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MAY 2012

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May 18, 2012

DCN: NMED-2012-11

Mr. David Cobrain
NMED - Hazardous Waste Bureau
2905 Rodeo Park Dr. E, Building 1
Santa Fe, NM 87505

RE: Draft Technical Evaluation of the *Lower Mortendad/Cedro Canyons Aggregate Area Investigation Report*, Los Alamos National Laboratory, New Mexico, dated October, 2011.

Dear Mr. Cobrain:

Attached please find draft technical review comments on the risk assessments conducted for the *Lower Mortendad/Cedro Canyons Aggregate Area Investigation Report*, Los Alamos National Laboratory (LANL), New Mexico (dated October, 2011). In an email dated February 22, 2012, Mr. Dan Comeau requested a review of the risk assessment portion of the investigation report.

Polycyclic aromatic hydrocarbons (PAHs) were detected at one sample location at Solid Waste Management Unit (SWMU) 05-004 above residential screening levels and caused the residential risk estimates to be greater than the NMED target level of 1E-5 based on maximum detected concentrations. LANL states that the source of these detections of PAHs is from a coat of hot oil penetration applied to an asphalt road adjacent to former building 05-1. PAHs were not detected in any other sample locations at SWMU 05-004. Therefore, all detections of PAHs were removed from the risk assessment data set and LANL concludes that there are no potential unacceptable residential risks at SWMU 05-004. Inasmuch as the current concentrations of PAHs at SWMU 05-004 result in an exceedance of the NMED target residential risk level, NMED may wish to further evaluate the source of PAH contamination at SWMU 05-004; however, it is possible that they are present due to the proximity of the road.

A removal action was conducted to remove lead contamination at SWMU 05-006(c). Remaining concentrations at location 05-613800 and concentrations at post-removal location 05-614431 indicate increasing concentrations of lead with increasing depth. Samples were collected down to a depth of six (6) feet below ground surface at these locations, and it is not clear whether additional sampling at greater depth would reveal increasing concentrations of lead contamination. As such, NMED may wish to further investigate the extent of vertical contamination of lead remaining at SWMU 05-006(c).

The risk assessments did not include an evaluation of the potential for adverse health effects to human and ecological receptors from exposure to total tetrachlorodibenzodioxin (TCDD) and

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total tetrachlorodibenzofuran (TCDF) at SWMU 05-005(b). There were no congener-specific detections of TCDD and TCDF and analytical results only showed results for TCDD (total) and TCDF (total). Total TCDD/TCDF are generally not used in risk assessments, and since there were no positive detects for the congeners, exclusion of the evaluation of dioxins/furans was deemed acceptable and a formal comment was not drafted.

This investigation report was published in October 2011, and LANL also updated their ECORISK database in October of 2011 from Version 2.5 to Version 3.0. LANL utilized the ecological screening levels (ESLs) from ECORISK Version 2.5 for the ecological risk assessments presented in the investigation report. With the exception of chromium, all of the ESLs for constituents of potential ecological concern remained unchanged. While use of the updated chromium ESLs would result in the exposure point concentrations being greater than some of the no-observed adverse effects level based ESLs, all of the exposure point concentrations would be lower than the lowest-observed adverse effects level based ESLs. Therefore, application of the updated ESLs for chromium would not affect the conclusions of the ecological risk assessments.

If you or any of your staff have questions, please contact me at (801) 451-2864 or via email at paigewalton@msn.com.

Thank you,

Paige Walton
AQS Senior Scientist and Program Manager

Enclosure

cc: Dan Comeau, NMED (electronic)
Neelam Dhawhan, NMED (electronic)
Joel Workman, AQS (electronic)
Sunny McBride, AQS (electronic)

Draft Technical Evaluation of the *Lower Mortendad/Cedro Canyons Aggregate Area Investigation Report*, Los Alamos National Laboratory, New Mexico, dated October, 2011

General Comments

1. The construction worker receptor was not evaluated at Lower Mortendad/Cedro Canyons Aggregate Area. Current and foreseeable future land use is industrial and as such, the construction worker receptor should be included in risk assessments where intrusive activities, such as digging and excavation are likely to occur. It is acknowledged that for many constituents, evaluation of a residential receptor would be protective of a construction worker receptor; this is not the case for some inorganic constituents such as barium, beryllium, and manganese. However, as barium, beryllium, and manganese were not listed as constituents of potential concern (COPCs) at the sites evaluated in this investigation, the construction worker should be evaluated at least qualitatively. Modify the risk assessments at Solid Waste Management Units (SWMUs) 05-003, 05-004, 05-005(b), and 05-006(c) to include evaluation of a construction worker receptor.

2. The vapor intrusion pathway was not evaluated in the risk assessments at Lower Mortendad/Cedro Canyons Aggregate Area. As shown on Figure I-3.1-1 (Conceptual Site Model), volatilization and subsequent inhalation of contaminants is shown to be a potentially complete pathway. Volatile organic compounds were detected at three of the four sites evaluated in this investigation report and evaluation of this pathway should be included in the risk assessments conducted at Lower Mortendad/Cedro Canyons Aggregate Area. Update the risk assessments to include evaluation of the vapor intrusion pathway.

