Response to the Notice of Disapproval for the Supplemental Interim Measure Report for Solid Waste Management Unit 01-001(f) at Los Alamos National Laboratory, EPA ID No. NM0890010515, HWB-LANL-10-031 Dated February 2, 2011

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim. Los Alamos National Laboratory's (LANL's or the Laboratory's) responses follow each NMED comment. This response contains data on radioactive materials, including source, special nuclear, and byproduct material. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with U.S. Department of Energy (DOE) policy.

PART I—COMMENTS ON MI SAMPLING

NMED Comment

The Permittees used Multi Incremental (MI) sampling as the method to collect their confirmation samples for removal of the PCB-contaminated soils and tuff. The use of the MI sampling approach was not included in the approved Los Alamos Site Monitoring Area 2 Interim Measure and Monitoring Plan (IMP). The Permittees also failed to notify NMED prior to using MI sampling as the approach for confirmation sample collection. Not only was the approach unapproved by NMED, the application was inappropriate for removal of contaminated soil and tuff. MI sampling is typically used for characterization at detonation sites and should not have been used for confirmation sampling for PCB removal. In any event, the Permittees did not correctly perform the MI sampling method and deviated from the guidance document referenced in the Report.

The Permittees state, "[t]he supplemental confirmation sampling approach for the excavated areas in the SWMU 01-001(f) outfall area and hillside drainage was based on MULTI INCREMENTAL (MI) sampling." MI sampling is inappropriate and was not conducted correctly for the following reasons:

1. *The Permittees did not appropriately propose the MI sampling method in the IMP which states, "[s]oils and sediments will be sampled in accordance with the approved Investigation Work Plan for Upper Los Alamos Canyon Aggregate Area [Work Plan]." Table 10.0-1 of the Work Plan describes other sampling methods that were approved by NMED and MI sampling was not mentioned in the table. Also, the Permittees did not contact NMED to seek approval for modifying the sampling method prior to completing the supplemental interim measure. No response required.*

LANL Response

1. The Los Alamos Site Monitoring Area 2 Interim Measure and Monitoring Plan (IMP) (LANL 2008, 104020) was written in November 2008 and did not propose removal actions in the drainage or subsequent confirmation sampling because it predates characterization sampling for Solid Waste Management Unit (SWMU) 01-001(f). The statement "Soils and sediments will be sampled in accordance with the approved Investigation Work Plan for Upper Los Alamos Canyon Aggregate Area…" refers to the characterization sampling conducted at SWMU 01-001(f) in accordance with the Compliance Order on Consent (the Consent Order) during the Upper Los Alamos Canyon Aggregate

Area investigation. This sampling, which was the first at SWMU 01-001(f) to include polychlorinated biphenyls (PCBs) in the analytical suite, was performed in late calendar year (CY) 2008, and the results were received in early CY2009. The PCB results indicated a removal action was necessary at SWMU 01-001(f), as directed by NMED in its approval with modifications for the IMP, dated May 5, 2009 (NMED 2009, 105858), and proposed in the investigation report for the Upper Los Alamos Canyon Area, originally submitted in May 2009 and revised in February 2010 (LANL 2010, 108528). In its approval with modifications for the IMP (NMED 2009, 105858), NMED directed the Laboratory to conduct source removal in accordance with Section VIII.B.1.a of the Consent Order and to collect confirmation samples every 100 ft^2. However, NMED did not require the Laboratory to submit a work plan before source removal and did not specify a method for confirmation sampling. During a site visit at SWMU 01-001(f) on December 2, 2009, NMED personnel suggested the Laboratory use multi-increment (MI) sampling for confirmation at SWMU 01-001(f).

NMED Comment

2. *The MI sampling method is inappropriate for this application, and may be acceptable as a screening tool in some situations, but it is not appropriate for compliance for cleanup activities.*

    a. *MI sampling is acceptably applied for the "collection and processing of samples for characterization of secondary explosive and propellant residues [which are] heterogeneously distributed as particulates of various sizes, shapes, and compositions over large areas at firing point, around targets, and around individual detonation events" (EPA Method 8330B, Appendix A).*

    b. *MI sampling is only appropriate for surface sampling and does not define the lateral extent of the contamination when applied to a soil removal action. The sampling method also calls for larger decision units (EPA Method 8330B, Appendix A) than the Permittees used and requires the sampler to avoid areas that could dilute the sample.*

LANL Response

2. The following responses clarify the Laboratory's use of MI sampling.

    a. Neither the supplemental interim measures (IM) report nor the State of Alaska Department of Environmental Conservation (DEC) Draft Guidance on MULTI INCREMENT Soil Sampling (State of Alaska DEC 2009, 110573) cite U.S. Environmental Protection Agency (EPA) Method 8330B, Appendix A. Appendix A of EPA Method 8330B describes MI sampling for the very specific purpose of characterizing secondary explosive and propellant residues in solid matrices associated with firing ranges and was developed to address the heterogeneous distribution of small particles of explosive residues at such sites. This distribution is very different from what would be expected from septic tank effluent contaminated with PCBs. Therefore, the Laboratory did not follow Appendix A of EPA Method 8330B to determine whether additional PCB cleanup was required at SWMU 01-001(f).

    Although Appendix A of EPA Method 8330B was developed to characterize firing range residues, this is not the only application of MI sampling. The section of the Alaska DEC guidance on applicability states, "DEC initially encouraged the use of MI at sites where soil is contaminated with petroleum hydrocarbons only. However, MI sampling may be applicable to contaminated sites with non-petroleum related contaminants. These may include PCBs, SVOCs, munitions' components, etc." (State of Alaska DEC 2009, 110573). Therefore, although MI sampling may be used for PCB cleanups, the procedures contained in Appendix A of EPA Method 8330B are

specific to secondary explosive and propellant residues and are not intended for use with other MI applications.

b. It is possible to use MI sampling results to define the lateral extent of contamination if bounding-decision units are sampled. However, it was not the Laboratory's intent to use the results of the MI sampling to define lateral or vertical extent, and therefore no bounding-decision units were sampled. The objective of the MI confirmation sampling approach implemented in 2010 at SWMU 01-001(f) was to determine whether additional cleanup is required. The MI sampling data are adequate to confirm the need for additional soil removal. No conclusions regarding the extent of contamination or risk to human health or the environment have been made using the MI sampling data because additional removal is warranted. Once removal actions have been completed, discrete samples will be collected and the results will be used to define the extent of contamination and evaluate risk to human health and the environment.

   As discussed above, EPA Method 8330B is not applicable to the MI sampling conducted at SWMU 01-001(f). The size of the decision unit was selected based on the requirements prescribed by NMED in its approval with modifications for the IMP, dated May 5, 2009 (NMED 2009, 105858). In this letter, NMED directed the Laboratory to collect confirmation samples every 100 ft^2. This requirement dictated the size of the decision units. The Laboratory understands NMED's concerns regarding potential MI sample dilution; however, because MI samples were collected only within the excavation footprint (i.e., where PCBs are or were present in excess of recreational soil screening levels [SSLs]), none of the MI samples could be diluted with material from historically clean areas.

