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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

June 21, 2012

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Michael Graham
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Los Alamos National Security, L.L.C.
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RE: DISAPPROVAL
INVESTIGATION REPORT FOR DP SITE AGGREGATE AREA DELAYED SITES AND DP EAST BUILDING FOOTPRINTS AT TA-21
LOS ALAMOS NATIONAL LABORATORY (LANL)
EPA ID #NM0890010515
HWB-LANL-11-097

Dear Messrs. Maggiore and Graham:

The New Mexico Environment Department (NMED) has received the United States Department of Energy (DOE) and the Los Alamos National Security L.L.C.'s (LANS) (collectively, the Permittees) *Investigation Report for DP Site Aggregate Area Delayed Sites [Consolidated Unit 21-004(b)-99 and Solid Waste Management Unit 21-011(b)] and DP East Building Footprints at Technical Area 21, Revision 1* (IR or Report), dated March 2012 and referenced by LA-UR-12-1060/EP2012-0061 and *Response to the Second Notice of Disapproval for the Investigation Report for DP Site Aggregate Area Delayed Sites [Consolidated Unit 21-004(b)-99 and Solid Waste Management Unit 21-011(b)] and DP East Building Footprints at Technical Area 21, Revision 1, and Replacement Pages* (Second NOD Response), dated April 6, 2012 and referenced by EP2012-0095. NMED has reviewed the IR and Second NOD Response and hereby issues this third Disapproval.

The Permittees must address the following comments before NMED can complete its review.

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General Comments:

1) NMED allowed the Permittees to submit electronic versions of the required tables in lieu of making changes to the summary data tables within the Report body. The format of the MS Excel tables submitted in Appendix C made review difficult.

   First, direct concatenation of the qualifiers onto the concentration/activity values creates difficulty for the reviewer in value comparison. Provide qualifiers in parenthesis, as presented in the summary data tables within the Report, instead of concatenating the qualifier onto the result.

   Second, in many instances where more than two samples were collected from the same location, the rows of the table were not organized according to increasing depth. Providing the data out-of-order relative to depth creates difficulty for the reviewer in evaluating concentration/activity trends relative to depth.

   Third, the appropriate SSLs or SALs must be included in the tables. Also, if maximum background values (BVs) are to be used as evidence of determination of extent, those values must also be included in the tables. Similarly, for organics, if an EQL is cited as reason to negate a detection, the EQL must be provided in the tables.

   Also, the pdf files of the tables that were included in Excel Files directory of Appendix C are not useful in the format provided and are not needed.

   Provide corrected electronic tables in the revised Report. Separate the qualifiers from the concentration/activity values in the same manner as the data summary tables within the Report. The Permittees must order the sample data in accordance with depth in the revised tables, and provide the appropriate SSLs, SALs, maximum BVs (in addition to the BV UTLs), and EQLs in the revised tables.

2) Assertions that detected concentrations are below the EQLs cannot be verified without provision of the EQL values. Until the EQLs are supplied for comparison, these claims cannot be considered valid. Although some of these instances may be specified in the Specific Comments section of this Disapproval, there are too many to include; therefore, NMED considers the extent as undefined for all locations where EQLs were cited as justification for definition of extent but were not provided in the IR for verification. Also, see Comment 1.

3) For all constituents which had detection limits (DLs) above the appropriate media background value (BV), thereby qualifying the analytical results as non-detect (ND), the maximum concentration, whether qualified as detected or ND, for those constituents must be carried forward in the risk assessment.

4) In the Second NOD Response, the Permittees added Appendix G, which contains Sample Collection Logs. The compilation of Sample Collection Logs provided was not complete.

Approximately 45% of the Sample Collection Logs were missing. Provide a complete set of the Sample Collection Logs in the revised Report.

Also, there are 216 data package pdf files in Appendix C with no sample identification provided to allow the reader to locate the associated file. In the revised Report and all other future reports, provide some mechanism to identify which data package pdf files are associated with each sample.

5) The Permittees present inconsistent arguments regarding the nature and extent of contamination in the Report. For instance, at location 21-614196, the acetone concentrations are 0.00206 mg/kg at 6-7 ft bgs and 0.00201 mg/kg at 8-9 ft bgs, a difference of approximately 2.4%. The Permittees state that the concentrations here "decreased with depth." At location 21-614193, the methylene chloride concentrations are 0.00328 mg/kg at 6-7 ft bgs and 0.00351 mg/kg at 8-9 ft bgs, a difference of approximately 7.0%. The Permittees state that the concentrations "remained essentially the same with depth."

The Permittees' use of inconsistent and contradictory arguments is not technically defensible. The conclusion that "concentrations [or activities] remained essentially the same with depth" is arbitrary and does not indicate a decreasing trend in concentration or activity; therefore, this conclusion is not a viable reason to dismiss contaminant detections. Although some of these instances are addressed in the Specific Comments section of this Disapproval, there are too many to list in a general comment. Remove all references to concentrations or activities remaining "essentially the same" and either sample deeper depths to define vertical extent at locations where concentrations or activities increase with depth or provide a defensible rationale for not doing so.

6) The Permittees used both SOIL and ALLH to indicate the same media in the Report. For this report and all future reports, use only one media code for soils. Revise the Report to utilize only one media code for soil.

