Subject: Three Mile SIR NMED comments

Attachments: NMED Draft Comments TMCAA SIR_01-30-2018.docx

From: Murphy, Robert, NMENV [mailto:Robert.Murphy@state.nm.us]
Sent: Wednesday, January 31, 2018 9:57 AM
To: Rich, Kent <krich@lanl.gov>
Cc: Rodriguez, Cheryl L <cheryl.rodriguez@em.doe.gov>; Dhawan, Neelam, NMENV <neelam.dhawan@state.nm.us>; Robinson, Bruce Alan <robinson@lanl.gov>
Subject: RE: Three Mile SIR NMED comments

Hi Kent,

Attached is a revised copy of NMED's draft comments dated 01-30-2018. NMED has deleted all but one of the ecological risk screening comments (see specific comment 13 regarding Chemicals without ESLs). Neelam left a voice message for you earlier this morning to discuss how to deal with the remaining comments. Please give her a call back after you have reviewed the attached document.

Thank you,
Robert

From: Rich, Kent [mailto:krich@lanl.gov]
Sent: Monday, January 22, 2018 10:32 AM
To: Murphy, Robert, NMENV <Robert.Murphy@state.nm.us>
Cc: Rodriguez, Cheryl L <cheryl.rodriguez@em.doe.gov>; Dhawan, Neelam, NMENV <neelam.dhawan@state.nm.us>; Robinson, Bruce Alan <robinson@lanl.gov>
Subject: RE: Three Mile SIR NMED comments

Hi Robert,

Thank you for the clarification on the Threemile SIR comments. I also went back and confirmed the ecorisk comments were included in the previous draft comment submittal. I had a look at LANLs original response to the ecorisk comments as well as the minutes from the technical meeting on February 14, 2017. Here is LANLs response on 1/31/17 to NMEDs draft comments.

Ecological Risk-Screening Assessment Methods

NMED provided comments on the screening level ecological risk assessment (SLERA) approach used in the TCAA SIR. These comments include requiring incorporation of refinements to the process (e.g., biouptake and bioaccumulation modeling), not eliminating chemicals of potential ecological concern (COPECs) with low hazard quotients (i.e., less than 0.3) from additional tiers of the screening analysis (e.g., lowest observed adverse effect level ecological screening level [ESL] comparisons), and comparisons of screening levels to background concentrations. The SLERA approach used by LANL in the SIRs is identical to the approach used in previous Compliance Order of Consent (Consent Order) investigations, including those previously approved by NMED. The requirements contained in NMED's comments would require additional effort but are not expected to change the conclusions regarding potential site risk. That is, the SLERA process is conservative, and additional

refinements to reduce uncertainty are not warranted given this conservatism. LANL has had an approved SLERA methodology since 1999, and this methodology has been the basis for ESLs and the screening approach. As a result, LANL does not use or reference NMED's 2015 SLERA guidance. It is unclear why a methodology previously approved by NMED should be revised. Further, LANL's SLERA process incorporates biouptake and bioaccumulation modeling in ESL calculations, which is equivalent to NMED's Tier 2 approach.

Recommendation: *LANL recommends that ecological risk screening assessments continue to be implemented using LANL's NMED-approved SLERA methodology. LANL notes that use of the SLERA methodology is consistent with the June 2016 Consent Order.*

And here are NMEDs February 14, 2017 meeting notes on this topic.

Ecological Risk-Screening Assessment Methods: Permittees use a two-fold screening approach that NMED does not agree with, specifically, Permittees do not provide justification for the use of a value of 0.3 for the LOAEL assessment. NMED agreed that the process Permittees use for first tier screening is acceptable but for second tier a more conservative value of 0.1 must be applied. The less conservative approach of using 0.3 would not be appropriate if more than three COPCs are present at a site. Permittees agree to use 0.1 in future reports. For the reports already submitted to NMED the issue will be addressed by NMED in comments. The Permittees also agreed to revise the Ecological Risk Assessment Guidance to include the LOAEL screening of COPECs.

I thought the eco comments had been resolved which is why I was surprised they were in the recent draft comments. LANL maintains its recommendation that ecological risk screening assessments continue to be implemented using LANL's NMED-approved SLERA methodology. Since this issue has not been resolved, I recommend we set up another technical meeting to discuss further. Let me know which days and times you are available next week.

