**Response to the Approval with Modifications for the
2011 Interim Facility-Wide Groundwater Monitoring Plan, Revision 1,
Los Alamos National Laboratory, EPA ID No. NM0890010515, HWB-LANL-11-058,
Dated May 21, 2012**

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: MODIFICATIONS

The following modifications must be implemented as part of the Approved Revised Plan.

NMED Comment

1. Table 2.4-1, Interim Monitoring Plan for TA-21 Monitoring Group, pages 52-55:

Make the following changes to the proposed sampling locations, analytical suites and sampling frequencies:

1. *Add biennial (once every two years) sampling for metals, VOCs, and SVOCs at wells LADP-3, LAOI(a)-1.1, and R-6.*
2. *Add annual sampling for metals and biennial sampling for VOCs and SVOCs at wells LAOI-3.2 and LAOI-3.2(a).*
3. *Add biennial sampling for metals at well R-6i.*
4. *Add biennial sampling for metals and annual sampling for VOCs and SVOCs at well TA-53i.*
5. *Add quinquennial (once every five years) sampling for high explosives, PCBs, and dioxins/furans at all wells. The quinquennial sampling may be changed to sexennial (once every six years) for sampling locations that are sampled biennially or triennially for all other constituents.*
6. *For characterization sampling, reduce the sampling frequency for high explosives to annual and add annual sampling for PCBs and dioxins/furans.*
7. *Move wells LAOI-7, R-8 Screen 1 and Screen 2 (S1 and S2), R-9, and R-9i S1 and S2 from General Surveillance Monitoring to the TA-21 Monitoring Group. Add biennial sampling for VOCs and SVOCs at wells LAOI-7 and R-9, annual sampling for tritium at well R-9, and annual sampling for low-level tritium at well R-8 S1 and S2.*

LANL Response

1.1. The Laboratory agrees to sample wells LADP-3, LAOI(a)-1.1, and R-6 biennially for metals, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs).

1.2. The Laboratory agrees to sample wells LAOI-3.2 and LAOI-3.2(a) annually for metals and biennially for VOCs and SVOCs.

1.3. The Laboratory agrees to sample well R-6i biennially for metals.

1.4. The Laboratory agrees to sample well TA-53i annually for VOCs and SVOCs and biennially for metals.

1.5. The Laboratory has evaluated NMED's request to include high explosives (HE), polychlorinated biphenyls (PCBs), and dioxins/furans at the Technical Area 21 (TA-21) monitoring group wells and finds no basis for including these constituents. HE is not a contaminant at TA-21 or in the Los Alamos/Pueblo watershed, and PCBs and dioxins/furans are strongly adsorptive to soils and are highly unlikely to migrate to groundwater in the vicinity of the TA-21 monitoring group. All TA-21 monitoring group wells drilled since 1998 have been sampled numerous times for HE, PCBs, and dioxins/furans, and the record of nondetects for these constituents supports the conceptual model that these constituents are not likely to migrate to groundwater even if they may be present in surface media in the watershed.

1.6. The Laboratory agrees to sample annually for HE, PCBs, and dioxins/furans at new wells in the TA-21 monitoring group undergoing characterization sampling.

1.7. The Laboratory has reassigned wells LAOI-7, R-8 (S1 and S2), R-9, and R-9i (S1 and S2) from the General Surveillance monitoring group to the TA-21 monitoring group in the 2013 monitoring year plan. The Laboratory also agrees to sample wells LAOI-7 and R-9 biennially for VOCs and SVOCs. Well R-9 will be sampled annually for tritium, and R-8 (S1 and S2) will be sampled annually for low-level tritium.

NMED Comment

2. Table 3.4-1, Interim Monitoring Plan for Chromium Investigation Monitoring Group, pages 56-61:

Make the following changes to the proposed analytical suites and sampling frequencies:

1. *Add biennial sampling for VOCs and SVOCs at wells SCI-1, SCI-2, R-11, R-35a, R-35b, R-43 S1 and S2, R-1, R-13, R-15, R-28, R-42, R-44 S1 and S2, R-45 S1 and S2, and R-50 S1 and S2.*

2. *Increase the sampling frequency from annual to semiannual for metals and general inorganics at wells R-35a, R-35b, R-36, and R-13.*

3. *Add annual sampling for VOCs and SVOCs at well R-36.*

4. *Increase the sampling frequency from annual to semiannual for SVOCs at wells MCOI-4, MCOI-5, and MCOI-6.*

5. *Increase the sampling frequency from annual to semiannual for metals, general inorganics, and perchlorate at well MCOI-5.*

6. *Add quinquennial sampling for high explosives, PCBs, and dioxins/furans at all wells. The quinquennial sampling may be changed to sexennial for sampling locations that are sampled biennially or triennially for all other constituents.*

7. *For characterization sampling, reduce the sampling frequency for high explosives to annual and add annual sampling for PCBs and dioxins/furans.*

LANL Response

2.1. Mortandad Canyon intermediate wells MCOI-4, MCOI-5, and MCOI-6 will continue to be sampled semiannually for VOCs and SVOCs because these wells indicate organic contamination from sources in Mortandad Canyon; specifically 1,4-dioxane is present in perched-intermediate groundwater. VOCs and SVOCs will also be analyzed annually in samples from R-36 (see NMED Comment 3 below) and semiannually in characterization samples collected from R-61 (S1 and S2) and R-62.

