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SNL:ER:NFA

M E M O R A N D U M

TO: Benito J. Garcia, Chief HRMB, NMED  
THROUGH: Neil Weber, Chief, DOE Oversight Bureau, NMED  
FROM: Lloyd Aker, SNL/ITRI POC, DOE Oversight Bureau, NMED  
DATE: December 4, 1995  
SUBJECT: SNL OU 1334 RFI Work Plan

The following represents AIP comments regarding the Sandia National Laboratories (SNL) draft RCRA Facility Investigation (RFI) Work Plan for Operable Unit (OU) 1334, Central Coyote Test Area, dated October 1994. These comments are provided for the purpose of communicating the results of our technical review. They are not provided for the purpose of representing the regulatory position of the New Mexico Environment Department.

The work plan addresses investigations to be conducted at seven Environmental Restoration (ER) Sites: 9, 11, 57A, 57B, 61A, 61C, and 68.

General Comments

1. Page 4-7, Section 4.1.3.4, SNL states "limited confirmatory sampling may be initiated to demonstrate that a SWMU is eligible for an administrative NFA."

If evidence for a site is insufficient to support an administrative NFA proposal, a site investigation (including sampling) or release assessment is generally required. If the release assessment indicates that concentrations of hazardous constituents are at acceptably low levels as determined by regulators, then the site may be proposed for NFA. Site investigation and release assessment sampling may, however, indicate the need for further investigation within an RFI. Therefore, investigators should not assume a priori that limited sampling will demonstrate that a SWMU is eligible for NFA.

2. For the seven sites, SNL states "Because of the limited precipitation, low permeability surface soil, limited mobility of the potential contaminants, and low infiltration rates (SNL/NM February 1994), groundwater is not considered a primary pathway and will not be investigated unless a hazardous source is identified."

These sites are located adjacent to the Manzanita Mountains. Surface soils in the area are generally coarse grained, and may exhibit relatively high permeabilities and infiltration rates. In addition, some potential contaminants, such as VOCs, may exhibit considerable mobility. Decisions regarding the investigation of ground water should be based on historical

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information and the results of the investigation and/or sampling.

3. Many maps in the work plan are not to scale or are drawn at only approximate scale. Scaled maps should be provided in the work plan.

4. Background sample fractions should be collected and analyzed for gross alpha, gross beta, and gamma spectrum.

Santa Fe staff do not understand the justification for background analyses for gross alpha, gross beta, and gamma spectrum.

5. At each of the seven sites, SNL states "The background concentrations and activities will be compared to metal and radionuclide concentrations in soil and sediment ... to assess if a release has occurred to the environment."

At each site, between 10 and 16 background samples are proposed by SNL.

AIP staff believe that background can not be reliably established based on so few samples. Result of SNL's sitewide background investigation have not been accepted by EPA or the NMED. Characterization data should be compared to approved sitewide background concentrations to determine whether contamination is present.

Santa Fe staff question whether this strategy (lack of approval of comparisons to background without an approved background study) to get EPA to buy off on a background study is making a positive contribution. Just because the SNL background numbers have not been approved, does not mean that they have no value in evaluating background. Also, staff questions, for how many of the COCs is it necessary to have a "precise" or an "approved" background value, when in a number of cases, background values are significantly less than risk based levels.

Presumably, the purpose of a background study is to reduce the number of additional "local" background samples that it is necessary to collect. Why are between 10 and 16 local background samples not sufficient for this purpose? Is there any statistical justification for such a statement? Anyway, if there are 7 sites, and at least 10 local background samples are collected at each site, there will be at least 70 local background samples. Is this enough? Is there a justification for saying that 70 is any better than 12, or any better or worse than the thousands that are included in the SNL draft background study?

6. Samples collected beneath the mounds should be analyzed for VOCs, gross alpha, gross beta, and gamma spectrum.

Santa Fe Technical Support staff are having trouble justifying the number of samples that Site Staff are proposing to be

analyzed for VOCs, gross alpha, gross beta, and gamma spectrum.

