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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

ESHID-603607

November 18, 2020

Michael Weis, Manager
National Nuclear Security Administration
Los Alamos Field Office
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Jennifer Payne, Division Leader
Env. Protection and Compliance Division
Los Alamos National Laboratory
P.O. Box 1663, MS-K491
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U2001233

RE: DISAPPROVAL
CLOSURE CERTIFCATION REPORT FOR TECHINICAL AREA 16-399 OPEN BURN UNIT
LOS ALAMOS NATIONAL LABORATORY
EPA ID#NM0890010515
HWB-LANL-20-006

Dear Mr. Weis and Ms. Payne:

The New Mexico Environment Department (NMED) has reviewed the United States Department of Energy (DOE) and the Triad National Security, LLC. (Triad) (collectively the Permittees *Transmittal of Closure Certification Report for Technical Area 16-399 Open Burn Unit* (Report) dated and received February 20, 2020 and referenced by EPC-DO-20-061/LA-UR-20-20437.

NMED hereby issues this notice of disapproval of the Report with following comments:

General Comments

1. The risk assessment contains data from only the 2019 sampling events. However, several samples were collected and included in the 2010 human health and ecological risk assessment (*Human-Health and Ecological Screening Assessment for The Technical Area 16 Burn Ground, Revision 1*, dated January 2010). Metals and dioxin/furans were included in the past analyses. The data presented in the 2010 report were collected outside the area of removal and as such, these data must be included as part of site characterization and used to demonstrate compliance with closure criteria. Inclusion of

the historical data will likely result in changes to analytes being carried forward in the assessment. As an example, the 2010 report identified cadmium above background, which would result in cadmium being carried forward as a constituent of potential concern (COPC); cadmium was not retained as a COPC in the current closure assessment. Revise the closure report to include all data representative of site conditions to support risk-based closure.

2. The site does not appear to meet the requirements for closure without controls. Several technical issues are noted with the approach for the human health risk assessment, as noted in the following general and specific comments. However, in looking just at the hazard index (HI) for the residential receptor, it appears that the site HI is over 5.0, which is well above the target level of 1.0 for closure without controls. The HI is based on maximum detected concentrations. As refined exposure point concentrations were not calculated for all COPCs, and the total HI was not refined appropriately, it is unclear if the site would meet the target level using refined exposure point concentrations (EPCs). It is noted for total cancer risk, while data are not combined according to proper risk methodology, it appears that the total cancer risk for the residential receptor clearly exceeds the New Mexico Environment Department Soil Screening Guidance (NMED SSG) target level of 1E-05. A similar case appears to be noted for the industrial receptor. Further, while ecological risks were not evaluated for specific receptors, it appears the generalized HI is greater than 1.0, indicating adverse ecological risk. The risk assessments must be revised in accordance with the NMED Soil Screening Guidance (SSG), Volumes I and II.

3. The report does not follow the NMED SSG Volume I for determining human health risks. The report and all tables/calculations must be revised in accordance with the methodologies contained in the NMED SSG, and as summarized below:

a. For cancer risks, a ratio of the EPC to the cancer screening level is provided as an inorganic and organic hazard index. First, cancer risks are provided a total cancer risk; a HI only applies to noncarcinogens. Second, total cancer risk is not evaluated independently for inorganics, organics, dioxins/furans. The cancer risk must be a total risk for all carcinogenic COPCs. Third, the cancer risk is the ratio of the EPC and screening level multiplied by the NMED target risk level. Refer to Section 5 and Equation 59 of the 2019 NMED SSG.

b. For noncarcinogens, the HI is not evaluated independently for inorganics and organics. The HI risk must be summation of hazard quotients for COPCs. Refer to Section 5 and Equation 60 of the NMED SSG.

c. The evaluation of lead is an independent evaluation, and a hazard quotient must not be calculated and added to the overall site hazard index. This is because the screening levels for lead are derived using different methodologies than other

analytes and are based on blood-lead levels. The evaluation of lead must be a standalone evaluation. Refer to Section 2.3.3 of the NMED SSG.

