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July 22, 2008

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RE: NOTICE OF DEFICIENCY
TECHNICAL REVIEW OF THE SEPTEMBER 7, 2007 LOS ALAMOS NATIONAL LABORATORY TECHNICAL AREA 16 BURN GROUND AIR PATHWAY ASSESSMENT REPORT, REVISION 0
HWB-LANL-01-006

Dear Messrs. Winchell and Watkins:

The New Mexico Environment Department (NMED) has reviewed the above-referenced document entitled, "Los Alamos National Laboratory Technical Area 16 Burn Ground Air Pathway Assessment Report, Revision 0" (referenced by LA-UR-07-5711), submitted by Los Alamos National Security, LLC (LANS) and the U.S. Department of Energy (the Permittees) for technical adequacy and hereby issues this Notice of Deficiency (NOD). The Permittees shall revise the Air Pathway Assessment Report (Report) for the Technical Area (TA) 16 Burn Ground (units TA-16-388 and TA-16-399) based on the comments provided below.

30230

General Comments:

1. The August 2007 Report lacks the necessary detail needed to demonstrate that treatment operations at the TA-16 Burn Ground are protective of human health and the environment. The text of the Report must be expanded to include:

    a. additional information supporting deviations from LANL's air pathway assessment protocols (LANL, 2007a and LANL, 2007c) (see comment #'s 4, 6, 7, 8, 9, and 13);

    b. additional information on the location of the receptors listed in Table 2-3 (Unit/Waste Scenarios Creating Maximum Impacts by Averaging Period), Table 3-1 (Deposition Fluxes), and Table 3-2 (Soil Input Concentrations) relative to the locations of the modeled emission sources (i.e., the UTM coordinates and elevations of the identified receptors) (see comment #'s 21, 22, 24, 28, 29, 32 and 34);

    c. information on the points of maximum on-site and maximum off-site impacts and deposition fluxes listed in Tables 2-3 and 3-1 (see comment #'s 24 and 32); and

    d. typical open burning operations at TA-16-388 and TA-16-399 compared to the worst-case scenarios addressed in the Report (see comment # 3).

2. The Report does not include an assessment of the uncertainties embedded in the air pathway assessment. Any assessment of the air pathway for an open burning unit is subject to uncertainty stemming from the tools and methodologies employed. Identification and discussion of the sources of uncertainty is essential to the interpretation and effective application of the assessment results by all stakeholders. The Report must include such a discussion to characterize the results of the air pathway assessment. Uncertainties typically associated with screening level risk based air pathway assessments for open burn units include, but are not limited to:

    a. use of surrogate emission factors to represent actual process emissions;

    b. use of air dispersion and deposition models to estimate air quality impacts; and

    c. application of risk-based screening levels to assess potential impacts to human health and the environment.

    Further, the assumptions made in applying the emission factors, air model, and screening levels introduce uncertainty into the assessment. Comments related to such assumptions are detailed herein (see comment #'s 3, 11, 14, 15, 19, 20, 30, 31, 36, and 37). Revise the Report to identify and discuss the sources of uncertainty associated with the air pathway assessment for the TA-16 Burn Ground. This discussion must address the three items listed above and the assumptions referenced above. The Permittees should identify and discuss additional sources of uncertainty as necessary to adequately characterize the results of the air pathway assessment.

3. Section 1.0 (Introduction) should be expanded to provide additional information on the open burning operations conducted at the TA-16 Burn Ground. Because the Report does not model typical operations (the analysis is intended to illustrate that worst-case operations are protective of human health and the environment), the Report must provide an expanded discussion of:

    a. typical open burning operations at TA-16-388 and TA-16-399. This could be accomplished by augmenting the revised Report with a technical comparison of the similarities and differences between typical open burn parameter values (from descriptions of typical operations at the Burn Ground found in other LANL documents, (e.g., LANL, 2003, Attachment G) and the parameter values used in the air pathway assessment. The Permittees must provide a text discussion and a comparative table; and

    b. changes in magnitude and location of the maximum air quality impacts as the amount of waste treated per event is decreased. The Permittees must demonstrate that treatment of smaller quantities than those addressed in the Report will not generate emissions that exceed levels that are protective of human health and the environment. If magnitudes and locations of maximum off-site and maximum on-site impacts change as the volume of waste treated decreases, and the Permittees are not able to demonstrate that treatment of smaller quantities will not be harmful, they must indicate what procedures and controls will be used to prevent exposures to human and ecological receptors that exceed protective levels.

