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M E M O R A N D U M

To: Benito J. Garcia, Chief  
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From: Danny Katzman, Bruce Swanton  
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Subject: Comments on the Operable Unit 1079 Work Plan

Date: August 28, 1992

The Hazardous and Radioactive Materials Bureau (HRMB) Agreement In Principle (AIP) personnel have completed review of the OU 1079 RCRA Facility Investigation (RFI) Work Plan. This memo represents HRMB's questions and concerns regarding the Work Plan. This is the second review of LANL's RFI Work Plans that HRMB has conducted. Many of the same concerns were raised during review of the OU 1078 Work Plan. Please see the August 11, 1992 memo and attachment (dated July 23, 1992) addressed to Jerry Bellows for description of general concerns. Other concerns regarding the current and pending sets of Work Plans will be addressed in a meeting planned for the near future.

Specific Questions/Concerns

These comments are keyed to the section numbers of the Work Plan, as well as to the paragraph ("p"), bullet number ("b"), figure ("f"), or table ("t"), as applicable.

- 1.4.1 p9 This paragraph refers to Corrective Action Requirements (CARs) as being contained within Module VIII of the HSWA Permit. HRMB is unable to find reference to CARs in the HSWA Permit.
- 2.2 p5 "If data are not sufficient to support these efforts, additional sampling (Phase II) is performed." This wording suggests that Phase II sampling may not occur.
- 2.2 p9 Explain discomfort curves and how they can be used to adequately determine a sample spacing for the TA-10 Firing Sites Aggregate.



2164  
TA-10

- 2.2 p9 "Expert judgment" as a basis for determining sampling locations and design criterion does not enable review of the Work Plan. All sampling and analysis plans proposed in the Work Plan should be of sufficient detail as to be third party executable.
- 2.2 p10 Use of VMAX does not preclude the need to assess the horizontal and vertical extent of contamination.
- 2.2 p11 Sampling plans that are based on existing radiological data suggest that an assumption of codisposal/colocation (see OU 1078 RFI Work Plan, p. 5, assumption 4) of radiological and nonradiological contaminants. This is not acceptable for characterization of nonradiological contamination.
- 2.3 p3 It appears that this paragraph suggests on one hand that direct ingestion is not being considered as a possible route to receptors, but on the other hand that Phase I sampling strategy will be modified if "contaminant sources are identified at locations and depths from which air transport or biologic uptake/ingestion may occur." Action levels in soil should be calculated pursuant to the proposed rule, Subpart S to 40 CFR Section 264 (see the July 27, 1990 Federal Register, page 30870, Appendix D, paragraphs 3 and 4, attached).
- 2.3 p4 Theoretical evaluations of infiltration into the Bandelier Tuff are not acceptable for characterization of SWMUs. Vadose zone infiltration of contaminants has been shown to occur in areas of continuous or substantial liquid input. Rate and extent of contamination will need to be determined.
- 2.5 p1 Action levels for nonradiological contaminants should be determined pursuant to Subpart S. "Trigger levels" and "baseline risk assessments" may not be appropriate. Also, nonradiological contamination is not likely to migrate in the same manner as radiological contamination, therefore, rate and extent of nonradiological contamination should be determined directly by field assessment.

- 2.5 p1 Residential or recreational use scenarios are not acceptable for risk evaluation of hazardous contamination unless they conform to the Subpart S assumptions noted for section 2.3 p3 above.
- 2.6 p3 Transport modelling on the Pajarito Plateau should consider the principles of **sediment transport** and not long-term erosion rates. In the case of Bandelier Tuff, "erosion" occurs primarily by catastrophic failure (rock falls) and much less so by gradual long-term erosion.
- 3.1.2.1 p1 Previous sampling of SWMUs described in this section was conducted **adjacent** to the SWMUs. Why weren't samples taken from the center or within the assumed boundary of SWMUs? This will be necessary in assessment of SWMUs that contain hazardous constituents.
- 3.1.3.1.1 p1 What was the fate of batteries or spent lead/acid solution of batteries that was contained in the battery building (TA-10-14)?
- 3.1.3.1.2 p1 Paragraph 1 appears to describe a situation in which contamination **increases** with depth. This contradicts previous statements in Chapter 3 that describe contamination that decreases with depth.
- 3.1.3.1.2 p4 Was the concrete from the bunkers (TA-10-13 and -15) only "considered uncontaminated" or was it sampled and analyzed and found to be uncontaminated?
- 3.1.3.1.3.1 p3-4 "...additional surface samples were taken near this location and analyzed for <sup>90</sup>Sr. None of these samples contained levels above background." "Thirty-three of the <sup>90</sup>Sr samples were above this background level [0.4 pCi/g]." These two statements are in apparent contradiction to each other. Can this be explained?
- 3.1.4 p1 Is there knowledge of the waste stream associated with this specific radiochemistry laboratory (TA-10-1) and/or radiochemistry labs in general?
- 3.1.4.1.1 p1 Again, is there specific knowledge of radiological and chemical waste streams associated with these radiochemistry laboratory operations? This knowledge is important for establishing analytical targets.

