NEW MEXICO
ENVIRONMENT DEPARTMENT

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.env.nm.gov

SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lt. Governor

BUTCH TONGATE
Cabinet Secretary-Designate
J. C. BORREGO
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

January 24, 2017

Doug Hintze, Manager
U.S. Department of Energy
EM-Los Alamos Field Office, DOE
3747 West Jemez Rd, MS A316
Los Alamos, NM 87544

Michael Brandt, Associate Director
Environment, Safety, Health
Los Alamos National Laboratory
P.O. Box 1663, MS K491
Los Alamos, NM 87545

U1700198

RE: APPROVAL WITH MODIFACTIONS
SUPPLEMENTAL INVESTIGATION REPORT FOR UPPER SANDIA CANYON AGGREGATE AREA, REVISION 1
EPA ID #NM0890010515
HWB-LANL-13-042

Dear Messrs. Hintze and Brandt:

The New Mexico Environment Department (NMED) has received the United States Department of Energy (DOE) and the Los Alamos National Security L.L.C.'s (LANS) (collectively, the Permittees) *Response to the Disapproval for the Supplemental Investigation Report for Upper Sandia Canyon Aggregate Area and Revision 1 of the Report*, dated September, 2015 (SIR), received on September 11, 2015 and referenced by LAUR-15-26596 & 15-26598/EP2015-0146. NMED has reviewed the Response to the Disapproval (Response) and the revised SIR and issues this Approval with Modifications. The comment numbers correspond to the April 14, 2015, Disapproval comments.

General Comment # 1: The Permittees provide additional discussion and lines of evidence supporting the assertion that polycyclic aromatic hydrocarbons (PAH) exceedances found at some solid waste management units (SWMUs) and areas of concern (AOCs) [SWMUs 03-014(k,l,m,n), 03-045(a), 03-015, 03-052(f) and AOCs 03-047(g), 03-051(c), 03-053, 61-002] are not associated with site activities.

- **SWMUs 03-045(a), 03-015, and AOC 03-053:** The first paragraph of the Response to General Comment 1 indicates that the Report does not dismiss PAHs at these sites as being not site related and further provides a discussion of uncertainties associated with the risk estimates (in excess of the NMED target risk level of $1x10^{-5}$) at SWMUs 03-045(a), 03-015 and AOC 03-053 that focuses on the "overestimation" of risk because the maximum detected concentration was used as the exposure point concentration (EPC). Section 9.2.1 of the report (first paragraph page 246) states that PAHs are not related to site operations but result from runoff. The text was not clear that this statement only pertains to SWMU 0-052(f) and not all the sites addressed in that paragraph. For SWMUs 03-045(a), 03-015 and AOC 03-053, it is confirmed that PAHs were retained as COPCs.

  Risks at these sites were exceeded for the residential scenario as well as for the industrial worker. However, it is asserted that risks to the industrial worker are acceptable if the upper confidence level (UCL) is used as the EPC. Reviewing the data on Table I-2.3-37 (SWMU 03-045(a)), there are only three to four sample results for PAHs with detections ranging from one to two. This does not represent sufficient data to determine a UCL. ProUCL User's Guide 5.1 allows that statistics (e.g., UCL95) based upon only a few detected values (e.g., < 4) cannot be considered reliable enough to estimate EPCs which can have a potential impact on human health and the environment. When the number of detected values is small, it is preferable to use ad hoc methods rather than using statistical methods to compute EPCs and other upper limits. Specifically, for data sets consisting of < 4 detects and for small data sets (e.g., size < 10) with low detection frequency (e.g., < 10%), the project team and the decision makers should decide, on a site-specific basis, how to estimate the average exposure (EPC) for the constituent and area under consideration. For data sets with low detection frequencies, other measures such as the median or mode represent better estimates (with lesser uncertainty) of the population measure of central tendency. Further, the Report does not provide any documentation (tables, input/output) as to how the UCL was determined. Based on the information provided, the determination and use of a UCL95 as the EPC has not been justified for SWMU 03-045(a).

  For SWMU 03-015 and AOC 03-053 (Table I-2.3-38), six sample results are available with detections ranging from three to five. For these sites, calculation of a UCL may be acceptable; however, the Report does not provide documentation (input/output file) on how the UCL was derived. Further, and as noted above, due to the high number of non-detects, use of the median or mode may be a better estimate of the EPC.