NMED Comment

3. *The Permittees did not correctly follow the sampling protocol for EPA Method 8330B, Appendix A or the State of Alaska Department of Environmental Conservation guidance document (DEC Guidance).*

   a. *The Permittees state, "[t]hirteen MI confirmation samples were collected, one MI confirmation sample from each discrete decision unit. Within each decision unit, 25 increments were collected by stainless-steel scoop throughout the entire footprint of the decision unit and combined in a stainless-steel bowl into a single sample." According to the guidance documents that describe MI sampling methods, at least 30 subsamples must be collected across the entire decision unit to ensure proper representativeness of the homogenized sample across the entire decision unit. No response required.*

   b. *From the description of the Report, it appears that the Permittees may have modified MI sampling by collecting and submitting the samples as a composite sample to the lab. The Permittees state, "25 increments were collected by stainless-steel scoop throughout the entire footprint of the decision unit and combined in a stainless-steel bowl into a single sample." The Permittees do not explain if the entire sample from the stainless-steel bowl was submitted to the laboratory or if only a portion of the sample was submitted for analysis.*

      1. *Provide more information regarding the sampling method used to collect and homogenize confirmation samples. Clarify if homogenization of the confirmation samples was conducted in accordance with EPA Method 8330B. If the Permittees did not conduct homogenization in the field per the EPA Method 8330B, verify that it was conducted by the analytical laboratory.*

2. *Clarify that confirmation sampling was not completed as composite sampling, which is not appropriate. If the MI sampling method was modified, revise the Report to explain that a form of grid sampling method was used to collect confirmation samples which were composited into one sample for each "decision unit" and sent to the laboratory for analysis.*

c. *The Permittees do not explain if the samples were processed (i.e., processed by grinding and passage through a #10 (2mm) sieve) prior to being sent to the laboratory or if the laboratory processed the samples before they were analyzed. Processing the samples ensures compositional and distributional heterogeneity reducing the fundamental error and grouping and segregation error. Verify that the samples collected were processed prior to analysis, either in the field or at the laboratory.*

d. *The Permittees state, "[q]uality control samples were collected and include one field duplicate (FD) sample, to evaluate the reproducibility of the sample technique." Both the DEC Guidance and Appendix A of the EPA Method 8330 discuss the importance of taking a triplicate sample. "Triplicate samples must be collected in order to verify that an MI sample truly represents the decision unit." Explain why a triplicate sample was not collected if the MI sampling method was applied at SWMU 01-001(f) and include in the revised Report.*

e. *The Permittees state, "[t]he 95% upper confidence limit [UCL] of the mean has decreased from 46.0 mg/kg to 9.07 mg/kg, based on the characterization data presented in the Investigation Report for the Upper Los Alamos Canyon, Revision 1 and the confirmation data presented in this supplemental interim measure report." The Permittees did not provide an explanation as to how they arrived at this conclusion. Provide the supporting calculations for the 95% UCL and indicate how this approach was selected (i.e., clarify if it was based on the MI sampling guidance documents or from another source). If the Permittees used the MI sampling guidance documents to perform 95% UCL calculations, the analysis is incorrect because the Permittees did not take a triplicate sample and/or apply the calculation based on the multiple decision units. Provide further documentation and discussion to clarify the analysis in the revised Report.*

NMED does not require additional sampling since the Permittees will be conducting additional investigation of SWMU 01-001(f) as part of the Upper Los Alamos Canyon Aggregate Area. However, the Permittees must provide clarification for the above comments to be included in the revised Report.

LANL Response

3. The following responses clarify the sampling approach used at SWMU 01-001(f).

   a. Comment noted.

   b. The Laboratory did not follow Appendix A of EPA Method 8330B, as explained in the response to Part I, Comment 2. The receiving analytical laboratory was not directed to perform "ball mill" homogenization of the submitted sample because this level of sample processing is not indicated for PCB contamination (State of Alaska DEC 2009, 110573). Rather, homogenization of the sample increments was accomplished in the field before containerization. The 25 separate and distinct increments were collected throughout each of the decision units in a uniform pattern, and the entire sample volume was mixed in a stainless-steel bowl, containerized, and submitted to the analytical laboratory. Section 4.1.2 has been revised to clarify the entire sample was homogenized and then submitted to the fixed laboratory for analysis.

As described in the Alaska DEC guidance (State of Alaska DEC 2009, 110573), MI sampling is not the same as composite sampling because of the use of decision units. The guidance states, "Unlike MI, composite sampling does not adequately address sampling FE [fundamental error] or GSE [grouping and segregation error]. A composite sample is a simple combination of discrete samples. A MULTI INCREMENT sample is a representative sample for a given decision unit. Although the physical process of collection is similar, the information derived from each process is different."

c. The bottom of the excavation in each of the 13 decision units consists of highly weathered, friable Bandelier Tuff (Qbt 3). The sample material was scraped from this surface using the stainless-steel scoop in accordance with Standard Operating Procedure (SOP) 0609, Spade and Scoop Method for the Collection of Soil Samples. The material collected for sampling was uniform and homogeneous, resembling sand. As presented in the sample collection logs, particle size was generally less than 1 mm, with some pumice fragments up to 5 mm. As stated in the Alaska DEC guidance, "If the >2mm fraction has or potentially has higher concentrations than the <2mm fraction, sieving is not appropriate…." Given the relatively high porosity of pumice, it is not expected to have lower concentrations of PCBs relative to smaller particles in the samples. In addition, no large rocks or other material that would cause widely ranging grain size was present in the samples, so sieving was not performed. The samples were submitted to the analytical laboratory and were not further processed. Section 4.1.2 has been revised to clarify that the samples were not sieved.

d. Quality control samples (field duplicates) were collected at a rate of approximately 1 in 10, in accordance with the requirements of the Consent Order. NMED is correct that triplicate samples were not collected, and the text has been revised to clarify this. (Note that samples and duplicates have good agreement with one another.)

e. The Laboratory did not use the MI sampling guidance documents to perform the 95% upper confidence limits (UCL) calculations. The EPA program ProUCL was used to calculate the 95% UCLs for SWMU 01-001(f) before and after the cleanup activities. This calculation approximates the exposure point concentration for SWMU 01-001(f) and provides an estimate of the relative risk reduction resulting from the IM to date. This calculation was performed using the characterization data presented in the investigation report for Upper Los Alamos Canyon Aggregate Area (LANL 2010, 108528) to represent the "before" value and the confirmation data presented in Table 5.1-1 of the supplemental IM report to represent the "after" value. Additional clarification is provided in section 5.1 of the revised supplemental IM report, and the ProUCL output is provided as Attachment 1 to this response. The IM is not intended to be a final remedy, and risk-screening results and recommendations will be presented in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.

