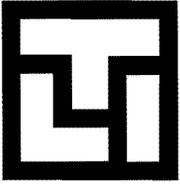


Permit



560 GOLDEN RIDGE ROAD, SUITE 130, GOLDEN, CO 80401

TECHLAW INC.

PHONE: (303) 763-7188
FAX: (303) 763-4896

September 9, 2002

Mr. Carl Will
State of New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building One
Santa Fe, New Mexico 87505-6303

2002

Reference: Work Assignment No. Y513, 06110.040; State of New Mexico Environment Department, Santa Fe, New Mexico; General Permit Support Contracts; LANL Permit Support; Evaluation of Response to NODs for the LANL General Waste Analysis Plan, Rev. 1.1; Task 7 Deliverable.

Dear Mr. Will:

Enclosed please find the deliverable for the above-referenced work assignment. The deliverable consists of a review of the Los Alamos National Laboratory (LANL) responses to Notice of Deficiencies (NOD) issued by NMED on the General Permit Application's Waste Analysis Plan. The deliverable is formatted to provide the NOD, LANL's response and TechLaw's evaluation of the response. Responses were deemed adequate, partially adequate or not adequate.

In conducting the evaluation/review of the responses, TechLaw did not include a detailed analysis of the overall technical adequacy of the changes or examination to ensure that all changes flow well, are congruent, and are adequately presented, but rather the review focused on the specific question of whether comment issues were responded to via revision of the Permit. In addition, the adequacy or inadequacy of a response was determined based on whether the Permittees addressed the comment posed by NMED, and whether the response appeared to be adequate with respect to TechLaw's understanding of NMED's position at the time the comments were issued. However, it is recommended that NMED examine the analysis to ensure adequacy/inadequacy assessments are congruent with current thought and policy.

32435



Mr. Carl Will
September 9, 2002
Page 2

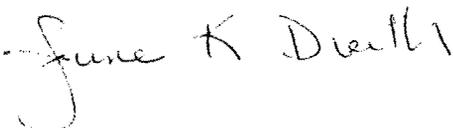
Revised Tables B-11 through B-20 were not provided, and therefore comments pertaining to revision of these Tables could not be assessed. Ms. Walton has relayed a request for these tables to Ms. Sandra Gabaldon. When these tables become available, TechLaw will review them and provide any revisions as necessary to the attached deliverable.

TechLaw recommends that a comparison of the final NMED Permit and the Adequacy of Responses assessment be performed. This would determine whether additional issues raised in the comments must be addressed in the revised NMED Permit Conditions.

The deliverable is formatted in Word. An electronic copy of this deliverable was sent to you at Carl_Will@nmenv.state.nm.us September 6, 2002.

If you have any questions, please feel free to contact Ms. Connie Walker at (303)763-7188 or myself at the same number.

Sincerely,



June K. Dreith
Program Manager

Enclosure

cc: Mr. James Bearzi, NMED
Mr. Steve Pullen, NMED
Ms. Paige Walton, TechLaw
Ms. Connie Walker, TechLaw
Mr. B. Jordan, TechLaw Central Files
Golden TechLaw Files

detail. Detailed information on individual waste types or items is available for review and has been provided to NMED reviewers and inspectors when requested through the course of this WAP's development.

Therefore, LANL is responding to the WAP-related comments contained in this NOD on the basis of the general approach to waste characterization descriptions and procedures, the retention and/or consolidation of the previously described waste stream types, and a goal of keeping the document size and level of detail within a range that allows it to provide sufficient Permit condition information without becoming cumbersome.

In line with that approach, additional information regarding the scope of the waste characterization program at the LANL waste management facilities has been added to the WAP to further illustrate how the program is implemented, including pre-generation information gathering, the review and checking of generator waste information, and waste verification. New text has been added to Section B.3 of the revised WAP discussing pre-characterization prior to generation of a waste, and how the waste characterization documentation is reviewed and approved by trained Facility and Waste Operations-Solid Waste Operations (FWO-SWO) personnel prior to authorization to transfer waste to TA-54 treatment, storage, and disposal facilities (TSDF). The revised WAP is included herein as Appendix C.

Adequacy of Response: Adequacy of the response cannot be determined. NMED's goal was not to "overburden" the DOE with regard to waste analysis, and NMED certainly recognizes that waste analysis for different wastes could be highly variable. That being said, the Permittees are still required to ensure that basic, fundamental requirements of NMAC 20.4.1, (264.13) are met. The Permit must meet these requirements, regardless of the number and type of wastes being managed.

The required analysis must be in the form of sampling and analysis of the waste stream, unless waste stream-specific reasons are provided sufficient to justify the use of Acceptable Knowledge (AK). United States Environmental Protection Agency (EPA) guidance, "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste," April 1994 (EPA 1994), and U.S. Nuclear Regulatory Agency (NRC) 1997 guidance indicates that the use of AK is appropriate under certain conditions, for example for mixed waste in order to address worker safety concerns, and where matrices are not amenable to sampling. However, the use of AK must be justified for each waste stream. EPA 1994 states that "wherever feasible, the referred method to meet the waste analysis requirements is to conduct sampling and laboratory analysis because it is more accurate and defensible than other options." The WAP must include specific and mandatory criteria for determining when AK is acceptable and sampling and analysis is not required for a specific waste stream.

Response: LANL does not disagree with the indicated assessment of the appropriateness of acceptable knowledge (AK) waste characterization in that specific AK

treatment at TA- 55 is contained in the TA-55-specific application. Separating WAP requirements in this manner is unnecessarily confusing.

Response: The WAP has been revised to include the waste analysis requirements for the cementation and vitrification units that were originally contained in the TA-55-specific application. These treatment requirements are addressed in new Sections B.3.2.3.1 and B.3.2.3.2. The revised WAP is included herein as Appendix C.

It must be noted however, that the WAP reviewed for this NOD was originally submitted in October 1998 and was prepared by LANL to meet the NMED Permit format provided in guidance received earlier that year (“Proposed Permit Strategy” letter from Robert S. Dinwiddie to John Browne and David Gurulé, dated February 5, 1998).

Adequacy of Response: The response to the comment appears to be partially adequate as information pertaining to waste treatment has been added. However, it is still unclear specifically which units the WAP applies to, as new language additions refer to TA-54 only and previous WAP versions were not as specific with respect to Technical Areas. It is recommended that NMED examine the insertion of TA-54-specific statements in conjunction with the units being permitted to ensure that the WAP still covers the appropriate Technical Areas, as currently amended.

Revise the WAP to specify that records of waste analyses will be maintained in the operating record in compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.73(b)(3)).

Response: The following text has been added to the second to last paragraph of Section B.3: “All waste generators must certify that, based on their knowledge of the waste, the information included in the characterization documentation and the shipping documentation is complete and accurate. Upon receipt and prior to accepting the waste containers for storage at the TA-54 TSDF, waste shipments are inspected to ensure that the shipping and characterization documentation has the proper FWO-SWO approvals in addition to ensuring that compliance with the WAC and all federal and state regulations are met. At the TA-54 TSDF, both the characterization documentation and the shipping documentation become part of the operating record upon receipt of the waste. These records will be made available at reasonable times to the NMED, upon request.” The revised WAP is included herein as Appendix C.

Adequacy of Response: The response to the comment appears to be adequate, although the specific reference to TA-54 appears to be somewhat limiting unless storage and treatment shall only occur at TA-54.

SPECIFIC COMMENTS ON PERMITTEES' NOVEMBER, 2002, RESPONSES TO NMED JUNE 25, 2001, RSI

6. *(NMED 6/25/01 RSI Comment No.37) Revise the WAP as requested by NMED to include a summary of procedures for complying with waste analysis requirements for handling of ignitable, reactive, and incompatible wastes in compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.17); determining compliance with Land Disposal Restrictions (LDR's) under 20.4.1.500 NMAC (incorporating 40 C.F.R. Part 268); determining compliance with 40 C.F.R. Part 264, Subparts AA, BB, and CC standards; receipt of waste from off-site; and shipment of waste to off-site facilities. The procedures contained in the LANL Standard Operating Procedures (SOP's) submitted by Permittees are sometimes not complete or sufficiently detailed. Because SOP's, for example Detailed Operating Procedures (DOP's), Laboratory Implementation Requirements (LIR's), and Laboratory Implementation Guidelines (LIG's), will not be included in the Permit, a summary of the above procedures must be included in the WAP.*

Revise the WAP to specify how waste analysis requirements will be met, and not only reference waste management requirements. For example, WAP Section B.5, Special Procedural Requirements, must address waste analysis requirements for ignitable, reactive, or incompatible wastes, and not only reference waste management procedures for those wastes.

Response: Under 40 CFR 262.11 "Hazardous Waste Determination," generators of solid wastes must determine if their wastes are hazardous. If the solid waste is not specifically excluded in 40 CFR 261.4(b), the generator may either test the waste or apply knowledge of the waste in light of the materials or processes used. To determine whether a waste is hazardous it is generally acceptable practice to apply user knowledge of the waste, although it may not be possible to accurately determine all the applicable waste codes without testing. Generators are responsible for reevaluating the nature of each waste stream on a yearly basis or if the process changes.

Many RCRA hazardous wastes are restricted from land disposal under the Hazardous and Solid Waste Amendments unless they are treated first to substantially diminish their toxicity and reduce the likelihood that hazardous constituents will migrate from the disposal site. As required in 20.4.1 NMAC, Subpart VIII, Part 268, each waste shipment must be accompanied by a notification stating whether the restricted waste meets specific treatment standards promulgated for hazardous constituents. In most cases, the notification can be completed after laboratory analysis of the waste. If a generator bases an LDR notification solely on user knowledge, the supporting documentation must be kept on record, in accordance with 20.4.1 NMAC § 268.7. User knowledge of the waste may not be sufficient to determine whether or not the waste is restricted from land disposal, and in those cases the TA-54 personnel will prepare a sampling and analysis plan for the waste stream and have the waste analyzed.