Specific Comments:

7) **Section 7.1.1.2, Nature and Extent of Soil and Rock Contamination, page 25**

Permittees' Statement: "Antimony was detected above the Qbt 3 BV (0.5 mg/kg) in two samples at location 21-614326. Its concentrations were below the estimated detection limits (DLs) in the deeper depths. Therefore, the lateral and vertical extents of antimony are defined."

NMED Comment: This statement implies that antimony was detected at concentrations below the detection limit. This is counterintuitive. Resolve this discrepancy.

8) **Section 7.1.1.2, Nature and Extent of Soil and Rock Contamination, page 25**

Permittees' Statement: "Chromium concentrations increased with depth at locations 21-614326 and 21-614328. Chromium concentrations decreased with depth at location 21-614329. Chromium was detected (8.97 mg/kg) below the maximum Qbt 3 background concentration (13 mg/kg) at location 21-614327. Chromium concentrations decreased downslope of the outfall. Therefore, the lateral extent of chromium is defined, but the vertical extent is not defined."

NMED Comment: While the lateral extent of chromium is defined at location 21-614328, the IR indicates it has only been defined in one direction at location 21-614326. The Permittees must propose to perform step out sampling in the other 3 directions at location 21-614326 in order to define the lateral extent of chromium or provide a defensible justification for not doing so.

9) **Section 7.1.1.2, Nature and Extent of Soil and Rock Contamination, page 26**

Permittees' Statement: "..., the lateral extent of nickel is defined, but the vertical extent is not defined."

NMED Comment: While the lateral extent of nickel is defined at location 21-614328, it has not been defined at locations 21-614326 and 21-614329. Propose to perform step out sampling at locations 21-614326 and 21-614329 in order to define the lateral extent of nickel or provide a defensible justification for not doing so.

10) **Section 7.1.2.2, Nature and Extent of Soil and Rock Contamination, page 29**

Permittees' Statement: "The concentrations decreased with depth at location 21-613821 and remained essentially the same at location 21-613826. The concentration of aluminum in the shallower sample at location 21-613826 was below the soil BV but similar to the concentration in the deeper tuff sample (Appendix C, Table C-4). Therefore, the vertical extent of aluminum is defined."

NMED Comment: At location 21-613826, concentrations of aluminum increase with depth and the deeper concentration exceeds the maximum background concentration for Qbt 3. The Permittees must propose to perform sampling at deeper intervals at this location in order to define the vertical extent of aluminum or provide defensible justification for not doing so.

11) **Section 7.1.2.2, Nature and Extent of Soil and Rock Contamination, page 30**

Permittees' Statement: "The concentrations of calcium at location 21-613821 remained essentially the same with depth, both below (shallowest depth) and above (deepest depth) the maximum Qbt 3 background concentration (2230 mg/kg). The concentrations were below the maximum soil background concentration (14,000 mg/kg) at locations 21-613827,

21-613834, and 21-613839 and increased at depth at location 21-613825. Therefore, the vertical extent of calcium is not defined at location 21-613825."

NMED Comment: In addition to location 21-613825, the vertical extent of calcium is also not defined at location 21-613821. The calcium concentrations increased with depth at location 21-613821 and the deepest concentration is above the maximum background concentration. Include location 21-613821 in the list of locations for which the vertical extent of calcium has not been defined.

12) Section 7.1.2.2, Nature and Extent of Soil and Rock Contamination, page 30

Permittees' Statement: "At location 21-613816, chromium concentrations remained essentially the same with depth; the concentration in the shallower sample was below the soil BV but similar to the concentration in the deeper tuff sample (Appendix C, Table C-4). At location 21-613836, concentrations decreased with depth. The concentrations were below the maximum Qbt 3 background concentration (13 mg/kg) at locations 21-613813, 21-613816, 21-613819, and 21-613820, and the concentration was below the maximum soil background concentration (36.5 mg/kg) at location 21-613847. Therefore, the vertical extent of chromium is defined."

NMED Comment: At locations 21-613816, 21-613819, and 21-613820, chromium concentrations increase with depth and the deepest concentrations are above the Qbt 3 BV. At location 21-613847, the chromium concentration increases with depth and the deepest concentration is above the Soil BV. Therefore, the vertical extent of chromium is not defined. The Permittees must propose to collect samples for chromium analysis at deeper intervals at locations 21-613816, 21-613819, 21-613820, and 21-613847 or provide defensible justification for not doing so.

13) Section 7.1.2.2, Nature and Extent of Soil and Rock Contamination, page 31

Permittees' Statement: "The concentrations of mercury decreased with depth at four locations and was essentially the same as the soil BV at location 21-613849 (0.116 mg/kg). The concentrations of mercury increased with depth at location 21-613827. Therefore, the vertical extent of mercury is not defined at location 21-613827."

NMED Comment: At location 21-613849, mercury concentrations increased with depth and the deepest concentration is above the maximum background value. Therefore, the vertical extent of mercury is also not defined at location 21-613849. The Permittees must include location 21-613849 in the list of locations where vertical extent of mercury is not defined.

