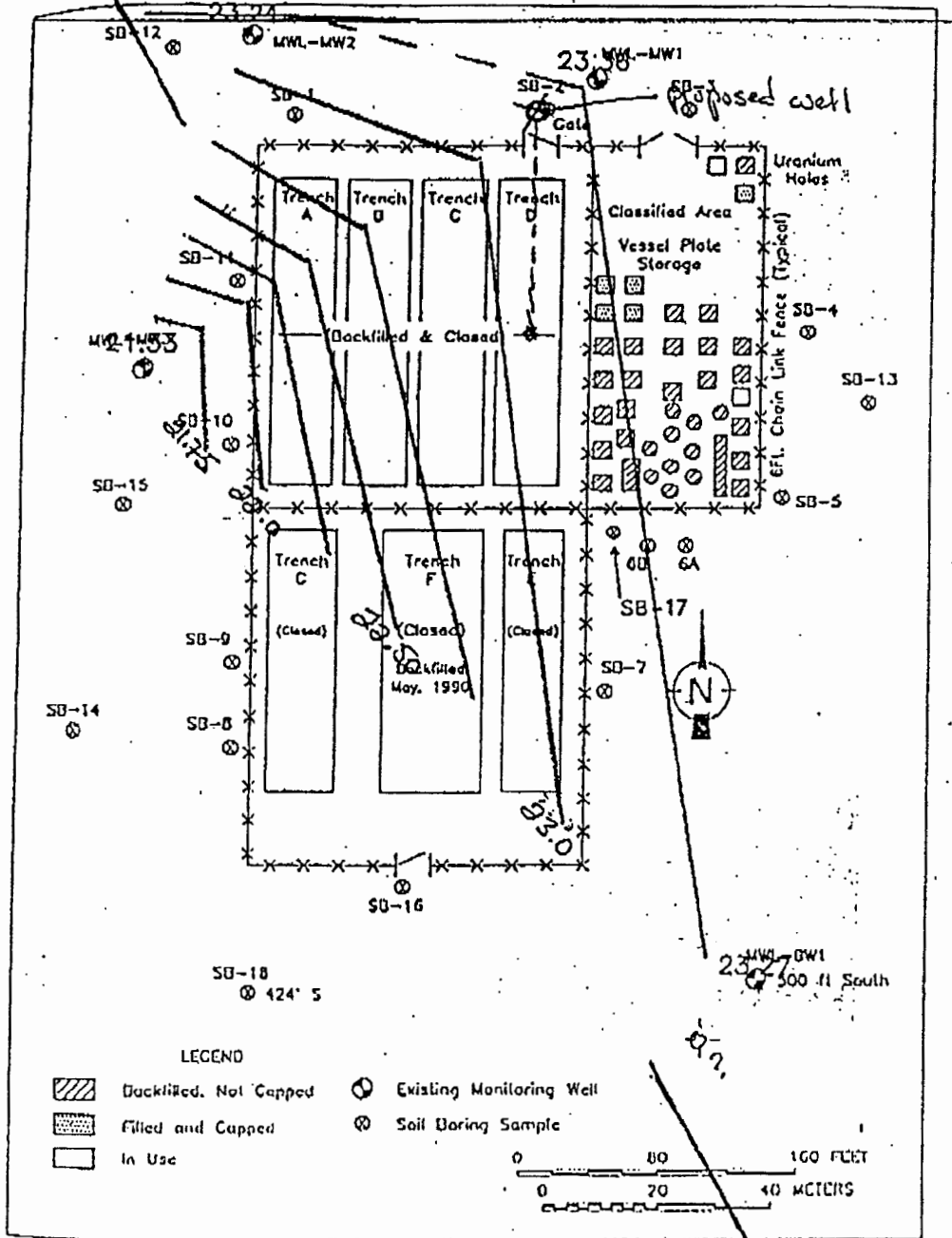


Figure 6 SOIL BORING LOCATIONS AT MWL

water level contours from 3/14/91 - these data indicate that there are three upgradient and one downgradient well.

Attachment I