If TA-54 accepts hazardous waste from an off-site facility, each shipment is inspected and analyzed as necessary to determine that it matches the waste identified on the waste manifest. These requirements are reiterated under LDR.

TA-54 ships waste off-site for treatment and/or disposal. Receiving TSDFs have their own WAC. FWO-SWO waste stream managers compare the analytical requirements in the WAC for the receiving TSDF with that supplied by the generator. They also determine any underlying hazardous constituents (UHC) that must be identified in LDR documentation for characterization. Any additional needed information, along with quality assurance/quality control (QA/QC) sample requirements, is identified and documented in an approved sampling and analysis plan (SAP). After the data package is received from the analytical laboratory and has undergone validation, the waste stream is then profiled to an off-site TSDF for approval to ship.

Whenever LANL ships waste to an off-site TSDF, it is done in accordance with that facility's WAC, and LANL obtains approval prior to shipment. If the off-site facility has any special waste analysis requirements, they are met prior to shipment.

Section B.5 of the WAP has been revised to address the issues discussed above.

Adequacy of Response: The response to the comment appears to be partially adequate in that the Permittees modified the draft Permit to address these concerns. However, it is TLI's understanding that NMED wished to have more detailed information provided in the Permit than the somewhat abbreviated version presented in the modifications (i.e. LDRs, in particular, are of concern).

Land Disposal

Revise the WAP to specify waste characterization procedures required to comply with LDR's under 20.4.1.800 NMAC (incorporating 40 C.F.R. Part 268), including storage prohibitions at 20.4.1.800 NMAC (incorporating 40 C.F.R. § 268.50) and characterization requirements at 20.4.1.800 NMAC (incorporating 40 C.F.R. §§ 268.7 and 268.9). The WAP does not adequately specify what are Permittees' LDR requirements and how Permittees will comply with those requirements. The WAP LDR procedures at WAP Section B.5.3 focus on off-site shipment of waste, do not provide sufficient detail on waste analysis for treatment, and do not address Permittees' storage prohibitions under 20.4.1.800 NMAC (incorporating 40 C.F.R. § 268.50).

Response: An on-site generator of hazardous waste must determine if the waste must be treated before it can be land disposed. This is done by determining if the hazardous waste meets the treatment standards in 20.4.1 NMAC §§ 268.40, 268.45, or 268.49. This determination can be done in either of two ways: testing the waste or using knowledge of the waste. If the generator tests the waste, testing would normally determine the total concentration of hazardous constituents or the concentrations of hazardous constituents in an extract of the waste obtained using SW-846 Test Method 1311.

Section B.3 has been modified to indicate that the waste characterization procedures included therein are used to support LDR documentation. The revised WAP is included herein as Appendix C.

Adequacy of Response: The response to the comment does not appear to be adequate. While Section B.3 has indeed been modified, specific mention of compliance with the above LDR requirements did not appear to be sufficient (i.e. it is TLI's understanding that NMED expected more explicit information be included in the Permit).

WAP Section B.5.3 states that Permittees will comply with 20.4.1.800 NMAC (incorporating 40 C.F.R. § 268.7(b)) for off-site waste received at the Facility for treatment. 20.4.1.800 NMAC (incorporating 40 C.F.R. § 268.7(b)) applies to all waste treated at the Facility, not just off-site waste.

Response: Section B.5.3 of the WAP discusses both treated wastes to be shipped off site and wastes that may be received from off-site and potentially treated. This section has been revised to show that LANL will also comply with the requirements of 20.4.1 NMAC, Subpart VIII, § 268.7(b) for any wastes treated at LANL that will be shipped off site for disposal.

Adequacy of Response: The response to the comment appears to be adequate, noting that the Permittees state that LDR determinations will be made by AK or by testing.

20.4.1.800 NMAC (incorporating 40 C.F.R. § 268.7(b)) requires that the frequency of testing treated waste must be specified in the WAP. Revise WAP Section B.5.3 to specify the frequency of testing or to reference where in the WAP the frequency is specified.

Response: See LANL's response to Comment No. 51

Adequacy of Response: See Comment No. 51.

WAP Section B.3.1.1 states that AK will be used to determine LDR status. WAP Section B.5.3 states that attainment of treatment standards will be determined by sampling or AK. Revise the WAP to include criteria for determining AK acceptability.

Response: See LANL's response to Comment No. 5.

Adequacy of Response: The response to the comment does not appear adequate because the Permittees provide no new criteria for determining AK acceptability.

Revise the WAP to specify waste analysis procedures sufficient to demonstrate compliance with storage prohibitions at 20.4.1.800 NMAC (incorporating 40 C.F.R. §

268.50), including ensuring that hazardous waste not included in the Federal Facility Compliance Order (FFCO) Site Treatment Plan (STP) is removed from the Facility within one year. If the Permittees intend to store hazardous waste not listed in the STP for longer than one year, the WAP must address how attainment of LDR treatment standards will be verified for that waste.

Response: LANL inspection procedures contained in Appendix C (Item 19 on the Inspection Record Form) of the General Part B, rather than the WAP, are relied upon to determine that the prohibition for storage of hazardous waste is not exceeded. LANL hazardous wastes are stored in accordance with 20.4.1 NMAC § 268.50. LANL's STP wastes are limited to mixed low-level and mixed transuranic waste types for which treatment or disposal options are not available on site. Off-site treatment or disposal options for these mixed wastes have been identified or developed through the STP. LANL's routine waste characterization procedures discussed in Section B.3 of the WAP are used to provide information needed for storage prior to the point that wastes are shipped off site for subsequent management. That information and documentation is also used to meet off-site waste acceptance criteria. In the event that further supplemental information is required by the off-site facility and is developed at LANL, it is specified by that facility's waste characterization requirements rather than contained in this WAP.

Adequacy of Response: It is not possible to determine the adequacy of the response because the General Part B section referenced was not provided for review. However, specific reference to meeting storage prohibitions for non-STP waste is not explicitly discussed in Section B.3, and 20.4.1 NMAC 268.50 is not discussed in Section B.5.3.

Revise the WAP to specify compliance with the 20.4.1.800 NMAC (incorporating 40 C.F.R. § 268.9(a)) requirement that all wastes determined to be characteristic hazardous waste must also be evaluated for the presence of underlying hazardous constituents.

Revise the WAP to specify how LDR's apply to treatment of hazardous waste. HE waste residues from OB may have LDR limitations based on underlying constituents under 20.4.1.800 NMAC (incorporating 40 C.F.R. § 268.40(e)).

Response: See LANL's response to Comment No. 61.

Adequacy of Response: See Comment No. 61

Permittees' statement in their November 2001 RSI response that "requirements in ... Part 268 . . . are followed" is not sufficient.

Response: Section B.5.3 of the WAP included herein as Appendix C has been revised to indicate how the requirements of 20.4.1 NMAC, Subpart VIII, Part 268 are met for TSDFs.

Adequacy of Response: The response to the comment appears to be partially adequate because it has been changed to specific reference treatment standard citations. However, it is TLI's understanding that NMED intended the Permittees more specifically address how these requirements would be met, not that the Permittees simply include a more detailed reference to regulatory citations.

Ignitable, Reactive, and Incompatible Wastes

Revise WAP Section B.5.1 to specify who makes the compatibility determination, what waste analysis is required to make the determination, and at what stage of the waste management process the analysis and the determination occur.

Response: When the waste is received at TA-54, it is evaluated for compatibility by TSDf receiving personnel and stored or segregated, as appropriate. The text of Section B.5.1 has been revised to address this issue.

Adequacy of Response: The response to the comment appears to be partially adequate. The Permittees revised the Permit to state when the compatibility determination occurs and who makes the determination, but did not state or reference the waste analysis required to make this determination.

WAP Section B.5.2 only addresses treatment by open burning (OB) and open detonation (OD). Revise to include waste analysis requirements for treatment of hazardous wastes by cementation, vitrification, and all other treatment at the Facility.

Response: The WAP has been revised to include waste analysis requirements for treatment of hazardous wastes by cementation and vitrification. These are the only other current hazardous waste treatment processes at LANL that require Permitting and were not included in the WAP reviewed for this NOD. The waste analysis requirements for the two treatment processes are now included as Sections B.3.2.3.1 and B.3.2.3.2 of the revised WAP, which is included herein as Appendix C.

Adequacy of Response: The response to the comment appears to be adequate because the Permit was revised to address vitrification and cementation. Technical adequacy of the vitrification and cementation discussions, however, is addressed with respect to response to other Comments (e.g. Comment Nos. 24 and 52).

Subpart CC

WAP Section B.5.4 is unacceptably vague. Revise WAP Section B.5.4 to include specific criteria for when sampling and analysis will be performed to ensure compliance with 20.4.1.500 NMAC (incorporating 40 C.F.R. Part 264, Subpart CC), for example if AK indicates that management of Volatile Organic Compounds (VOC's) occurred. Section B.5.4 states that generators are responsible for determining Subpart CC

compliance and may do so based on AK. However, the WAP does not specify when sampling and analysis will be required and when AK alone is sufficient to identify 500 ppm VOC concentrations.

Response: Section B.5.4 of the WAP has been revised to address these issues.

Adequacy of Response: The response to the comment appears to be partially adequate in that while the Permittees state that the generators are responsible for assembling information to assess Subpart CC compliance, specific trigger points/criteria where sampling and analysis would be required (either by the generator or by the Permittees) are not addressed.

Mixed waste is not exempt from Subpart CC requirements, as is stated in Permittees, November 2001 RSI response. A hazardous waste management unit used solely for mixed waste in accordance with all applicable regulations under the Atomic Energy Act and the Nuclear Waste Policy Act is exempt from Subpart CC requirements under 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.1080(b)(6)).