PART II—OTHER COMMENTS

NMED Comment

1. Page 3 and 7, Section 3.0 and 6.0

The Permittees state, "SWMU 01-001(f) is regulated under the Laboratory's individual National Pollutant Discharge Elimination System [NPDES] permit for stormwater discharges from SWMUs and AOCs (individual permit). Under the individual permit, the Laboratory is required to implement best management practices (BMPs) and monitor stormwater discharges from SWMU 01-001(f). Additional corrective actions may be needed if concentrations of contaminants in stormwater discharges exceed

target action levels. To date, the individual permit has not required additional corrective actions at SWMU 01-001(f)." Provide additional documentation, such as sampling and analytical results, to show that the target action levels are being met for stormwater discharge.

LANL Response

1. SWMU 01-001(f) will be monitored at Los Alamos Site Monitoring Area (LA-SMA) 2.1 in accordance with the individual permit beginning in summer 2011. The individual permit does not require stormwater monitoring to begin until after baseline control measures are installed. Baseline control measures at SWMU 01-001(f) have been installed, and certification will be provided to the EPA and the NMED Surface Water Quality Bureau (SWQB) by May 30, 2011. Following this, stormwater monitoring will begin at LA-SMA-2.1. Data from stormwater monitoring will be reported in the annual stormwater report to the EPA and the NMED SWQB.

   In addition, stormwater is being monitored under the Consent Order at a sampling location at the outlet from the second retention basin (CO101037, shown on the revised Plate 1) in accordance with the NMED-approved Monitoring Plan for the Los Alamos and Pueblo Canyons Sediment Transport Mitigation Project (LANL 2009, 107457; NMED 2010, 108444). Samples will be collected from LA-SMA-2.1 and CO101037 when sufficient rainfall results in enough runoff to sample.

NMED Comment

2. Page 4, Section 4.1.1

The Permittees state, "[c]ontaminated soil, sediment, and tuff were excavated in the areas of previous confirmation sampling locations LA-609812, LA-609813, LA-609814, LA-609817, LA-611165, LA-611166, LA-611167, LA-611168, LA-611169, LA-611170, LA-611171, LA-611172, LA-611173, LA-611174, and LA-611178." There are six other sample locations where aroclor concentrations exceed the PCB recreational screening levels (SSLs): LA-610960, LA-610964, LA-610966, LA-611150, LA-611183, and LA-611185. Explain why these other locations were not addressed during removal activities.

LANL Response

2. As stated in sections 3.0 and 5.1 of the supplemental IM report, the IM is not intended as a final remedy of the site. The objectives of the IM, described in section 1.2 of the supplemental IM report, are to "decrease the PCB inventory and control contaminant migration to minimize risk while long-term corrective measures are identified and implemented." In addition, the goal of risk-based cleanups is to ensure that a site does not pose a risk under the applicable exposure scenario. For SWMU 01-001(f), the applicable exposure scenario is recreational. Decision-level data are used to determine a conservative EPC, which is used to evaluate a representative exposure to a recreational user. Although individual data points may exceed the recreational SSLs, the EPC must be less than the recreational SSL. This was also presented in section 6.0 of the original IM report (LANL 2010, 109422), which discusses the three locations within the pond footprint where recreational SSLs are exceeded (LA-610960, LA-610964, and LA-610966). Because cleanup has not been completed at SWMU 01-001(f), a risk-screening evaluation has not been conducted. Risk screening will be performed and the results presented in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area, which is due to NMED on August 30, 2012.

Note that data for location LA-611178 were erroneously included in Table 5.1-1, Plate 1, and Appendix D of the supplemental IM report. The area of this sampling location was excavated during supplemental IM activities, and a new confirmation sample (01-612632) was collected. Table 5.1-1, Plate 1, and Appendix D have been revised to correct this error. In addition, the 95% UCL representing conditions after the IM was also recalculated without the data from location LA-611178, and the text in section 5.1 has been revised.

NMED Comment

3. Page 4, Section 4.1.2

The Permittees did not fully address Comment 3 in the Direction, which directed the Permittees to "provide a description of the methods of sample collection (e.g., method of location selections, use of a shovel or coring device, collection of loose material vs. in-place soils or tuff)." This information was not included in the previous Interim Measures Report. Provide the additional information (e.g. method of locations selections, collection of loose material vs. in-place soils or tuff) in Section 2.0 (Background) and Appendix B in the revised Report.

LANL Response

3. In response to NMED's comment in the Direction to Modify, Interim Measure Report for Solid Waste Management Unit 01-001(f) and Los Alamos Site Monitoring Area 2, dated August 25, 2010 (NMED 2010, 110469), the Laboratory included Appendix B, Field Methods, in the supplemental IM report. As indicated in Appendix B, samples were collected using either the spade-and-scoop method (SOP-0609) or a hand auger (SOP-0610). Table B-1.0-1 gives a brief description of these methods and states that spade-and-scoop sampling is typically used to collect surface soil and fill samples. A hand auger is typically used to collect deeper samples and/or samples of more consolidated material, such as weathered or nonwelded tuff. As discussed in section 4.1.2 of the IM report, the spade-and-scoop method was used to collect MI samples, which were shallow samples of unconsolidated material. Therefore, no modification to the supplemental IM report is warranted.

   The locations for confirmation sampling were selected based on direction given by NMED in its approval with modifications of the IMP, dated May 5, 2009 (NMED 2009, 105858). The approval with modifications states, "No less than one sample from each excavated area and a minimum of one sample for every 100 square feet must be collected from the limits of each excavation…." As stated in section 4.1.3 of the May 2010 IM report, "Where the drainage was 10 ft across, samples were collected every 10 linear ft. Where the drainage was narrower or wider, sample collection was adjusted accordingly" (LANL 2010, 109422). In approximately 550 linear ft of drainage (not including the outfall and slope area), 52 samples were collected, or approximately 1 sample every 106 ft^2, assuming an average drainage width of 10 ft. At the outfall and slope leading into the drainage, which were sampled for the supplemental IM report, the decision units were set up to provide a sample every 100 ft^2 or less, as described in section 4.1.2. Therefore, no modification to the supplemental IM report is warranted.

NMED Comment

4. Page 5, Section 4.1.2, Paragraph 1

The Permittees state, "MI confirmation samples "top depth" was the distance measured from the original ground surface to the current surface at the bottom of the excavation. The MI confirmation

sample "bottom depth" was the distance measured from the original ground surface to the total depth where the MI confirmation sample was collected." Based on the confirmation sampling results, it appears that the vertical extent of PCB contamination has not yet been reached for each of the decision units and more removal may be required. However, the Permittees did not verify that the boundaries of the excavation extended to the lateral extent of the PCB contamination. Verify that the lateral extent of PCB contamination has been addressed by collecting confirmation samples from the side walls of the excavations as well as from beyond the excavation boundaries. Provide this information as well as a description of the confirmation sampling performed (i.e., method used, sampling equipment, results, and discussion) in the revised Report.