Thank you,
Kent

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From: Murphy, Robert, NMENV [mailto:Robert.Murphy@state.nm.us]
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To: Rich, Kent <krich@lanl.gov>
Cc: Rodriguez, Cheryl L <cheryl.rodriguez@em.doe.gov>; Dhawan, Neelam, NMENV <neelam.dhawan@state.nm.us>
Subject: Three Mile SIR NMED comments

Hi Kent,

I was a little concerned when you said earlier today that you thought there were some changes to the NMED ecorisk comments for Three Mile Canyon AA SIR. Attached are NMED's original draft comments dated 10/14/2016 and the latest revision dated 12/13/2017. It appears to me that the ecorisk comments are consistent between the two versions with the exception of few deletions in the latest revision.

Please let me know if I can help clear up any discrepancies.

Thanks,
Robert

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NMED DRAFT COMMENTS ON SUPPLEMENTAL INVESTIGATION REPORT FOR THREE MILE CANYON AGGREGATE AREA, FEBRUARY 2016

General Comments

1. **NMED Comment:** The Permittees combine several individual solid waste management units (SWMUs) into consolidated units for the human health and ecological risk screening assessments. NMED does not support the use of consolidated units for human health and ecological risk screening assessments. The SWMUs are listed individually in Appendix K of the Permit and must be evaluated individually. The Permittees must conduct risk assessments for each individual SWMU and area of concern (AOC) included in the Report. The affected SWMUs are SWMU 36-008, and SWMU C-36-003. In limited instances, such as with SWMU 12-001(a) and SWMU 12-001(b), it may be appropriate to combine data from sites that overlap one another and where it is not possible to distinguish potential contamination from one site from that of the other.

2. Section 5.1.1 lists lines of evidence to be used in determining if an inorganic chemical should be eliminated as a constituent of potential concern (COPC). The comparison to the maximum background concentration is listed as a line of evidence to be used to screen out a COPC. Except in special cases, NMED does not consider such comparisons as a valid line of evidence for eliminating detected inorganic compounds as COPCs. Note that Section 2.7.3 of the NMED 2015 Risk Assessment Guidance for Site Investigations and Remediation[i] (SSG) does not state that comparison to maximum background is an acceptable line of evidence. The range of values in the background data set is considered in the statistical determination of appropriate background threshold values (e.g., background values, BVs). As indicated in Section 2.7.3 of the SSG, if the maximum concentration of a COPC exceeds the applicable BV, statistical tests must be used to determine if the data set for the COPC is statistically different from the applicable background data set. However, NMED would allow the upper end of the background data set to be used for comparison in special cases:

   - Statistically determined BV is significantly greater than the maximum background concentration.

   - Statistical tests cannot be performed because of insufficient data or a high percentage of non-detections.

   - Sufficient number of samples have been collected to determine nature and extent but results are predominately non-detect (discussion of sample number versus detections).

   - There is no history to suggest the constituent is directly related to site activities. If there is site history to suspect that the constituent is present due to site activities (such as lead at a firing site), then it is possible that the constituent could be present from historical activities at low levels (in the high range of background). In these cases, the constituent still must be carried forward as a COPC and retained in the risk assessment (it will likely not be a risk driver).

- Spatial analyses do not show a pattern or trend indicating contamination.

- The maximum detected result is statistically determined to be an outlier (note, sufficient samples must be collected to show a point is an outlier and not indicative of a hotspot).

Section 5.1.1 (and the Report in its entirety) should be revised to eliminate comparisons of COPC concentrations to the maximum value in the applicable background data set as a line of evidence for eliminating a detected inorganic chemical as a COPC unless one (or more) of the special cases in the bulleted items above exists; thus, precluding the comparison of COPC data to the statistically derived BV. In such cases, lines of evidence supporting the comparison of COPC data to the maximum background value should be provided to demonstrate that one or more of the special cases exists in the area being evaluated.

3. Section 5.2, Extent of Contamination, states that comparisons of sample results to soil screening levels/screening action levels (SSLs/SALs) are used in determining whether the extent of contamination has been defined. According to the text, the comparisons are performed after determining whether extent is defined by decreasing concentrations vertically and laterally and that sample concentrations are below estimated quantitation limits (EQLs) or detection limits (DLs). The Permittees consider that no further sampling for extent is warranted if the applicable SSL/SAL is at least an order of magnitude greater than the maximum COPC concentration.