7. Although field screening methods may be used to guide an investigation, field screening results should be confirmed by Level III analyses. Data derived from field screening (such as for VOCs) are not acceptable for site characterization purposes.

Does this capture the meaning of the specific comments regarding field screening and Level III analyses?

8. Waste piles and other sites can be sampled for TCLP metals and organics for the purpose of waste characterization. However, samples must be collected and analyzed for total metals and organics in order to investigate potential releases of hazardous wastes or hazardous waste constituents to underlying soil or other media.

Note that this subject was also discussed in response to Chris Hanlon-Meyers review of March 1995, and the subsequent meeting in April. The SNL response to Comment No. 2 was:

"It should be emphasized that in each of these cases (sampling at Sites 9, 57A, 61A, and 68), environmental media samples will be collected below the waste piles to determine if a release has occurred, and these samples will be analyzed for total constituents as indicated in the sampling plans for these sites."

9. The contingency plans for each site may not be adequate. (Please explain why they may not be adequate. Does this refer to what they should do if they have a detection of contaminants above background?)  Holding times for VOC and SVOC samples may be exceeded for some samples if the plans are strictly followed. Also, although field screening methods may be used to guide an investigation, field screening results should be confirmed by Level III analyses.

### Specific Comments

#### ER Site 9, Burial Site/Open Dump

5. Page 5-12, section 5.1.6.3, Debris Mounds 2 and 3, SNL states "The debris exposed in mounds 2 and 3 appears to be **principally** (emphasis added) nonhazardous solid waste and will not be sampled."

We caution that generators are responsible for determining if their wastes are hazardous (40CFR 262.11).

6. What is the origin of the "shallow crater-like feature" northeast of Debris Mound 1? Has it been sampled?

7. According to Figure 5-5, Debris Mounds 2 and 3 extend to distances of 100 ft or more. One sample to be collected beneath each mound is not enough to investigate a potential release to the environment. Additional samples should be collected beneath

each mound, spaced no more than 25 ft apart.

Wastes within the area defined as Debris Mound 3 appear to actually occur as discrete piles. Although a maximum spacing of 25 ft was recommended above, site conditions should influence the selection of judgmental sampling locations for this specific debris mound.

Site history is not well known; therefore, samples collected beneath the mounds should also be analyzed for volatile organics (VOCs), gross alpha, gross beta, and gamma spectrum. Santa Fe staff question the value of sample analysis for VOCs, considering the consistently negative findings of VOCs at surface or near surface features, when there is no other evidence (visual, or field screening) to suspect them. Also, Santa Fe staff wonder if laboratory measurement of gross alpha and gross beta contributes any useful information, if a laboratory gamma spectrum is run, and also considering that there may be a limited number of COCs.

During a visit to the site, it was noted that numerous rusty containers and aerosol cans, a 55 gallon empty drum which originally contained methyl alcohol, and pieces of fiberboard (asbestos?) are present at Debris Mound 2.

Data derived from field screening techniques (such as for VOCs) are not acceptable for site characterization purposes. Can this statement be deleted? It is included in general comment 7.

The sample located further downstream in the arroyo (Figure 5-5, locations denoted by triangles) should be moved close to Debris Mound 2 (just downstream of it), or alternatively, another sample collected.

8. Page 5-12, Debris Mound 1, SNL states "Characterization of Debris Mound 1 includes debris sampling to determine if the mound contains regulated hazardous waste and soil sampling beneath the mound to determine the extent of waste migration if a hazardous source is identified."

It is unclear if soil beneath Debris Mound 1 will actually be sampled. Sampling must be conducted beneath Debris Mound 1, even if TCLP tests demonstrate that the "average" mound debris is not a hazardous waste for the purpose of its removal and disposal.