    Revise Section 1.0 of the Report to address these issues.

4. Section 1.1 (Protocol Variances) states, "...the TA-16 Burn Ground Units are too small an area for CALPUFF to model as an area source, so they were modeled as point sources." Based on discussions with the Permittees in addressing NMED's comments on the Permittees' initial Burn Ground Air Pathway Assessment Protocol (Protocol) (LANL, 2007a), NMED expected the Permittees to model the open burning processes at TA-16 as area sources (NMED, 2007 and LANL, 2007b). Assuming that the processes are analogous to a point source represents a significant change in methodology and will require additional explanation and justification by the Permittees.

    It is not clear if the size issue the Permittees refer to is the result of a data resolution problem, a size constraint built into the version of CALPUFF used by the Permittees, or some other origin. The Permittees must provide an expanded discussion of the problem encountered with CALPUFF's area source algorithm. The Permittees shall also:

    a. state the size limitations of the area source algorithm;

    b. indicate if all available versions of CALPUFF are subject to these size limitations; and,

c. identify and discuss the criteria considered in deciding to use the point source algorithm.

While it is possible to adequately model processes such as the open burning of bulk high explosives (HE) and HE-contaminated wastes using CALPUFF's point source algorithm, its application requires that the expected buoyant rise is adequately represented. As indicated in Section 2.4.6, Area Source Plume Rise, of the CALPUFF User's Guide, CALPUFF computes the plume rise for area sources by solving the mass, momentum, and energy equations free of the Boussinesq Approximation[1] (Scire *et al.*, 2000). The plume rise calculation for area sources accounts for the difference in density between the plume and the ambient air and the effects of radiative heat loss. These processes are not considered by the point source algorithm (Scire *et al.*, 2000). Due to the importance of adequately modeling the source in regulatory air dispersion modeling, the Permittees must demonstrate that the application of the CALPUFF point source algorithm that was used to model the open burning operations at the TA-16 Burn Ground adequately represents the buoyant rise of the open burns that would be predicted by CALPUFF's area source algorithm (Strimaitis, 2007b).

Within Section 2.1 (Unit/Waste-Specific Modeling Scenarios) of the Report, the Permittees present an equation for vertical velocity, w_s (see LANL, 2007c, Section 4.3, Source-Specific Information). However, w_s is never related to the buoyant plume rise predicted by CALPUFF for an area source. Further, it appears that the derivation of w_s presented in the Protocol (LANL, 2007c) does not account for radiative heat loss from the rising plume.

Equation 2-143, Section 2.4.6, Area Source Plume Rise, of the CALPUFF User's Guide (Scire *et al.*, 2000) presents an energy balance for an area source as a function of the change in plume height. Based on the information provided by the Permittees, it is not clear how the expression for w_s in Section 1.1 of the Report is related to Equation 2-143.

In order to ensure appropriate application of CALPUFF in modeling the open burn processes at the TA-16 Burn Ground, the Permittees must demonstrate that the plume rise predicted by the point source algorithm is analogous to that predicted by the area source algorithm. If such a demonstration cannot be made mathematically, the Permittees must perform sensitivity modeling runs using the CALPUFF point source algorithm to determine the change in estimated plume rise due to variations in stack exit temperature, stack exit velocity, and stack cross-sectional area.

The plume rise produced by the actual open burn operations must then be modeled by the CALPUFF area source algorithm using a version of the model not subject to the size constraint encountered by the Permittees (if available) or by a source model with demonstrated capability for modeling the plume rise from an open burn operation (e.g., OBODM, POLU). The results of the two modeling efforts must then be compared to

[1] The Bousinesq Approximation, used in calculating plume rise in the CALPUFF point source algorithm, neglects the density difference between the ambient air and the rising plume except in the buoyancy equation.

identify a set of input parameter values that will ensure that CALPUFF's point source algorithm mimics the buoyant plume rise obtained from the actual open burning operations (Strimaitis, 2007b).