While the above approach is not recommended in the SSG, the approach may be applied as a single line of evidence to determine that no further sampling is warranted for the COPC in question if the caveats listed below are met and sufficient justification for the applied methodology (including references) is provided in the discussion:

- Contaminant concentrations do not increase significantly with depth or laterally and appear to be isolated cases (do not indicate a trend);

- There is no history of a contaminant release due to site activities and that sample results are representative of site conditions (sufficient data are available to determine extent);

- The SSL/SAL must be at least an order of magnitude greater than the COPC concentration;

- Inclusion or exclusion of the COPC would not impact overall risk (e.g., the COPC is not a significant contributor to risk due to low toxicity); and

- There is not a contaminant release from outfall into a drainage. Transport along drainages may be significant, both along the land surface and at depth, and require additional lines of evidence to ensure transport of contamination has been fully considered and that increasing concentrations are not the result of erosion/sediment transport. Under these circumstances, and similar, it is possible

to have greater concentrations away from the initial source area due to release into drainages and outfalls.

Further, the comparison may only be used to determine the extent of COPC contamination and may not be used to eliminate a COPC from either the human health risk assessment or ecological risk assessment.

4. The Permittees eliminate nitrate as a COPC based on it being naturally occurring. Where the history of a site indicates that nitrate may be present due to lab activities, such as when the site contains a sanitary waste line and septic tank, nitrate must be considered as a potential COPC. For example, SWMU 15-009(b) is a former septic system where nitrate was detected but not retained as a COPC. Alternatively, additional lines of evidence may be provided to fully justify the statement that the detected concentrations of nitrate likely reflect naturally occurring levels. Appropriate lines of evidence may include site history and comparison of the maximum detected concentration to the SSL.

5. **NMED Comment:** Section H-3.1 states that the potential for construction workers to be exposed to subsurface soil is complete. Review of the information provided in the main text and Appendix H indicates that exposure during construction activities at these sites is feasible, however, the risk assessment does not include estimations of risk to construction workers. Further, many of the sites may include COPCs that result in more conservative screening levels for the construction worker than the residential receptor. The Permittees must revise the risk assessment to address the potential for construction workers to be exposed to site contamination at the SWMUs and AOCs. For those sites where COPCs that drive the construction worker risks are not present as COPCs, a statement that the residential scenario is protective of the construction worker, along with other lines of evidence supporting the exclusion of a construction worker exposure scenario in the human health risk assessment must be provided. If COPCs are present resulting in the residential screening not being protective of the construction worker, the construction worker scenario must be evaluated and added to the assessment.

6. **NMED Comment:** The sites at Threemile Canyon Aggregate Area impacted by volatile organic compounds (VOCs) were evaluated based on data collected in 2009-2010 during implementation of the October 2008 Investigation Work Plan (IWP). In the September 30, 2011 *Notice of Disapproval of the Phase II Investigation Work Plan, Three Mile Canyon Aggregate Area* (NOD Phase II IWP), NMED required the Permittees to describe in detail the methods that would be used to collect bulk soil samples for VOCs. NMED made this requirement in order to ensure that proposed collection methods would minimize the loss of VOCs during sample collection. In the October 2011 response to the NOD Phase II IWP, the Permittees stated that standard operating procedures (SOPs) were being revised to address potential loss of VOCs during sampling. Further, the Permittees proposed to submit a work plan addendum to NMED for review and approval before the Phase II investigation was implemented. Due to the methods used to collect the samples during the Threemile Canyon Aggregate Area investigation, VOC concentrations in soil samples may be under detected and risk underestimated. In the Supplemental Investigation Report the Permittees recommend additional sampling at some of the sites where VOCs are present. However, all sites where VOCs were detected should be re-

evaluated, including: AOC C-14-006, AOC 15-005(c), SWMU 15-009(b), SWMU 15-009(c), SWMU 15-009(h), SWMU 15-010(b), AOC 15-014(h), SWMU 36-002, and SWMU 36-003(a). The Permittees must provide justification that the soil samples collected during the 2009-2010 investigation are representative of site conditions, or collect additional samples that are appropriate for evaluating the vapor intrusion pathway.

7. **NMED Comment:** Based on NMED's comments, the Permittees' must revise their conclusions and recommendations for each SWMU or AOC as necessary.

Specific Comments

8. **Section 8.6.4.4, Nature and Extent of Contamination, AOC 15-008(g), page 113:**

   Permittees Statement: *Lead was detected above the soil BV in two samples with a maximum concentration of 370 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient but increased laterally at location 15-610568. The residential SSL was approximately 1.1 times the maximum concentration and the industrial SSL was approximately 2.2 times the maximum concentration at location 15-610568. The vertical extent of lead is defined, and lateral extent at location 15-610568 is not defined.*

   NMED Comment: The nature and extent of lead contamination has not been defined to the west-southwest towards SWMU 15-006(d) or to the east at AOC 15-008(g). For example, sample 15-610722 has elevated concentrations of lead (644 mg/kg), increasing away from the site and at levels above the residential SSL. The Permittees must define the extent of contamination by collecting additional samples in the east and west-southwest directions. SWMU 15-006(d), currently an active site, is located less than 50 feet west of AOC 15-008(g). It is not clear where the boundary lies between these two sites or if contamination is commingled. The Permittees must define the boundary between these two sites. NMED notes that SWMU 15-006(d) is active, and that further investigation and/or risk analysis will be performed at that site in the future.