According to Figure 5-5, Debris Mound 1 extends to a maximum distance of about 200 ft. The nine samples collected from the bottom of the trenches are not enough to investigate a potential release to the environment. Additional samples should be collected beneath Debris Mound 1, spaced no more than 25 ft apart.

9. Page 5-12, Debris mound 1, Debris Sampling - Does "three grab samples collected from the entire vertical profile at each trench location" refer to the collection of composite samples?

11. Page 5-14, Table 5-2

The arroyo channel sediments should also be sampled for VOCs, gross alpha, gross beta, and gamma spectrum.

What is the rationale for analyzing arroyo channel sediments for VOCs? Also, is it possible to make a case for running a gamma spectrum only, since most, if not all of the COCs are at least weak gamma emitters?

12. Page 5-5, Section 5.1.3, SNL states "The depth to groundwater at the site is approximately 138 ft bgl, according to a December 1991 measurement at the Schoolhouse well located approximately 1 mi west of ER Site 9 (IT May 1994a)."

For this geologic environment, the Schoolhouse well is located too far away for the purpose of estimating depth to ground water at ER Site 9. In addition, given that bedrock crops out within a few hundred feet east of the site, ground water at Site 9 could be much shallower than 138 ft.

#### **ER Site 11, Explosive Burial Mound**

4. Page 5-24, section 5.2.6.3, SNL states "Surface and near-surface soil samples will be collected to determine if the surface depressions may have released potential COCs to the environment by any potential burn tests."

Site history is not well known. Therefore, samples collected in the bottoms of the depressions should also be analyzed for VOCs, gross alpha, gross beta, and gamma spectrum. Santa Fe staff question the value of sample analysis for VOCs, considering the consistently negative findings of VOCs at surface or near surface features, when there is no other evidence (visual, or field screening) to suspect them. Also, Santa Fe staff wonder if laboratory measurement of gross alpha and gross beta contributes any useful information, if a laboratory gamma spectrum is run, and also considering that there may be a limited number of COCs.

5. Page 5-27, Section 5.2.6.3, in reference to Former Debris Mounds, SNL states "Two judgmental soil sample locations will be selected equidistant along the longest axis..."

According to Figure 5-6, Debris Mounds 2, 3, 4, 1, and 5 extend to distances of about 50, 60, 75, 100, and 100 ft, respectively. Two samples collected from the bottom of each mound are not enough to investigate a potential release to the environment. Additional samples should be collected beneath each debris mound, spaced no more than 25 ft apart. Because the widths of Debris Mounds 2 and 5 are large, additional samples should be collected on both sides of the centerline.

Samples collected beneath the mounds should also be analyzed for VOCs, gross alpha, gross beta, and gamma spectrum. Is VOC, gross alpha, gross beta, and gamma spec really necessary?

7. No sampling was specifically mentioned to verify cleanup of the radiological point source near Debris Mound 1.

**ER Site 57A - Workman Site: Firing Area**

1. Page 5-37, Section 5.3.1, SNL states "The underground bunker contained two 5-gal and one 20-gal containers of liquid waste..."

What was this liquid waste and was it hazardous?

2. Page 5-37, Section 5.3.2, in reference to radiological area sources, SNL states "These anomalies appear to result from the presence of manmade materials, rather than from tests conducted with radioactive materials."

From a health-based perspective, AIP staff see no difference between radiological contamination from tests, and the abandonment of (manmade) radioactive materials.

4. Page 5-40, Section 5.3.5.1

No sampling plan is presented for the purpose of verifying cleanup of radiological contamination.

6. Page 5-46, Section 5.3.6.3, Utility Poles

No sampling is planned along and beneath the high pressure pipes.

7. Page 5-46, Section 5.3.6.3, Gun Mounts

The gun mounts should be centered on the grid, and at least one sample collected on each side of the gun mounts.

8. Page 5-46, Section 5.3.6.3, Underground Bunker, SNL states "If a drainline is connected to the drain, contingency sampling may be required."