If such a set of input parameter values for CALPUFF's point source algorithm cannot be identified, the Permittees' air dispersion and deposition modeling analysis must be repeated using a suitable source model (e.g., OBODM, POLU). Note that CALPUFF provides "plug in" capabilities, allowing the plume rise to be modeled by another source model (e.g., OBODM, POLU) and the result used as an input to the CALPUFF dispersion and deposition routines (Strimaitis, 2007a). This type of "hybrid" application may offer an approach that reflects the inherent strengths of a dedicated source model and the air dispersion and deposition algorithms in CALPUFF.

Revise the Report to demonstrate that the input parameter values used in the air pathway assessment based on the CALPUFF point source algorithm produce the same buoyant plume rise as the CALPUFF area source algorithm when actual process parameter values are used as model inputs. If such a demonstration cannot be provided, the Permittees must repeat the air dispersion and deposition modeling using source models and/or techniques that constitute a scientifically defensible representation of the open burns performed at the TA-16 open burn ground.

5. According to the Protocol (LANL, 2007c) and the TA-16 General Part B Application (LANL, 2003), the Permittees state that the treatment of three different types of wastes (Bulk HE at TA-16-399, Wet and Bulk HE at TA-16-388, and HE-contaminated waste at TA-16-388) will occur at the Burn Ground. In conversations with the Permittees, it is understood that the Permittees are requesting an allowance to treat a maximum of 20,000 pounds cumulatively (with maximum single treatment events of 1000 lb/treatment of Bulk HE at TA-16-399, a maximum of 250 lb/treatment of Wet or Bulk HE at TA-16-388, and a maximum of 250 lb/treatment of HE-contaminated waste at TA-16-388) of HE annually at the two permitted units with a maximum use of 15,000 gallons/year of propane for treatments at TA-16-388. The Permittees' application (LANL, 2003), however, does not explicitly state these limits (see Attachment G in LANL, 2003). The Permittees must ensure that these quantities are the values for which a permit is sought. If the air pathway assessment successfully demonstrates that these quantities can be treated without negatively impacting human health and the environment, NMED will consider them in setting permit limits (e.g., annual treatment amounts) for the TA-16 Burn Ground in the Permittees' draft renewal permit. Revise the Report to explicitly state that these are the actual treatment volumes for which the Permittees are seeking allowance to treat at the Burn Ground.

Specific Comments:

6. **Section 1.1, Protocol Variances, Page 1 of 41**

The Permittees indicate that the air pathway assessment for the TA-16 Burn Ground was performed using a meteorological data set that differed from that proposed in the Protocol (LANL, 2007c):

> "The 1995 meteorological data were not available in a format that could be processed by CALMET, the meteorological model associated with CALPUFF. Meteorological data from 1999 were available in a CALMET-processed file and were used."

The Report must include the following information related to the meteorological data file from 1999:

a. the identity of the raw data sets used;

b. the identity of any meteorological data preprocessors (e.g., CALMET) used to generate the model-ready meteorological data file for the air pathway assessment; and

c. a brief summary of the procedures followed in converting the raw data into a model-ready file. This summary should include references to documents that provided detailed descriptions of the methods used to generate the model-ready meteorological data file (e.g., CALMET User's Guide).

The Permittees submitted to NMED "Meteorological Input to the CALPUFF Modeling System" (referenced by SWRC: 02-028) dated April 15, 2002. However, the Permittees have not cited the document in Section 1.1 or included it in the Report's reference section. If the meteorological data described in the above-referenced document is in fact the data used by the Permittees in the air pathway assessment, the Permittees must revise the Report to accurately cite the document and ensure it is listed in Section 5.0 (References). Revise the Report to address this issue.

7. **Section 2.1, Unit/Waste-Specific Modeling Scenarios, Page 2 of 41**

The first paragraph of Section 2.1 describes the modeling of bulk HE that burns rapidly at a relatively high temperature and the modeling of bulk HE that burns slower at a lower temperature so that upper and lower bound values for vertical plume velocity could be addressed in the Report. The two cases were referred to as the maximum and the minimum lofting scenario, respectively. While Section 2.1 (Unit/Waste-Specific Modeling Scenarios) indicates that these scenarios were "referred to in the protocol," no such reference could be found in either LANL, 2007a or LANL, 2007c (see references in Attachment A). For completeness and a transparent description of the modeling analysis, the Permittees must revise Section 1.1 of the Report to indicate that although not

proposed in the Protocols, modeling of a maximum and a minimum lofting scenario was performed for the open burning of bulk HE at the TA-16 Burn Ground.