With the exception of the Mortandad Canyon source of 1,4-dioxane, VOCs and SVOCs are not constituents known to have been released in Sandia Canyon. Historical data show very few sporadic detections of these constituents in regional wells in this monitoring group. However, the Laboratory agrees to sample for VOCs and SVOCs every 2 yr at the following wells within this monitoring group to ensure potential changes at the edge of the plume would be detected: R-1, R-35a, R-35b, R-42, R-44 (S1 and S2), and R-45 (S1 and S2).

2.2. The Laboratory agrees to sample for metals and general inorganics at wells R-35a, R-35b, R-36, and the sampling frequency has been increased from annually to semiannually at well R-13.

2.5. The Laboratory agrees to increase the sampling frequency from annually to semiannually for metals, general inorganics, and perchlorate at well MCOI-5.

2.6. The Laboratory has evaluated NMED's request to add sampling for HE, PCBs, and dioxins/furans in Chromium Investigation monitoring group wells and finds no basis for including these constituents. The effluent releases into Sandia Canyon, which were the source for the chromium and other contaminants that have migrated to regional groundwater, were not known to contain HE or dioxins/furans. PCBs and dioxins/furans are strongly adsorptive to soils and are not likely to migrate to the regional groundwater. However, because PCBs are present in the Sandia Canyon wetland, they will be monitored in perched-intermediate wells SCI-1 and SCI-2, located within a key infiltration pathway in Sandia Canyon. Monitoring will be conducted every 2 yr (rather than every 5 yr) for potential early detection for PCBs. All wells within the Chromium Investigation monitoring group drilled since 1998 have been sampled numerous times for HE, PCBs, and dioxins/furans, and the history of nondetects supports the conceptual model that these constituents do not need to be monitored in this group.

2.7. The Laboratory concurs. New wells within the Chromium Investigation monitoring group undergoing characterization sampling will be sampled annually for HE, PCBs, and dioxins furans.

NMED Comment

3. Table 4.4-1, Interim Monitoring Plan for MDA C Monitoring Group, pages 62-63:

Make the following changes to the proposed analytical suites and sampling frequencies:

1. *Add biennial sampling for metals at well R-14.*
2. *Add semiannual sampling for metals at well R-46.*
3. *Increase the sampling frequency from annual to semiannual for general inorganics at well R-46.*
4. *Add biennial sampling for perchlorate at all wells.*
5. *Add quinquennial sampling for high explosives, PCBs, and dioxins/furans at all wells. The quinquennial sampling may be changed to sexennial for sampling locations that are sampled biennially or triennially for all other constituents.*

LANL Response

3.1. The Laboratory agrees to sample well R-14 biennially for metals.

3.2. The Laboratory agrees to sample well R-46 semiannually for metals.

3.3. The Laboratory agrees to increase the sampling frequency from annually to semiannually for general inorganics at well R-46.

3.4. The Laboratory agrees to sample all Material Disposal Area (MDA) C monitoring group wells biennially for perchlorate.

3.5. The Laboratory concurs with NMED's request to sample for HE every 5 yr in MDA C monitoring wells because some evidence indicates TNT (trinitrotoluene[2,4,6-]) may have been disposed of at MDA C. However, PCBs and dioxins/furans have not been added to the MDA C monitoring because these constituents are strongly adsorptive to soils and are not likely to migrate to regional groundwater. Furthermore, all wells within the MDA C monitoring group drilled since 1998 and wells elsewhere around the Laboratory have been sampled numerous times for PCBs and dioxins/furans, and the results do not show any evidence of migration to deep groundwater.

NMED Comment

4. Table 5.4-1, Interim Monitoring Plan for TA-54 Monitoring Group, pages 64-70:

Make the following changes to the proposed analytical suites and sampling frequencies:

1. *Add biennial sampling for perchlorate at all wells, with the exception of well R-40 S1.*
2. *Increase the sampling frequency from semiannual to quarterly for VOCs and low-level tritium at wells R-37 S1 and S2, R-56 S1, R-39, R-41, and R-57 S1.*
3. *For characterization sampling, reduce the sampling frequency for high explosives to annual and add annual sampling for PCBs and dioxins/furans.*

4. *Add quinquennial sampling for high explosives, PCBs, and dioxins/furans at all wells, with the exception of well R-40 S1. The quinquennial sampling may be changed to sexennial for sampling locations that are sampled biennially or triennially for all other constituents.*

LANL Response

4.1. The Laboratory agrees to add biennial sampling for perchlorate at all TA-54 monitoring group wells, with the exception of R-40 S1 and R-55i. Perchlorate will be sampled semiannually in R-55i and will not be sampled in R-40 S1 because of issues with well yield.