LANL Response

4. As presented in section 6.0, profile sampling will be performed to verify the volume of additional material to be removed. The results of this sampling, along with historical characterization sampling and additional confirmation sampling in the side walls of the excavation, will be used to determine the lateral and vertical extent of PCB contamination at SWMU 01-001(f). Section 6.0 has been modified for clarification. The results of this sampling as well as the methods will be presented in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.

NMED Comment

5. Page 5, Section 4.1.2, Paragraph 3

The Permittees state, "[t]he expedited [polychlorinated biphenyls (PCB)] screening analyses used to help guide PCB removal activities implemented in late 2009 and early 2010, as reported in the May 2010 interim measure report (LANL 2010, 109422), were not used during supplemental removal and confirmation sampling activities implemented in June and July 2010. The expedited screening analyses, which used a more simplified solvent extraction technique than the standard analytical method, tended to bias results low. While useful for quickly identifying areas with high levels of contamination requiring removal, it is not appropriate for confirmatory analyses." Provide clarification that confirmation samples screened with the expedited screening analyses from the previous interim measure did not allow contaminated areas to be overlooked or underestimated for the residential and default PCB SSLs. Submit, in the revised Report, all expedited screening analysis results and provide a section for sampling methods, equipment used, analytical methods, discussion of results and verification that the screening analyses did not overlook areas due to biased results.

LANL Response

5. Applicable screening results are presented in Table 5.1-1 of the May 2010 IM report. As stated in section 1.3 of the October 2010 supplemental IM report, "this…report describes activities performed in the SWMU 01-001(f) outfall area and in the drainage downgradient of SWMU 01-001(f) since submittal of the original IM report (i.e., after May 1, 2010)…." Screening-level data were not collected after May 1, 2010, and therefore are not presented again in the supplemental IM report. Furthermore, as stated in section 4.1.2 and above in NMED's comment, screening-level data are not appropriate for confirmation data. The Laboratory uses only level 4 data generated by approved analytical methods and fixed analytical laboratories for decision purposes. Therefore, no revision to the supplemental IM report is warranted.

NMED Comment

6. Page 6, Section 4.3, Paragraph 1

The Permittees state, "[g]rab samples were collected from stormwater in both basins on July 26, 2010, following three days of rain." The Permittees did not include these data in the Report. Revise the Report to include the stormwater sample data for the two basins and provide discussion of the results.

LANL Response

6. The data from the grab samples had not been received at the time the supplemental IM report was delivered to NMED and therefore could not be included in the report. The results were subsequently reported in "Stormwater Performance Monitoring in the Los Alamos/Pueblo Watershed During 2010" (LANL 2011, 111808), which was submitted to NMED on February 28, 2011. The PCB concentrations in the grab samples decreased from 15.1 µg/L at the culvert intake in the upper basin to 1.01 µg/L at the culvert intake in the lower basin and to 0.545 µg/L in the riparian zone below the lower basin. These results show a decreasing trend as stormwater progresses through the surface water retention basins and into the constructed riparian zone, indicating the retention basins are operating as intended. Initial sampling results may have been affected by residual loose material being flushed down the drainage following disturbance, and lower concentrations should be detected in future sampling as the drainage stabilizes and the riparian zone continues to mature. Section 4.3 has been revised to include the results of the grab sampling.

NMED Comment

7. Page 6, Section 5.1, Paragraph 1

The Permittees state, "[a]lthough Table 5.1-1 shows that Aroclor-1254 and Aroclor-1260 were the only Aroclors detected, review of the analytical data in Appendix D indicates that there were a number of instances where detection limits for other Aroclors were greater than clean up levels. These elevated detection limits were associated with the analytical sample dilution needed because of high concentrations of Aroclor-1254 and/or Aroclor-1260. In no cases were the high detection limits for some Aroclors without at least one other Aroclor being detected at high concentrations. Therefore, although some Aroclors above cleanup levels may not have been quantified in all samples, the results were acceptable for identifying all locations requiring removal. Elevated detection limits were not an issue with the supplemental confirmation data set because samples were less contaminated and high sample dilution was not needed." NMED recognizes that analytical sample dilution is one reason Aroclor-1254 and Aroclor-1260 were the only Aroclors detected in the confirmation samples. Stormwater analytical data from SWMU 01-001(f) was reviewed by NMED and the results show that concentrations of Aroclor-1254 and Aroclor-1260 are the dominant Aroclors present in the surface water samples. No response required.

LANL Response

7. Comment noted.

NMED Comment

8. Page 7, Section 6.0, Paragraph 2

The Permittees state, "[t]o further control migration of residual contamination at the site, it is recommended that run-on be diverted from the outfall area and hillside drainage portions of the site and that additional stabilization measures be implemented within the hillside drainage. These activities will be coordinated with the installation of BMPs and other controls under the individual permit. To date, the individual permit has not required the installation of run-on controls or monitoring at the top of the SWMU 01-001(f) drainage." In Section 3.2 of the Interim Measure Report for SWMU 01-001(f) and LA-SMA-2, the Permittees state, "[a]dditional actions to be taken at SWMU 01-001(f), including those to be implemented above the drainage, will be identified in the Phase II work plan."

a. NMED has reviewed the Upper Los Alamos Canyon Aggregate Area Phase II Work Plan and did not identify any activities pertaining to the top of the drainage for SWMU 01-001(f). No response required.

b. Per Comment 2 of the Approval with Modifications (Approval) letter dated August 25, 2010, NMED directed the Permittees to "take all measures necessary to prevent contaminants from the mesa top from migrating into the drainage below SWMU 01-001(f)." The Permittees state, "to date, the individual permit has not required the installation of run-on controls or monitoring at the top of the SWMU 01-001(f) drainage." Part 1, Section A.2 of the NPDES Permit No. NM0030759, states "[n]othing in this permit relieves the Permittees of the obligation to implement additional control measures required by other Federal authorities, or by a State or local authority." Therefore, address Comment 2 of the Approval and provide documentation that installation occurred and include in the Phase II Investigation Report.

LANL Response

8. The following response addresses run-on from private property and erosion controls in place in the drainage below SWMU 01-001(f).

   a. Comment noted.

   b. The referenced comment is from the approval with modifications for the IMP, dated May 5, 2009 (NMED 2009, 105858). Section 3.2 of the May 2010 IM report (LANL 2010, 109422) summarizes discussions with NMED during a July 9, 2009, site visit regarding the feasibility of controlling run-on from private property. As proposed in the supplemental IM, the Laboratory's current recommendation is that run-on be diverted from the outfall area and hillside drainage portions of the site (located on DOE property) and that these activities be coordinated with other controls under the individual permit. Controls currently installed at LA-SMA-2.1 under the individual permit include an erosion control blanket, a log check dam, and riprap for runoff and erosion control. Additionally, permanent vegetation forested/needle cast is being maintained to provide erosion control. Certification of the completion of baseline control measures will be provided to the EPA and the NMED SWQB by May 30, 2011. The effectiveness of these baseline controls will be evaluated through stormwater monitoring, and enhanced controls will be installed as necessary.