- 3.1.4.1.2 p2 Explain the statement "Samples from these holes indicated above background gross-beta activity and movement of contamination, especially at depth." Does this mean that migration rates increased with depth?
- 3.1.4.2.3 p1 The data set in Appendix B does not show any data for nonradiological constituents. Sampling and analysis plans and grid sampling plans in this Work Plan do not consider nonradiological contamination. It cannot be assumed that radiological and nonradiological contamination is codisposed or colocated.
- 3.1.4.6.3 p2 The paragraph states that maximum gross-beta activity was 48 Pci/g and that the maximum <sup>90</sup>Sr activity was 67.2 pCi/g. Since <sup>90</sup>Sr is a beta emitter, how can the total gross-beta activity be less than that reported for <sup>90</sup>Sr?
- f 3.4-2b It is unclear how the canyon sampling locations are represented on this figure.
- 3.4.2.2.1 p10 The FUSRAP sampling plan for stream channel sediments in Pueblo and Los Alamos Canyons is not considered to have been adequate for characterizing possible radiological or nonradiological contamination in the canyons. The sampling scheme allowed for the possibility of samples being taken up to 1000 m apart. In addition, the sampling stations that were used in the FUSRAP study should be shown on a map and included in the Work Plan.
- 3.4.2.3 p6 It is reported that 154 pCi/g is the estimated <sup>239</sup>Pu concentration in Acid Canyon. Does 154 pCi/g represent an average or a maximum concentration?
- 3.6.1.1.1 p2 USATHAMA, and EPA method for determining organic contamination from use of high explosives, is **not** described in this section or in Appendix C of the Work Plan as stated.
- 3.6.1.1.2 p1 This section states that "significantly elevated <sup>90</sup>Sr concentrations" in the tuff at depths of up to 20 m below the surface indicate "migration of

the more soluble constituents through the alluvium and into the volcanic tuff bedrock". This statement is inconsistent with the argument that the tuff represents a barrier to contaminant migration.

- 3.6.2 p2 It cannot be assumed that transport of radioactive contamination under unsaturated conditions will correlate with transport of nonradioactive contamination or even that radiological contaminants will migrate at the same rates. The principles of segregation used to isolate cations or anions of varying charge densities in column chromatography are known to operate in soils systems. These principles function to spatially segregate radioisotopes and heavy metals as they migrate through soils, and will serve to segregate organic species as well based on their charge densities and/or molecular sizes.
- 3.6.2.2 p1 Information provided in this section does not support the conclusion that monitoring of the channel sediments is not useful for determining the magnitude of contaminant movement to downstream areas.
- 3.6.3 p2 What is the DOE guideline referred to in paragraph 2 of this section?
- 4.2.1.2 p1 HRMB will not except proposals for No Further Action (NFA) based on the argument that "possible contamination...would have been...disturbed beyond the point at which the site could be characterized...". Some sampling would be required at SWMUs where radiological or nonradiological constituents were used.
- 5.1.1.2 p2 What constitutes a baseline risk assessment? The use of any other criteria for risk assessment other than health-based risk assessment is not acceptable for RCRA wastes (See comment 2.3 p3 above). RCRA assessments assume direct ingestion by the receptor of the most contaminated soil remaining at the site.
- 5.1.1.3.3 p1 Are trigger levels used for radiological contamination only?
- 5.1.1.3.3 p1 What is meant by "no specific information

regarding the activities, behavior, or location of actual receptors is required for the Phase I investigation?

- 5.1.1.4.2 p1 Subpart S would not permit use of the "exposure unit" - the averaging of contamination over a site. Any location found to exceed health-based levels (comment 2.3 p3) for any contaminant should be remediated.
- 5.1.1.5 p4 This section explains why "<sup>90</sup>Sr data were used to estimate the spatial correlation for Be." There is no physical evidence to support the argument that these constituents would have migrated at the same rate. See 3.6.3 p2.
- 5.1.1.6.2 p1 Referring to the sampling plan for surface soils. It appears that judgmental samples may be valuable in this situation and could serve to better target possible locations of contamination. Sample points may be approximately set at 200-foot intervals, but exact locations should be based on judgmental selection of sediment storage areas. The specific locations should each be narratively described in the sampling plan.
- 5.1.2.1 p1 Contamination in Bayo Canyon is **not** likely to be "concentrated in the Bayo Canyon channel", but probably exists stored in terrace and active floodplain sediments. These "stored" sediments are susceptible to remobilization during large runoff events or as the main channel migrates laterally in the canyon bottom.
- 5.1.2.1 p1 This section states that contaminants of concern in the channel sediments include Be, Pb, Ba, <sup>90</sup>Sr, and total U, however, SWMUs 10-003 (a-g, m) and 10-002 (a) managed extensive lists of chemical wastes very near the stream channel. Stream channel sampling should include all reasonably likely contaminants in the waste stream from the above SWMUs.
- 5.1.2.3.2 p1 Geomorphic mapping should be an integral part of Phase I efforts. This would provide the basis for effective judgmental sampling in the canyon bottom to be conducted in Phase I.
- 5.1.2.4.1 p1 What grain size actually constitutes "fine-grained