3. Recent research provides evidence that hexavalent chromium is carcinogenic by a mutagenic mode of action via ingestion. The New Jersey Department of Environmental Protection (NJDEP) released a publication entitled *Derivation of Ingestion-Based Soil Remediation Criterion for Cr^{+6} Based on the NTP Chronic Bioassay Data for Sodium Dichromate Dihydrate* (April 8, 2009) which presents cancer potency values derived from a two-year dose-response study conducted by the National Toxicology Program (2008). NJDEP derived an oral cancer potency value of 0.5 mg/kg-day for hexavalent chromium. Based on this information, the risk-based human health screening levels would be lower than the screening levels presented and utilized in the human health risk assessments this investigation report. The 2012 NMED Soil Screening Levels (SSLs) as well as the US EPA's (2011) Regional Screening Levels also include screening levels for hexavalent chromium in soil and tap water utilizing the NJDEP updated oral cancer slope factor of 0.5 mg/kg-day and age-adjustment calculations for exposure to mutagenic constituents. Modify the human health risk assessments to utilize updated soil and tap water screening levels for hexavalent chromium and the oral cancer slope factor of 0.5 mg/kg-day.

Specific Comments

1. Figure I-3.1-1. The exposure pathways presented on the conceptual site model are designated as 'very low', 'low', 'moderate', or 'not applicable'. Based on these designations, it is not clear from the figure alone as to which pathways were determined to be complete and

whether they were evaluated in the risk assessments. Modify Figure I-3.1-1 to indicate whether the pathways are designated as complete or incomplete, and if they are evaluated (quantitatively and/or qualitatively) in the risk assessments.

2. Section I-5.4.4. Several inorganics were eliminated as constituents of potential ecological concern (COPECs) based on a comparison of exposure point concentrations (EPCs) with background concentrations, as shown on Tables I-5.4-1, I-5.4-2, and I-5.4-3. This is not an appropriate screening tool to be used to eliminate COPECs from further evaluation in the ecological risk assessments for the following reasons:

   - Site-to-background comparisons were already conducted in the nature and extent of contamination investigations and resulted in the lists of COPCs to be retained for analysis in the risk assessments;

   - It is not appropriate to compare 95% upper confidence limits (UCLs) with individual background concentration terms. In cases where statistical tests concluded that site concentrations of COPCs were elevated compared to background, EPCs based on 95% UCLs would be greater than 95% UCLs that could be calculated for the background data set. Therefore, it is incorrect to assume that exposure to EPCs (based on 95% UCLs) for inorganic COPCs would be the same as exposure to background levels.

   - Chromium was eliminated as a COPEC at SWMU 05-006(c) despite having an EPC greater than the range of background concentrations. Thus, the EPC versus background comparison appears to be subjective;

   - Refinement of inorganic COPECs should include application of area use factors and use of soil screening levels based on lowest observed adverse effects levels (LOAELs).

   Remove the discussion comparing EPCs with background concentrations from the ecological risk assessments at SWMUs 05-004, 05-005(b), and 05-006(c). Retain all inorganics that were eliminated as COPECs based on a comparison of EPCs with background concentrations. Modify the ecological risk assessments to utilize the accepted methods for refining COPECs, such as the application of area use factors and use of ecological screening levels based on LOAELs.

3. Table I-5.4-4. The population area use factors (PAUFs) shown on Table I-5.4-4 appear to be incorrect. The footnote explains that the PAUF is calculated as the area of the site divided by the population area. For example, the PAUF at SWMU 05-004 for the American Kestrel should be calculated as 0.003 hectares (ha)/4240 ha = 7E-7. However, a value of 6E-8 is listed in the table. Clarify how the PAUFs were calculated, and modify Table I-5.4-4 to display the correct PAUFs. Modify any subsequent calculations if necessary.

4. Section 6.4.2.4. Nature and Extent of Soil and Rock Contamination. In the discussion for lead, the text states, "The preexcavated concentration of lead was 26,500 mg/kg from 0–1 foot (ft) below ground surface (bgs) at location 05-61380 (RE05-11-3393, excavated sample, Appendix F). Lead was detected at concentrations of 26.4 mg/kg and 60.1 mg/kg from 2–3 ft

and 5–6 ft bgs, respectively. Overall, **lead concentrations decreased with depth at this location** and decreased laterally in all four directions at the excavation." The analytical results show that there are increasing concentrations of lead with increasing depth at location 05-613800. In addition, there are increasing concentrations of lead with increasing depth at location 05-614431. Modify the discussion of lead to state that there are increasing concentrations with increasing depth at locations 05-613800 and 05-614431. Provide a basis for the conclusion that the vertical extent of lead contamination is defined.