9. **Section 8.10.4.1 Soil, Rock, and Sediment Sampling, SWMU 15-010(b), page 134:**

   Permittees' Statement: *Seventeen samples were collected in 2009–2010 from nine locations in the drainage below the site.*

   NMED Comment: A review of the NMED approved 2008 Threemile Canyon Aggregate Area Investigation Work Plan (WP) indicates that the Permittees proposed to remove a high explosives (HE) settling tank and its contents and to collect eight subsurface samples from four locations beneath the inlet pipe, tank inlet, tank, and tank outlet. As stated in Section 3.4, Deviations, of the Report, the settling tank was not removed and planned samples were not collected. While samples from nine locations were collected in the drainage below the settling tank, these samples are not sufficient to characterize the potential contamination from the settling tank. The Permittees must collect samples from beneath the inlet pipe, tank inlet, tank, and tank outlet in order to identify COPCs, determine nature and extent of contamination, and calculate potential risk to human and environmental receptors. The Permittees must also revise Section 10.0, Conclusions and

Section 11.0, Recommendations, to indicate that at SWMU 15-010(b), the nature and extent of contamination has not been defined, that additional sampling is required, and that corrective actions complete without control status is not appropriate for the site at this time.

10. Section 9.4.4.3 Soil, Rock, and Sediment Sampling Analytical Results, Inorganic Chemicals, SWMUs 36-008 and C-36-003, pages 165:

Permittees' Statement: *Because SWMU C-36-003 is located within the footprint of SWMU 36-008, the combined data sets for SWMUs 36-008 and C-36-003 are evaluated below for COPC identification and nature and extent.*

NMED Comment: The Permittees state that the combined data sets for SWMUs 36-008 and C-36-003 are evaluated for COPC identification and nature and extent, however, it is not evident that all the inorganic and organic chemicals were evaluated using the combined data sets. For instance, on page 173, Aroclor-1254 is reported as being detected in 18 samples. A review of Appendix E All Analysis spreadsheet of the Report indicates that Aroclor-1254 was detected in 19 samples at SWMU 36-008 and 8 samples at SWMU C-36-003. The Permittees must revise the Report to ensure that the correct data is evaluated for each potential COPC. Furthermore, the Permittees must revise the Report to conduct risk assessments for each individual site (see Comment 1). A review of Plates 26, 27, and 28 indicates that elevated concentrations of multiple COPCs appear to be concentrated in the drainage below the former outfall associated with SWMU C-36-003. The risk assessment for SWMU C-36-003 must include the 8 sampling locations in the drainage below the former outfall (36-610821 through 36-610828) as well as the sampling locations from SWMU 36-008 (36-610621, 36-610598, 36-610622) nearest to the most downgradient sampling location associated with SWMU C-36-003 (36-610823). The risk assessment for SWMU 36-008 may use the combined data sets.

11. Section 11.1, Recommendations, SWMU 15-008(b), pages 181-182:

NMED Comment: In Section 11.1, Additional Field Characterization and Remediation Activities, the Permittees recommend removal of contaminated soil at SWMU 15-008(b). As elevated uranium concentrations above residential SSLs are somewhat collocated with elevated lead concentration, this "hotspot" removal action must take into account the spatial distribution of both metals.

12. Section B-8.0, SWMU 15-007(c), Deviations from Work Plan, page B-5:

Permittees' Statement: *SWMU 15-007(c): Two sampling locations were inadvertently not sampled.*

NMED Comment: The Permittees must provide a description of the two sampling locations not sampled at SWMU 15-007(c) and justify that the missing samples do not constitute a data gap. If justification cannot be provided, the Permittees must collect the samples and incorporate the analytical results into a future investigation report.

13. **Section H-5.4.8, Chemicals without ESLs, page H-60:**
NMED Comment: Iron and perchlorate are listed as chemicals for which no toxicity data are available. Some ecological toxicity information (e.g.,) is available for iron and perchlorate. For example:
    - EPA CLU-IN information on the ecological impacts of perchlorates available at: https://clu-in.org/contaminantfocus/default.focus/sec/perchlorate/cat/Toxicology/.
    - OSWER Directive 9285.7-69 on ecological screening levels for iron available at: https://rais.ornl.gov/documents/eco-ssl_iron.pdf.