8. **Section 2.1, Unit/Waste-Specific Modeling Scenarios, Page 2 of 41**

With the vertical velocity serving as a key line of evidence in the justification for using the point source algorithm to model the open burning processes at the TA-16 Burn Ground, the Permittees must provide information on the range of vertical velocities expected from the bulk HE burned at the TA-16 Burn Ground in the Report. Revise Section 2.1 to discuss whether or not the vertical velocities derived for use in the air pathway assessment effectively bracket the range of vertical velocities (i.e., represent the maximum and minimum vertical velocities) expected for the bulk HE treated at the TA-16 Burn Ground.

9. **Section 2.1, Unit/Waste-Specific Modeling Scenarios, Page 2 of 41**

With the vertical velocity serving as a key line of evidence in the justification for using the point source algorithm to model the open burning processes at the TA-16 Burn Ground, the Permittees must provide additional information on the calculation of this parameter. Revise the Report to include a summary of the calculation performed in determining the vertical velocities presented in Table 2-1 (Vertical Velocities for Unit/Waste Scenarios). Provide this information for Composition B (COMPB), PBX 9501, propane, and any other constituent for which a vertical velocity was needed.

10. **Section 2.1, Unit/Waste-Specific Modeling Scenarios, Page 3 of 41**

The third bullet on page 3 states that receptor elevations were taken from Digital Elevation Model (DEM) data. Section 1.0 of the Protocol (LANL, 2007c), however, referenced the coordinates of the open burn pads to NAD27 projections. It is unclear whether the same datum was used for source locations and modeled receptor locations when the coordinates were entered into the CALPUFF input files. For clarification and transparency in the description of the air pathway assessment, confirm that the same datum was used. As part of the revised Report, provide an electronic copy of the DEM data utilized in the air pathway assessment.

11. **Section 2.1, Unit/Waste-Specific Modeling Scenarios, Page 4 of 41**

The first bullet at the top of page 4 lists burn times for calculating the vertical velocities of COMPB, PBX 9501, and propane. Section 4.2 (Meteorology and Source Specific Input) of the Protocol (LANL, 2007a) indicates that air dispersion and deposition modeling of open burning processes at the Burn Ground would simulate a 1-hour burn time. Revise Section 2.1 of the Report to include the burn time simulated in the CALPUFF dispersion and deposition modeling for open burns conducted at the Burn Ground. If the time differs from the burn times used to calculate the vertical velocities employed in the analysis, revise the Report to include a discussion of the impact of using

different burn times to calculate vertical velocities and to simulate the open burning processes on the output of the CALPUFF model.

12. **Section 2.1, Unit/Waste-Specific Modeling Scenarios, Page 4 of 41**

The Permittees reference author Hatler (1982) in the text but do not include the entire reference in the Report's reference page. Revise the Report including the full reference.

13. **Section 2.1, Unit/Waste-Specific Modeling Scenarios, Page 4 of 41**

The discussion on page 4 notes that a burn rate of one (1) gallon per minute (gpm) was assumed for the propane-only scenario at TA-16-388. This differs from the 25 gallons per hour (gph) per propane burner proposed in Section 3.2.5 (Emission Factors for Open Burning of Propane) of the Protocol (LANL, 2007a). For two burners, the total burn rate for propane in the Protocol was 50 gph compared to the 60 gph (60 min/hr × 1 gal/min) used in the air pathway assessment. Information provided to NMED by the Permittees indicate that calculations performed for estimating 1-hour impacts from burning propane would use a burn rate of 100 gph (LANL, 2007c). It does not appear that a burn rate of 100 gph was used in the 1-hour impact calculations. Revise Section 1.1 in the Report to indicate that the burn rate for propane used in the air pathway assessment differed from that proposed in the Protocol. In addition, explain why a 1 gpm burn rate was used in the air pathway assessment instead of the Protocol value of 50 gph.