Response: LANL believes that the Subpart CC applicability of mixed waste stored in containers or stored or treated in tanks has been and is still deferred pending the resolution of inconsistencies between the Atomic Energy Act (AEA) and RCRA requirements. This comment implies that the terminology “hazardous waste management unit” and “waste management unit” as used in the cited regulation are the same. Although similar, the former term describes treatment, storage or disposal facilities such as container storage units (included in 20.4.2 NMAC and 20.4.1.101 NMAC), and the latter term has been used in a more general sense by the EPA to include discrete containers in Subpart CC.

Upon review, the term “waste management unit” does not appear to have been modified in 40 CFR § 264.1080(b)(6) since the original regulation was promulgated on December 6, 1994. Sections IV.F and VII.A.1.d (*Federal Register*, Vol. 59, December 6, 1994, pages 62903 and 62914) of the preamble to the rule contain explanatory language that indicates the temporary deferral for radioactive mixed wastes was to be applied on the basis of individual containers. Section IV.F states that “...the EPA has decided to temporarily defer application of the Subpart CC standards to tanks, containers, and surface impoundments which are being used solely to manage radioactive mixed wastes . . .”. Please note the similarity of the explanation with the actual text of 40 CFR § 264.1080(b)(6). In addition, the technical basis for the deferral is explained in Section VII.A.1.d using drums and venting as an example of non-compatibility with radioactive mixed waste handling procedures. The subsequent discussion clarifying the use of the term “solely” in the specific regulation (*Federal Register*, Vol. 61, February 9, 1996, page 4904) does not address or change the use of the term “waste management unit.” Overall, the title of the regulation and the examples and discussions used throughout the developmental language for the regulation appear to limit the requirement to, for

example, containers rather than container storage units. Therefore, the following portion of this response and associated changes to the revised Section B.5.4 of the WAP are limited to discussions regarding hazardous waste containers only.

However, much of the mixed waste stored at LANL is managed in a manner that is equivalent to the Subpart CC requirements. Waste-generating organizations characterize newly-generated LANL mixed waste using the same procedures and documentation necessary for hazardous waste to meet TA-54 waste acceptance criteria. This includes waste evaluation for volatile organics, packaging, and transportation requirements. The volatile organic content of all LANL waste is determined by acceptable knowledge or analysis and that determination is subject to the same documentation and waste management facility review prior to acceptance at TA-54. All containers of waste are subject to the same DOT packaging and transportation requirements (49 CFR, Parts 171 through 180) before shipment to TA-54. All waste containers are inspected prior to shipment for compliance with DOT requirements, including container closure requirements. Once received at TA-54, only mixed transuranic waste (MTRUW) destined for shipment to the Waste Isolation Pilot Plant (WIPP) is fitted with vents in accordance with the AEA. All mixed and hazardous waste containers stored at TA-54 are subject to the same minimum weekly inspection schedule, including the requirement to check that containers are kept closed. Although the Subpart CC requirements cannot be applied to mixed waste through conditions in the hazardous waste facility Permit until the technical basis for the mixed waste deferral in 40 CFR § 264.1080(b)(6) are resolved, LANL manages this waste in a substantially equivalent manner, except for those instances where the Subpart CC requirements are in opposition to AEA requirements.

Adequacy of Response: The response to the comment appears to be inadequate. The NMED intended to clarify that exemptions apply to the unit in which the waste is contained (be it a hazardous waste management unit or “waste management unit”), and the actual waste itself is not exempt.

Generator Characterization

7. *(Comment 38) Revise the WAP as requested by NMED to include procedures for generator waste characterization, including Facility-wide criteria for when AK is adequate and when sampling and analysis is required. The procedures in the submitted LANL SOP's are not sufficiently detailed, and do not include criteria for generator waste characterization, including criteria for AK adequacy. Because DOP's, LIR's, and LIG's will not be included in the Permit, a summary of the procedures must be included in the WAP.*

Generator waste characterization procedures must include sampling and analysis procedures, including sampling methodologies and analytical parameters.

WAP Section B.3.1 includes somewhat general waste analysis information, relying primarily on AK for waste characterization, but does not specify the decision

criteria under which sampling and analysis will be performed. Revise the WAP to include these criteria.

Response: The requirements for waste characterization in WAPs, as set out in 20.4.1 NMAC § 264.13, apply to treatment, storage, and disposal facilities. Generator requirements are addressed in 20.4.1 NMAC, Subpart III, Part 262. Therefore, the WAP was not revised to address waste characterization for generators. However, additional language has been added to Section B.3 describing the procedures for reviewing documentation provided to the TSDF by the generator.

Adequacy of Response: The response to the comment appears to be inadequate because the Permittees did not revise the Permit to discuss how characterization is performed, decision criteria for use of AK vs. sampling and analysis, etc. The Permittees are correct in asserting that generator and TSD requirements are presented in separate sections of the regulations, but it is also incumbent upon the Permittees of the TSD to obtain a representative characterization of waste they will manage, which is typically obtained from the generator.

Verification

8. *(Comment 39) Revise the WAP as requested by NMED to include a summary of verification procedures for sampling and analysis and for AK for all waste management locations at the Facility, including locations other than TA-54. Include sample methods, including sample selection, frequency, and analytes. Because DOP's, LIR's, and LIG's cannot be included in the Permit, a summary of the procedures must be included in the WAP.*

20.4.1.500 NMAC (incorporating 40 C.F.R. §§ 264.13(a)(3) and 264.13(b)(4)) requires that Permittees verify waste analysis meeting the requirements of 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.13) when necessary and that the WAP specify the frequency that initial analysis will be reviewed or repeated to ensure its accuracy. WAP Section B.3.1.3 states that verification of AK may be performed to confirm the initial accuracy of waste characterization, to verify that applicable treatment standards have been met, when there is a change in a waste-generating process, when the generator requests a review, or when analytical results indicate a change in a waste stream. The WAP states that random selection of waste for verification will take place at a rate of one per cent per year of waste streams received at a storage unit and characterized by AK, and states that verification of factory sealed containers and original containers and lab packs will not take place. The WAP States that "all routinely generated waste streams will be re-evaluated annually to verify that they have not changed," and that this will be accomplished through "review and recertification of applicable waste characterization documentation." The WAP also States "any information that indicates a change in the process that generates the waste and may affect the waste shall cause the waste to be re-characterized no later than the next time the waste is generated." Revise the WAP or explain the above Statement as follows:

- a. *Revise the WAP to specify all criteria triggering mandatory verification. Verification is not discretionary, as use of the word "may" indicates.*
- b. *Explain how the one per cent value was determined. The number is very low. Revise the WAP to specify random verification based on a percentage of containers received rather than waste streams and to specify a minimum number of containers that will be verified. The language submitted could be interpreted to mean that if, for example, 90 waste streams are received at a storage unit in one year, no random verification would be required.*
- c. *LANL's DOP-FMU64-026, R.0, MLLW, Chemical, and Hazardous Waste Sample Verification, Section 8.1, references a database used for identifying the waste stream that serves as the one per cent to be verified. Revise the WAP to specify how Permittees will determine the one per cent of the waste streams that will undergo verification.*
- d. *Specify what actions are taken if verification shows AK to be inaccurate.*
- e. *The WAP States that re-verification of "routinely generated" waste is to occur through review and recertification of documentation, not actual sampling and analysis. This approach requires justification and clarification, if that is Permittees' intent. Address Permittees response if this review indicates that a process change occurred in the past. If so, additional characterization of waste generated in the past after this process change is warranted.*

WAP Section B.3.1.3 commits to re-characterizing waste when the waste generating process changes. Section B.3.1.3 also commits to a one per cent verification of waste characterization based on AK and an annual verification of all routinely generated waste streams. Revise the WAP to specify how non-routinely generated waste characterization is verified.

LIG 404-00-02.0 (2.0), Acceptable Knowledge Guidance, Section 7.3, recommends to generators that "procedures should be maintained to identify (and flag) when there are changes to the waste generating process or to the raw materials used in the process." Revise the WAP to include these procedures. Waste characterization verification may be variable based upon unit-specific considerations, and the WAP is not intended to constrain unique characterization appropriate for specific waste streams. However, the WAP must establish general but enforceable verification criteria to ensure that sampling is performed when necessary.

LANL's DOP 26, Section 8.1, states that verification will also occur when there is a non-conformance report associated with a particular waste stream. LIG 2.0, Section 7.6, states that waste streams should be re.-evaluated for quality assurance purposes. LIG 404-00-02.3 (2.3) states that waste verification is to be determined by facility-specific waste acceptance criteria. Revise the WAP to include these verification requirements and criteria.

DOP 26 Section 8.6, requires quality assurance sampling. Revise the WAP to include this requirement and procedures.

Response: The waste verification process at TA-54 is designed to satisfy WAP requirements. The process applies to the verification of waste received at TA-54 and designated for storage, treatment, and off-site disposal. Personnel involved in verification activities are trained and qualified for the activities they perform.

Waste may be identified as part of the verification program through any of the following:

- Random selection, with a bias toward AK waste streams,
- Past performance of the waste generators, including previous non-conformances,
- Recommendations from TSDF personnel, and
- Incomplete or suspect documentation.

Once the waste stream has been designated for verification, the waste verification personnel are notified of its pending arrival at TA-54. Waste streams needing verification are sampled in accordance to approved EPA and American Society for Testing and Materials (ASTM) protocols and under an approved sampling plan. Some waste streams may only require a visual verification of the container's contents.

If the characterization for the waste stream is found to be inconsistent with the documentation, a non-conformance report (NCR) is issued. The NCR program is used both to trigger further verification of waste and as enforceable criteria for the TA-54 waste verification program. Waste is not accepted for management unless the NCR is resolved. Depending on the severity of the discrepancy, the waste generator or waste-generating facility may be subject to increased verification review under the program.