    The Permittees must revise the discussion in the second paragraph of Section H-5.4.8 to indicate that qualitative information on the ecological toxicity of some chemicals without ecological screening levels (ESLs) is available. In addition, the revised discussion must state that eliminating chemicals known to produce negative impacts on the environmental media in the Threemile Canyon Aggregate Area (e.g., soil) from the quantitative ecological risk assessment (because no ESLs are available) results in a risk estimate that underestimates actual risk.

Minor Editorials:

14. **Section 6.2.4.4 Nature and Extent of Contamination, Inorganic Chemicals, page 28:**

    NMED Comment: Magnesium concentrations increase rather than decrease with depth at location 12-610701 from 1980 mg/kg to 2040 mg/kg.

15. **Section 8.3.4.3 Soil, Rock, and Sediment Sampling Analytical Results, SWMU 15-007(c), page 88:**

    NMED Comment: Aluminum was detected in six rather than five Qbt 3 samples.

16. **Section 8.4.4.1 Soil, Rock, and Sediment Sampling, SWMU 15-007(d), page 95:**

    NMED Comment: The first bulleted item erroneously refers to SWMUs 15-004(d) and 15-004(c) rather than SWMUs 15-007(d) and 15-007(c).

17. **Section 8.4.3.3, SWMU 15-007(d), Soil, Rock, and Sediment Sampling Analytical Results, page 96:**

    NMED Comments:

    a. The Permittees refer to the Gehan statistical test result for beryllium rather than for chromium.

    b. Antimony was detected in one rather than two sediment samples and twelve rather than thirteen tuff samples. Magnesium was detected at a maximum concentration of 2870 mg/kg rather than 22,300 mg/kg. Barium, chromium, and copper concentrations increased rather than decreased with depth at locations 15-610760, 15-610728, and 15-610730, respectively.

18. **Section 8.5.4.3 Soil, Rock, and Sediment Sampling Analytical Results, SWMU 15-008(b), pages 105-106:**

    NMED Comment: The maximum lead concentration is 138,000 mg/kg (16-610745) rather than 2870 mg/kg. However, NMED notes that tables H-2.3-28 and H-2.3-29 indicate the maximum lead concentration of 138,000 mg/kg was used in calculating the EPCs for the industrial and residential scenarios for SWMU 15-008(b), thus, no change to the EPC calculation is required.

19. **Section 8.8.4.4 Nature and Extent of Contamination, Inorganic Chemicals, SWMU 15-009(c) page 125:**

    NMED Comment: Chromium was detected above the sediment and Qbt 2,3,4 BVs in 5 sediment samples and 9 tuff samples rather than 4 sediment samples and 10 tuff samples.

20. **Section 8.8.4.4 Nature and Extent of Contamination, Radionuclides, SWMU 15-009(c) page 127:**

    NMED Comment: Tritium was detected at a maximum concentration of 0.0173 pCi/g rather than 0.173 pCi/g. The residential SSL was approximately 15,843 times rather than 9900 times the maximum activity.

21. **Section 8.10.4.4 Nature and Extent of Contamination, Organic Chemical, SWMU 15-010(b) page 139:**

    NMED Comments:

    a. Selenium was detected above the sediment and Qbt 2,3,4 BVs in one sediment sample and one tuff sample at location 15-610871. The Permittees must revise the statement for accuracy. Tables H-2.3-40 and H-2.3-41 indicate that the industrial and residential EPCs were determined using the maximum detected concentrations of selenium for sediment and tuff, thus no revision to the human health and risk screening evaluations are necessary.
    b. Di-n-butylphthalate was detected in five rather than three samples.

22. **Section 8.11.4.4 Nature and Extent of Contamination, Radionuclides, AOC 15-014(h) page 152:**

    NMED Comment: Uranium was detected in one soil sample in addition to the four sediment samples reported.

23. **Section 9.4.4.3 Soil, Rock, and Sediment Sampling Analytical Results, Inorganic Chemicals, SWMUs 36-008 and C-36-003, pages 167:**

    NMED Comments:

    a. Copper was detected above the BV in fourteen rather than five soil samples (10 ALLH and 4 FILL). The Permittees must revise the statement for accuracy.
    b. Lead was detected in three rather than 2 tuff samples.

[i] NMED comments refer to the 2015 SSG because the Supplemental Investigation Report for Three Mile Canyon Aggregate Area was submitted prior to the release of the 2017 SSG.