- **AOCs 03-047(g) and 03-051(c):** The second paragraph of the Permittees Response to General Comment 1 indicates that the "unacceptable risk" at AOCs 03-047(g) and 03-051(c) under the residential scenario is based on the use of the maximum detected concentrations of PAHs. NMED does not support the use of the maximum detected concentration as the EPC as the primary line of evidence for eliminating the exceedance from further consideration in the risk assessment. Additional PAH data must be collected and a statistically derived EPC used to refine risk estimates. Risks using the maximum

detected concentration for the industrial/construction worker were within acceptable risk levels (it is noted PAHs were not a COPC for the industrial scenario at 03-051(c)). In lieu of additional data collection, it is agreed that AOCs 03-047(g) and 03-051(c) meet corrective action complete with controls, but not complete without controls.

- **SWMUs 03-014(k,l,m,n):** As indicated above NMED does not support use of the maximum detected concentration as the EPC as the primary line of evidence for eliminating the exceedance from further consideration in the risk assessment. Additional PAH data must be collected and a statistically derived EPC used to refine risk. The photographs of the SWMUs and the decaying berms provided by the Permittees as part of Attachment 3 of the Response were incorporated into Appendix I as figures. Discussion of the photographs was added to the uncertainty discussion for SWMU 03-014(k,l,m,n) and the discussion references Figure I-4.4.2 to illustrate sludge beds and decaying berms. The photographs show asphalt in the sludge beds but also indicate that the berms are integral to the design of these units (i.e., the decaying asphalt berms would not be present if it was not for the presence of the sludge beds). Thus it appears that the PAH contamination at SWMUs 03-014(k,l,m,n) is site related and is due to the design and operation of these units. The information presented on PAHs at SWMUs 03-014(k,l,m,n) in the main text and Appendix I of the revised SIR and in the Response must be reviewed and Phase II IR must indicate that the exceedances are driven by PAHs associated with the design and operation of the sludge beds. Alternatively, the Permittees must provide multiple lines of evidence demonstrating that the decaying asphalt berms are not associated with the design and operation of SWMUs 03-014(k,l,m,n). It is also noted that the PAH concentrations are orders of magnitude above SSLs; the occurrences of PAHs at such high levels is not typical on sites where the PAHs are a result of runoff from nearby asphalt surfaces.

- **SWMU 03-052(f):** The discussion at the bottom of page 3 and top of page 4 in the Response indicates that the "unacceptable risk" at this site under the industrial scenario is based on the use of the maximum detected concentrations of PAHs. As indicated above, NMED does not support the use of the maximum detected concentration as the EPC as the primary line of evidence for eliminating the exceedance from further consideration in the risk assessment. The last sentence of the discussion at the top of page 4 states that 95% UCLs were calculated for SWMU 03-052(f) for use as EPCs although the tools and/or methods used to derive the 95% UCLs are not identified or discussed. In addition, the discussion does not indicate why 95% UCLs were not used as EPCs in the initial risk estimates. The Phase II IR must identify and discuss the approach followed in calculating the 95% UCLs. If ProUCL or another statistical software package was used, the text must reference the location of the input and output files for the computer runs.

In addition, the Response to General Comment 1 addresses uncertainties associated with the exposure time and exposure frequency used to estimate risk at SWMUs 03-014(k,l,m,n) and 03-052(f). The discussion proposes alternate values for exposure time (8 hours per day), and exposure frequency (12 and 24 hours per day) to reflect monthly and/or bimonthly maintenance of these outdoor sites. However, references for these values have not been

provided. As such, deviating from the default exposure assumptions outlined in the NMED Soil Screening Guidance, SSG, (and default EPA values) has not been justified and has not been approved.