4.2. The Laboratory has evaluated NMED's request to increase the sampling frequency for VOCs and low-level tritium at wells R-37 S1 and S2, R-56 S1, R-39, R-41, and R-57 S1 and finds no technical basis for increasing the frequency of monitoring for these constituents at this time. A long record of monitoring for these constituents in vadose zone and groundwater indicates stability in the vapor plume. Detections of organic compounds in groundwater have been very limited and consistently below standards. Additionally, the Laboratory has proposed soil-vapor extraction of the vapor-phase contamination at MDAs L and G, which will further protect the regional groundwater from potential impacts.

4.3. The Laboratory agrees to reduce the sampling frequency for HE to annually and to include PCBs and dioxins/furans in the characterization sampling for wells in the TA-54 monitoring group.

4.4. The Laboratory agrees to sample for HE and PCBs in all TA-54 monitoring group wells every 5 yr but has evaluated the request to conduct sampling for dioxins/furans at TA-54 monitoring group wells and finds no basis for adding dioxins/furans to the suite because of its environmental behavior and the lack of a significant dioxin/furan source term at TA-54.

The Laboratory agrees to sample for HE in all TA-54 monitoring group wells every 5 yr because HE (including RDX [hexahydro-1,3,5,trinitro-1,3,5-triazine]) is present in the inventory at MDA H.

PCBs are also present in the TA-54 waste inventory and were disposed of in Areas G and L. For this reason, the Laboratory agrees to sample for PCBs every 5 yr in TA-54 monitoring wells. However, both PCBs and dioxins/furans are highly sorptive to soils and are not likely to migrate to perched-intermediate or regional groundwater.

NMED Comment

5. Table 6.4-1, Interim Monitoring Plan for TA-16 260 Monitoring Group, pages 71-75:

Make the following changes to the proposed sampling locations, analytical suites and sampling frequencies:

1. *Add biennial sampling for perchlorate and SVOCs at all wells and springs that are not already sampled for this constituent, with the exception of well R-25 (all screens).*

2. *For characterization sampling, add annual sampling for PCBs and dioxins/furans. All other constituents, with the exception of radionuclides, must be sampled quarterly. Radionuclides may be sampled annually.*

3. *Conduct quarterly characterization sampling at well CdV-16-4ip S1 until S2 is abandoned and a permanent sampling system is installed at S1. After the permanent sampling system is installed*

at S1, conduct one additional quarterly characterization sampling at S1 and compare the analytical results with previous data to determine the appropriate sampling frequency for future monitoring of S1.

4. *Add biennial sampling for low-level tritium at wells CdV-37-1(i), R-18, R-47i, and R-48.*

5. *Increase the sampling frequency from annual to semiannual for metals, VOCs, high explosives, and general inorganics for well R-25b.*

6. *Move Bulldog Spring from General Surveillance Monitoring to the TA-16 260 Monitoring Group and sample the spring in the same manner as the other springs in the Group.*

7. *Add quinquennial sampling for PCBs and dioxins/furans at all wells and springs. The quinquennial sampling may be changed to sexennial for sampling locations that are sampled biennially or triennially for all other constituents.*

LANL Response

5.1. The Laboratory agrees to add biennial sampling for perchlorate and SVOCs at all TA-16 260 monitoring group wells and springs not already sampled for perchlorate and SVOCs (with the exception of all screens at R-25).

5.2. The Laboratory agrees to add annual sampling for PCBs and dioxins/furans to the characterization sampling suite for new wells in the TA-16 260 monitoring group.

5.3. The Laboratory concurs with this modification. CdV-16-4ip will be sampled quarterly for the characterization suite for the TA-16 260 monitoring group using a portable Bennett pump. Following reconfiguration and installation of the permanent sampling pump in CdV-16-4ip, the well will be sampled for one additional quarter, the analytical data will be evaluated, and if it is not significantly different with the permanent sampling system, sampling will revert to the semiannual default sampling frequency for the TA-16 260 monitoring group.

5.4. The Laboratory concurs with this modification. Wells CdV-37-1(i), R-18, R-47i, and R-48 will be sampled biennially for low-level tritium.

5.5. The Laboratory concurs with this modification. The sampling frequency for metals, VOCs, HE, and general inorganics will be increased from annually to semiannually for well R-25b.

5.6. The Laboratory concurs with this modification. Bulldog Spring has been moved administratively from the General Surveillance monitoring group to the TA-16 260 monitoring group and will be sampled at the same frequency as the other springs of the group.

5.7. The Laboratory concurs with NMED's request to sample for PCBs and dioxins/furans every 5 yr (quinquennially) at shallow monitoring locations within the TA-16 260 monitoring group, including base-flow locations, alluvial monitoring wells, and springs. However, because PCBs and dioxins/furans are strongly sorptive to soils and are unlikely to migrate through the extensive vadose zone to deep perched-intermediate and regional groundwater, sampling for PCBs and dioxins/furans at these deeper locations is not necessary to protect human health and the environment. Historical data also show relatively few detections of PCBs and dioxins/furans in deep perched-intermediate and regional groundwater locations within the TA-16 260 monitoring group.