14. **Section 2.1, Unit/Waste-Specific Modeling Scenarios, Page 4 of 41**

According to the text on page 4, COMPB chip burn time and temperature data were adjusted based on the differences observed in the data for chip and solid PBX 9501 and PBX 9502. The basis for making such an adjustment must be established within the Report. Revise Section 2.1 of the Report to establish the similarity between COMPB, PBX 9501, and PBX 9502. The Permittees must demonstrate that adjusting COMPB chip burn time and temperature data based on similar data for PBX 9501 and PBX 9502 is a technically sound and acceptable approach. The Permittees must identify this approach as a source of uncertainty in the analysis and discuss the impact of its use on the results of the air pathway assessment. Revise the Report to address this issue.

15. **Section 2.1, Unit/Waste-Specific Modeling Scenarios, Page 4 of 41**

The information on T_s values presented in the fifth bullet on page 4 includes a short discussion on the modification of COMPB chip temperature data based on PBX 9501 and PBX 9502 solid HE temperature measurements. While the discussion indicates that the COMPB data were modified similarly to burn time data for chips, the modifier(s) are not specifically stated. Revise this discussion in the Report to include additional information on how the chip data were modified. The information should be analogous to information provided under the first bullet on page 4 for modification of chip burn times

based on burn times for solid HE (e.g., "...solids burn 2 to 4 times longer than the same HE burned as chips. The COMPB burn time was adjusted accordingly.").

16. **Section 2.1, Unit/Waste-Specific Modeling Scenarios, Page 5 of 41**

The discussion at the top of page 5 indicates that the release height for the burn tray at TA-16-399 is 2.38 meters (m) based on a tray base height of one (1) m. Section G.1.2 (page G-5) in Attachment G (LANL, 2003) lists the leg height of the TA-16-399 burn tray as 1.5 feet (0.46 m). The discussion also states that the TA-16-399 burn tray is lined with firebrick. However, insufficient information was provided to determine the actual height of the tray base. Revise Section 2.1 to include additional information that establishes the appropriate tray base height for TA-16-399.

17. **Section 2.2, Air Quality Impacts Calculations, Page 5 of 41**

The discussion in Section 2.2 states, "[t]he annual averaging period assumes that 20,000 lb of waste and 15,000 gal of propane are burned at the most conservative unit and the burn size is not considered in calculating impacts." It is not clear how an impact presented in Section 2.2 with units of micrograms of pollutant per cubic meter of air ($\mu g/m^3$) can be obtained from the air modeling results (in units of $\mu g/m^3$ per gram of pollutant emitted per second) without consideration of the amount of waste treated, (i.e., burn size). Revise the Report clarifying this statement and provide a numerical example illustrating the calculation of the annual average impacts presented in Table 2-3.

18. **Section 2.2, Air Quality Impacts Calculations, Page 5 of 41**

The text does not clearly explain why the TA-16-399 conversion factors were multiplied by four. The discussion in Section 2.2 states, "[b]ecause the fuel amount burned at TA-16-399 is four times higher than at TA-16-388, the TA-16-399 conversion factors were multiplied by four and compared to the TA-16-388 conversion factors." Revise Section 2.2 to include a numerical example clearly illustrating the impact calculation for TA-16-399. Within the calculation, show that the term 1000 lb_{waste}/hr can be represented as four times 250 lb_{waste}/hr. The revision must illustrate that when comparing calculated impacts, the comparison is made between four times the correction factors for TA-16-399 and TA-16-388.

19. **Section 2.2, Air Quality Impacts Calculations, Page 6 of 41**

The discussion at the top of page 6 indicates that in calculating impacts for 3-, 8-, and 24-hour averaging periods, "...the equation doesn't change because the amount of fuel doubles...in the numerator and the number of seconds...doubles in the denominator..." The meaning of this statement is not clear. In determining the impacts for the 3-, 8-, and 24-hour averaging periods, the total mass emitted over the time period considered should be divided by the total time period considered. For example, to calculate an 8-hour

average impact, two one-hour burns would occur and the following equation would be applied:

$$EF\ g_{pollutant}/g_{waste} \times 454\ g_{waste}/lb_{waste} \times 250\ lb_{waste}/hr \times 2\ hr \times (1\ hr/3600\ sec) \times (1/8\ hr) \times [CF\ \mu g/(m^3 \cdot g/sec)]_{8\text{-}hour} = [I\ \mu g/m^3]_{8\text{-}hour}$$

Revise the text at the top of page 6 to address the average impacts as stated above as well as the entries in the columns labeled "Waste Burned and Calculated Contaminant Emissions" presented in Tables 2-4 and 2-5 where appropriate. Provide a numerical example illustrating the impact calculation for the columns entitled 3-, 8-, and 24-hour averaging periods listed in Table 2-3. Further, identify and discuss the implemented approach as a source of uncertainty in the air pathway assessment.