d. Cancer risks and HIs must not be calculated on a sample-specific basis. For the screening assessment, the EPC must represent the maximum detected concentrations, for each receptor, across the site. If the resulting cancer risk and/or HI is greater than the NMED SSG target levels of 1E-05 or 1.0, respectively, a refined EPC may be calculated. The refined EPC represents exposure across the site, and again, is not evaluated on a sample-specific basis. The refined EPCs and subsequent risk evaluation must address all COPCs and not just those analytes that were below screening levels.

e. The report must provide a clear summary of the resulting total cancer risk and HI for each receptor, i.e., residential, industrial, and construction worker.

4. The ecological screening assessment was not conducted following current NMED or LANL guidance. The 2018 SSG, Volume II along with LANL 2018 (Version 5.1 of the Ecological Risk Assessment Methods) should have been applied. Several technical deficiencies are noted in the specific comments due to use of outdated guidance. The ecological risk assessment must be revised following current NMED-approved guidance along with the current LANL guidance for ecological assessments. Further, a HI must be determined for each receptor and based on exposure to all analytes. HIs for organics, inorganics, explosives and dioxin/furans must not be considered separately but must be combined to represent total exposure. This effects the discussions and associated tables presented in Sections 3.3.1 through 3.3.3 of this report.

5. The Permittees have only conducted risk assessment evaluations for the residential pathway prior to removing soil beneath the cement pad. The current residential risk at the site based on the residual contamination is not known, the Permittees must recalculate the residential risk using the confirmatory sample data collected after RDX contaminated soil was removed.

6. The Permittees must revise this Report to include risk assessment screening for the industrial and construction worker pathways.

7. The Permittees report that they were not successful in collecting tetryl compounds in any of the 16 soil samples. The Permittees state that tetryl compounds were reported as non-detects in the November 2013. The Permittees must resample the Open Burn Unit and collect tetryl compounds and include these values in the revised Closure Certification Report.

Specific Comments

1. **Section 2.2.4.1.2 Other Analytical Discussions, page 9**
   Rationale for Eliminating N-nitrosodimethylamine, hexachlorocyclopentadiene, and hexachlorocyclopentadiene as COPCS
   Two analytes (N-nitrosodimethylamine and hexachlorocyclopentadiene) had method detection limits and reported detection limits greater than the residential noncancer screening level.

   The Permittees state that N-nitrosodimethylamine is often used as a food preservative and as a contaminate in rubber products and that it is not likely that N-nitrosodimethylamine would be present at the site based on past operations. NMED notes that the EPA 2014 fact sheet states that N-nitrosodimethylamine was formerly used in the production of rocket fuel and the source could also be from industrial sources through chemical reactions such as those that involve alkylamines with nitrogen oxides, nitrous acid or nitric salts. Since the Permittees were not able to provide adequate documentation for burn operation from 1951-1980, N-nitrosodimethylamine must be retained as a COPC because other potential industrial sources cannot be ruled out at this time.

   The Permittees state that hexachlorocyclopentadiene readily evaporates in the air, is used in the manufacture of certain pesticides; and that it is therefore not likely to be present at the unit based on previous operations. NMED notes that the 2000 EPA hexachlorocyclopentadiene factsheet describes hexachlorocyclopentadiene as acutely toxic to humans and states that it may also be used to make flame-retardants, resins that will not burn, and shock-proof plastics all of which are likely to be associated with past operations. Since the Permittees were not able to provide adequate documentation for burn operation from 1951-1980, hexachlorocyclopentadiene must be retained as a COPC, because other potential industrial sources cannot be ruled out at this time.

   The Permittees must retain N-nitrosodimethylamine and hexachlorocyclopentadiene as COPCs. The Permittees do not have sufficient sampling data to establish the nature and extent of contamination of organic COPCs. The Permittees must resample for N-nitrosodimethylamine and hexachlorocyclopentadiene and re-analyze using sampling methods with detection limits less than the screening level values and provide this information in a revised Report.