14) Section 7.1.2.2, Nature and Extent of Soil and Rock Contamination, page 31

Permittees' Statement: "The concentrations in the shallower samples were below the soil BV but above the concentrations in the deeper tuff sample at locations 21-613816 and 21-613826 (Appendix C, Table C-4). The concentrations increased with depth at location 21-613821. Therefore, the vertical extent of nickel is not defined at location 21-613821."

NMED Comment: At location 21-613826, nickel concentrations are essentially the same and the deepest concentration is above the maximum background value for Qbt 3. Therefore, the vertical extent of nickel is also not defined at location 21-613826. The Permittees must include location 21-613826 in the list of locations where vertical extent of nickel is not defined.

15) Section 7.1.2.2, Nature and Extent of Soil and Rock Contamination, page 33

Permittees' Statement: "Thorium-228 was detected in one soil sample at essentially the same activity as the BV (2.28 pCi/g) at location 21-613814 from 8–9 ft bgs. Therefore, the vertical extent of thorium-228 is defined."

NMED Comment: Thorium-228 was detected above the BV and at the residential SAL at location 21-613814 and concentrations increased with depth; therefore, vertical extent is not defined. In addition, thorium-228 was detected at location 21-613813 above the residential SAL and concentrations increased with depth; therefore, vertical extent is not defined. The Permittees must propose to collect samples at deeper depths at both of these locations in order to define vertical extent of thorium-228 or provide defensible justification for not doing so.

16) Section 7.1.3.2, Nature and Extent of Soil and Rock Contamination, page 34

Permittees' Statement: "Aluminum was detected above the Qbt 3 BV (7340 mg/kg) in seven samples at seven locations. The maximum concentration (17,800 mg/kg) was detected at location 21-614192 from 8–9 ft bgs. The concentrations of aluminum decreased with depth at locations 21-614187, 21-614213, and 21614236. The concentrations in the shallower samples at these three locations were below the soil BV but above the concentrations in the deeper tuff samples (Appendix C, Table C-7). The aluminum concentration was below the maximum Qbt 3 background concentration (8370 mg/kg) at location 21-614187. The concentrations of aluminum increased with depth at locations 21-614192, 21-614206, 21-614211, and 21-614216. Therefore, the vertical extent of aluminum is not defined."

NMED Comment: Although concentrations of aluminum decreased at locations 21-614213 and 21-614236, the deepest concentrations were above the maximum Qbt 3 background concentration. Therefore, the vertical extent at these locations has not been defined. Samples from locations 21-614193 and 21-614208 were not analyzed for aluminum and no explanation was provided. In addition, locations 21-614217, 21-614218,

and 21-614221 all display increasing concentrations similar to location 21-614216. While the deeper sample (3-4 ft bgs) from 21-614216 is listed in the Qbt 3, the other three locations to the south indicate that the deeper samples (3-4 ft bgs) were collected from soils. No sample collection logs were provided for these locations in Appendix G; therefore, this information could not be verified. Based on the sampling results, it appears that the southern central area of former building 21-152 has increased aluminum concentrations with depth. The Permittees must propose to collect samples for aluminum analysis from locations 21-614193 and 21-614208, as well as from deeper intervals at locations 21-614192, 21-614206, 21-614211, 21-614213, 21-614216, 21-614217, 21-614218, and 21-614221 or provide defensible justification for not doing so.

17) Section 7.1.3.2, Nature and Extent of Soil and Rock Contamination, page 35

Permittees' Statement: "The concentrations in the shallower samples at locations 21-614187, 21-614212, 21-614213, 21-614216, 21-614226, 21-614233, 21-614234, and 21-614236 were below the soil BV but above the concentrations in the deeper tuff samples (Appendix C, Table C-7). Barium concentrations were below the maximum Qbt 3 background concentration (51.6 mg/kg) at locations 21-614198 and 21-614213. The detected concentrations were below the barium soil maximum background concentration (410 mg/kg) at location 21-614217 and increased with depth at locations 21-614192, 21-614206, 21-614211, 21-614219, 21-614221, and 21-614232. Therefore, the vertical extent of barium is not defined."

NMED Comment: Barium concentrations at location 21-614226 decreased in the first interval, then increased to a value above the maximum Qbt 3 background value in the second interval. Barium concentrations were similar at location 21-614236 and exceeded the maximum Qbt 3 background value in the deepest interval. While the barium concentration at location 21-614217 was below the maximum soil background concentration, the concentrations at this location increased significantly with depth and exceed the soil BV UTL. Therefore, the Permittees must add locations 21-614217, 21-614226, and 21-614236 to the list of locations where the vertical extent of barium is not defined or provide defensible justification for not doing so.

18) Section 7.1.3.2, Nature and Extent of Soil and Rock Contamination, page 35

Permittees' Statement: "The concentrations remained essentially the same with depth at location 21-614192; the concentration in the shallower sample was below the soil BV but similar to the concentration in the deeper tuff sample (Appendix C, Table C-7). The concentrations of calcium increased with depth at locations 21-614183, 21-614222, 21-614232, and 21-614236. Therefore, the vertical extent of calcium is not defined."

NMED Comment: While concentrations at location 21-614192 remained similar with depth, the deepest sample concentration exceeds the maximum Qbt 3 background value for calcium. Therefore, based on the Permittees' approach to defining extent, add location 21-614192 to the list of locations where the vertical extent of calcium is not defined.