20. **Section 2.2, Air Quality Impacts Calculations, Page 6 of 41**

At the end of the first paragraph on page 6, the discussion states, "[a]nnual emissions were averaged over 508 hours, the number of meteorological hours modeled..." The meaning of this statement is not clear. To determine actual annual averages (as would be experienced by receptors at the modeled locations), the total mass of pollutant emitted over a calendar year should be averaged over the total number of hours in a calendar year. Review the information presented at the end of the first paragraph on page 6 and revise as necessary. Provide a numerical example illustrating the calculation of annual average impacts. If the calculation does not show the correct parameter values for calculating the total mass emitted during a year averaged over the total hours in a calendar year, identify and discuss the approach used as a source of uncertainty in the air pathway assessment.

21. **Section 2.2, Air Quality Impacts Calculations, Page 6 of 41**

The third paragraph on page 6 discusses the worst-case on-site and worst-case off-site impact receptors and indicates that other receptors have lower impacts than the worst-case impact receptors. This implies that the worst-case on- and off-site impact receptors represent those locations where the maximum on-site CALPUFF modeling result and the maximum off-site CALPUFF modeling result, respectively, occurred. However, the text does not explain how the worst-case on- and off-site locations were determined and the figures in the Report do not explicitly identify which points represent these locations. Revise Section 2.2 to describe how the worst-case on-site and off-site receptor locations were identified and indicate these locations on the figures (see also comment #22).

22. **Section 2.2, Air Quality Impacts Calculations, Page 6 of 41**

As indicated in comment #21, little information is provided on the worst case on-site and off-site impacts (identified as HE Max On Site and HE Max Off Site, respectively, in Table 2-3). As such, it is not clear that the worst case on-site and off-site impacts listed in Table 2-3 represent the overall maximum impacts among all on-site receptor locations

and among all off-site receptor locations. If they do, this should be clearly stated in the text. If not, on-site and off-site modeled receptor locations with higher predicted impacts than those listed in Table 2-3 must be identified in the text. For any modeled location exhibiting an impact higher than the impacts listed for HE Max On Site and Max Off Site in Table 2-3, identify and discuss in the revised Report the procedures and/or controls used to prevent exposure to human and ecological receptors.

23. **Section 2.2, Air Quality Impacts Calculations, Page 7 of 41**

The first full sentence on page 7 is confusing; off-site impacts should be compared to 0.1 times Environmental Protection Agency's (EPA's) Preliminary Remediation Goals (PRGs). Revise the sentence to read, "[t]he annual off-site impacts are compared with 0.1 times the EPA's PRGs and long-term Ambient Air Quality Standards (AAQSs) in Table 2-10."

24. **Table 2-3, Unit/Waste Scenarios Creating Maximum Impacts by Averaging Periods, Page 9 of 41**

The far left column of Table 2-3 lists the "Receptors" considered in the presentation of maximum impacts by averaging period. While identified by a text descriptor, (e.g., Sombrillo Nursing Care), the modeled location (described by its UTM coordinates and elevation) is not provided. Revise Table 2-3 to include the modeled location for the receptors listed in the far left column (see also comment #32). The Permittees must also revise Figures 2-1, 2-2, 2-3, 2-4, 3-1, and 3-2 in the Report labeling these receptors appropriately.

25. **Table 2-3, Unit/Waste Scenarios Creating Maximum Impacts by Averaging Periods, Page 9 of 41**

The footnote to Table 2-3 states, "TA-16-388 propane was never the most conservative weighted conversion factor." The parameter TA-16-388 propane is not defined. Revise the Report to define this parameter.

26. **Table 2-9, Annual On-Site Impacts, Pages 21 and 22 of 41**

The far right column of Table 2-9 lists and identifies the EPA Region 9 PRGs as the screening level for assessing annual on-site impacts. According to Section 4.1.2 (Step 2-Identify Criteria) (USEPA Region 3, 2002) annual impacts should be screened against 0.1 times the EPA Region 9 PRGs. Revise Table 2-9 in the Report to list and identify 0.1 times the EPA Region 9 PRGs as the screening criteria for annual on-site impacts.