NMED Comment

6. Table 7.4-1, Interim Monitoring Plan for MDA AB Monitoring Group, pages 76-77:

Make the following changes to the proposed analytical suites and sampling frequencies:

1. *Add biennial sampling for perchlorate at all wells.*
2. *Add quinquennial sampling for PCBs and dioxins/furans at all wells. The quinquennial sampling may be changed to sexennial for sampling locations that are sampled biennially or triennially for all other constituents.*

LANL Response

6.1. The Laboratory concurs with this modification. All MDA AB monitoring group wells will be sampled biennially for perchlorate.

6.2. The Laboratory has evaluated NMED's request to add sampling for PCBs and dioxins/furans at all wells in the MDA AB monitoring group and finds no basis for adding these constituents.

PCBs and dioxins/furans are not contaminants of concern at MDA AB. Additionally, PCBs and dioxins/furans are strongly adsorptive to soils and are highly unlikely to migrate to regional groundwater. In addition, the preponderance of nondetects for PCBs and dioxins/furans in MDA AB monitoring locations and elsewhere across the Laboratory provides additional justification not to sample further for these constituents.

NMED Comment

7. Table 8.3-1, Interim Monitoring Plan for General Surveillance Monitoring, pages 78-88:

Make the following changes to the proposed analytical suites and sampling frequencies:

1. *Add biennial sampling for VOCs and SVOCs at all wells that are not already sampled for these constituents, with the exception of wells R-19 (all screens) and R-31 S4 and S5.*
2. *Reduce the sampling frequency for VOCs and SVOCs to biennial at well R-3i.*
3. *Add biennial sampling for low-level tritium at wells R-3, R-4, R-24, R-10a, R-10 S1, R-33 S1, R-34, PCI-2, and R-17 S1.*
4. *Reduce the sampling frequency for tritium to biennial at well 03-B-13.*
5. *Reduce the sampling frequency for perchlorate to biennial at wells R-12 S1 and S2, CDBO-6, 18-MW-18, PCAO-8, 03-B-13, R-19 (all screens), PCI-2, WCO-1r, and R-31 S4 and S5.*
6. *Reduce the sampling frequency for metals and general inorganics to biennial at wells R-12 S2, CDBO-6, R-19 (all screens), and WCO-1r.*
7. *Reduce the sampling frequency for high explosives to biennial at well R-19 S2 and to quinquennial at wells 18-MW-18, PCAO-8, 03-B-13, R-19 S3 and S4, WCO-1r, and R-31 S4 and S5. Add quinquennial sampling for high explosives at all wells that are not otherwise scheduled to be sampled for this constituent. The quinquennial sampling may be changed to*

sexennial for sampling locations that are sampled biennially or triennially for all other constituents.

8. *Add quinquennial sampling for PCBs and dioxins/furans at all wells and springs. The quinquennial sampling may be changed to sexennial for sampling locations that are sampled biennially or triennially for all other constituents.*

9. *The Permittees may, at their own discretion, reduce the sampling frequency for radionuclides to biennial at wells POI-4, R-3i, TW-2Ar, R-2, R-3, R-4, R-24, R-12 S1 and S2, CDBO-6, 18-MW-18, PCAO-8, PCI-2, R-17 S1 and S2, WCO-1r, R-19 (all screens), and R-31 S4 and S5.*

LANL Response

7.1. The Laboratory concurs with this modification. All General Surveillance monitoring group wells not already sampled for VOCs and SVOCs will be sampled biennially for these constituents starting in fiscal year (FY) 2013, with the exception of wells R-19 (all screens) and R-31 (S4 and S5).

7.2. The Laboratory concurs with this modification. VOCs and SVOCs will be sampled biennially at well R-3i.

7.3. The Laboratory concurs with this modification. Low-level tritium will be sampled biennially at wells R-3, R-4, R-24, R-33 S1, PCI-2, and R-17 S1. Low level tritium is sampled annually at R-10a, R-10 (S1 and S2), and R-34 under the memorandum of understanding (MOU) with San Ildefonso Pueblo.

7.4. The Laboratory concurs with this modification. The sampling frequency for tritium at well 03-B-13 has been reduced to biennial.

7.5. The Laboratory concurs with this modification. Perchlorate will be sampled biennially for wells R-12 (S1 and S2), CDBO-6, 18-MW-18, PCAO-8, 03-B-13, R-19 (all screens), PCI-2, WCO-1r, and R-31 (S4 and S5).

7.6. The Laboratory concurs with this modification. The sampling frequency for metals and general inorganics has been reduced to biennial at wells R-12 S2, CDBO-6, R-19 (all screens), and WCO-1r.

7.7. The Laboratory concurs with the request to reduce the sampling frequency for HE to biennially at well R-19 S2 and to quinquennially at wells 18-MW-18, PCAO-8, 03-B-13, R-19 (S3 and S4), WCO-1r, and R-31 (S4 and S5). The Laboratory has evaluated NMED's request to add sampling for HE at all General Surveillance sampling locations not already scheduled to be sampled for HE and finds no basis for adding the monitoring. Locations with potential for HE contamination are well constrained at the Laboratory, and wells in those locations already include HE in the sampling suite. Additionally, the historical HE groundwater data across the Laboratory show a preponderance of nondetects for HE at these locations.