2. **Attachment 5, Section 1.1, Conceptual Site Model, page 1**
   a. Per Section 2.6 of the New Mexico Soil Screening Guidance (NMED SSG) for those sites greater than two acres in size, grazing of cattle must be evaluated to determine if beef ingestion is a plausible and complete exposure pathway. If

grazing is not permitted (or could not be permitted due to land use restrictions), or the land does not support grazing (e.g., insufficient forage and/or water availability, terrain, or highly industrialized area), lines of evidence must be provided to demonstrate this as an incomplete pathway. Revise the report to indicate the size of TA 16-399 and to address beef ingestion.

b. The risk assessment does not address construction workers. Either a statement must be included to indicate the risk assessment for the industrial worker and resident is protective of the construction work (i.e., no COPCs have screening levels (SLs) driven by the inhalation pathway such that the construction worker SL is more conservative), or the risk assessment must be updated to include the construction worker. Revise the text and/or assessment accordingly.

3. Attachment 5, Section 1.2.2 Evaluation of Inorganic Analytes, page 3

a. The first paragraph states that, "For analytes that the maximum exceeded the established background value (BV) but did not exceed risk-based SL known as the New Mexico Soil Screening Levels (SLs), no further evaluation is necessary." It appears this is a misinterpretation of Step 2 outlined in Section 1.3 of the NMED SSG. Step 2 refers to the cumulative hazard index being less than 1.0 for all non-carcinogens. As outlined in Section 2.8.3.2.1 of the NMED SSG, if an individual analyte is greater than background and additional lines of evidence are not available to justify the analyte as not being site-related, then either a two-sample hypothesis test may be used to compare the distributions of the site data to the distributions of background data to determine if site concentrations are elevated compared with background or the analyte must be retained as a constituent of potential concern (COPC). This text also appears to contradict text in Section 1.3 of the Report. Revise the Report to include COPCs with results which are above BV; or provide additional lines of evidence which demonstration that the analyte is not a COPC in accordance with the NMED SSG criteria.

b. The first paragraph states that, "If the maximum exceeded the BV and one or more risk-based SLs as indicated by a ratio of the maximum to the SL being >1, a 95% upper confidence level of the mean (UCL95) was calculated…." This text also appears to contradict text in Section 1.3. Review the text in this section and Section 1.3 and resolve the inconsistency in the revised report.

c. The first bullet states that there are no toxicity data available for calcium, sodium, potassium, or magnesium from NMED. However, Table A-1 of the 2019 NMED SSG provides screening levels for these analytes. In addition, Section 5.2 of the NMED SSG directs how risks to these analytes considered essential nutrients should be evaluated. Revise the text and subsequent evaluations accordingly.

d. The second bullets states that toxicity values for trivalent chromium were applied as screening levels as total chromium values are not contained in the NMED SSG and that it was unlikely that hexavalent chromium producing products were historically treated in the unit. As noted in the 2017 *Chromium Study Background Report*, it was agreed that LANL had provided sufficient data to establish that background levels of chromium in the various site media are representative of trivalent chromium and the use of the trivalent chromium screening level is acceptable and appropriate if site history is provided to demonstrate there were no site sources for hexavalent chromium. This justification as cited in the associated report should be used as the line of evidence to support use of trivalent chromium screening levels rather than a lack of a total chromium screening level. Revise the justification of chromium in this section accordingly.

4. Attachment 5, Section 2.1 Screening Evaluation, page 4

a. The second sentence states that the EPC is compared to the cancer and noncancer-based screening levels by dividing the maximum value by the screening level. This is not accurate, as this approach is only partially correct for carcinogens; the text does not include multiplying the ratio by the NMED SSG target cancer risk of 1E-05. Revise the text to clarify the risk determination process for carcinogens and ensure that it is compliant with the NMED SSG.

b. The third sentence implies the EPCs included results for both the parent sample and its field duplicate. As noted in Section 2.8.3 of the NMED SSG, for the initial screening assessment, duplicates should be handled using the higher concentration as the EPC. NMED notes for the initial screening assessment, where the EPC is represented by the maximum detected concentration, the inclusion of both samples does not affect the EPC, revise the text to clarify that for field duplicates, the higher result will be used as the EPC.