19) Section 7.1.3.2, Nature and Extent of Soil and Rock Contamination, page 35

Permittees' Statement: "Chromium was detected at or below the maximum Qbt 3 background concentration (13 mg/kg) at locations 21-614182, 21-614183, 21-614187, 21-614205, 21-614206, 21-614209, 21-614213, 21-614216, 21-614222, 21-614224, 21-614233, 21-614238, and 21-614240."

NMED Comment: The statement above is not accurate. Chromium was detected above the maximum Qbt 3 background concentration in the deepest sample at location 21-614206. Add location 21-614206 to the list of locations where the vertical extent of chromium is not defined.

20) Section 7.1.3.2, Nature and Extent of Soil and Rock Contamination, page 36

Permittees' Statement: "The concentration (9.7 mg/kg) at location 21-614221 from 3–4 ft bgs was essentially the same as the maximum soil background concentration in soil (9.5 mg/kg). The concentrations of cobalt increased with depth at locations 21-614192, 21-614236, and 21-614240. Therefore, the vertical extent of cobalt is not defined."

NMED Comment: While the statement above is accurate, it is also incomplete and does not provide a basis for determining that vertical extent is defined. The concentrations at location 21-614221 increased with depth and the deepest sample exceeds the maximum soil background concentration. Add location 21-614221 to the list of locations where the vertical extent of cobalt is not defined.

21) Section 7.1.3.2, Nature and Extent of Soil and Rock Contamination, page 36

Permittees' Statement: "The concentrations remained essentially the same with depth at locations 21-614222 and 21-614226. The concentration in the shallowest sample at location 21-614222 was below the tuff BV but similar to the concentration in the deepest tuff sample (Appendix C, Table C-7). At location 21-614226, the concentrations also remained essentially the same with depth; the concentration in the shallower sample was below the soil BV but similar to the concentration in the deeper tuff sample (Appendix C, Table C-7)."

NMED Comment: Based on the Permittees' approach, the statements above do not provide a basis for determining that vertical extent is defined. The concentrations at location 21-614222 increased with depth in the Qbt 3 and the deepest sample exceeds the maximum Qbt 3 background concentration. The concentrations at location 21-614226 also increased with depth and the deepest sample exceeds the maximum Qbt 3 background concentration. Therefore, based on the Permittees' approach to defining extent, add locations 21-614222 and 21-614226 to the list of locations where the vertical extent of copper is not defined.

22) Section 7.1.3.2, Nature and Extent of Soil and Rock Contamination, page 37

Permittees' Statement: "Manganese was detected above the Qbt 3 BV (482 mg/kg) in four samples at four locations. The detected concentrations were below the maximum Qbt 3 background concentration (752 mg/kg) and were above the construction worker SSL. Therefore, the vertical extent of manganese is defined."

NMED Comment: Samples from locations 21-614193 and 21-614208 were not analyzed for manganese and no explanation was provided. All four of the samples mentioned above significantly increased in manganese concentration with depth and exceeded the construction worker SSL; therefore, the vertical extents of manganese have not been defined. Propose to collect samples for manganese analysis from locations 21-614193 and 21-614208 and from deeper intervals at locations 21-614192, 21-614194, 21-614199, and 21-614236 or provide defensible justification for not doing so.

23) Section 7.1.3.2, Nature and Extent of Soil and Rock Contamination, page 38

Permittees' Statement: "The concentrations of one or more PAHs increased with depth at locations 21-614187, 21-614210, 21-614212, 21-614215, 21-614222, 21-614224, 21-614225, 21-614229, 21-614232, and 21-614234. Therefore, the vertical extent of PAHs is not defined."

NMED Comment: Acenaphthene and anthracene both increased with depth at location 21-614183. Phenanthrene concentrations increased with depth at location 21-614185. Flouranthene, phenanthrene, and pyrene concentrations also increased with depth at location 21-614195. In addition, indeno(1,2,3-cd)pyrene was detected at location 21-614219 with no deeper sample concentration data listed on Table C-8. Based on the Permittees' approach to defining extent, locations 21-614183, 21-614185, 21-614195, and 21-614219 must be included in the list of locations where the vertical extent of PAHs is not defined.

24) Section 7.1.3.2, Nature and Extent of Soil and Rock Contamination, page 39

Permittees' Statement: "The concentrations of one or more dioxins/furans increased with depth at locations 21-614204, 21-614207, 21-614220, 21-614222, and 21-614225. Therefore, the vertical extent of dioxins/furans is not defined."

NMED Comment: Concentrations of one or more dioxins/furans also increased with depth at locations 21-614205 and 21-614206. Add these two locations to the list of locations where the vertical extent of dioxins/furans is not defined.

25) Section 7.1.3.2, Nature and Extent of Soil and Rock Contamination, page 40

Permittees' Statement: "Tritium activities increased with depth at locations 21-614204, 21-614209, 21-614210, 21-614211, 21-614212, 21-614214, 21-614216, 21-614218, 21-

614219, 21-614220, 21-614221, 21-614225, 21-614226, and 21-614234. Therefore, the vertical extent of tritium is not defined."

NMED Comment: Tritium activity also increased with depth at locations 21-614194, 21-614237, and 21-614240. Add these locations to the list of locations where the vertical extent of tritium is not defined.