27. **Table 2-10, Annual On-Site Impacts, Pages 23 and 24 of 41**

The far right column of Table 2-10 lists and identifies the EPA Region 9 PRGs as the screening level for assessing annual off-site impacts. According to Section 4.1.2 (Step 2-

Identify Criteria) (USEPA Region 3, 2002), annual impacts should be screened against 0.1 times the EPA Region 9 PRGs. Revise Table 2-10 to list and identify 0.1 times the EPA Region 9 PRGs as the screening criteria for annual off-site impacts.

28. **Section 3.0, Deposition Modeling Results, Page 29 of 41**

The first sentence in Section 3.0 indicates that deposition modeling was performed for the same worst-case unit/waste scenarios addressed in Section 2.0. The third paragraph of Section 3.0 notes that the worst-case unit deposition factors are shown in Table 3-1 (Deposition Fluxes). Neither the text nor Table 3-1 explains how the unit deposition factors listed in the table were selected from among the CALPUFF output to represent the worst-case on-site and worst-case off-site deposition fluxes. Revise Section 3.0 of the Report to describe how the worst-case on- and off-site deposition rates listed in Table 3-1 were chosen.

29. **Section 3.0, Deposition Modeling Results, Page 29 of 41**

As indicated in comment #28, little information is provided on the worst case on-site and off-site deposition fluxes listed in Table 3-1. As such, it is not clear that the worst case on-site and off-site fluxes listed in Table 3-1 represent the overall maximum deposition fluxes among all on-site receptor locations and among all off-site receptor locations. If they do, this should be clearly stated in the text. If not, on-site and off-site modeled receptor locations with higher predicted fluxes than those listed in Table 3-1 must be identified in the text. For any modeled location exhibiting a deposition flux higher than the fluxes listed in Table 3-1, identify and discuss the procedures and/or controls used to prevent exposure to human and ecological receptors.

30. **Section 3.0, Deposition Modeling Results, Page 29 of 41**

The discussion at the end of the first paragraph of Section 3.0 states that CALPUFF default parameters for particulate matter, oxides of nitrogen, and toluene were used as surrogates for the constituents considered in the deposition analysis. Specifically, the text indicated:

a. particulate matter would represent total suspended particulate and PM_{10};
b. oxides of nitrogen would represent inorganic gaseous pollutants such as carbon monoxide and nitrogen dioxide; and
c. toluene would represent emissions of gaseous hydrocarbons.

No information supporting these assumptions was provided. Revise Section 3.0 of the Report to include information supporting the use of CALPUFF default parameter values as surrogates for those constituents addressed in the deposition analysis. The information provided should:

d. demonstrate that the use of the identified surrogates is a technically sound approach and will lead to conservative results for the constituents that they represent; and

e. characterize the uncertainty related to the use of surrogate data so that its impact on the results of the deposition analysis is clear.

Further, identify and discuss in the revised Report this approach as a source of uncertainty in the air pathway assessment. Revise the Report to address these issues.

31. **Section 3.0, Deposition Modeling Results, Page 29 of 41**

While the discussion at the end of the first paragraph of Section 3.0 indicates that the CALPUFF default parameters for particulate matter were used to represent total suspended particulate and PM_{10} in the deposition analysis, a surrogate for the metals addressed in the analysis was not identified. Based on information contained in Table 3-3, it appears that the CALPUFF default parameters for particulate matter were used. Revise Section 3.0 of the Report to identify the surrogate used for the metals addressed in the deposition analysis. Further, identify and discuss the use of a surrogate as a source of uncertainty in the air pathway assessment.

32. **Table 3-1, Deposition Fluxes, Page 31 of 41**

Table 3-1 lists the pollutant type and the worst-case on-site and worst-case off-site deposition rates obtained from the CALPUFF deposition modeling. The locations corresponding to the listed deposition rates are not provided. Revise Table 3-1 to include the modeled location, described by its UTM coordinates and elevation, for each deposition rate listed in Table 3-1. If a text descriptor is associated with the modeled location, the descriptor should be provided as well.