Section B.3.1.3 of the WAP has been revised to address these issues. The source of the one percent verification rate is Section A.5.1 in Permit Attachment A of LANL's existing Hazardous Waste Facility Permit.

Adequacy of Response: The response to the comment(s) appears to be inadequate. The verification criteria are non-specific, and content of an "approved SAP" is not addressed (i.e. who approves the SAP, what it contains, etc). Elements a-e of the comment are either not addressed or are only briefly addressed, and the Permit retains the use of the word "may" when describing the verification program. TLI was not in possession of Section A.5.1 of LANL's existing Permit, and therefore assessment of the 1% value could not be performed. However, any discussion of the 1% or any other elements discussed in other Permit sections/attachments should be referenced in Attachment B.

9. *(Comment 40) 20.4.1.500 NMAC (incorporating 40 C.F.R. §§ 264.16(a)(1) and (c)) requires that personnel be trained both initially and annually to perform waste analysis required under 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.13). Include*

Permittees' November 2001 RSI Response language in the revised Application, with the specification that training will take place initially and annually.

Response: As stated in LANL's response to Comment No. 40 of the November 2001 RSI, the described training is required for waste management coordinators and others who have oversight of waste profiling documentation, and is suggested for generators of hazardous and mixed waste who complete the forms. These activities are not performed subject to 20.4.1 NMAC, Subpart V, Part 264 standards and should not be included in either the WAP or the Personnel Training Plan of the Permit. This is also the reason the course description was provided for informational purposes only in the previous RSI response.

Adequacy of Response: The response to the comment appears to be inadequate because the Permittees did not revise the Permit to include the annual and initial training requirements apparently included in the "information only" course description provided in the RSI response. The Permittees suggest this is training specific to generators, not to the TSD personnel, but TSD personnel should be trained in all aspects of waste analysis to ensure that they adequately assess and understand information obtained from the generator.

10. (Comment 41) The Installation Work Plan Chapter 6 referenced in Permittees' response contains only general procedures, and is not part of the Permit. Revise the WAP to include specific, mandatory, uniform characterization procedures for remediation waste, including criteria for determining the acceptability of AK.

Response: The Laboratory's Environmental Restoration (ER) Project has developed two Standard Operating Procedures (SOP) to fully address characterization of remediation waste: "Management of Environmental Restoration Project Waste," ER-SOP-01.06, R.2 (12/13/01), which describes the process for managing ER Project waste generated during corrective action, and "Waste Characterization," ER-SOP-01.10, R.1 (12/13/01), which describes the development of a strategy for characterizing wastes generated during specific corrective action-related activities implemented by the ER Project. ER-SOP-01.06, R.2 and ER-SOP-01.10, R.1 are included as Appendices D and E of this response, respectively. These SOPs describe specific, mandatory, and uniform procedures for managing and characterizing remediation waste and incorporate, by reference, the most current version of Laboratory Implementation Requirements (LIR) and Laboratory Implementation Guidance (LIG) associated with waste management. Both SOPs specifically define AK and reference Laboratory LIG 404-00-02, which describes in detail how an AK determination for waste characterization purposes is to be made. This LIG was provided in Appendix G of the RSI response submitted in November 2001. Specific waste definitions are provided in both SOPs. These SOPs are summarized in the new Section B.3.3 of the revised WAP, included herein as Appendix C. The SOPs are included as Appendices D and E herein for informational purposes only.

Adequacy of Response: The response appears to be partially adequate in that an ER waste discussion was added to the Permit, but the SOP summaries do not address substantive requirements pertaining to waste characterization procedures/activities, documentation, etc. ER-SOP-01.06, R.2 and ER-SOP-01.10 are referenced, and NMED should consider whether incorporation by reference is applicable.

11. *(Comment 42) In the revised Application, insert "presents information on and establishes requirements for." The WAP will be incorporated into the Permit, and the Permit will be an enforceable document containing requirements that the Permittees must follow, not a guidance document just presenting information.*

Response: The requirements of 20.4.1 NMAC § 264.13(b) state that "The owner or operator must develop and follow a written waste analysis plan which describes the procedures which he will carry out to comply with paragraph (a) of this section [i.e., 20.4.1 NMAC § 264.13(a)]. Therefore the introduction to the WAP has been revised to read "This waste analysis plan (WAP) presents information on and describes sampling and/or characterization procedures for . . . wastes stored and treated at Los Alamos National Laboratory (LANL)." The revised WAP is included herein as Appendix C.

Adequacy of Response: The response to the comment appears to be inadequate in that the specified language was not incorporated. Should the suggested language stand, addition of the specific regulatory citations stating that "... This waste analysis plan (WAP) presents information on and describes sampling and analysis procedures for...as required in 20 4.1. NMAC § 264.13(b)" could help mitigate the impression that the Permittees believe the contents of the WAP to be guidance, not requirement. Note that inclusion of specific requirements in a WAP as an attachment to the Permit "makes" those requirements equal in enforceability as general Permit Module conditions (depending upon the specific language used, i.e. if the terms "shall", "must", etc. are used instead of "can", "may", "might", etc.).

12. *(Comment 43) Revise or clarify the term as requested, because NMED requests that all waste characterization requirements for the Facility be included in the Facility-wide WAP. The WAP must specify waste characterization as required under 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.13) for generation, storage, treatment, and all other hazardous waste management that takes place at the Facility.*

The term "may be used" implies that other information may be used in addition. Include in the WAP all information used for waste characterization.

Response: The introduction to the WAP has been revised to read "The waste analysis information contained in this WAP is used for characterization of wastes managed in containers and tanks, and to support treatment by open burning (OB), open detonation (OD), and stabilization (cementation or vitrification)." In addition, the WAP has been revised to address all information used for waste characterization. The revised WAP is included herein as Appendix C.

The requirements of 20.4.1 NMAC § 264.13 apply to treatment, storage, and disposal facilities. Generator requirements are addressed in 20.4.1 NMAC, Subpart III, Part 262. Therefore, the WAP was not revised to address waste characterization for generators.

Adequacy of Response: The response appears to be partially adequate in that the “soft” language of question was revised, but the WAP was not revised to include “all information used for waste characterization” because a portion of this information was to be obtained from the generator and the Permittees do not believe that the Permit applies to generator requirements.

13. *(Comment 44) NMED recommends revising the description of Section B.1 to refer the reader to Attachment B-1.*

Response: Section B.1.4 of the WAP refers the reader to Attachment B-1 for a list of waste management units at LANL. The introduction to the WAP has been revised to indicate that Section B.1 includes a reference to a table listing the waste management units at LANL. The revised WAP is included herein as Appendix C.

Adequacy of Response: The response to the comment appears to be adequate, as the Permit has been revised, albeit circuitously, to reference Attachment B-1.

14. *(Comment 46) Revise as requested. Spent solvent waste streams may be chemically homogenous.*

Response: As stated in LANL’s response to Comment No. 46 in the RSI Response submitted in November 2001, the distinction between homogeneous and heterogeneous hazardous waste streams is discussed in Section B.1.2.1, “Hazardous Waste.” The distinction between homogeneous and heterogeneous waste has been removed from the waste stream descriptions in the revised WAP in order to alleviate the discrepancies referred to in this comment.

LANL agrees with the second portion of this comment (Comment No. 14) that “spent solvent waste streams may be chemically homogeneous.”

Adequacy of Response: The response to the comment appears to be adequate. However, note that while the Permit was revised to address the “homogenous” and “heterogeneous” waste designation, the modification itself is somewhat confusing and does not adequately clarify the use of the terms. See response to Comment No. 56.

15. *(Comments 50, 54 and 68) Revise as requested. The language as submitted may exclude constituents of concern, for example cyanides and PCB’s. RCRA may impose requirements in addition to those under the WIPP Permit. The WAP must address all hazardous waste at the Facility, and is not restricted to characterization required of TRU waste intended for shipment to WIPP.*

Response: As stated in LANL’s responses to Comment Nos. 50 and 54 in the RSI Response submitted in November 2001, LANL proposes no changes to the language in

Section B.2.1 (for Comment No. 50) and Section B.3.1.2 (for Comment No. 54) of the WAP because the categories for the proposed analytical parameters are limited to and reflect the subsequent waste characterization methods and rationale tables. The categories include analytical methods for total determinations for metals and sample preparation methodologies for Toxicity Characteristic Leaching Procedure (TCLP). The organic TCLP-constituents tests are included with volatile organic compound (VOC) and semivolatile organic compound (SVOC) methods; therefore, the categories in the second bullet of Section B.2.1 and in the text of Section B.3.1.2 are inclusive for the commonly used waste characterization methodologies. The specificity of the categories in the second bullet of Section B.2.1 and in the text of Section B.3.1.2 does not preclude other testing methods, and the other bulleted categories in Section B.2.1 indicate additional characterization procedures and methods. LANL also stated in the response to Comment No. 50 in the RSI Response submitted in November 2001 that "Reactivity" would be added to the bulleted list in Section B.2.1 of the WAP when the final revision to the General Part B is prepared. A bullet indicating "Reactivity characterization" has been added to the revised WAP, included as Appendix C herein.

As stated in LANL's response to Comment No. 68 in the RSI Response submitted in November 2001, the specificity of the analytical parameters presented in Table B-9 is necessary for the LANL waste characterization procedures described in Section B.3. Therefore, LANL proposes no changes to Table B-9. Table B-9 addresses analytical parameters and the rationale for selection, and includes determining the characteristic for reactivity.

It should be noted that polychlorinated biphenyls (PCB) are regulated under the Toxic Substances Control Act (TSCA), and are not hazardous wastes under RCRA.