7.8. The Laboratory concurs with the request to sample for PCBs and dioxins/furans every 5 yr (quinquennially) at shallow monitoring locations within the General Surveillance monitoring group, including base-flow locations, alluvial monitoring wells, and springs. However, because PCBs and dioxins/furans are strongly sorptive to soils and are not likely to migrate to perched-intermediate and regional groundwater, sampling for PCBs and dioxins/furans at these deeper locations is not necessary. Historical data also show few and sporadic detections of PCBs and dioxins/furans in

perched-intermediate and regional groundwater locations within the General Surveillance monitoring group.

7.9. The sampling frequency for radionuclides in the Interim Plan represents the Laboratory's approach for meeting DOE's monitoring objectives.

NMED Comment

8. Table 8.3-2, Interim Monitoring Plan for White Rock Canyon and Rio Grande Watershed, pages 89-94:

Make the following changes to the proposed analytical suites and sampling frequencies:

1. *Discontinue sampling for pesticides at all locations that are not subject to the MOU with the San Ildefonso Pueblo.*

2. *Reduce the sampling frequency for metals, VOCs, general inorganics, perchlorate, and suspended sediment to biennial at all base-flow locations that are not subject to the MOU with the San Ildefonso Pueblo.*

3. *Discontinue sampling for suspended sediment and reduce sampling frequency for SVOCs and high explosives to biennial at all springs that are not subject to the MOU with the San Ildefonso Pueblo*

4. *The Permittees may, at their own discretion, reduce the sampling frequency for radionuclides to biennial at all base-flow locations that are not subject to the MOU with the San Ildefonso Pueblo.*

5. *The Permittees may, at their own discretion, reduce the sampling frequency for radionuclides to triennial (once every three years) at all springs that are not subject to the MOU with the San Ildefonso Pueblo.*

LANL Response

8.1. The Laboratory concurs with this modification. Pesticides are not primary contaminants of concern at the Laboratory, and analysis for pesticides has been discontinued at all locations, except those stipulated in the MOU, including the White Rock Canyon and Rio Grande watershed locations.

8.2. The Laboratory concurs with this modification. The sampling frequency for metals, VOCs, general inorganics, perchlorate, and suspended sediment has been reduced to biennially at all base-flow locations not subject to the MOU.

8.3. The Laboratory concurs with this modification. Suspended sediments are no longer sampled in spring samples The sampling frequency for SVOCs and HE has been reduced to biennially at all springs not subject to the MOU. However, SVOCs are sampled annually at Springs 3 and 4 to meet a 1996 U.S. Environmental Protection Agency (EPA) authorization/agreement regarding disposal of PCBs at TA-54, Area G.

8.4. The sampling frequency for radionuclides in the plan represents the Laboratory's approach for meeting DOE's monitoring objectives.

8.5. The sampling frequency for radionuclides in the plan represents the Laboratory's approach for meeting DOE's monitoring objectives.

NMED Comment

9. Appendix B, B-2.0 Protocol for Selecting Screening Levels for Groundwater Data, second paragraph, page B-3:

The protocol for selecting screening levels for groundwater data must match the procedure described in Section 11.4.1, Groundwater Cleanup Levels, of the LANL Hazardous Waste Permit (Permit) and the Consent Order. If no EPA MCL or WQCC water quality standard exists for an analyte, use the most recent version of NMED Tap Water Screening Levels. In the absence of an NMED tap water screening level, use EPA Regional Screening Levels for tap water multiplied by a factor of ten.

LANL Response

9. In accordance with the Compliance Order on Consent (the Consent Order), the Laboratory has been using EPA's tap water screening levels in its screening process for constituents that have neither a New Mexico groundwater standard or an EPA maximum contaminant level. To remain consistent with the Laboratory's historical approach to screening under the Consent Order, the Laboratory proposes to continue this practice.

NMED Comment

10. Appendix C, C-4.0 Analytical Methods – Groundwater Analytical Suites, pages C-9 and C-10:

Section IX.C of the Consent Order and Section 11.10.2 of the Permit state that the detection limits for each analytic method for chemical analyses of environmental samples must be less than applicable background, screening and regulatory cleanup levels. Furthermore, the same sections state that analytical methods used by the Permittees must be approved by NMED.

The following VOC and SVOC contaminants have been routinely analyzed by the Permittees using analytical methods with detection limits that were consistently equal to or exceeding the corresponding regulatory cleanup levels at all groundwater (and/or, in some instances, base-flow) sampling locations (Group A Contaminants): azobenzene, benzidine, benzo(a)pyrine (only base-flow sampling), bis(2-chloroethyl)ether, dibenz(a,h)anthracene, 3,3'-dichlorobenzidine, 4,6-dinitro-2-methylphenol, hexachlorobenzene (both groundwater and base-flow sampling), n-nitrosodiethylamine, n-nitrosodimethylamine, n-nitroso-di-n-butylamine, n-nitroso-di-n-propylamine, n-nitrosopyrrolidine, pentachlorophenol, acrolein, acrylonitrile, 2-chloro-1,3-butadiene, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane, methacrylonitrile, and 1,2,3-trichloropropane.