NMED Comment

9. Page 7, Section 6.0, Paragraph 4

The Permittees state, "[t]o evaluate the potential need for further cleanup activities within the hillside drainage portion of the site, a risk assessment is recommended for this area. This risk assessment would evaluate the risk associated with current and potential future use of the site. It is recommended that this risk assessment be performed as part of the Phase II investigation for Upper Los Alamos Canyon Aggregate Area and that any additional clean up activities be implemented as part of corrective measures for the aggregate area. The Phase II investigation will also address the determination of the nature and extent of contamination at SWMU 01-001(f), including at the five sampling locations at the former location of SWMU 01-001(f) septic tank."

a. The risk assessment must be completed once the Phase II investigation has been completed for the Upper Los Alamos Canyon Aggregate Area and must include all hazardous constituents of concern. No response required.

b. Clarify if samples have been collected from the five sampling locations cited above in the Report. They are not mentioned in Section 2.5.3 (Proposed Extent Sampling at SWMU 01-001(f)) of the Phase II Investigation Work Plan.

LANL Response

9. The following responses clarify proposed sampling at SWMU 01-001(f) to define the lateral and vertical extent of PCBs.

   a. Comment noted.

   b. The five sampling locations are in reference to Comment 5 of the Approval with Modifications, Interim Measure Report, Solid Waste Management Unit 01-001(f) and Los Alamos Site Monitoring Area 2, dated August 25, 2010 (NMED 2010, 110469). Comment 5 states, "Five sampling locations are marked at the location of the former septic tank as having been excavated; confirmation samples to demonstrate removal of PCB contamination were not collected. Confirmation samples must be collected from the five locations marked on Figure 4.1-1 to demonstrate that soils containing concentrations of PCBs greater than the screening levels have been removed. The results of the confirmation sampling must be included in the Report." Because the approval with modifications was received in late August and the supplemental IM report was due to NMED on October 1, 2010, it was not possible to collect the samples and include the results in the supplemental IM report. Therefore, the results of this sampling will be reported in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area. It should be noted that four sampling locations are marked as excavated in the area of the septic tank in Figure 4.1-1 of the IM report; in any case, the Laboratory will collect adequate confirmation samples to define the lateral and vertical extent of PCB contamination and ensure cleanup goals have been met.

NMED Comment

10. Page 20, Table 5.1-1

Revise Table 5.1-1 as follows:

a. Superscript "a" states "SSLs from NMED (2009, 108070)." NMED does not include recreational SSLs in its soil screening guidance. Revise the Notes section to resolve this discrepancy.

b. Revise the Table to include a footnote defining "QBT3."

c. Revise the Table to include a footnote to indicate when samples were collected (i.e., initial and supplemental interim measures).

d. Revise the Table to include the duplicate sample collected as part of the MI confirmation samples.

e. In the final report, include all confirmation and expedited screening analysis samples.

LANL Response

10. The following revisions have been made to the tables, as appropriate.

    a. The notes to Table 5.1-1 have been revised to reflect the correct source of the recreational SSLs.

    b. A note has been added to Tables 4.1-1 and 5.1-1 to define the applicable media codes.

    c. Shading has been added to Table 5.1-1 to indicate which samples were collected during supplemental IM activities.

    d. The table has been revised to include the duplicate sample data.

    e. See response to Comment 5 of Part II—Other Comments.

NMED Comment

11. Page B-2, Section B-4.4

Clarify that all heavy equipment used for excavation were also decontaminated prior to demobilization from the SWMU 01-001(f) outfall and drainage area.

LANL Response

11. Although no heavy equipment was used during supplemental IM activities, all heavy equipment used during initial IM activities was screened for PCBs and radioactivity before it was released for work in other areas. During the supplemental IM, hand tools and air hammers were used for excavation. Many of the hand tools were disposed of with the appropriate waste stream. Tools and equipment that were kept for reuse were screened and/or decontaminated as appropriate before they were released for work in other areas.

NMED Comment

12. Plate 1

Revise Plate 1 as follows:

a. Include symbols representing LA-SMA-2.1 and former LA-SMA-2.

b. Include missing data for samples 01-609991, 01-609994, 01-611286 LA-60815, LA611127, LA-611128, LA-611151, LA-611152, and LA-611156.

c. Depict the entire excavation boundary within SWMU 01-001(f).

The revised figure must be submitted with the revised Report.

LANL Response

12. The following revisions have been made to Plate 1 and text, as appropriate.

    a. Plate 1 has been revised to include symbols for LA-SMA-2.1, former LA-SMA-2, and the Consent Order stormwater sampling location (CO101037).

    b. The data are not missing for samples from locations 01-609991, 01-609994, 01-611286, LA-609815, LA-611127, LA-611128, LA-611151, LA-611152, and LA-611156; rather, no PCBs were detected in these samples. Therefore, only the sampling locations and depths are shown on the map, and no changes to Plate 1 are warranted. The full data set, including nondetected results, is provided in Appendix D (on DVD).

    c. The boundary of the excavation throughout the drainage is not shown on the map because it is not continuous. Only the areas around the surface water retention basins and at the outfall and the slope leading into the drainage were excavated in such a manner that boundaries can be meaningfully outlined. Plate 1 has been revised to show the excavation boundaries in the area of the retention basins and the outfall and slope. As presented in section 4.1.2 of the IM report (LANL 2010, 109422), the majority of the material removed from within the drainage was sediment, which was vacuumed out of accumulation areas (e.g., around boulders and in pockets in bedrock). Although virtually all the sediment was removed from the drainage in accordance with direction from NMED (2009, 105858), sediment was not present at all locations. Soil and tuff were removed from areas where sampling indicated PCBs exceeded recreational SSLs. These areas were often collocated with areas of high sediment accumulation and are likely the result of the greater residence time of water associated with sediment deposition.