c. The third sentence states that if the maximum EPC was less than the lowest screening level, it was not evaluated further. This approach does not allow for evaluation of cumulative risk. In the event the maximum EPC is lower than its associated screening level, the analyte must still be retained as a COPC for calculating cumulative risk. A point-to-point comparison and screening process are not allowed for in accordance with the NMED SSG. This sentence also appears in contradiction to the following paragraph in the report. Revise the text and associated calculations accordingly.

d. The second paragraph states that is there were too few detections to calculate a UCL95 (i.e., number of detections <6), the median of all the data was applied as the EPC. The NMED SSG does not allow the use of the median concentration as an EPC; if a UCL cannot be calculated, the maximum detected concentration

must be retained as the EPC. Further, in accordance with Section 2.8.4.1 of the NMED SSG, the minimum requirements for calculating UCLs are: 1) each data set must contain at least eight samples (i.e., n ≥ 8) for the analyte being evaluated; and 2) there must be a minimum of five detections (i.e., ≥ 5 detected observations) for the analyte being evaluated. However, it was agreed in the February 14, 2017 risk meeting between LANL and NMED that calculation of UCLs may be conducted if there are a minimum of five detections, as long as the Permittee can provide sufficient technical justification for the number of samples used in determining UCLs and that the number is consistent with USEPA guidance. Therefore, UCLs must be calculated for data sets that meet the minimum requirements for calculation UCLs. Revise the text and associated calculations accordingly.

e. The fourth paragraph refers to a cancer risk of 1E-06 for stated exposure as defined by the NMED SSG. NMED notes that this value is inconsistent with the NMED SSG cancer risk factor of 1E-05. Either revise the text to clarify that 1E-06 cancer risk factor utilized is based on EPA region 6 risk factors or use the NMED SSG cancer risk factor of 1E-05.

f. This section does not address comparison of site concentrations to the soil-to-groundwater target soil leachate concentrations (refer to Step 5 of Sections 1.3 and 5.0 and the SL-SSL based on a dilution attenuation factor (DAF) of 20 presented in Table A-1 in the NMED SSG). In order to achieve clean closure without controls, this pathway must be evaluated.

5. Attachment 5, Section 2.1.1 Data Analysis, page 5

a. The last sentence of the first paragraph indicates that data for both surface and subsurface soil depths were combined for the human health risk assessment. The soil exposure interval for the industrial worker is 0-1 foot below ground surface (ft bgs) while the interval for the resident is 0-10 ft bgs. Typically, subsurface soil data are excluded from the analysis of the industrial worker. However, all soil (surface and subsurface) for this assessment represent soil within the top foot of soil, as such, inclusion of the subsurface data for the industrial worker is acceptable. The report must be revised to include this clarification to support why the datasets were appropriate to combine for both receptors. Note: a similar discussion is needed in Section 3.1, addressing the appropriateness of combining surface and subsurface data for the ecological risk assessment based on the identified receptors and soil exposure intervals (refer to Volume II of the NMED SSG).

b. The first sentence of the fourth paragraph states that the cancer-based sum of the screening level risk ratios is called the HI. This is incorrect. The HI only refers to the sum of the individual hazard quotients for noncarcinogens. For

carcinogens, either refer to analyte-specific risk or total risk, for additive risk. Revise the text throughout the entire report.

c. The discussion of organics presents the cancer risk and HI separately for organics and explosives from those from dioxin/furans. This is incorrect. The total cancer risk is the risk associated from exposure to all carcinogens that include metals, organics, explosives, and dioxin/furans. The Permittees must revise the cancer risk calculations to include the cumulative risk of all carcinogens identified in the NMED SSG.

d. A refined risk assessment was conducted for only dibenz(a,h)anthracene and RDX, as those were the only COPCs having a maximum detected concentration greater than the SL. The refined assessment must address all COPCs, regardless of whether the maximum concentration was below its corresponding SL. This is because site risk evaluates additive risk from exposure to all COPC. Given that the total cancer risk and HI for both the resident and industrial worker exceed target levels when using maximum detected values for the EPC, it is likely that several contaminants will need a revised EPC to show acceptable site levels. Revise the risk assessment accordingly to be consistent with the other revised portions of the Report.