In addition, the following SVOC contaminants have been routinely analyzed by the Permittees using analytical methods with detection limits that were frequently equal to or exceeding the corresponding regulatory cleanup levels at multiple groundwater sampling locations (Group B Contaminants): atrazine, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, and 2,2'-oxybis(1-chloropropane).

In order for NMED to approve the continuing use of the current analytical methods for the aforementioned groundwater contaminants, the Permittees must first demonstrate that these contaminants do not occur at concentrations that would constitute a potential threat to human

health and the environment. By the end of the calendar year 2013, the Permittees must analyze all Group A Contaminants at all relevant sampling locations at least once by analytical methods with detection limits that are lower than the corresponding regulatory cleanup levels. Correspondingly, by the end of the calendar year 2013, the Permittees must analyze, in a similar manner, those Group B Contaminants at those sampling locations that have not been analyzed with proper detection limits at least once since January 1, 2010.

Preference in the selection of analytical methods must be given to the EPA-approved methods; however, if an EPA-approved method that can achieve the required detection limit for a particular contaminant is not available, the Permittees may choose any industry-accepted analytical method that attains the required detection limit or, if such method is not offered by any North American analytical laboratory, the method that provides the lowest achievable detection limit. If, for a particular Group A or Group B contaminant and a particular sampling location, the Permittees select an analytical method that has practical quantitation limit (PQL) no greater than the corresponding regulatory cleanup level (or, if such method is not available, a method with the lowest achievable PQL), and none of the detectable analytical results, including J-flagged results, exceeds one-half of the regulatory cleanup level, then the Permittees must use this, or equivalent, analytical method at least quinquennially (sexennially for sampling locations that are sampled biennially or triennially for all other constituents). If, for a particular Group A or Group B contaminant and a particular sampling location, the Permittees select an analytical method that has PQL greater than the corresponding regulatory cleanup level (unless this is the method with the lowest achievable PQL), and none of the detectable analytical results, including J-flagged results, exceeds one-half of the regulatory cleanup level but one or more of U-flagged results exceeds one-half of the regulatory cleanup level, then the Permittees must use this, or equivalent, analytical method at least triennially (quadrennially [once every four years] for sampling locations that are sampled biennially for all other constituents); however, if none of the U-flagged results exceeds one-half of the regulatory cleanup level, then the Permittees may use this, or equivalent, analytical method at least quinquennially (sexennially for sampling locations that are sampled biennially or triennially for all other constituents). If, for a particular Group A or Group B contaminant and a particular sampling location, any detectable analytical result, including any J-flagged result, exceeds one-half of the regulatory cleanup level, then the Permittees must propose to NMED a sampling protocol for this contaminant at the particular sampling location that is protective of human health and the environment.

LANL Response

10. The Laboratory has evaluated NMED's request to use alternative analytical methods to obtain lower practical quantitation limits (PQLs) and does not find a basis for applying resources to lower the PQLs for the group of constituents presented in NMED's comment. The Laboratory's position is discussed below.

    Of the 26 analytes listed by NMED, 6 constituents have method detection limits (MDLs) that are less than the regulatory cleanup level, thereby meeting the requirements of the Consent Order. The remaining 20 constituents have MDLs greater than the corresponding regulatory cleanup levels. However, the Laboratory believes that MDLs and PQLs obtained for these constituents are sufficient to ensure groundwater monitoring is protective.

    The Consent Order establishes corrective action requirements for historical releases of hazardous constituents from solid waste management units (SWMUs) and areas of concern (AOCs) at the Laboratory. The Group A and Group B constituents at issue are typically not related to any releases from SWMUs or AOCs. The Laboratory proposes that obtaining lower MDLs or PQLs for these

constituents is not necessary to characterize the nature and extent of contamination and would only divert resources from the corrective actions process.

The January 5, 2012, Framework Agreement between DOE and NMED acknowledges that collecting and reporting characterization and monitoring data should be limited to what is "necessary and sufficient" and that DOE and NMED should follow pertinent EPA guidance, except where such guidance is not supported by sound science. EPA's "results-based" corrective action guidance, which was developed to comply with the 1993 Government Performance and Results Act, directs EPA and the regulated community to focus on collecting data that strike a balance between having sufficient information to proceed with remedy selection and gathering additional site-characterization information.