REFERENCES

LANL (Los Alamos National Laboratory), November 2008. “Los Alamos Site Monitoring Area 2 Interim Measure and Monitoring Plan,” Los Alamos National Laboratory document LA-UR-08-6891, Los Alamos, New Mexico. (LANL 2008, 104020)

LANL (Los Alamos National Laboratory), October 2009. “Monitoring Plan for Los Alamos and Pueblo Canyons Sediment Transport Mitigation Project,” Los Alamos National Laboratory document LA-UR-09-6563, Los Alamos, New Mexico. (LANL 2009, 107457)

LANL (Los Alamos National Laboratory), February 2010. “Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1,” Los Alamos National Laboratory document LA-UR-10-0422, Los Alamos, New Mexico. (LANL 2010, 108528)

LANL (Los Alamos National Laboratory), May 2010. “Interim Measure Report for Solid Waste Management Unit 01-001(f) and Los Alamos Site Monitoring Area 2,” Los Alamos National Laboratory document LA-UR-10-2641, Los Alamos, New Mexico. (LANL 2010, 109422)

LANL (Los Alamos National Laboratory), February 2011. “Stormwater Performance Monitoring in the Los Alamos/Pueblo Watershed During 2010,” Los Alamos National Laboratory document LA-UR-11-0941, Los Alamos, New Mexico. (LANL 2011, 111808)

NMED (New Mexico Environment Department), May 5, 2009. “Approval with Modifications, Los Alamos Site Monitoring Area 2 (LA-SMA-2) Interim Measure and Monitoring Plan to Mitigate Contaminated Sediment Transport in Los Alamos Canyon,” New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2009, 105858)

NMED (New Mexico Environment Department), January 11, 2010. “Approval with Modifications, Los Alamos and Pueblo Canyons Sediment Transport Monitoring Plan,” New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M. Graham (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2010, 108444)

NMED (New Mexico Environment Department), August 25, 2010. “Direction to Modify Interim Measure Report, Solid Waste Management Unit 01-001(f) and Los Alamos Site Monitoring Area 2 (LA-SMA-2),” New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M. Graham (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2010, 110469)

State of Alaska DEC (State of Alaska Department of Environmental Conservation), March 2009. “Draft Guidance on Multi Increment Soil Sampling,” State of Alaska Department of Environmental Conservation, Division of Spill Prevention and Response Contaminated Sites Program, Juneau, Alaska. (State of Alaska DEC 2009, 110573)

Attachment 1

ProUCL Results

ProUCL Results Before Interim Measure

1				**General UCL Statistics for Data Sets with Non-Detects**								
2			**User Selected Options**									
3			From File	Sheet2.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	**Aroclor-1254**											
10												
11						**General Statistics**							
12						Number of Valid Data	129			Number of Detected Data	50	
13						Number of Distinct Detected Data	49			Number of Non-Detect Data	79	
14										Percent Non-Detects	61.24%	
15												
16						**Raw Statistics**				**Log-transformed Statistics**		
17						Minimum Detected	0.0063			Minimum Detected	-5.067	
18						Maximum Detected	610			Maximum Detected	6.413	
19						Mean of Detected	31.62			Mean of Detected	-0.411	
20						SD of Detected	95.41			SD of Detected	3.357	
21						Minimum Non-Detect	0.033			Minimum Non-Detect	-3.411	
22						Maximum Non-Detect	0.045			Maximum Non-Detect	-3.101	
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	94	
25	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	35	
26	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	72.87%	
27												
28						**UCL Statistics**							
29						**Normal Distribution Test with Detected Values Only**				**Lognormal Distribution Test with Detected Values Only**		
30						Shapiro Wilk Test Statistic	0.389			Shapiro Wilk Test Statistic	0.925	
31						5% Shapiro Wilk Critical Value	0.947			5% Shapiro Wilk Critical Value	0.947	
32						**Data not Normal at 5% Significance Level**				**Data not Lognormal at 5% Significance Level**		
33												
34						**Assuming Normal Distribution**				**Assuming Lognormal Distribution**		
35						DL/2 Substitution Method				DL/2 Substitution Method		
36						Mean	12.27			Mean	-2.579	
37						SD	61.02			SD	2.705	
38						95% DL/2 (t) UCL	21.17			95% H-Stat (DL/2) UCL	7.914	
39												
40						Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method		
41						**MLE yields a negative mean**				Mean in Log Scale	-3.128	
42										SD in Log Scale	3.381	
43										Mean in Original Scale	12.27	
44										SD in Original Scale	61.02	
45										95% t UCL	21.17	
46										95% Percentile Bootstrap UCL	21.78	
47										95% BCA Bootstrap UCL	27.29	
48												
49						**Gamma Distribution Test with Detected Values Only**				**Data Distribution Test with Detected Values Only**		
50						k star (bias corrected)	0.194			**Data do not follow a Discernable Distribution (0.05)**		
51						Theta Star	163.4					
52						nu star	19.35					

53												
54					A-D Test Statistic	2.893	**Nonparametric Statistics**					
55					5% A-D Critical Value	0.913				Kaplan-Meier (KM) Method		
56					K-S Test Statistic	0.913					Mean	12.26
57					5% K-S Critical Value	0.139					SD	60.78
58	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	5.406
59											95% KM (t) UCL	21.22
60	**Assuming Gamma Distribution**										95% KM (z) UCL	21.15
61	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	21.16
62					Minimum	0.0063					95% KM (bootstrap t) UCL	32.57
63					Maximum	610					95% KM (BCA) UCL	21.97
64					Mean	31.61					95% KM (Percentile Bootstrap) UCL	22.6
65					Median	31.43					95% KM (Chebyshev) UCL	35.83
66					SD	59.05					97.5% KM (Chebyshev) UCL	46.02
67					k star	0.428					99% KM (Chebyshev) UCL	66.05
68					Theta star	73.77						
69					Nu star	110.5	**Potential UCLs to Use**					
70					AppChi2	87.28					97.5% KM (Chebyshev) UCL	46.02
71					95% Gamma Approximate UCL	40.04						
72					95% Adjusted Gamma UCL	40.14						
73	**Note: DL/2 is not a recommended method.**											
74												
75	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**											
76	**These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).**											
77	**For additional insight, the user may want to consult a statistician.**											
78												
79												
80	**Aroclor-1260**											
81												
82	**General Statistics**											
83					Number of Valid Data	128				Number of Detected Data		24
84					Number of Distinct Detected Data	21				Number of Non-Detect Data		104
85										Percent Non-Detects		81.25%
86												
87	**Raw Statistics**						**Log-transformed Statistics**					
88					Minimum Detected	0.0031				Minimum Detected		-5.776
89					Maximum Detected	0.094				Maximum Detected		-2.364
90					Mean of Detected	0.0214				Mean of Detected		-4.21
91					SD of Detected	0.0209				SD of Detected		0.872
92					Minimum Non-Detect	0.033				Minimum Non-Detect		-3.411
93					Maximum Non-Detect	3.6				Maximum Non-Detect		1.281
94												
95	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		128
96	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
97	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
98												
99	**UCL Statistics**											
100	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
101					Shapiro Wilk Test Statistic	0.746				Shapiro Wilk Test Statistic		0.982
102					5% Shapiro Wilk Critical Value	0.916				5% Shapiro Wilk Critical Value		0.916
103	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
104												