26) Section 7.1.4.2, Nature and Extent of Soil and Rock Contamination, page 41

NMED Comment: Samples collected from locations 21-614024 and 21-614026 were not analyzed for aluminum and no explanation was provided. Provide an explanation for why these locations were not analyzed for aluminum and propose to collect samples at these locations for aluminum analysis or provide defensible justification that the sampling is not necessary.

27) Section 7.1.4.2, Nature and Extent of Soil and Rock Contamination, page 42

Permittees' Statement: "Barium concentrations were below or approximately equivalent to the maximum Qbt 3 background concentration (51.6 mg/kg) at locations 21-613996, 21-613998, and 21-614005. The concentrations increased with depth at location 21-614009. Therefore, the vertical extent of barium is not defined at location 21-614009."

NMED Comment: Although the deepest barium concentration at location 21-614005 was approximately equivalent to the maximum Qbt 3 background concentration, the concentrations significantly increased with depth; therefore, based on the Permittees' approach to defining extent, the vertical extent of barium has not been defined at this location. Add location 21-614005 to the list of locations where the vertical extent of barium is not defined.

28) Section 7.1.4.2, Nature and Extent of Soil and Rock Contamination, page 42

Permittees' Statement: "The concentration at location 21-613985 was equivalent to the maximum Qbt 3 background concentration (2230 mg/kg). Calcium concentrations were below the maximum soil background concentration (14,000 mg/kg) at locations 21-613989, 21-613992, 21-614000, and 21-614021. The concentrations increased with depth at locations 21-613983 and 21-614001. Therefore, the vertical extent of calcium is not defined."

NMED Comment: Although the deepest calcium concentration at location 21-613985 was equivalent to the maximum Qbt 3 background concentration, the concentrations significantly increased with depth; therefore, the vertical extent of calcium has not been defined. Based on the Permittees' approach to defining the extent of constituents, add location 21-613985 to the list of locations where the vertical extent of calcium is not defined.

29) Section 7.1.4.2, Nature and Extent of Soil and Rock Contamination, page 42

Permittees' Statement: "The concentrations of copper decreased with depth at 12 locations and remained essentially the same with depth at location 21-614005. The concentrations in the shallower depths at locations 21-613987, 21-613998, 21-613999, 21-614000, 21-614003, and 21-614020 were below the soil BV but above the concentrations in the deeper tuff samples (Appendix C, Table C-10). Copper concentrations were below the maximum Qbt 3 background concentration (6.2 mg/kg) at locations 21-613978, 21-613997, 21-614011, and 21-614020. The copper concentration was below the maximum soil background concentration (16 mg/kg) at location 21-613993. The concentrations increased with depth at locations 21-613983, 21-614006, 21-614012, 21-614014, and 21-614015. Therefore, the vertical extent of copper is not defined."

NMED Comment: Although the copper concentrations were similar with depth at location 21-614005, the deepest sample concentration was above the maximum Qbt 3 background concentration; therefore, based on the Permittees' approach to defining extent, the vertical extent of contamination has not been defined. In addition, although the DLs for copper at location 21-614009 were above the Qbt 3 BV, the results indicate an increasing trend in concentrations that are likely above the Qbt 3 maximum background concentration. Add locations 21-614005 and 21-614009 to the list of locations where the vertical extent of copper is not defined.

30) Section 7.1.4.2, Nature and Extent of Soil and Rock Contamination, page 43

Permittees' Statement: "The detected concentrations were below the maximum Qbt 3 background concentration (15.5 mg/kg) at locations 21-613996, 21-613999, and 21-614009 and below the maximum soil background concentration (28 mg/kg) at location 21-614021. The concentrations of lead increased with depth at locations 21-613987, 21-614005, 21-614006, 21-614007, and 21-614012. Therefore, vertical extent of lead is not defined."

NMED Comment: Although the deepest lead concentration at location 21-614021 was slightly less than the maximum soil background concentration, the concentrations significantly increased with depth; therefore, based on the Permittees' approach to defining extent, the vertical extent of lead contamination has not been defined. Add location 21-614021 to the list of locations where the vertical extent of lead is not defined.

31) Section 7.1.4.2, Nature and Extent of Soil and Rock Contamination, page 43

NMED Comment: Samples from locations 21-614024 and 21-614026 were not analyzed for magnesium and no explanation was provided. Provide an explanation for omitting the analysis for magnesium and propose to collect samples from these locations for magnesium analysis or provide defensible justification for not doing so.

32) Section 7.1.4.2, Nature and Extent of Soil and Rock Contamination, page 43

Permittees' Statement: "The concentrations were below the maximum Qbt 3 background concentration (752 mg/kg) at locations 21-613986, 21-614005, and 21-614007. The manganese concentration was below the maximum soil background concentration (1100 mg/kg) at location 21-613987. The concentrations of manganese increased with depth at location 21-614000 and were above the construction worker SSL at all five locations. Therefore, the vertical extent of manganese is not defined."

NMED Comment: Samples from locations 21-614008, 21-614009, 21-614013, and 21-614014 were not analyzed for manganese and no explanation was provided. While the deepest sample concentrations at locations 21-613986 and 21-614005 were slightly below the maximum Qbt 3 background concentration, the concentrations significantly increased with depth; therefore, the vertical extent of contamination at these locations has not been defined. Propose to collect samples for manganese analysis from locations 21-614008, 21-614009, 21-614013, and 21-614014 and from deeper intervals at locations 21-613986, 21-614000, and 21-614005 or provide defensible justification that the sampling is not necessary.