If a drainline is connected to the drain, AIP staff recommend that contingency sampling **shall be** required.

9. Page 5-46, Section 5.3.6.3, Debris Sampling

No sampling plan is proposed to investigate the scattered debris shown in Figure 5-19. Also, please describe the scattered debris.

11. Page 5-50. Table 5-6

Sample fractions should also be collected and analyzed for gross alpha, gross beta, and gamma spectrum at the wind tunnel and other concrete pads; utility poles, underground bunker, Debris Mound 1, Debris Mound 2, and Debris Mound 3.

VOC samples should also be collected beneath Debris Mounds 1, 2, and 3; and beneath the machine shop area at the wind tunnel pad.

Is VOC, gross alpha, gross beta, and gamma spec really necessary?

12. Although a significant concern, no sampling is specifically planned for the machine shop area.

A pipe, sticking out of the ground, is located on the east side of the wind tunnel/machine shop pad. What was the purpose of this pipe?

13. Signs posted around Building 9900 read "Flammable Liquid" and "Danger No Smoking". What was the flammable liquid?

14. Soils in the open center part of Pad 4 need to be sampled.

15. What, if anything, is under the steel plate north of Pad 2? Could this be another underground bunker?

#### **ER Site 57B - Workman Site: Target Area**

3. Page 5-58, Section 5.4.5

Section 5.4.2 says that all field radiological measurements were "approximately at the background activity level (Appendix F)."

Where was the radiological point source located? No sampling plan is presented for the purpose of verifying cleanup of the radiological point source. What were the values of the field radioactivity measurements? What was the background activity level?

6. Page 5-65, Table 5-8

Sample fractions should also be collected and analyzed for gross alpha, gross beta, and gamma spectrum. Is VOC, gross alpha, gross beta, and gamma spec really necessary? beneath the pits and the area between the tower bases,

VOC and SVOC samples should also be collected beneath the pits.

7. At least two samples should be collected from the bottom of each pit at depths of 0-6, 18-24, and 114-120 inches. Composite samples should not be collected for any sample fraction.

8. No sampling of the debris mound and beneath the debris mound is mentioned. If these wastes are removed, and are shown in the process as being strictly nonhazardous construction demolition debris, then sampling will probably not be necessary (for this specific case).

9. What is the purpose of the small concrete pad (dated 4-1-44) that is located south of the south tower base?

10. What was the purpose of the small concrete pad that is located northwest of the northern extent of the debris pile (near the power pole)?

## ER Site 61A - Schoolhouse Mesa Test Site: Blast Area

3. Page 5-72, Section 5.5.5, SNL states "Radiological point source and area source anomalies are distributed over the ER 61A site (Figure 5-28).

No sampling plan is presented for the purpose of verifying cleanup of the radiological sources. Point sources are not shown on Figure 5-28.

5. Page 5-79, Section 5.5.6.3, Debris Mounds 1 and 2, SNL states "Characterization of debris mounds 1 and 2 includes debris sampling to determine if the mounds contain regulated waste and soil sampling beneath the mounds to determine the extent of waste migration if a hazardous source is identified."

It is unclear if soil beneath Debris Mounds 1 and 2 will actually be sampled. Sampling must be conducted beneath the two debris mounds, even if TCLP tests demonstrate that "average" mound debris is not a hazardous waste for the purpose of removing and disposing of the debris.

According to Figure 5-2, the two debris mounds extend to a maximum distance of 200 to 300 ft. The proposed number of soil samples to be collected from beneath each mound are not enough to investigate a potential release to the environment. Additional samples should be collected beneath each mound, spaced no more than 25 ft apart. However, digging along Debris Mound may reveal that this feature is nothing more than a berm along the road, created as a result of clearing the immediate area.

Samples collected beneath each mound should be analyzed for VOCs, gross alpha, gross beta, and gamma spectrum. Is VOC, gross alpha, gross beta, and gamma spec really necessary? Field screening data are not acceptable for site characterization purposes.