General Comment # 2: The Permittees indicate that the criteria noted in Comment 2 (Henry's Law Constant greater than 1E-5 atm-m3/mole and an atomic mass of less than 200 g/mole) were used to identify volatile organic compounds (VOCs) to be included in the evaluation of the vapor intrusion pathway at the sites addressed in the SIR. Risks via the vapor intrusion (VI) pathway were qualitatively estimated for the residential scenario for some of the sites. Because only soil data are available, the Johnson & Ettinger- based advanced soil model (J&E Soil Model) was used to estimate risk-based soil concentrations for VOCs at the sites. While NMED no longer supports the application of the J&E Soil Model as the primary line of evidence for eliminating or dismissing the vapor intrusion pathway as a potential exposure source, the J&E Soil Model results were augmented to include multiple lines of evidence as described in Section 2.5.2 of the SSG. However, the resulting risks from the vapor intrusion pathway were not included in the overall site risks in accordance with Section 5.0 of the NMED SSG. It is noted that addition of the risk from the J&E model (Tables I-4.3-1 through H-4.3-29) would not change the overall risk conclusions. However, in future assessments, if risks are estimated for the vapor intrusion pathway, the results must be included with overall risk (added to risks via comparison to SSLs). It is also recommended that the bulk soil J&E model not be used in future and that lines of evidence approach be applied as noted in the SSG.

Comment #8, Section 6.5.4.4, Nature and Extent of Contamination, page 46: As indicated in the Response, the text in Section 6.5.4.4 was revised to state: "Concentrations did not change markedly across the site." NMED does not agree with the general characterization that concentrations did not change markedly. The Response also states that the difference in copper concentrations across the site was "only 9.5 mg/kg." While this difference of less than 10 mg/kg is not presented and/or discussed in Section 6.5.4.4, it represents a change of over 1300% between the minimum and maximum copper concentrations at the site. The Permittees also cite the difference between minimum and maximum background concentrations of copper for the site. The percent difference is even larger than for the site copper concentrations. Thus, it appears that the variation in copper concentrations over the site underscore the need to use statistically based estimates of pertinent concentrations when making site-based decisions. The Phase II Investigation Report (IR) must eliminate characterizations such as: "Concentrations did not change markedly across the site" and replace them with statements such as: "Concentrations varied across the site from a minimum of 0.696 mg/kg to a maximum of 10.2 mg/kg."

Comment #12, Section 6.7.4.4, Nature and Extent of Contamination, page 65: The Response provides information on the numerical magnitude of the difference between the sample results at 0-1 foot below ground surface (bgs) and 1-2 feet bgs for eight PAHs. In addition, the Response proposes alternate values for exposure time and exposure frequency for the industrial scenario. The Response does not address the risk exceedance for the residential scenario.

As noted in NMED Comment, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene were detected above the NMED residential SSLs at all depths at sample location 03-608219. It

does not appear that any samples were collected below the 1-2 feet bgs depth interval at any sampling locations associated with SWMU 03-052(f). Because PAH concentrations at location 03-608219 exceed their residential SSLs at the maximum sampled depth and no samples have been collected at SWMU 03-052(f) at depths greater than 2 feet bgs, it appears that the vertical extent of contamination is not defined at the site and additional sampling is required to define the vertical extent of contamination at SWMU 03-052(f).

Comment #15, Section 6.20.4.4, Extent of Contamination, page 165: The Response provides information that no concentrations of TPH-DRO at SWMU 03-056(a) exceed the applicable screening criteria. The Response does not address the potential for TPH-DRO concentrations at depths greater than 2 feet bgs to be higher than the 288 mg/kg obtained at location 03-608347 for the 1-2 feet bgs depth interval. Samples were only collected from two depths, and concentrations were higher in samples collected from greater depth. In addition, the statement in the Response incorrectly states that TPH-DRO concentrations were greater than the corresponding screening value when, in fact, they are not. Either additional samples must be collected or additional lines of evidence must be provided to illustrate the vertical extent of TPH-DRO contamination at SWMU 03-056(a) has been defined.