Adequacy of Response: The response to the comment appears to be adequate because the Permittees included a bullet for "reactivity characterization". However, the apparent "open ended" nature of the Permit language, allowing the addition of heretofore unseen analysis (as implied by the Permittees above discussion) apparently without a Permit modification requires scrutiny. It is suggested that Permit language wherein analysis of additional parameters not specified in the Permit is "allowed" be removed or modified.

16. (Comment 51) Revise as requested. NMED requires that Permittees sample, monitor, and report radionuclides to NMED.

Response: LANL's position on Comment No. 51 in the RSI Response submitted in November 2001 is not addressed in this comment. Comment No. 51 in the HWB's RSI dated June 2001 requested LANL to include as the fourth and fifth bullets under "Sampling and analysis to determine the presence and concentrations of:" "-RCRA characteristic waste" and "-Radionuclides (including alpha, beta, and gamma spectroscopy and individual radionuclides)." As stated in LANL's response to Comment No. 51 in the RSI Response submitted in November 2001, the list of the proposed analytical parameters includes all RCRA characteristic waste parameters once the

“Reactivity” bullet is added (see LANL’s response to Comment No. 15 herein and LANL’s response to Comment No. 51 in the RSI Response submitted in November 2001). RCRA characteristic waste is covered with the bullets “Flash point characterization” (for ignitability), “pH characterization” (for corrosivity), and “Reactivity characterization” (for reactivity). The characteristic of toxicity is covered with the bullet “Sampling and analysis . . . for RCRA-regulated metals, VOCs, and SVOCs.” Therefore, no changes to this language (other than adding the “Reactivity characterization”) have been made.

As stated in LANL’s response to Comment No. 51 in the RSI Response submitted in November 2001, radionuclides are not a hazardous waste parameter needed to define the detailed chemical and physical characterization of a hazardous waste, pursuant to 20.4.1 NMAC, Subpart II, and this determination is supported by Section 1.2 of the 1994 WAP guidance. AEA requirements are sufficient to sample and monitor radionuclides, to ensure that there is no threat of release, and to ensure no exposure to the public or the environment. Therefore, a bullet for “-Radionuclides (including alpha, beta, and gamma spectroscopy and individual radionuclides)” has not been added to this RCRA WAP.

Adequacy of Response: The response to the comment appears to be inadequate because the Permit was not modified as NMED requested. The Permittees are correct in pointing out that radionuclides are not hazardous waste parameters. Limited characterization of radionuclides, however, is warranted to ensure that any waste characterization based on radionuclide characterization (i.e. low level, TRU, non-mixed hazardous waste distinctions) is appropriately performed.

17. *(Comment 52) The categories used in Section B.3 are confusing because both HE waste and mixed waste are hazardous waste. Having a category called "hazardous waste" separate from "HE waste" and "mixed waste" can be read as meaning that mixed waste and HE waste are not hazardous waste, which is not the Permittees' intended meaning. Section B.3.1 is titled "Hazardous and Mixed Low-level Waste Characterization," but it does not include all hazardous waste characterization procedures, as might be expected. Revise the Application to rename the category called "hazardous waste" as "non-mixed, non-HE hazardous waste," or something equivalent.*

Response: Section B.3.3 (HE waste characterization) of the June 2000 WAP (which was included as Attachment 1 of LANL’s response to the RSI issued by the HWB in March 2000) is now included in Section B.3.1, “Hazardous and Mixed Low-Level Waste Characterization,” in the revised WAP included herein as Appendix C. Section B.3.2 of the revised WAP addresses “Mixed TRU Waste Characterization” as it was in the June 2000 WAP. A new Section B.3.3 now addresses remediation waste characterization.

Adequacy of Response: The response to the comment appears to be adequate as the HE discussion is now included under the Hazardous and Mixed Low-Level Waste Characterization discussion.

The fourth bullet on page B-38 appears to contradict Table B-17 with respect to how homogenous solids will be characterized with respect to HE. The fourth bullet states that "HE concentrations may be directly measured in homogenous materials (e.g. soil or water). This is usually done by High Performance Liquid Chromatography, SW-846 Method 8330. Parameters such as the concentration of HE, its sensitivity, and the media in which it occurs are used to determine whether the waste is likely to be reactive or not." This statement implies that AK may be used to characterize homogenous waste in lieu of sampling and analysis. However, Table B-17 implies that AK will be used to characterize heterogeneous waste only. The proposed changes appear to indicate that AK shall be used to characterize heterogeneous waste, while sampling and analysis will be used to characterize homogenous waste, but this is very unclear from the proposed language changes. The Permittees must clarify the specific characterization processes with respect to heterogeneous and homogenous waste contaminated with HE. The use of AK to characterize debris may be appropriate if adequate AK is available for these wastes.

Response: To clarify the specific characterization processes with respect to heterogeneous and homogeneous waste contaminated with HE, Table B-17 (now Table B-13) has been revised. Acceptable knowledge for homogeneous waste has been added to the Test Method column. The AK entry in the rationale column for heterogeneous waste has been revised to read "If all surfaces of heterogeneous waste cannot be directly tested or visually examined (e.g., debris or equipment) and the waste object was potentially contaminated with HE during its use." The revised table is included in the revised WAP contained in Appendix C of this response.

Adequacy of Response: TLI cannot evaluate the adequacy of the response because Table B-17 was not provided for review.

NMED recommends not inserting the term "heterogeneous" into the second and third bullets on page B-38, as suggested in the RSI response. Homogenous waste could contain visual HE and could come in contact with HE where it cannot be tested or visually examined. Revise the WAP page B-38, fourth bullet, to indicate that heterogeneous waste as well as homogenous waste may be directly measured for HE.

Response: The second, third, and fourth bulleted items in Section B.3.3 (now in Section B.3.1) have been revised to clarify the specific characterization processes with respect to heterogeneous and homogeneous waste contaminated with HE. The modified bulleted items are shown in new Section B.3.1 of the revised WAP, included herein as Appendix C.

Adequacy of Response: The response to the comment appears to be adequate because the requested language changes were made.

18. (Comment 53) *The revision was requested because Permittees are not authorized to dispose of hazardous waste on-site. Revise as requested or specify what future options would be limited by the revision requested by NMED.*

NMED recommends the term "disposed of" instead of "disposed."

Response: Section B.3 of the WAP has been revised to insert "or disposed of" after the term "stored." The Permittees acknowledge that on-site disposal of hazardous waste is not authorized. The phrase "or disposed of" has been added to address hazardous wastes that are transported off site for disposal. The revised WAP is included herein as Appendix C.

Adequacy of Response: The response to the comment appears to be adequate because the requested language change was made.

Acceptable Knowledge

19. (Comment 56) *The Permittees' response to NMED's comment is inadequate because the criteria for deciding whether to use sampling and analysis or AK and procedures to determine AK adequacy must be specifically, completely, and consistently described in the WAP for incorporation into the Permit. The Permittees may have an AK process, but if the procedures are not specified in the WAP, NMED and the public cannot review those procedures and have no assurance that the procedures will continue to be implemented. Specifying AK procedures in the WAP also ensures enforceability and ensures that parties at the Facility subject to waste analysis requirements are aware of the procedures and that the procedures are mandatory Facility-wide, in accordance with 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.13) and EPA guidance (EPA 1994).*

Response: It is stated throughout the new entries in the entire Section B.3 that trained FWO-SWO personnel review the generator's characterization documentation for approval and acceptance based on the WAC, and that the WAC is a laboratory requirements document. The revised WAP is included herein as Appendix C.

Adequacy of Response: The response to the comment appears to be inadequate. A statement that personnel are trained to certain documents does not address the specific question of AK adequacy and identification of AK criteria.

NMED requires that Permittees use sampling and analysis to characterize waste, unless explicit justification is provided for using AK. The criteria used to select AK instead of sampling and analysis must be well defined, consistently applied, and of sufficient detail to ensure that AK used is technically satisfactory, and NMED requires that these elements be incorporated into the Permit. Revise the WAP to include specific and mandatory criteria to determine when AK will be performed in lieu of sampling and analysis.

20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.13(a)(1)) requires that a detailed chemical and physical analysis of wastes must be obtained prior to treatment or storage. According to EPA guidance, AK means process knowledge and past records of analysis used in place of sampling and analysis for waste characterization. EPA and NMED policy is to prefer characterization by sampling and analysis, because it provides more accurate and defensible information.

AK may be used if specifically justified and if there is sufficient quality assurance. EPA guidance (EPA 1994) and U.S. Nuclear Regulatory Agency (NRC) 1997 guidance indicates that the use of AK for mixed waste is appropriate under certain conditions, for example to address worker safety concerns, and where matrices are not amenable to sampling. EPA and NRC guidance support the use of AK for mixed waste to reduce the potential for worker exposure, but NRC guidance recommends alternative sampling strategies to achieve similar ends. However, the use of AK requires justification, particularly since EPA has clearly indicated in its 1994 guidance that "wherever feasible, the preferred method to meet the waste analysis requirements is to conduct sampling and laboratory analysis because it is more accurate and defensible than other options."

Response: See LANL's response to NMED's paragraph 3 of Comment No. 5.

Adequacy of the Response: The response appears to be partially adequate, as additional detail regarding implementation of the AK process is provided and the WAP has been updated to include more AK-related discussions with respect to responsible parties, etc. However, NMED's comment clearly stated that reasons/justification for the use of AK must be provided (i.e. criteria for use), and the Permittees did not provide this information.

The discussion of AK must include at minimum waste stream identification, determination of hazardous constituents and associated hazardous waste codes, data assembly and documentation requirements, data evaluation and adequacy decision criteria, and discrepancy resolution. The process must be mandatory, with clearly defined trigger points where sampling and analysis will be considered.

Response: See LANL's response to Comment No. 5 and associated changes in the revised WAP.

