

ER#  
76089

Memorandum

To: Ron Rager, Washington Group

From: Gary Stoores, Aurora Technical Services

*Gary Stoores*

Date: August 8, 2003

RE: Drilling and radiological contamination at former building 35, TA-21, (former OU 1106).

After reviewing the drilling logs, memo, and drawings presently available, I can recall additional details from the drilling/sampling that took place nine years ago (August, 1994) at former building 35. I can also make a few corrections and add further details to the record. As best I can recall we undertook the following:

We (WESTON) drilled a series of exploratory borings near and within the former footprint of building 35 and two associated tanks (tanks #110 and #111). No obvious footprint of the building or tanks remained and old blueprints and/or surveys probably determined the locations of the exploratory holes.

A CME 750 wheel-mounted drill rig was used for all borings. This is a highly mobile auger drill rig that used ~ 8-inch augers and employed a split-spoon core barrel sampler to retrieve continuous core. Layne Drilling Company, out of Denver, Colorado was the drilling company.

A total of 15 borings (location ID's 21-2535 – 21-2549) were initially called for in the work plan and completed, with two additional borings (21-2547A and B on core sample logs, 21-2609 and 21-2610 on maps of MDA T sample locations) completed after radiological contamination was encountered. No boring was deeper than 20 ft and most were to a depth of 7.5 to 10 ft bgs, deep enough to encounter coherent tuff. Continuous core was retrieved, screened, and logged for each boring but sampling was only done at 21-2545 and 21-2546. Four samples each were collected from these two borings at progressive depths from ~ 2 to 20 ft bgs. I assume these samples were called for in the work plan. The core was not archived and was placed in 55-gallon drums and disposed of, probably at TA-54.

Field screening was done for radiological parameters (alpha and beta/gamma survey meters), organic vapors, and oxygen/explosive gases. Organic vapors were detected in the additional boring 21-2547B, at about the 7.5 to 10 foot interval at 254 ppm (down hole reading). Vapors dissipated after ~1.5 hours.

There were a number of radiological "hits" during screening at various depths in the borings as follows:

Location: 21-2536 @ 5-7.5 ft, alpha radiation of 25-50 cpm (background is usually considered ~ 0 or 1). This boring was directly beneath former tank # 111.

Location: 21-2539 @ 7.8 –10 ft, alpha radiation of 800 cpm. This boring is directly beneath the old footprint of building 35.

Location: 21-2541 @ 2-2.5 ft, alpha radiation of 450 cpm. This boring is directly beneath the old footprint of building 35.

Location: 21-2543 @ ~ 4 ft, beta/gamma radiation of 280 cpm (background for beta is usually ~200 cpm). This boring is outside of the former building footprint probably along the east side.

Location: 21-2544 @ 5-7 ft, alpha radiation of 250 cpm and beta/gamma radiation of 1,200 cpm. This boring is outside the former building footprint along the north side.



Location: 21-2547 @ 5-7 ft, alpha radiation of 25,000 cpm and beta/gamma radiation of 2,000 cpm. This boring is outside the former building footprint along the southwest corner, and near a former junction box/ "manhole" that was a nexus of piping from various buildings - "including a 6-inch pipe that carried waste to the absorption beds a MDA-T" according to a memo.

Location: 21-02609 (21-2547A) @ 6-7.5 ft, alpha radiation of 250 cpm and beta/gamma radiation of 350 cpm. This is one of the additional borings and is located southwest of boring 21-2547.

Location: 21-02610 (21-2547B) @ 4.8 - 5 ft, alpha radiation of 350 cpm and beta/gamma radiation of 340 cpm; @ 5 - 7 ft alpha radiation of 25-50 cpm. This is one of the additional borings and is located southeast of boring 21-2547.

As addressed in a "memo" the main radiological contamination is near the southwest corner of former building 35 and is probably associated with a large junction box that was a connection point for a lot of piping and "raffinate lines" from building 35 and other buildings at TA-21.

The contamination encountered at boring 21-2547 was high enough that the job was shut down (August, 19, 1994) and a radiological work permit was required from LANL before work could continue. We shut down for approximately 5 days. There is other probable radiological contamination associated with building 35 as noted by the elevated radiological screening counts at various other borings. However, radiological contamination is probably concentrated near the former junction box and associated lines. Also note worthy is that most of the radiological contamination is in a zone between the upper fill and coherent tuff. That is, in a generally moist layer of mixed soil/fill and weathered/alterted tuff sandwiched between present "topsoil" and tuff. No elevated radiological readings were encountered near or at the surface or in the tuff. Thus, the radiological contamination associated with building 35 is probably limited both laterally and vertically.

A portion of the core from 21-2547 that had elevated radiological screening values was sampled. This sampled was, I think, sent to a laboratory in Colorado (Denver or Grand Junction) for analysis. The sampled contained plutonium 239/240 and americium-241. This is oral information only (from Gary McMath); I do not know of nor have I seen any written documentation of the analysis. Of the eight other samples taken of core the analyses should be in the LANL ER database.

I was only associated with the drilling on this project and was not involved with any reports or other follow up documentation. A logbook was kept and should be available. In addition, weekly activity reports or updates were issued to LANL. Gary McMath was in charge of the project at the time and he now works for LANL. Mr. McMath would be an excellent contact to substantiate or correct the material in this memorandum and for obtaining additional needed information. Also, Mr. McMath was associated with the trench sampling at building 3A in December of 1994. I was not involved with this part of the fieldwork. However, ten samples were collected and sent for analysis as documented in drawings and sample collection logs that give sample numbers and associated survey locations. The trench sampling by building 3A at TA-21 is not within the MDA-T study limit but may have been called for in the work plan, or been add on work.

Additional note (from Curtis Schultz): sample location 21-2549 does not appear on MDA T sample location maps that we have seen. After reviewing core logs and project sketches I have come to the conclusion that that particular location dot and ID number on the map was covered up by a location ID text box during map production.