Comment #19, Section 8.3.5, Summary of Health Risk Screening, page 233:
NMED's Notice of Approval Letter issued on November 9, 2010 for the Investigation Report for Upper Sandia Canyon Aggregate Area states that the investigations conducted in 2005 and 2006 clearly identified the limited source area of petroleum hydrocarbons in the northwest area. The Permittees opted not to remediate, and instead use an industrial land use scenario as a justification not to conduct additional cleanup. Contamination was detected in samples collected from depth to 23-25 ft below ground surface (bgs). The Permittees excavated to four ft bgs and backfilled the excavated area with clean backfill material. Aroclor-1254 was detected at 11 mg/kg and 2.4 mg/kg in samples collected from a depth of 1.5-2.0 ft bgs (locations 61-24316 and 61-24314, respectively). To clarify the comment as stated earlier in the NOD, use of 95% upper confidence level of the mean to calculate exposure point concentrations (EPCs) is not appropriate as there is a clear hot spot. The hot spot is located within an area of potential exposure. In such cases, an EPC specific to the hot spot must be evaluated to determine whether removals are needed. Inclusion of data associated with the hot spot in the overall site EPC only serves to minimize the potential risk due to the hot spot and does not allow for adequate evaluation of potential risks. Source areas were identified, were limited in size, were accessible, but inexplicably not removed. The residual concentrations at location 61-24352 (10-10.5 ft) for naphthalene, trimethylbenzene[1,2,4-], xylene[total], TPH-DRO and TPH-GRO were1300 mg/kg, 610 mg/kg, 870 mg/kg, 16,000 mg/kg, and 8500 mg/kg, respectively. NMED had previously recommended removal of the hotspot. However, the Permittees state that further remediation of hotspot is not warranted and have recommended corrective action complete with controls for SWMU 61-002. If the current land use changes, the Permittees will likely be required to evaluate the vapor intrusion pathway.

In the next to last paragraph of the Response, the Permittees state that the NMED's November 9, 2010 letter indicated that use of 95% UCLs as EPCs was inappropriate when evaluating risks. Since that time, the 2012 and 2014 versions of NMED's SSG have provided recommended

approaches for determining 95% UCLs suitable for use as EPCs when evaluating risk. However, as stated above, the intent of the use of the 95% UCL in this case was to average away the contamination associated with the hot spot by not specially evaluating potential risks within the hotspot. The risk and hazard under the residential scenario must be reevaluated using 95% UCLs calculated for both the hot spot and the rest of the site excluding the data associated with the hot spot. Based on the results, conclusions and recommendations for SWMU 61-002 must be reevaluated and presented in the Phase II IR. The reevaluated risk(s) must also be presented as a line of evidence supporting the revised conclusions and recommendations regarding SWMU 61-002.

Comment #20, Section I-4.4.2, Exposure Evaluation pages I-45 – I-51: The last paragraph of the Response indicates that Section I-4.4.2 has been revised to include a discussion addressing the activity patterns of the receptors addressed in the SIR. Review of the revisions to Section I-4.4.2 indicates that the majority of the information contained in the Response to NMED Comment 20 has been incorporated into Appendix I of the revised SIR. However, the information in the Response related to the activity patterns of ecological receptors was not found. Additional documentation in the Phase II IR is required to include the information furnished in the Response regarding activity patterns for ecological receptors.

Comment #21, Section I-4.4.2, Exposure Evaluation pages I-45 – I-51: As indicated by the Permittees, Section I-4.4.2 has been revised to include the information contained in the response to NMED Comment 21. However, note the additional issues related to PAHs at some sites remain and are discussed in the General Comment 1.

Comment #22, Section I-4.4.2, Exposure Evaluation pages I-45 – I-51: The Response does not address the issue raised in the original comment. However, the Response notes that the issues raised in NMED Comment 22 are addressed in the Response to NMED Comment 1. NMED has addressed the outstanding issues related to PAHs at some sites in the evaluation of NMED Comment 1.

Comment #23, Section I-4.4.2, Exposure Evaluation pages I-45 – I-51: The Response partially addresses the issue raised in the original comment. The Permittees have revised Section I-4.5.9 as indicated; however, issues related to existing contamination at SWMUs 03-014(k,l,m,n) remain and are addressed in NMED's evaluation of the response to NMED Comment 1.

The Permittees must address these comments in Phase II Investigation Report for Upper Sandia Canyon Aggregate Area . Please contact Neelam Dhawan at (505) 476-6042, if you have any questions.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: N. Dhawan, NMED HWB
S. Yanicak, NMED DOE OB, MS J993
L. King, EPA 6MM-RC
A. Duran, DOE-EM-LA, MS A316
R. Massey, DOE-EM-LA, MS A316
B. Robinson, ADEM ER, MS M992
K. Rich, ADEM ER, MS M992

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