33. **Table 3-1, Deposition Fluxes, Page 31 of 41**

Table 3-1 does not identify the scenario corresponding to the worst-case on-site and worst-case off-site deposition rates listed in the table. Revise Table 3-1 to include the modeled scenario (e.g., TA-16-388 HE Min) that generated each listed deposition rate.

34. **Table 3-2, Soil Input Concentrations, Page 31 of 41**

Similarly to Table 3-1, Table 3-2 lists the worst-case on-site and worst-case off-site soil input concentrations by pollutant type but does not identify the corresponding modeled locations. Revise Table 3-2 to include information that identifies the modeled locations associated with the listed soil concentrations (see also comment #32 above).

35. **Section 4.0, Regulated Solvent Impacts Analysis, Page 37 of 41**

The second paragraph of Section 4.0 indicates that no bulk solvents have been treated at the TA-16 Burn Ground in several years. The meaning of bulk solvents as related to open burning operations at the TA-16 Burn Ground is not clear. Revise Section 4.0 to define the term bulk solvent. Provide in the revision a comparison of a bulk solvent to an HE-contaminated solvent as they relate to open burning operations at the TA-16 Burn Ground. Also, specify when the last treatment of bulk solvents occurred at the burn ground as well as their composition and volume.

36. **Section 4.0, Regulated Solvent Impacts Analysis, Page 37 of 41**

The fourth paragraph of Section 4.0 indicates a destruction efficiency of 95% was assumed in the regulated solvent impacts analysis. No information was furnished in support of this value. Revise Section 4.0 of the Report to include information supporting the use of a destruction efficiency of 95% in the regulated solvent impacts analysis. The information provided should include a technically defensible argument supporting a 95% (or higher) destruction efficiency for the open burning of HE contaminated solvents at the TA-16 Burn Ground. Numerical and/or observational data from the Permittees' process or other similar processes (e.g., open burning of solvents where the burn is assisted by an auxiliary fuel source) should be presented and/or referenced as needed. Further, the uncertainty of estimating solvent emissions from the Permittees' process should be discussed to place the regulated solvent impacts analysis in the proper context. As part of the uncertainty discussion, specifically address the assumed value for destruction efficiency.

37. **Section 4.0, Regulated Solvent Impacts Analysis, Page 37 of 41**

Examination of Table 4-1 (Short-Term and Annual Solvents Impacts Estimation) revealed several aspects of the analysis that were not discussed in the text. These include:

a. EPA Region 9 PRGs were used as the chronic screening level rather than 0.1 times the PRGs;

b. deposition was not considered in the calculation of annual solvent limits; and

c. the calculated annual solvent limits assume open burning of solvents during 508 hours per year.

Revise the text in Section 4.0 to include a description and numerical example of the calculation of annual solvent limits and identify and characterize the uncertainties associated with the methodology employed in the analysis so that the results of the regulated solvent impacts analysis are placed in the proper context.

ATTACHMENT A
REFERENCES

EPA, 2004. "2004 Environmental Protection Agency's Region 9 Preliminary Remediation Goals (PRGs)," October 2004. (http://www.epa.gov/region09/waste/sfund/prg/files/04prgtable.pdf,)

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Scire, J.S., D.G. Strimaitis, and R.J. Yamartino, 2000. A User's Guide for the CALPUFF Dispersion Model, Earth Tech, Inc., Concord, MA, January 2000.

Strimaitis, David, 2007(a). Personal Communication with David Strimaitis, TRC Corporation. March 14, 2007.

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United States Environmental Protection Agency Region 3 (EPA Region 3), 2002. "Draft Final Open Burning/Open Detonation Permitting Guidelines," February 2002. (http://www.epa.gov/reg3wcmd/OBOD_Guidelines.pdf)

The revised Report as well as any additional model input/output parameters, results, and analysis must be submitted to NMED no later than Tuesday, October 14, 2008. The Permittees must submit all results of any new model applications and input parameters with the revised Report. The Report must be submitted in the form of two paper copies and one electronic copy. In addition, the Permittees must submit an electronic copy showing all changes in redline-strikeout format.

If you have any questions or comments regarding this letter, please contact Rebecca Kay of my staff at (505) 476-6040 or by email at rebecca.kay@state.nm.us.

Sincerely,

James P. Bearzi
Chief
Hazardous Waste Bureau

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