33) Section 7.1.4.2, Nature and Extent of Soil and Rock Contamination, page 43

Permittees' Statement: "The detected concentrations at location 21-613995 were below the maximum soil background concentration (29 mg/kg). The concentrations of nickel increased with depth at location 21-613979. Therefore, the vertical extent of nickel is not defined at location 21-613979."

NMED Comment: While the deepest sample concentration at location 21-613995 was slightly below the maximum Qbt 3 background concentration, the concentrations significantly increased with depth; therefore, based on the Permittees' approach for defining extent, the vertical extent of nickel has not been defined. The Permittees must add location 21-613995 to the list of locations where the vertical extent of nickel is not defined.

34) Section 7.1.4.2, Nature and Extent of Soil and Rock Contamination, page 45

Permittees' Statement: "The concentrations decreased or remained essentially the same with depth at five locations. The concentrations were detected below the EQLs at locations 21-614012 and 21-614015, and the concentrations of one or more dioxins/furans increased with depth at locations 21-614000, 21-614001, 21-614013, and 21-614014. Therefore, the vertical extent of dioxins/furans is not defined."

NMED Comment: Concentrations of one or more dioxins/furans also increased with depth at locations 21-613998, 21-613999, and 21-614011. Add these three locations to the list of locations above for which vertical extent of dioxins/furans is not defined.

35) Section 7.1.4.2, Nature and Extent of Soil and Rock Contamination, page 46

Permittees' Statement: "Plutonium-239/240 activities increased with depth at locations 21-613982, 21-613999, 21-614002, 21-614003, and 21-614019. Therefore, the vertical extent of plutonium-239/240 is not defined."

NMED Comment: Plutionium-239/240 was also detected at location 21-614005. The deeper sample at this location was not analyzed for plutonium-239/240. Add this location to the list of locations above for which vertical extent of plutonium-239/240 is not defined.

36) Section 7.1.4.2, Nature and Extent of Soil and Rock Contamination, page 46

Permittees' Statement: "Activities decreased with depth at 23 locations and remained essentially the same with depth at locations 21-613995, 21-614009, 21-614015, and 21-614016. Tritium activities increased with depth at locations 21-613977, 21-613980, 21-613982, 21-613988, 21-613989, 21-613990, 21-613991, 21-613992, 21-613993, 21-613994, 21-613997, 21-613998, 21-613999, 21-614001, 21-614003, 21-614017, 21-614018, 21-614019, 21-614020, 21-614021, 21-614022, 21-614023, and 21-614024. Therefore, the vertical extent of tritium is not defined."

NMED Comment: Concentrations of tritium also increased with depth at locations 21-614016 and 21-614026. Add these two locations to the list of locations above for which vertical extent of tritium is not defined.

37) Section 7.1.5.2, Nature and Extent of Soil and Rock Contamination, page 48

Permittees' Statement: "The concentrations decreased with depth at location 21-613175; chromium was not detected above BV in the bottom depth (12.3–13 ft bgs). The detected concentration at location 21-614361 was below the maximum Qbt 3 background concentration (13 mg/kg). Chromium concentrations increased with depth at location 21-614372. Therefore, the vertical extent of chromium is not defined at location 21-614372."

NMED Comment: Although Table 7.1-17 indicates that a sample was collected from 12.3-13 ft bgs at location 21-613175, no data was provided for this depth interval in Table 7-1-18 or Table C-13. Therefore, based on the data provided and the Permittees' approach to defining extent, vertical extent of chromium contamination at location 21-613175 has not been defined. Add location 21-613175 to the list of locations where the vertical extent of chromium is not defined or provide the data referenced in the quote above accordingly.

38) Section 7.1.5.2, Nature and Extent of Soil and Rock Contamination, page 48

Permittees' Statement: "The detected concentrations of cobalt exceed the construction worker and/or residential SSLs under the basement at locations 21-612263, 21-612264, 21-612266, 21-612268, 21-613173, and 21-613174. The concentrations of cobalt decreased with depth at seven locations. Because refusal occurred at location 21-612268 at 11 ft bgs,

only one sample was collected. The concentrations of cobalt increased with depth at locations 21-612265 and 21-614366. Therefore, the vertical extent of cobalt is not defined."

NMED Comment: Auger refusal does not relieve the Permittees of the duty to define the extent of contamination. A sample obtained from location 21-612268 contained the highest concentration of cobalt of all samples collected at this building footprint. Add location 21-612268 to the list of locations where the vertical extent of cobalt is not defined.

39) Section 7.1.5.2, Nature and Extent of Soil and Rock Contamination, page 49

Permittees' Statement: "The concentrations increased with depth at locations 21-614361 and 21-614372. Therefore, the vertical extent of copper is not defined."

NMED Comment: In addition to the two locations above, Table C-13 indicates that the concentration at location 21-612813 exceeds the maximum soil background concentration; therefore, based on the Permittees' approach to defining extent, the vertical extent of copper contamination has not been defined. Add location 21-612813 to the list of locations where the vertical extent of copper is not defined.