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0999	Mean	-3.795
SD	0.364	SD	1.043
95% DL/2 (t) UCL	0.153	95% H-Stat (DL/2) UCL	0.0476
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-4.403
		SD in Log Scale	0.636
		Mean in Original Scale	0.0151
		SD in Original Scale	0.0116
		95% t UCL	0.0168
		95% Percentile Bootstrap UCL	0.0169
		95% BCA Bootstrap UCL	0.0172
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.357	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	0.0157		
nu star	65.15		
A-D Test Statistic	0.352	**Nonparametric Statistics**	
5% A-D Critical Value	0.761	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.761	Mean	0.016
5% K-S Critical Value	0.181	SD	0.0123
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.002
		95% KM (t) UCL	0.0193
Assuming Gamma Distribution		95% KM (z) UCL	0.0193
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.0193
Minimum	0.0031	95% KM (bootstrap t) UCL	0.0197
Maximum	0.094	95% KM (BCA) UCL	0.0196
Mean	0.0212	95% KM (Percentile Bootstrap) UCL	0.0193
Median	0.021	95% KM (Chebyshev) UCL	0.0247
SD	0.00895	97.5% KM (Chebyshev) UCL	0.0285
k star	7.226	99% KM (Chebyshev) UCL	0.0359
Theta star	0.00293		
Nu star	1850	**Potential UCLs to Use**	
AppChi2	1751	95% KM (t) UCL	0.0193
95% Gamma Approximate UCL	0.0224		
95% Adjusted Gamma UCL	0.0224		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

ProUCL Results After Interim Measure

1				**General UCL Statistics for Data Sets with Non-Detects**								
2			**User Selected Options**									
3			From File	Sheet2.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	**Aroclor-1254**											
10												
11						**General Statistics**							
12					Number of Valid Data	115			Number of Detected Data	103		
13					Number of Distinct Detected Data	88			Number of Non-Detect Data	12		
14									Percent Non-Detects	10.43%		
15												
16					**Raw Statistics**				**Log-transformed Statistics**			
17					Minimum Detected	0.0028			Minimum Detected	-5.878		
18					Maximum Detected	58.8			Maximum Detected	4.074		
19					Mean of Detected	4.2			Mean of Detected	-0.0821		
20					SD of Detected	8.456			SD of Detected	1.984		
21					Minimum Non-Detect	0.00343			Minimum Non-Detect	-5.675		
22					Maximum Non-Detect	1.06			Maximum Non-Detect	0.0583		
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	66		
25	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	49		
26	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	57.39%		
27												
28						**UCL Statistics**							
29					**Normal Distribution Test with Detected Values Only**				**Lognormal Distribution Test with Detected Values Only**			
30					Lilliefors Test Statistic	0.31			Lilliefors Test Statistic	0.0631		
31					5% Lilliefors Critical Value	0.0873			5% Lilliefors Critical Value	0.0873		
32					**Data not Normal at 5% Significance Level**				**Data appear Lognormal at 5% Significance Level**			
33												
34					**Assuming Normal Distribution**				**Assuming Lognormal Distribution**			
35					DL/2 Substitution Method				DL/2 Substitution Method			
36					Mean	3.77			Mean	-0.459		
37					SD	8.098			SD	2.246		
38					95% DL/2 (t) UCL	5.022			95% H-Stat (DL/2) UCL	16.89		
39												
40					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
41					**MLE yields a negative mean**				Mean in Log Scale	-0.445		
42									SD in Log Scale	2.178		
43									Mean in Original Scale	3.766		
44									SD in Original Scale	8.1		
45									95% t UCL	5.018		
46									95% Percentile Bootstrap UCL	5.068		
47									95% BCA Bootstrap UCL	5.326		
48												
49					**Gamma Distribution Test with Detected Values Only**				**Data Distribution Test with Detected Values Only**			
50					k star (bias corrected)	0.423			**Data appear Lognormal at 5% Significance Level**			
51					Theta Star	9.93						
52					nu star	87.12						

53												
54					A-D Test Statistic	2.151	**Nonparametric Statistics**					
55					5% A-D Critical Value	0.836				Kaplan-Meier (KM) Method		
56					K-S Test Statistic	0.836					Mean	3.767
57					5% K-S Critical Value	0.0947					SD	8.064
58	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.756
59											95% KM (t) UCL	5.02
60	**Assuming Gamma Distribution**										95% KM (z) UCL	5.01
61	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	5.019
62					Minimum	1E-12					95% KM (bootstrap t) UCL	5.45
63					Maximum	58.8					95% KM (BCA) UCL	5.202
64					Mean	3.761					95% KM (Percentile Bootstrap) UCL	5.144
65					Median	0.64					95% KM (Chebyshev) UCL	7.061
66					SD	8.102					97.5% KM (Chebyshev) UCL	8.486
67					k star	0.177					99% KM (Chebyshev) UCL	11.29
68					Theta star	21.3						
69					Nu star	40.62	**Potential UCLs to Use**					
70					AppChi2	27.02					97.5% KM (Chebyshev) UCL	8.486
71					95% Gamma Approximate UCL	5.656						
72					95% Adjusted Gamma UCL	5.685						
73	**Note: DL/2 is not a recommended method.**											
74												
75	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**											
76	**These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).**											
77	**For additional insight, the user may want to consult a statistician.**											
78												
79												
80	**Aroclor-1260**											
81												
82	**General Statistics**											
83					Number of Valid Data	116					Number of Detected Data	64
84					Number of Distinct Detected Data	63					Number of Non-Detect Data	52
85											Percent Non-Detects	44.83%
86												
87	**Raw Statistics**						**Log-transformed Statistics**					
88					Minimum Detected	0.0025					Minimum Detected	-5.991
89					Maximum Detected	19.4					Maximum Detected	2.965
90					Mean of Detected	1.951					Mean of Detected	-0.771
91					SD of Detected	3.415					SD of Detected	1.997
92					Minimum Non-Detect	0.00343					Minimum Non-Detect	-5.675
93					Maximum Non-Detect	3					Maximum Non-Detect	1.099
94												
95	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	104
96	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	12
97	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	89.66%
98												
99	**UCL Statistics**											
100	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
101					Lilliefors Test Statistic	0.284					Lilliefors Test Statistic	0.0664
102					5% Lilliefors Critical Value	0.111					5% Lilliefors Critical Value	0.111
103	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
104												

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.182	Mean	-1.527
SD	2.678	SD	2.003
95% DL/2 (t) UCL	1.594	95% H-Stat (DL/2) UCL	3.012
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.159
		SD in Log Scale	2.285
		Mean in Original Scale	1.095
		SD in Original Scale	2.702
		95% t UCL	1.511
		95% Percentile Bootstrap UCL	1.522
		95% BCA Bootstrap UCL	1.659
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.438	**Data Follow Appr. Gamma Distribution at 5% Significance Level**	
Theta Star	4.453		
nu star	56.1		
A-D Test Statistic	0.858	**Nonparametric Statistics**	
5% A-D Critical Value	0.829	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.829	Mean	1.109
5% K-S Critical Value	0.119	SD	2.687
Data follow Appr. Gamma Distribution at 5% Significance Level		SE of Mean	0.252
		95% KM (t) UCL	1.527
Assuming Gamma Distribution		95% KM (z) UCL	1.523
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.525
Minimum	0.0025	95% KM (bootstrap t) UCL	1.686
Maximum	19.4	95% KM (BCA) UCL	1.572
Mean	1.72	95% KM (Percentile Bootstrap) UCL	1.534
Median	0.735	95% KM (Chebyshev) UCL	2.207
SD	2.652	97.5% KM (Chebyshev) UCL	2.682
k star	0.646	99% KM (Chebyshev) UCL	3.614
Theta star	2.661		
Nu star	150	**Potential UCLs to Use**	
AppChi2	122.7	95% KM (BCA) UCL	1.572
95% Gamma Approximate UCL	2.103		
95% Adjusted Gamma UCL	2.108		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