The detection frequency of an analyte is a useful indicator of the presence of a contaminant. The Laboratory has evaluated the detection frequency for analytes identified by NMED with PQLs exceeding screening levels, and the results have been presented to NMED previously in the Laboratory's response to NMED's approval with modifications to the 2010 Interim Plan (NMED 2010, 109327; LANL 2011, 205230). For most of the organic compounds where MDLs or PQLs are greater than the screening levels, the compound has seldom or never been detected in thousands of samples (LANL 2011, 205230). Based on the extremely low frequency of detects for most of these organic compounds, these contaminants are not considered to be Laboratory constituents of concern for groundwater. Additionally, if these constituents were associated with releases from SWMUs and AOCs at the Laboratory, they would not likely be present in groundwater without collocated organic compounds for which MDLs and PQLs are lower than screening levels. Therefore, other mobile organic compounds with MDLs lower than screening levels may be used as conservative measures of groundwater contamination in a given area. Detections of organic compounds in groundwater are very limited at the Laboratory and are consistent with site knowledge of limited release or disposal of such compounds.

NMED Comment

11. Table F-1.0-1, page F-5:

1. *Add well R-64 to the watch list. The well produces significant amounts of fine-grained suspended solids with a chemical signature typical of annular-fill bentonite.*

2. *Add wells R-55i and R-53 S1 to the watch list. Field data and trace-metal analytical results suggest that water samples from these wells are likely not representative of aquifer conditions.*

3. *Add well R-29 to the watch list. Turbidity and water chemistry data indicate possible impacts from drilling fluids. The well must be purged ten (10) casing volumes before sampling or until dissolved oxygen concentrations (DO) are within 10% of average DO at nearby well R-30, whichever comes first.*

LANL Response

11.1. The Laboratory agrees to add well R-64 to the watch list presented in Appendix E of the FY2013 Interim Plan.

11.2. The Laboratory agrees to add well R-55i to the watch list presented in Table E-1.0-1 of Appendix E in the Interim Plan.

The Laboratory has evaluated NMED's request to add well R-53 S1 to the watch list and does not find a basis for including the well. A review of water-quality data collected from R-53 S1, including an analysis of field parameter data, general inorganic data, and trace metal data, indicates the water-quality data from screen 1 are currently representative. Nonrepresentative water-quality parameters from earlier samples were limited to a small number of trace metals.

11.3. The Laboratory has evaluated NMED's request to add well R-29 to the watch list and does not find a basis for including the well in the watch list. Concentrations of iron and manganese have decreased significantly in recent samples collected from R-29, and the recent iron and manganese data collected from R-29 are representative do not merit adding this well to the watch list.

PART II: COMMENTS

Resolve the following comments and concerns in future Plans, beginning in May 2012.

NMED Comment

1. Due to reduction in groundwater monitoring by the Permittees caused, in part, by budgetary constraints, NMED may decide to collect and analyze a number of groundwater samples at its own cost. To facilitate sample collection by NMED, the Permittees must provide notification to NMED of upcoming groundwater sampling events at least 15 calendar days before commencing each event in accordance with Permit Section 11.3.6 and Consent Order Section IX.

LANL Response

1. The Laboratory will continue to notify NMED at least 15 calendar days before each sampling campaign, in accordance with the requirements of Section 11.3.6 of the Resource Conservation and Recovery Act Permit and Section IX of the Consent Order. In addition, the Laboratory will continue to notify NMED as early as possible before nonroutine sampling activities are conducted, although the 15-d advance notification requirements may not always be feasible given scheduling constraints.

NMED Comment

2. In future Plans, the Permittees must follow the expanded document format established in the Original Plan.

LANL Response

2. The Interim Plan will continue to include the key elements required by Section IV.A.3.b of the Consent Order. All interim plans will state the proposed locations and frequency of groundwater sampling, the proposed parameters for analysis, and the proposed methods for sampling and analysis, as established in the original plan.

NMED Comment

3. *In future Plans, the Permittees must include maps of groundwater contaminants, similar to Plates 5 to 7 in 2011 General Facility Information (EP2011-0070). The maps must be created separately for alluvial, intermediate and regional aquifers, and must show the following information:*

    1. *boundaries of area-specific monitoring groups;*

    2. *all monitoring wells in the corresponding aquifer, with well names;*

    3. *wells on the watch list, which must be identified by different color scheme, highlight, or font;*

    4. *contaminant information text boxes for wells where contaminant detection(s) occurred during any of the two most recent sampling events for that well and contaminant (regardless of sampling frequency). Contaminant detection means a validated concentration (including J-flagged results) greater than one-half of applicable groundwater cleanup level. A contaminant information box must include the following items: well name, depth, contaminant name (can be abbreviated), dates (month and year) and contaminant concentrations for the two most recent sampling events for the contaminant (including J-flag where applicable), concentration units, and proposed frequency of sampling for the contaminant. Contaminant concentrations greater than the corresponding groundwater cleanup levels must be emphasized by using bold or different color font (for example, RDX 3/11 9/11 5.9* ***10.7*** *µg/L S). If the amount of information would make a map difficult to read, the Permittees must create separate maps for different classes of contaminants.*

LANL Response

3. The inclusion of contaminant distribution maps, such as those described above, is not a requirement of the Consent Order. Periodic monitoring reports already include consistently updated contaminant distribution maps highlighting monitoring wells where contaminant concentrations are above applicable screening levels. The Laboratory will continue to reference the most recent applicable periodic monitoring report that will include the most current contaminant distribution map for a particular monitoring group.