6. Page 5-79, Section 5.5.6.3, Positive Gamma Areas

The approximate soil sampling locations are not shown in Figure 5-32.

7. Page 5-79 Section 5.5.6.3, Concrete Blocks

On page 5-67, SNL states "Fragments of plastic materials and small HE compound fragments (Figure 5-29b) are scattered around the concrete blocks (61-72)."

Soils surrounding the blocks should be sampled for high explosives, gross alpha, gross beta, and gamma spectrum. Is VOC, gross alpha, gross beta, and gamma spec really necessary? regardless of what is found in the chip samples of concrete.

8. Page 5-75, Table 5-10

Sample fractions should also be collected and analyzed for gross

alpha, gross beta, and gamma spectrum does gross alpha and gross beta really help? at the cleared area, the positive gamma areas, and at sampling locations proposed for arroyo channel sediment.

10. The sampling grid shown in Figure 5-33 should be expanded in all directions, and the number of samples increased.

11. Dark gray pieces of plastic (?) debris, metal shrapnel, and orange resinous materials are scattered over the entire area. What are these materials? Are these materials hazardous and/or radioactive?

#### **ER Site 61C - Schoolhouse Mesa Test Site: Schoolhouse Building**

1. Page 5-83, Figure 5-34

Was the CEARP soil data acquired from sampling conducted in 1988 or in 1989?

2. Page 5-85, Section 5.6.2, SNL states "Five composite samples were analyzed for HE compounds, VOCs, metals, and radionuclides."

Composite samples are not generally accepted for the purpose of site characterization.

4. Page 5-85, Section 5.6.2, SNL states "Aluminum, barium, ...silver and radium concentrations were less than the method detection limit."

The preceding sentence lists detections for each of these metals. Also, the value for cadmium (107 ug/L) does not match that of Table 5-11, page 5-86, listed as 1.7 ug/L. Which is correct. Obviously, cadmium concentrations of 107 ug/L in ground water would be a concern.

5. Page 5-85, Section 5.6.2

Where exactly was the one "lb" of HE compounds located?

6. Table 5-11, Page 5-86

The Schoolhouse well (so called "East Well") has been sampled numerous times by SNL's Sitewide Ground-Water Surveillance Group. ~~Why was relatively old, selected data included in the RFI work plan?~~ More current data should be included in the RFI work plan.

The reported concentration for nitrate as nitrogen (5.2 mg/L, Table 5-11) is relatively high, and thus a concern. Other sampling at the Schoolhouse well has produced similar results. Monitor wells should be installed at the Schoolhouse site to investigate potential ground-water contamination.

Soil samples should be collected from deep boreholes drilled in the drainfield/leachfield area.

5. Page 5-85, Section 5.6.2, SNL states "Calcium, iron,

manganese, potassium, and sodium were determined to be within the range of background for groundwater in this region"

Ground water is relatively shallow at this site. Ground water should be investigated as part of the RFI. Does this mean by installing additional monitor wells or by investigating potential contaminants/ground water chemistry or both?

8. Page 5-89, Section 5.6.5.1, SNL states sampling may also be conducted at the site to support a baseline risk assessment if COCs are detected above action levels or background concentrations.

Results of air sampling are not acceptable for the purpose of site characterization.

10. Page 5-93, Section 5.6.5.3, Sink Drain Line

The drainline/leachfield must be located before samples are collected. The proposed trenches may not be adequate. Trenching should be conducted until the drainline/leachfield are delineated. Samples should be collected in those areas most likely to have received wastes.

12. Page 5-99, Table 5-13

In addition to those shown in Table 5-13, soil samples collected from the sink drainline, the Schoolhouse Building, the drainage to the arroyo channel, and the arroyo channel sediment should also be analyzed for VOCs, gross alpha, gross beta, and gamma spectrum. Is VOC, gross alpha, gross beta, and gamma spec really necessary?