Adequacy of the Response: The response appears to be generally inadequate. The revisions do not include a definition of waste stream, specific requirements with respect to identification of hazardous constituents and hazardous waste, detailed documentation requirements (other than mention of inclusion of information in the record), detailed AK evaluation criteria, or adequacy decision criteria and discrepancy resolution (other than to imply that this may fall under the NCR process). The Permittees apparently advocate a case by case determination of adequacy, which is difficult to implement consistently and equally difficult to regulate.

WAP Section B.3.1.1.1 presents information on AK, but does not clearly indicate mandatory information and processes that will be followed, how AK will be assessed for usability, and when sampling and analysis will occur if AK is not of sufficient quality.

WAP Section B.3.1.1 states that there are certain circumstances where obtaining a representative sample for analysis may not be possible, but the WAP appears to make the blanket assumption that a representative sample will never be obtainable and therefore AK will be used to characterize waste. As stated in EPA guidance, sampling and analysis is the preferred methodology, and rather than assuming it is "impossible" to collect such information, the Permittees must provide clear justification for the use of AK rather than sampling analysis, and also criteria whereby the "acceptability" of AK will be established.

WAP Section B.3.1.2 states that sampling and analysis is "generally performed when a waste lacks sufficient process information to adequately characterize the waste based on acceptable knowledge." However, AK criteria to make such a determination are not presented in the WAP.

LIG 2.0 does not include the specific elements that would trigger sampling and analysis, and how Permittees will determine whether sampling and analysis alone, or sampling and analysis in combination with AK, will be used. LIG 2.0 does not discuss or reference the type of sampling that will take place or how that sampling will be determined. Also, while LIG 2.0 does attempt to establish an AK process, the procedures are not mandatory.

Response: See LANL's response to NMED's paragraph 3 of Comment No. 5.

Adequacy of Response: The response to the comment appears to be inadequate because the Permit was not revised to include the level of detail required by comment contents. While the Permittees did revise the Permit to more clearly designate the general process and responsible parties, the specific information requirements set forth in the comment were not specifically addressed.

LIG 2.0, Section 7.0, states the TSDF and/or ESH-19 should be contacted for a case-by-case determination of AK acceptability based on on-site waste acceptance criteria (WAC) and the Permit, but does not specify these criteria, nor does it include or reference sampling methodologies to be employed if AK is unacceptable.

The processes outlined in LIG 2.0 appear incomplete. For example, LIG 2.0 states that the TSDF and/or ESH-19 is responsible for case-by-case determinations of AK acceptability. Revise the WAP to include this procedure, replace the term "TSDF" with a better defined term, and specify the following:

- a. *whether every generator submits an AK analysis request to the facility or ESH-19;*

- b. *how the decision making responsibility is divided between the facility and ESH-19 and the appropriate authority determined;*
- c. *what specific decision-making criteria the facility and ESH-19 will follow;*
- d. *what information is considered mandatory to this determination;*
- e. *how the facility and ESH-19 will make their AK determination; and*
- f. *how the decision will be documented and reviewed.*

Response: "ESH-19" was not considered for these answers as the waste is sent through FWO-SWO personnel for transfer to TSDFs. If you take out the words "ESH-19," the remainder of the requirements (as they apply to TA-54, FWO-SWO) is met by LANL's response to paragraph 3 of NMED's Comment No. 5. Section B.3 of the WAP has been revised to address these issues.

Adequacy of Response: The response to the comment appears to be partially adequate. It is unclear whether each generator submits AK information (even if sampling and analysis is performed) as questioned in Item A, but the decision making responsibilities regarding AK documentation are well defined. However, the specific decision making criteria are not spelled out, and mandatory information is not clearly specified (although one could assume the B.3.1.1.1 listing is mandatory). Detailed information regarding "how" the FWO-SWO make their determinations is not provided, but AK information must be recorded on the "waste profiling document", with traceability to all AK sources and maintenance of support documentation in generator records.

The lists in LIG 2.0, Sections 7.4 and 10.0, are partially adequate with respect to AK documentation; the general process presented in Section 7.5 of LIG 2.0 does appear to capture many of the major AK elements that would be of concern, and is particularly good with respect to how AK documentation is referenced and retained, for example items 7, 8, and 9. Revise the WAP to include those procedures and to specify the following:

- a. *The type of information retained in the waste characterization record, for example summaries of AK information or copies of AK data;*
- b. *The mandatory use of existing sampling and analysis data in AK determinations, and the inclusion of that data in the AK record;*
- c. *Criteria for determining whether AK data are "accurate and relevant," and training provided to those examining the information.*

Response: For characterization, the list of examples from EPA guidance (EPA, 1994) is appropriate for the use of AK. This list is included in Section B.3.1.1 of the revised WAP, provided as Appendix C herein.

Please see LANL's response to Comment No. 9 regarding training.

Adequacy of Response: The response to the comment appears to be generally inadequate. The Permittees don't say whether a specific AK Summary will be provided, although they do indicate that AK documentation will be maintained. The Permittees do not specify whether assembly of AK analytical data will be mandatory, nor are criteria provided for determining whether AK data are accurate and relevant (apparently this will be determined on a case by case basis). With regard to training, the Permittees are required to ensure that adequate information is obtained for waste management at the TSDs, therefore the Permittees must have sufficient training to ensure that they adequately evaluate data obtained to fulfill this requirement (i.e. generator information).

LIG 2.0 lists examples stating that AK may be sufficient where F, K, P, and U listed wastes are generated because the physical and chemical makeup of the wastes are generally well known and consistent from one facility to another, when wastes are discarded commercial chemical products, when radiological health concerns preclude sampling, and when the physical form of the waste, for example heterogeneous waste, precludes sampling. These basic categorical listings could be made more complete by including specific chemical constituents in the wastes documented through existing laboratory sample analysis data or process knowledge.

DOP-26, Section 8.2, refers to LIG 402-720-01 for guidance for determining what is ALARA with regard to radiological characterization. Risk associated with the analysis of radioactive waste streams may justify using AK for their characterization. Because the justification affects the characterization of the hazardous component of the mixed waste, Permittees must provide in the WAP the method of characterizing the radioactive component of a waste stream and qualifying or quantifying radiological analytical risks used to justify the use of AK instead of sampling and analysis.

Response: No exact quantifying data for when radiological concerns may inhibit or prohibit sampling and analysis have been developed by the DOE, and there are too many radiological, physical, and chemical factors to address this comment completely. The use of AK for mixed waste will undergo the same reviews as non-mixed waste. The determination that the radioactive component of the waste precludes sampling and analysis will be made by reviewing the dose rate associated with the waste, the amount of radioactivity in the waste, the physical hazards associated with sampling that waste, and capabilities of analytical laboratories to handle a sample with that amount of radioactivity.

Adequacy of Response: The response to the comment appears to be adequate, but the Permit was not revised to reflect the statements presented in the comment response. The Permit should have been revised to indicate, at a minimum, that those radionuclides or radionuclide information necessary to differentiate between low level and TRU waste shall be acquired.

With respect to data assembly in LIG 2.0, Section 7.4, specify in the WAP how the "adequacy of the documentation based on criteria established by the final TSD" is determined.

Response: See LANL's response to NMED's paragraph 3 of Comment No. 5.

Adequacy of Response: The response to the comment appears to be inadequate because criteria for determining adequacy of AK documentation is not specified.

20. *(Comment 57) Revise as requested. The term "constituents" is defined in RCRA and will be defined in the Permit. "Component" has no certain meaning.*

Response: As stated in LANL's response to Comment No. 57 in the RSI Response submitted in November 2001, the term "constituents" has several meanings in RCRA. The various meanings include listed hazardous waste constituents in 20.4.1 NMAC, Subpart II, Part 261, Subpart D (and Appendix VII therein); contaminants in 20.4.1 NMAC, Subpart II, Part 261, Subpart C, Table 1; constituents listed in 20.4.1 NMAC, Subpart II, Part 261, Appendix VIII (as described in 20.4.1 NMAC, § 268.2(b); and hazardous constituent as used in 20.4.1 NMAC § 264.93 (which references Appendix VIII of 20.4.1 NMAC, Subpart II, Part 261).

LANL disagrees with HWB's suggested use of the term "constituent." LANL has not been provided with HWB's proposed definition of "constituent" to this point, but assumes that the definition would reflect specificity for the term. The fact that the term "component" has no certain meaning allows its use as defined in the WAP without adding another meaning to the term "constituent." Therefore, LANL has used the term "component" throughout the revised WAP to mean a discrete portion(s) of the waste. An example of the use of the term is to identify the hazardous component(s) of a mixed waste versus the radioactive component.

Adequacy of Response: The response to the comment appears to be inadequate because the word "component" was retained. As written, this allows tremendous latitude in the characterization process (characterizing a "component" could mean anything, including simply the physical state of the material, and no more). It is suggested that NMED provide the definition of the term "constituent" to the Permittees in the specific context of the Permit.

21. *(Comment 58) Revise as requested. "VOCs, SVOCs, and metals" does not include all RCRA constituents, for example cyanides. The TRU Waste Certification Plan is not part of the Permit, and may not fulfill all RCRA requirements.*

Response: LANL has deleted the text "(i.e., VOCs, SVOCs, and metals)" from the referenced text, and has replaced the word "constituents" with "components" (see LANL's response to Comment No. 20).

Adequacy of Response: The response to the comment appears to be inadequate because use of the term “components” is insufficient and NMED’s intended change was to require more specificity with regard to analysis/identification. The use of the term “components” should be evaluated by NMED on a case-by-case basis as presented in the Permit.