40) Section 7.1.5.2, Nature and Extent of Soil and Rock Contamination, page 49

Permittees' Statement: "The detected concentrations of lead at location 21-614361 were below the maximum Qbt 3 background concentration (15.5 mg/kg). The lead concentration was below the maximum soil background concentration (28 mg/kg) at location 21-612264. The concentrations increased at location 21-614366. Therefore, the vertical extent of lead is not defined at location 21-614366."

NMED Comment: While the deepest sample concentration at location 21-614361 was slightly below the maximum Qbt 3 background concentration, the concentrations significantly increased with depth; therefore, based on the Permittees' approach to defining extent, the vertical extent of contamination has not been defined. Add location 21-614361 to the list of locations where the vertical extent of lead is not defined.

41) Section 7.1.5.2, Nature and Extent of Soil and Rock Contamination, page 49

Permittees' Statement: "Manganese was detected above the Qbt 3 BV (482 mg/kg) in one sample at location 21-614372 from 14– 15 ft bgs. The concentration was below the maximum Qbt 3 background concentration (752 mg/kg). The concentration was above the construction worker SSL. Therefore, the vertical extent of manganese is defined."

NMED Comment: While the deepest sample concentration at location 21-614372 was below the maximum Qbt 3 background concentration, the concentrations significantly increased with depth; therefore, based on the Permittees' approach to defining extent, the vertical extent of contamination has not been defined. Propose to collect samples for

manganese analysis from deeper intervals at location 21-614372 or provide defensible justification for not doing so.

42) Section 7.1.5.2, Nature and Extent of Soil and Rock Contamination, page 49

Permittees' Statement: "Nickel was detected above the Qbt 3 BV (6.58 mg/kg) in one sample at location 21-614361 from 3– 4 ft bgs. The concentrations of nickel remained essentially the same with depth and were only slightly above the BV. The concentration in the shallower sample at this location was similar to the concentration in the deeper tuff sample (Appendix C, Table C-13). Therefore, the vertical extent of nickel is defined."

NMED Comment: The nickel concentrations at location 21-614361 increased with depth and the deepest sample concentration exceeded the maximum Qbt 3 background concentration; therefore, based on the Permittees' approach to defining extent, the vertical extent of nickel has not been defined. The Permittees must propose to collect samples for nickel analysis from deeper intervals at location 21-614361 or provide defensible justification for not doing so.

43) Section 7.1.5.2, Nature and Extent of Soil and Rock Contamination, page 50

Permittees' Statement: "Zinc was detected above the Qbt 3 BV (63.5 mg/kg) in one sample at location 21-614361 from 3–4 ft bgs. The concentrations increased with depth at this location. Therefore, the vertical extent of zinc is not defined."

NMED Comment: In addition to location 21-614361, Table C-13 indicates that the zinc concentration at location 21-612813 exceeded the maximum soil background concentration; therefore, based on the Permittees' approach to defining extent, the vertical extent of zinc is not defined. Add location 21-612813 to the list of locations where the vertical extent of zinc is not defined.

44) Section 7.1.5.2, Nature and Extent of Soil and Rock Contamination, page 50

Permittees' Statement: "The concentrations decreased with depth at four locations. The concentrations were below EQLs at location 21-61436, and the concentrations of one or more PAHs increased with depth at locations 21-614361, 21-614362, 21-614365, 21-614366, and 21-614370. Therefore, the vertical extent of PAHs is not defined."

NMED Comment: No specific location was provided in the statement above regarding EQLs (apparently a typographical error). The concentrations of one or more PAHs also increased with depth at locations 21-612813, 21-614367, and 21-614368. Add these locations to the list of locations where vertical extent of PAHs is not defined.

45) Section 7.1.5.2, Nature and Extent of Soil and Rock Contamination, page 50

Permittees' Statement: "Aroclor-1254 was detected in three samples at three locations. The concentrations decreased with depth at all locations. Therefore, the vertical extent of Aroclor-1254 is defined."

NMED Comment: Aroclor-1254 was detected at 3.76 mg/kg at location 21-612813. This concentration is above the Consent Order default PCB soil cleanup level of 1 mg/kg. Correct the error in the quoted section above and propose to remove the contaminated media at this location.

46) Section 7.1.5.2, Nature and Extent of Soil and Rock Contamination, page 51

Permittees' Statement: "The concentrations decreased or remained essentially the same with depth at these locations. Therefore, the vertical extent of dioxins/furans is defined."

NMED Comment: Concentrations of one or more dioxins/furans increased with depth at locations 21-612263, 21-613171, 21-614361, 21-614365, 21-614370, and 21-614371. Propose to collect samples from deeper intervals at the locations listed above to define the vertical extent of dioxins/furans or provide defensible justification for not doing so.

47) Section 7.1.5.2, Nature and Extent of Soil and Rock Contamination, page 51

NMED Comment: Americium-241 was detected at location 21-612813 above the soil FV; therefore, extent is not defined. The Permittees did not provide any discussion of this detection. Include the detection of this tracer in the nature and extent discussion in the revised Report.

48) Section 7.1.5.2, Nature and Extent of Soil and Rock Contamination, page 51

Permittees' Statement: "Activities decreased with depth at four locations and increased with depth at locations 21-614361 and 21-614366. Therefore, the vertical extent of plutonium-239/240 is not defined."