13. Was there a septic system located at the Schoolhouse which could have contributed to the elevated nitrate?

14. What was machined at the schoolhouse? Were radiological materials machined or used at the schoolhouse?

#### **ER Site 68 - Old burn Site**

1. Page 5-104, Section 5.7.1

What is a SNAP reactor?

2. Page 5-106, Section 5.7.2

The CEARP data, representing sample composites, are not suitable for the purpose of site characterization. Detection limits are not given in Table 5-14. Field and laboratory quality control results are also not presented.

3. Page 5-106, Section 5.7.2, SNL states "Acetone is a common laboratory contaminant, and the toluene values were less than 10 ug/kg, suggesting that these VOC detections may be false positives."

The toluene detections should be considered valid, unless verified otherwise.

6. Page 5-111, Section 5.7.5, Radiological Anomalies

Where are the 240 radiological point sources located at ER Site 68? No sampling plan is presented for the purpose of verifying cleanup of point sources.

8. Page 5-114, Section 5.7.6.3, Borrow Pits

Composite samples are not suitable for the purpose of site characterization.

9. Page 5-114, Section 5.7.6.3, Burn Pan

Composite samples are not suitable for the purpose of site characterization.

At least 4 discrete soil samples should be collected beneath the burn pan at two depths (0-6 and 18-24 inches). These samples should be collected, even if sediments in the burn pan are found to be non-hazardous for the purpose of their removal and disposal.

10. Page 5-116, Section 5.7.6.3, Debris Mounds

The proposal to collect only one sample beneath each debris mound may be inadequate, depending on the dimensions of each individual debris mound. Samples should be collected beneath each debris mound, spaced no more than 25 ft apart.

11. Page 5-116, Section 5.7.6.3, Drainage Ditch and Overflow Basin, and Plastic Lined Pit

The proposed sampling for these features is inadequate. The overflow basin and the plastic lined pit should be investigated in a similar way to that done for the burn pan. At least 4 discrete soil samples should be collected beneath the overflow basin and the plastic-lined pit.

Additional samples should be collected along the bottom of the drainage ditch, spaced no further than 25 ft apart.

13. Page 5-117, Table 5-16

The proposed sample fractions for some features are inadequate, and should include the following:

Sample fractions should be collected and analyzed for gross alpha, gross beta, and gamma spectrum beneath the borrow pits, burn pan, drainage ditch, overflow basin, plastic-lined pit, and at sampling locations proposed for arroyo channel sediment.

Sample fractions should be collected and analyzed for VOCs beneath the borrow pits, burn pan, drainage ditch, overflow

basin, plastic-lined pit, and at sampling location proposed for arroyo channel sediment.

Is VOC, gross alpha, gross beta, and gamma spec really necessary?

Sample fractions should be collected beneath the burn pan and analyzed for total SVOCs (not TCLP SVOCs).

Sample fractions should be collected beneath the burn pan and analyzed for total metals (not TCLP metals).

14. There is a debris mound (12 ft by 3 ft) not shown on the Site 68 maps. The mound is located immediately east of the utility poles, and contained burned pieces of pipe (?).

15. There is a relatively large debris mound located about 1000 ft northeast of ER Site 68, across the arroyo. This debris mound, definitely a concern, is not shown on the maps of Site 68.

16. Page 5-110, section 5.7.3, SNL states "The depth to groundwater at the site is approximately 199 ft bgl based on measurements at the KAFB 1902 well located approximately 0.5 mi north of ER Site 68 (IT May 1994a)."

For this geologic environment, KAFB 1902 is located too far away for the purpose of estimating depth to ground water at ER Site 68. In addition, given that limestone bedrock crops out within a few hundred feet west of the Burn Pan, ground water at Site 68 could be much shallower than 199 ft.

If there are any questions, please contact me (505-845-5933) or William P. Moats (505-845-5824) of the DOE Oversight Bureau.

William P. Moats/Bill McDonald

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