NMED Comment

4. Section 2.2, Background, Contaminant Sources and Distributions, last paragraph, page 11:

Well R-6i is not located near the confluence of DP and Los Alamos Canyons. It is located in DP Canyon, approximately half-way between the confluence and TA-21. Correct this inaccuracy.

LANL Response

4. The text in section 2.2 of the Interim Plan has been revised to correct the inaccuracy and now states that R-6i is located near the north boundary of TA-21 and DP Canyon.

NMED Comment

5. Section 6.2, Background, Contaminant Sources and Distributions, first paragraph, page 11:

The Permittees incorrectly identified one of VOC contaminants as tetrachloroethane. The correct contaminant name is tetrachloroethene (PCE). In addition, the Permittees failed to mention that low-level concentrations of RDX have been detected in the regional aquifer well R-63. Correct the error and provide information on RDX detections in R-63.

LANL Response

5. The text has been corrected to identify the VOC contaminant as tetrachloroethene. The following statement on RDX detections in the regional aquifer has been added to the Interim Plan: "Low level concentrations of RDX have also been detected in the regional aquifer in wells R-18 and R-63."

NMED Comment

6. Tables 1.6-2 and 1.6-3, pages 44 – 47:

If sampling at a specific location for a specific analytical suite is performed at two or more different frequencies, all sampling frequencies must be listed in the tables.

LANL Response

6. Tables 1.6-2 and 1.6.-3 have been updated and now list all sampling frequencies.

NMED Comment

7. Table 1.8-1, page 48:

Expand the table (or create a separate table) to provide the next anticipated sampling time (year and quarter) for biennial, triennial, and lower-frequency sampling that is not included in the sampling schedule for the upcoming monitoring year.

LANL Response

7. Table 1.8-1 has been expanded to provide additional information on the year each analyte will be collected.

NMED Comment

8. Appendix B, B-1.0 Overview, second bullet list, page B-2:

The description of column headings for Tables B1-1 and B1-2 contains inaccuracies. For example, contrary to the information in the bullet list, Tables B1-1 and B1-2 do not include 'Number of Nondetects' column, and include 'Avg' column instead of 'Mean'. Correct all inaccuracies.

LANL Response

8. Because this Interim Plan was developed based primarily on the 2011 Interim Monitoring Plan, Revision 1 (LANL 2011, 208811) and on direction received from NMED for the 2011 Interim Plan,

Revision 1 (NMED 2012, 520410), the data screening process used to develop previous Interim Plans was not used. The analytical data screening tables, Tables B1-1 through B1-4, are not included in this year's Interim Plan.

NMED Comment

9. Appendix D, Table D-1, page D-3:

The Background column for Chromium Monitoring Group contains inconsistent information. First, the Permittees state that "Cr concentrations in regional aquifer exceed New Mexico Groundwater Standard", and then, in the same table cell, they state that "[n]o constituent concentrations exceed standards or SLs in regional aquifer." Correct the discrepancy.

LANL Response

9. The discrepancy in Table D-1 has been corrected. The statement, "No constituent concentrations exceed standards of SLs in regional groundwater," has been removed.

NMED Comment

10. Appendix F, F-2.0 Deep Wells with Limited Purge Volumes, page F-1:

The Permittees omitted, from their discussion, wells with non-purgeable Westbay systems. Include Westbay wells in future listings and discussions of wells with limited purge volumes.

LANL Response

10. A discussion of wells with limited purge volumes is presented in section E-2.0, Deep Wells with Limited Purge Volumes, of the Interim Plan. A list of wells with nonpurgeable Westbay systems has been added to Table E-1.0-1, Preliminary Watch List of Deep Monitoring Wells.

NMED Comment

11. Plate 1, Monitoring Group Overview:

Boundaries of some area-specific monitoring groups are incorrect. Ensure that the Plate properly represents the area-specific monitoring groups.

LANL Response

11. The boundaries of area-specific monitoring groups have been updated on the plate and in the monitoring group maps, as necessary, to ensure the maps accurately reflect the proper boundaries of the monitoring groups.

REFERENCES

LANL (Los Alamos National Laboratory), August 2011. "Response to the Approval with Modification for the 2010 Interim Facility-Wide Groundwater Monitoring Plan," Los Alamos National Laboratory document LA-UR-11-4671, Los Alamos, New Mexico. (LANL 2011, 205230)

LANL (Los Alamos National Laboratory), December 2011. "2011 Interim Facility-Wide Groundwater Monitoring Plan, Revision 1," Los Alamos National Laboratory document LA-UR-11-6958, Los Alamos, New Mexico. (LANL 2011, 208811)

NMED (New Mexico Environment Department), May 4, 2010. "Approval with Direction, 2009 Interim Facility-Wide Groundwater Monitoring Plan," New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M.J. Graham (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2010, 109327)

NMED (New Mexico Environment Department), May 21, 2012. "Approval with Modifications, 2011 Interim Facility-Wide Groundwater Monitoring Plan, Revision 1," New Mexico Environment Department letter to P. Maggiore (DOE-LASO) and M.J. Graham (LANL) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2012, 520410)