NMED Comment: Plutonium-239/240 was also detected above the soil FV at location 21-612813. Add this location to the list of locations above for which vertical extent of plutonium-239/240 is not defined.

49) Section 7.1.5.2, Nature and Extent of Soil and Rock Contamination, page 51

Permittees' Statement: "Tritium activities decreased at 12 locations. Activities remained essentially the same with depth at locations 21-614363 and 21-614367. Activities increased with depth at locations 21-613173, 21-614361, 21-614362, 21-614368, 21-614369, and 21-614370. Therefore, the vertical extent of tritium is not defined."

NMED Comment: Tritium was also detected or increased with depth at locations 21-612813, 21-614363, 21-614367, and 21-614372. Add these locations to the list of locations above for which vertical extent of tritium is not defined.

50) Section 7.1.6.2, Nature and Extent of Soil and Rock Contamination, page 52

Permittees' Statement: "Chromium concentrations were below the maximum Qbt 3 background concentration (13 mg/kg) at locations 21-614373 and 21-614374. Chromium concentrations decreased with depth at three locations and increased with depth at location 21-614377 and decreased laterally to the west. Therefore, the lateral extent of chromium is defined, but the vertical extent is not defined."

NMED Comment: Although the deepest concentration at location 21-614374 was slightly below the maximum Qbt 3 background concentration, concentrations significantly increased with depth; therefore, based on the Permittees' approach to defining extent, the vertical extent of chromium is not defined. Although the chromium concentration at location 21-614375 initially decreased from the soil interval into the Qbt 3 (as is expected based on BVs), the concentration then increased with depth and ultimately exceeded the maximum Qbt 3 background concentration; therefore, vertical extent is not defined. Add locations 21-614374 and 21-614375 to the list of locations where the vertical extent of chromium is not defined.

51) Figure 2.6-1, Former building 21-209 and associated former structure 21-466 footprints site map with sampling locations, page 73

NMED Comment: Location 21-612813 is not shown on this map. Provide a corrected figure that depicts location 21-612813 in the revised Report.

52) Table 7.1-5, Samples Collected and Analyses Requested at SWMU 21-011(b), page 110

NMED Comment: Samples collected from location 21-613835 indicate that Qbt 3 Tuff was present at 2-3 ft bgs and that soil was present at 3-4 ft bgs. This stratigraphic sequence is likely not accurate and sample collection logs were not included for this location for verification. Provide sample collection logs for all samples collected and clarify whether the media descriptions for this location are accurate. See Comment 4.

53) Table 7.1-5, Samples Collected and Analyses Requested at SWMU 21-011(b), page 110

NMED Comment: Sample ID RE21-11-3875, collected from location 21-613839, is listed in the table as soil. On the Sample Collection Log for this sample it is classified as Qbt 3. Reconcile this discrepancy. In addition, thoroughly review the report to determine if there are other discrepancies regarding media descriptions and re-evaluate the nature and extent determinations based on the corrected media types as necessary.

54) Radionuclides Tables of Appendix C

NMED Comment: The radionuclide tables of Appendix C indicate that analyses for cesium-134 and plutonium-239/240 were not completed for a number of samples. No explanation of this deviation from the work plans was provided. Provide explanations for these deviations and propose to collect additional samples from these locations for analyses that were not performed or provide defensible justification for not doing so.

55) Tables C-4, C-5, and C-6, Appendix C, SWMU 21-011(b)

NMED Comment: Sample locations 21-614361 through 21-614372 are listed on these spreadsheets in Appendix C for SWMU 21-011(b). These samples are related to building footprint 21-209 and should be included in Tables C-13, C-14, and C-15. Provide corrected tables in the revised IR.

55) Appendix B, Field Methods

NMED Comment: The Permittees provided inconsistent information regarding VOC sampling. For instance, in Table B-1.0-1, under the Spade and Scoop Collection, the Permittees state that, "Containers for VOC analysis were immediately transferred from the auger bucket to the sample containers and sealed with Teflon-lined caps." First, there is no auger bucket utilized in the spade and scoop method. Second, a container cannot be transferred to a container. The quoted statement is repeated in the section describing Hand Auger Sampling.

The Permittees must correct the statements above in the revised Report. In addition, the Permittees must provide a detailed description of the collection procedures for VOC samples from consolidated tuff, specifically, how the hand-augered consolidated tuff samples were consolidated to fit into VOC sample containers and the methods used to reduce or eliminate headspace in the sample containers.

The Permittees must address all comments herein and submit a revised IR by **August 6, 2012**. As part of the response letter that accompanies the revise IR, the Permittees must include a table that details where all revisions have been made to the IR and that cross-references NMED's numbered comments. Any additional work proposed for the next phase of investigation (Phase II) must be listed in the Recommendations section of the IR. All submittals (including maps) must be in the form of two paper copies and one electronic copy in accordance with Section XI.A of the Order. In addition, the Permittees must submit a redline-strikeout version that includes all changes and edits to the IR (electronic copy) with the response to this NOD.

Please contact Ben Wear at (505) 476-6041 should you have any questions.

Sincerely,

John E. Kieling
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File: LANL '12, TA-21, DP Site Aggregate Area