22. *(Comment 59) Revise as requested. Revise the WAP to address waste analysis requirements for TRU mixed waste in addition to requirements for waste to be disposed of at WIPP. Waste characterization by generators and to comply with storage requirements may be required by RCRA in addition to requirements imposed by disposal facilities accepting waste. The requested revision does not change the characterization process for waste destined for WIPP, but does allow the option of sampling and analysis characterization if AK information is not sufficient to meet RCRA standards.*

Response: A new Section B.3.2.2 has been added to the revised WAP to address waste analysis requirements for MTRUW not destined for WIPP. The revised WAP is included herein as Appendix C.

Adequacy of Response: The response to the comment appears adequate in that non-WIPP MTRUW will apparently be characterized in the same manner as MTRUW intended for WIPP, although ultimate disposition of the waste is pending.

23. *(Comment 60) Revise as requested. The intent of the comment was to revise the WAP to specify the obligation to review historical sampling and analysis results as part of the AK program. The Permittees’ proposed revision does not make this explicit commitment. The Permittees’ AK record and AK program must include the mandatory consideration of existing sampling and analysis data, if such data are available.*

Response: As stated in LANL’s response to Comment No. 60 in the RSI Response submitted in November 2001, the second bullet in the referenced section states “Procedures to evaluate acceptable knowledge information and to resolve discrepancies in documentation.” The evaluation of AK includes a review of process knowledge and historical sampling and analysis results. In the revised WAP included herein as Appendix C, the text in the second bullet has been revised to read “Procedures to evaluate acceptable knowledge information (e.g., reviewing process knowledge and historical sampling and analysis results) and to resolve discrepancies in documentation.” This demonstrates LANL’s commitment to include reviewing process knowledge and historical sampling and analysis results.

Adequacy of Response: The response to the comment appears to be inadequate. While attempting to demonstrate the Permittees’ commitment to adequate AK data assembly, the revised Permit does not address the question posed by NMED. The Permittees should have committed to specifically collect historic analytical data, and to evaluate this data in the context of other information to obtain the AK waste characterization results.

24. *(Comment 63) The Permittees' response is partially adequate. NMED's intent was to remove the statistical basis for sampling of homogenous, treated TRU mixed waste. Statistically based sampling may be appropriate for wastes generated under controlled processes, but the Permittees' proposed revision does not address how waste generated outside of the controlled process will be sampled. Include the proposed revision in the revised WAP and revise to address how sampling will take place for those treated wastes that are generated via uncontrolled processes.*

Response: Sampling and analysis procedures for cementation and vitrification are included in Section B.3.2.3 of the revised WAP, included herein as Appendix C.

Adequacy of Response: The response appears to be partially adequate because the virtrified and cemented wastes are intended for disposal at WIPP and must therefore meet WIPP-Permit sampling and analysis requirements. However, the description could better cross reference WIPP-related sampling and analysis included in the LANL WAP. Also, the comment infers that NMED is concerned about other non-treated wastes generated outside of a controlled process, but the response does not address these wastes.

25. *(Comment 64) Revise as requested. "Metals, VOCs, and SVOCs" do not include all RCRA constituents, for example cyanides. The TRU Waste Certification Plan specifies waste characterization requirements for shipment to WIPP, is not part of the Permit, and may not fulfill RCRA requirements. The Certification Plan is separate from the Permit, and the Permit will be based on RCRA-requirements, not consistency with an unrelated internal plan. WIPP does not accept liquid waste, and therefore WIPP Waste Analysis is not applicable to this waste form.*

Response: In the revised WAP included herein as Appendix C, the phrase "total metal content, VOCs, and SVOCs" has been replaced with "the hazardous components of the waste stream." See LANL's response to Comment No. 20.

It should also be noted that the references to WIPP-derived characterization documentation was expressly included in previous versions of the WAP in order to meet earlier NMED concerns regarding the documentation of waste characterization procedures for WIPP-destined MTRUW. This was first suggested in the "Notice of Deficiency: Technical Adequacy Review of Los Alamos National Laboratory RCRA Waste Analysis Plan, Rev. 0.0," issued by the NMED on May 24, 1996. A revised WAP responsive to Comment No. 2 of that NOD was submitted to the NMED on June 26, 1996, incorporating references to the WIPP TRU Waste Certification Plan in order to provide the requested level of detail for waste characterized for the WIPP Program.

The liquid MTRUW waste discussed in the referenced paragraph is treated by cementation or vitrification to form a treated waste in solid form. After treatment, the waste is acceptable for receipt at WIPP. Any other form of liquid MTRUW that will be

generated at LANL but not subsequently managed at WIPP will be characterized in the manner described in Section B.3.2.2 of the revised WAP.

Adequacy of Response: See response to Comment No. 20. In addition, the request to include WIPP-related requirements was made a full three years before the final Permit was issued, and significant changes to the WIPP Part B occurred since that time (1996).

26. *(Comment 65) Revise as requested. "Metals, VOCs, and SVOCs" do not include all RCRA constituents, for example cyanides. The TRU Waste Certification Plan specifies waste characterization requirements for shipment to WIPP, is not part of the Permit, and may not fulfill RCRA requirements. The Certification Plan is separate from the Permit, and the Permit will be based on RCRA-requirements, not consistency with an unrelated internal plan. WIPP does not accept liquid waste, and therefore WIPP Waste Analysis is not applicable to all mixed TRU waste.*

Response: In the revised WAP included herein as Appendix C, the phrase “analyze mixed TRU waste samples for RCRA-regulated hazardous constituents (VOCs, SVOCs, and metals) and characteristics, according to SW-846 or documented and approved equivalent methods” has been replaced with “be used for the required analyses.” See LANL’s response to Comment No. 20.

Adequacy of Response: See Response to Comment No. 20. The suggested language change appears to be adequate so long as the removed information (i.e. that LANL will analyze samples using SW-846 or documented and approved equivalent methods) is presented elsewhere in the WAP.

27. *(Comment 66) Revise as requested. NMED requires that alternative methods be reviewed and approved by NMED prior to use. The Permittees’ response to NMED’s comment is inadequate. NMED’s intent is to allow NMED review of alternative methods prior to site use. RCRA does not mandate the spectrum of analysis methods that must be performed, and EPA and authorized states can and do regulate non-SW-846 methods that are included in Permits.*

Response: As stated in LANL’s response to Comment No. 66 in the RSI Response submitted in November 2001, LANL does not believe that inserting the phrase “acceptable to NMED” after “equivalent methods” in the referenced text is necessary because other analytical methods may be used for waste characterization by AK, and LANL will seek concurrence on the use of alternative or equivalent methods. The requirement to receive approval from the Secretary of the NMED for equivalent testing or analytical methods in accordance with 20.4.1 NMAC § 260.21 is limited to methods specified in 20.4.1 NMAC, Subparts II, V, and VI, Parts 261, 264, and 265. Because of the diverse nature of waste streams generated through research at LANL, the use of alternative methods to produce information for waste characterization through AK or the use of methods not directly specified in the regulations may be required. The review and

approval of such alternative methods is routinely subject to certification by the relevant industries. As stated in LANL's response to Comment No. 66 in the RSI Response submitted in November 2001, this approach is consistent with Section 2.4.2 in EPA's 1994 WAP guidance document.

Adequacy of Response: The response to the comment is appears to be inadequate because the requested language change was not made. While LANL believes the change to be unnecessary because "LANL will seek concurrence on the use of alternative or equivalent methods", without explicit statements that this concurrence/approval shall be obtained, there is no enforceable requirement mandating approval and LANL could therefore use any procedure/method they deem appropriate without NMED concurrence.

28. *(Comment 67 and 69) Revise as requested. Method 8330 does not include all HE components.*

Response: As indicated in LANL's response to Comment No. 67 in the RSI Response submitted in November 2001, replacing "Method 8330" in the fourth bullet of the referenced text with "Method 8300 series" is not the best choice of terminology because the Method 8300 series includes many methods *not* used for HE analysis. In the revised WAP included herein as Appendix C, the sentence "This is usually done by High Performance Liquid Chromatography; *SW-846* Method 8330" has been replaced with "This is usually done using the appropriate analytical method from the *SW-846* Method 8300 series." The item "(8330)" in Table B-17 (now Table B-13), to which Comment No. 69 in the RSI issued by the HWB in June 2001 refers, has also been changed to "(Appropriate analytical method from the Method 8300 series)."

Adequacy of Response: The response to the comment appears adequate.

ADDITIONAL COMMENTS ON WASTE ANALYSIS PLAN

Sampling Methods

51. *Revise the WAP to include more specific information regarding potential sampling methodologies, how sample locations will be selected, and selection of representative samples. Revise the WAP to include specific sampling techniques used for the different waste descriptions and specifying how a representative sample will be obtained, type of samples collected, sampling device, frequency, sample selection, and quality assurance.*

WAP Sections B.3.1.2.1 and B.3.1.2.2 provide a very general discussion of solid and liquid sampling, but include no specific information regarding sampling methodology, sample location, and selection of representative samples. While SW-846 and ASTM are referenced, the WAP must include more detailed information specific to the waste encountered to ensure that the Permittees have a sufficient understanding of the sampling methodologies and a strategy in place to perform the necessary sampling

and analysis. EPA 1994 guidance provides several examples of WAP's, which clearly demonstrate the need for inclusion of this information.

Revise the WAP to address determination of sample analyses based on available sample size and process knowledge, rather than to state that all one gallon or less "unknown" samples will undergo minimal analyses. WAP Section B.3.1 states that "occasionally, chemicals of an unknown nature require disposal." The Permittees state that such waste will be "tentatively" characterized by knowledge of operations and activities that were performed in the specific area in which the waste was generated, and that liquids less than one gallon will be analyzed only for pH, flash point, and reactivity, because full analysis of less than one gallon of a liquid cannot be performed. NMED does not agree with this assertion. At least some additional analyses can be performed. For example, chemical analysis of liquids for SVOC's requires a minimum of one liter of sample, VOC's require a minimum of 40 milliliters, and metals require a minimum of 100 milliliters. Additionally, EPA/NRC 1997 guidance recommends the use of less than 100 gram samples of mixed waste to reduce personnel exposure to radioactivity.