Cross-Reference of NMED NOD Comments and Revisions to the Supplemental Interim Measure Report for Solid Waste Management Unit 01-001(f)

NMED NOD Comment No.	Summary of NOD Comment Requirement	Section(s) in Original Report	Section(s) in Revised Report	Nature of Revision
Part I—Comments on MI Sampling				
1	The Permittees did not appropriately propose the multi-incremental (MI) sampling method or contact the New Mexico Environment Department (NMED) for approval to modify the sampling method. No response required.	n/a*	n/a	n/a
2	The MI sampling method is inappropriate for this application; MI sampling does not define the lateral extent of the contamination and calls for larger decision units and avoidance of areas that could dilute samples.	n/a	n/a	n/a
3	Follow the correct sampling protocol for U.S. Environmental Protection Agency (EPA) Method 8330B. Clarify how 95% upper confidence limits (UCLs) were calculated.	Section 4.1.2	Sections 4.1.2 and 5.1	Text has been added to section 4.1.2 clarifying that the samples were homogenized but not sieved and that triplicate samples were not collected. Section 5.1 was revised to indicate 95% UCLs were calculated using ProUCL.
Part II—Other Comments				
1	Provide additional documentation, such as sampling and analytical results, to show target action levels are being met for stormwater discharge.	Sections 3.0 and 6.0	n/a	n/a

NMED NOD Comment No.	Summary of NOD Comment Requirement	Section(s) in Original Report	Section(s) in Revised Report	Nature of Revision
2	Explain why six other sample locations where Aroclor concentrations exceed PCB recreational screening levels were not addressed during removal activities.	Section 4.1.1	Section 5.1, Table 5.1-1, Plate 1, and Appendix D	Data for location LA-611178 was erroneously included in Table 5.1-1, Plate 1, and Appendix D of the supplemental IM report and was used in the 95% UCL calculations. The area of this sampling location was excavated during supplemental interim measure (IM) activities and a new confirmation sample (01-612632) was collected. Text in section 5.1, Table 5.1-1, Plate 1, and Appendix D have been revised to correct this error.
3	Fully address Comment 3 in the direction to modify the IM report, which required a description of the methods of sample collection.	Section 4.1.2	Appendix B	Appendix B was added to the supplemental IM to address Comment 3 of the direction to modify letter. This is consistent with the methods appendix submitted with other Compliance Order on Consent documents. No revision is warranted.
4	Clarify whether vertical extent of polychlorinated biphenyl (PCB) has been defined in each decision unit and removal may be warranted; verify that the lateral extent of PCB contamination has been addressed.	Section 4.1.2	Section 6.0	Text has been added to section 6.0 clarifying that additional sampling is being conducted to determine the volume of material that needs removal and the lateral and vertical extent of PCB contamination. Results of this sampling, as well as the methods, will be presented in the Phase II investigation report for Upper los Alamos Canyon Aggregate Area.
5	Submit in the revised report all expedited screening analysis results and provide a section for sampling methods, equipment used, analytical methods, discussion of results, and verification that the screening analyses did not overlook areas because of biased results.	Section 4.1.2	n/a	The screening level data are presented in their entirety in the IM report, dated May 2010. No revisions to the supplemental interim measure report are warranted.

NMED NOD Comment No.	Summary of NOD Comment Requirement	Section(s) in Original Report	Section(s) in Revised Report	Nature of Revision
6	Include data from the stormwater grab samples collected from the basins on July 26, 2010, and include the data and discuss the results in the revised report.	Section 4.3	Section 4.3	The data were not included in the report because they were not available at the time the report was due. The report has been revised to include the data and a brief discussion.
7	NMED recognizes that analytical sample dilution is one reason why Aroclor-1254 and Aroclor-1260 were the only Aroclors detected in the confirmation samples. NMED has reviewed stormwater analytical data from Solid Waste Management Unit (SWMU) 01-001(f), and the results show Aroclor-1254 and Aroclor-1260 are the dominant Aroclors present in the surface water samples. No response required.	Section 5.1	n/a	n/a
8	a. NMED did not identify any activities pertaining to the top of the drainage for SWMU 01-001(f). No response required. b. Address Comment 2 of the approval with modifications letter; provide documentation that run-on controls have been installed and include it in the Phase II investigation report.	Section 6.0	n/a	n/a
9	a. Complete risk assessments once the Phase II investigation has been completed and include all hazardous constituents of concern. No response required. b. Clarify if samples have been collected from the five sampling locations cited above in the report.	Section 6.0	n/a	n/a

NMED NOD Comment No.	Summary of NOD Comment Requirement	Section(s) in Original Report	Section(s) in Revised Report	Nature of Revision
10	Revise Table 5.1-1 to include the correct source of the recreational soil screening level, define QBT3, show when samples were collected (i.e., during the IM or supplemental IM), include duplicate MI sampling results, and also include confirmation and screening analysis samples.	Table 5.1-1	Tables 4.1-1 and 5.1-1	A note has been added to Table 5.1-1 to provide the correct source of recreational SSLs and to define QBT3 and SED in Tables 4.1-1 and 5.1-1. Shading has been added to Table 5.1-1 to indicate which samples were collected during supplemental IM activities. All confirmation sampling results are included in the supplemental IM report, either in Table 5.1-1 or in Appendix D (on DVD). All screening level data are presented in the original IM report.
11	Clarify that all heavy equipment used for excavation was decontaminated before demobilization from the SWMU 01-001(f) outfall and drainage area.	Section B-4.4	Section B-4.4	Appendix B text has been revised to clarify that excavation tools and equipment were either disposed of or screened for PCB and radionuclide contamination and decontaminated, as necessary, before they were released for other work.
12	Revise Plate 1 to include symbols representing LA-SMA-2 and LA-SMA-2.1, include missing data, and depict the entire excavation boundary within SWMU 01-001(f).	Plate 1	Plate 1	Plate 1 has been revised to include symbols for all stormwater sampling locations currently or formerly at the site. Because plates and figures do not include nondetect data, no data were added to the plate. The boundary of the excavation in the pond area and outfall and slope area has been added to the plate.
n/a	n/a	Throughout	Throughout	Minor editorial changes were made throughout the document for the sake of correctness and clarity.

*n/a = Not applicable.