6. Attachment 5, Section2.3 Conclusions, page 8

The risk assessment as presented in this report does not meet the requirements for closure without controls. As noted in the above comments, several technical issues must be addressed, and the risks re-calculated in order to discern whether the site meets acceptable risk.

7. Attachment 5, Section 3.1 Introduction, page 9

a. Ecological screening levels (ESLs) are referenced in Table 3-1. However, there is no discussion on which receptors are being evaluated in this assessment. It appears that the minimum ESL, regardless of mammalian or terrestrial receptor, was applied in the assessment. However, a HI must be calculated for specific representative receptors, which are identified based on the size are the investigation area. At a minimum, the plant, deer mouse and horned lark must be evaluated, per the NMED SSG Volume II. However, LANL requires additional receptors to be considered, as listed in Table 2.6-1 of the LANL ecological risk guidance. Revise the ecological assessment to include a discussion of potential ecological receptors at TA-16-399. In addition, review Table 3-1 to include the receptor-specific ESLs to be used in the evaluation. Note this comment also applies to Sections 3.2 and 3.3.

b. The third paragraph (and Table 3-1) indicates that hazard quotients (HQs) greater than 0.3 in the initial screening are used to determining if an analyte

should be retained as a constituent of potential ecological concern (COPEC). When conducting the screening assessment, analytes with HQs greater than 0.3 were retained as COPECs. As noted in the agreements made in the February 14, 2017 risk meeting between LANL and NMED, the use of 0.3 is not appropriate for the second-tier analysis, if more than three COPECs are present. Thus, Table 3-1 must be revised to indicate the lowest observed adverse effect level (LOAEL)-COPECs using the criterion of 0.1. This comment also applies to Sections 3.3.1 through 3.3.3.

8. **Attachment 5, Table 3-7 No Effect Hazard Index Analysis for By Receptor for Exposure Adjusted Within Area Use Factors, page 59**
   A revision of ecological risks using refined exposure assumptions, such as site-specific area use factors, etc., would apply the LOAEL-based ESLs not the no observed adverse effect level (NOAEL) ESLs (as shown in Table 3-8). Table 3-7 must be removed from the report.

9. **Attachment 5, Table 3-8 Low Effect Hazard Index Analysis by Receptor Adjusted Within Area Use Factors, page 61**
   Table 3-8 presents a refinement of the LOAEL-based assessment. However, based on the improper handling of ESLs, and determinations of COPECs, it is unclear if the revised list of COPECs and EPCs listed in Table 3-8 is correct. Upon revision of the Report and risk assessment, update Table 3-8 accordingly.

10. **Attachment 7, TA-16-399 Analytical Results After Excavation, page 1**
    The Permittees have not used the residual soil concentrations, following excavation, to recalculate risk and demonstrate that the residual contamination meets NMED's human health and ecological risk.

The Permittees must address all comments and submit a revised Report **within sixty (60) days of receipt of this letter**. Two hard copies of the revised Report, and one electronic copy must be submitted to NMED. As part of the response letter that accompanies the revised Report, the Permittees shall include a table that details where all revisions have been made and cross-references NMED numbered comments. In addition, provide a redline-strikeout version (electronic and hard copy) of the revised Report.

If you have any questions regarding this letter, please contact Siona Briley at (505) 476-6049.

Sincerely,

Kevin Pierard

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Kevin M. Pierard, Chief
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cc:

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File: 2020 LANL, TA-16, Disapproval Closure Certification Report OB Unit 16-399
LANL-20-006

U2001233

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Subject:	[EXTERNAL] Letter to Mr. Weis and Ms. Payne
Date:	Wednesday, November 18, 2020 10:40:07 AM
Attachments:	2020-11-18 NOD Closure Certification Report 16-399 Nov 2020.pdf

Good Morning,
Please see attachment.

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