samples"? Samples collected for analysis of radiological contamination should target the silt and clay-sized fraction of the sediment found in point bars, floodplains and terraces.

- 5.1.2.5 p2 Point bars are a good sampling target, however, the upper 5-10 cm of sediment likely represents very young deposits and may not accurately assess the levels of contamination stored within that geomorphic feature.
- 5.1.4 p2 Again, this section assumes that radiological and nonradiological contaminants will have correlative transport histories. See 3.6.2 p2.
- 5.2.1.1 p1 What is meant by "there are no known current pathways for exposure from subsurface contamination...". This assessment does not consider direct ingestion of the most contaminated soil. This approach is not recommended in areas highly susceptible to erosion and sediment transport and is unacceptable for RCRA wastes under the proposed Subpart S to the 40 CFR Part 264 regulations.
- 5.2.1.3.2 p1 HRMB recommends that non-intruder scenarios not be utilized.
- 5.2.1.3.3 p2 The recreational use/residential use scenarios should not use the "exposure unit" contaminant averaging approach (see comment 5.1.1.4.2 p1 above).
- 5.2.1.4.2 p1 Trigger level values should be included in the Work Plan.
- 5.2.1.5 p1 Archived sampled may exceed holding times for laboratory analyses.
- 5.2.1.6.2.1 p4 What are the actual values of field screening trigger levels. Values like these, critical for evaluation of sampling plans, should be included in the Work Plan.
- 5.2.1.6.2.1 p5 Referring to samples collected at the soil (sediment)/bedrock interface. It is unclear as to whether these samples will be collected from the sediment just above the interface or from the bedrock just below the interface. It is

recommended that samples be collected from both above and below the interface.

- 5.2.2.6.1 p2 VMAX distances should be specified in the Work Plan so that they can be evaluated.
- 6.1.4.1 p1 Does "bound[ing] the levels of contamination" imply physically locating the boundaries of contamination?
- 6.1.4.1 p1 Evidence of bedrock contamination presented earlier in this Work Plan does not support the assertion that the "bedrock presents a relative barrier to the continued downward migration of contaminants".
- 7.1.1 p3 Again, physical evidence presented in the Pork Plan and elsewhere does not support the argument that "the bedrock presents a barrier to downward migration".
- 7.1.1 p3 It is not clear why the percent of areal coverage is pertinent to the determination of "significant leakage" from septic tanks. Leaks may occur at a single point representing a small area, but may still contain elevated levels of contaminants and may provide enough liquid input to obtain locally saturated conditions.
- 7.1.5 p1 What is the justification for the assertion that "if any contamination exists above trigger levels, a large portion of the site will have at least this level of contamination"?
- 7.2.1 p1 HRMB does not consider a single sample taken from a depth of approximately 3 feet as adequate for characterizing SWMU 32-001. The sampling is based on "the assumption the entire area under the base of the former incinerator will show contamination if it exists". No support is presented for this assumption.
- 7.2.2.3 p1 The statement that "Random samples will be selected from locations with a higher probability of residual contamination accumulation..." does not enable a reviewer to determine the adequacy or inadequacy of the sampling plan. The number and locations of the proposed locations should be



narratively described and indicated on maps included in the Work Plan.

- 8.1.2 p2            Trigger levels for nonradiological contaminants are **not** found in Table 8.1-1.
- 8.1.4.2 p1        Risk assessments should not be conducted using averages of the data from SWMU 1-002. See comment to 5.1.1.4.2 p1.
- 8.1.6 p2            Referring to samples in the transects located perpendicular to the drainage. At what depth will the samples be collected, and what grain sizes will be targeted?
- 8.2.6 p1            Referring to the sampling plan for SWMU 45-001. The auger holes should be drilled **at least** to the depth proposed in the sampling plan, but also deeper, if contamination continues to be present above detection limits.
- 8.3.6 p1            The sampling plan for SWMU 45-002 is vague. Are the shallow boreholes, referred to in 8.3.6, the same as the judgmental samples referred to in 8.3.5? Samples should also be taken from within the column of soil above the soil/bedrock interface.