Response: Detailed instructions for conducting the TCLP waste analysis method are found in *SW-846*, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," and are incorporated by reference into 40 CFR 261, Appendices II and III. Also listed in *SW-846* is the appropriate analytical method for each hazardous constituent required to determine if the waste contains a contaminant in excess of the maximum contaminant concentration regulated under 40 CFR 261. The TCLP itself is a method for leaching hazardous constituents from the solid portion of the waste and is used only if the solids constitute more than 0.5% of the waste by weight. The laboratory can also forego extraction if: 1) total waste analysis of the waste shows the concentrations of the analytes are so low, an extract of the waste could not contain analytes at concentrations above the regulatory limits; or 2) analysis of any liquid portion of the waste contains such high concentrations of hazardous constituents that, even accounting for dilution, the entire sample would be hazardous.

Appendix III of 40 CFR 261 provides references which list actual chemical analytical methods used to determine the concentrations of hazardous constituents in the liquid and solid fractions and extracts of waste samples. All the methods are fully described in *SW-846*. These and other approved methods will be used in order for analytical results to be considered valid in determining whether a waste stream is hazardous. Samples will not be analyzed for all listed hazardous constituents, only those that are most likely to be present based on the source of the waste stream. Typically these constituents are documented through the preparation of a Sampling and Analysis Plan.

Many laboratories will provide sample containers and specify required minimal volumes for individual waste types or physical states. The most important determinants of sampling method and volume are the physical state of the waste (liquid, solid, sludge), the waste container (drum, tank, pile), accessibility, waste variability, and safety concerns. Detailed sampling recommendations and guidance are provided in *SW-846*, Chapter 9. For solids, 500 grams in a glass container is usually adequate. Liquid sample

volumes vary from one liter to approximately eight liters, depending on the number of analysis parameters and solids content. Sample jars containing volatile compounds must be completely filled to minimize volatilization of contaminants from the liquid into the “head space.”

Sampling is performed with a device appropriate for the waste being sampled. Weighted bottles or composite liquid waste samples (coliwesas) are appropriate for sampling liquids in drums, pits, or tanks. Augers, triers, and shovels are useful for sampling solid wastes in piles, containers, or other locations.

The aim of the sampling method is to obtain a sample or samples representative of the waste stream. The facility must use an understanding of the waste generating and handling process to ensure samples are representative. Some wastes separate into distinct layers with time, and representative samples must include aliquots from each layer. In some cases, it may be important to use a statistical or random sampling scheme that provides for the collection of representative samples.

A number of criteria must be considered in determining how many samples are required, how locations are selected, and how frequently sampling should be repeated. If a facility generates a highly uniform waste stream from a single process location, one sample collected annually is sufficient. However, if a single waste stream is a mixture of materials generated in several locations under varying conditions through time, more samples will be required, and composite sampling may be appropriate. At a minimum, the sampling must be repeated if the waste generating process changes in a material way, or if inspection of the waste reveals it has changed.

Appendix I of 40 CFR 261 provides a list of specific guidance documents that detail sampling protocols for different waste types. Waste samples collected in accordance with these protocols are considered representative by the EPA. The protocols include standards developed by the ASTM and portions of *SW-846*.

Section B.3.1.2 of the WAP included herein as Appendix has been revised to include the information presented above.

The use of the one-gallon analytical limit for unknown wastes is set by precedent as a Permit condition from the 1989 Hazardous Waste Facility Permit. Unknown wastes at the Laboratory commonly involve volumes much smaller than one gallon. The language in the WAP regarding the analytical procedures for small volumes of unknown wastes also states that small volumes are “typically analyzed for pH, flash point, and reactivity” rather than “only” so analyzed, as stated in this comment. Unknown waste collection and characterization projects at LANL have also utilized the Haztech Systems, Inc. HAZCAT[®] Chemical Identification System. The system is a series of screening tests for metals, organic compounds, inorganic compounds, and physical characteristics (i.e., oxidizers, acids, bases, solubility) that can be used to provide additional characterization information for waste management purposes. The system minimizes the amount of material needed for sampling by utilizing simple observations and tests (copper wire

flame test, colorimetric screens, water solubility tests) and testing flowcharts to determine probable chemical groups contained in the sample. Users of this screening test are trained to perform the tests correctly. The results of the screening procedures are included in waste profiling documentation and subject to review to meet the TA-54 WAC for subsequent management.

Adequacy of Response: The response itself is partially adequate, as some of the information presented above was added to the Permit. However, better reference to specific sampling devices, sample selection strategies, etc. could have been included. Additionally, TLI cannot comment on the precedent set in the previous 1989 Permit concerning the analytical suites for “unknown”, small volume samples; it is recommended that NMED revisit this 1989 requirement for context and justification. Note that the Permittees also state that Sampling and Analysis Plans are “typically” prepared, which presumably document the sampling strategy, analytical suites, etc., for a given waste or waste stream.

Treatment

52. *Revise the WAP to include compliance with all waste analysis requirements for all treatment at the Facility. The WAP in the General Application must specifically address all requirements under 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.13) for the Facility as a whole. The WAP with specific procedures for treatment must include the required detailed chemical and physical analysis of a representative sample of wastes being treated and all the information required to treat the waste for OB, OD, cementation, vitrification, and all other treatment at the Facility, to comply with 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.13) and 20.4.1.800 NMAC (incorporating 40 C.F.R. § 268.7(b)).*

Revise the WAP to specify what is the purpose of treatment by stabilization for all treated waste, for example de-characterizing the waste, attaining LDR treatment standards, or removing free liquids for disposal at WIPP or for LANL waste management purposes. Waste analysis must demonstrate treatment success. WAP Section B.1.3 states that mixed TRU waste is treated by cementation to stabilize the waste for storage and to meet the WIPP waste acceptance criteria. The WAP for cementation and vitrification included with the TA-55 specific Part B Application states that mixed TRU waste may be analyzed for toxicity characteristic metals utilizing the Toxicity Characteristic Leaching Procedure (TCLP) to confirm successful treatment and to confirm that the waste is no longer hazardous.

Response: The WAP has been revised to include the cementation and vitrification processes that were originally contained in the TA-55 Permit application.

Adequacy of Response: The response appears to be adequate, as vitrification and cementation discussions were added to the text of the Permit. The added information

does not explicitly address LDR treatment standards (or reference the reader to applicable sections), but does state that TCLP shall be performed to confirm successful treatment.

Off-Site Waste

53. *Revise the WAP to specify all waste analysis requirements for receipt of off-site wastes. The discussion in Section B.4 and Table B-8 are incomplete because they do not present information about off-site wastes to be received at the Facility. The Application indicates that some sort of plan is to be developed for the acceptance and management of off-site wastes. This information must be included with the Application for receipt of off-site waste to be authorized under the Permit. The WAP must address all requirements in 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.13), including the potential need to sample and analyze each waste stream and waste stream fingerprint analysis. If Permittees are to rely on off-site AK to provide sufficient characterization information, the WAP must reflect how the Permittees will obtain and evaluate AK information from an off-site source, AK sufficiency criteria, how waste will be managed and characterized if sufficient AK is not available, when data analysis will occur, for example before or after shipment, and all other necessary considerations to ensure that only waste that is appropriately characterized is accepted at the Facility. The WAP must also specify what is done with waste after receipt from an off-site source, for example length of storage (more or less than 90 days). All waste accepted from off-site will ultimately be subject to the same management as on-site generated waste, and must therefore meet all WAP criteria.*

Application Supplement 6, Off-Site Waste Information, states that Sandia National Laboratory will be sending mixed TRU waste to LANL for further waste certification and preparation for subsequent transport to WIPP. Supplement 6 further states that the mixed TRU wastes will utilize LANL's "capacity to confirm the hazardous component of the wastes."

Revise the WAP to specify how this confirmation will take place, including, if accurate, reference to the sampling and analysis of homogeneous TRU wastes in accordance with WIPP requirements in WAP Section 3.2. Submit an explanation of why ALARA concerns justify AK for non-WIPP mixed wastes, if Permittees can sample and analyze mixed TRU wastes bound for WIPP.

WAP Section B.5.3 addresses LDR standards for waste received at the Facility from off-site. Revise the WAP to provide an explanation of the intention of this provision, for example compliance with storage prohibitions under 20.4.1.500 NMAC (incorporating 40 C.F.R. § 268.50), when on-site disposal of hazardous waste is not authorized.

Response: LANL agrees that all wastes accepted from off site are subject to the same management as on-site generated waste and, therefore, meet all WAP criteria. Section B.4 was written in general terms because the sites from which wastes will be received

have not yet been identified. The information regarding Sandia National Laboratory MTRUW was provided to indicate that the waste would be subject to the LANL MTRUW characterization program for certification prior to subsequent disposal at WIPP. Regarding characterization of non-WIPP mixed waste, please see LANL's response to Comment No. 19. Section B.5.3 of the WAP has been revised to address the issues in the final paragraph of this comment.

See LANL's response to Comment No. 6.

Adequacy of Response: See response to Comment No.s 19 and 6. In addition, the response to the comment appears to be generally inadequate, even though some of the general LDR questions were addressed in Section B.5.3. The specific issues raised in the comment concerning acceptance of off-site waste were not addressed by the Permittees via changes to the Permit, although the Permittees do recognize that off-site waste must meet WAP requirements.

54. *Revise the WAP to include waste characterization requirements for determining the presence of free liquids.*

Response: Sections B.3.1 and B.3.2 of the WAP have been revised to address this issue. The following information has been added, where appropriate:

Information regarding the presence of free liquids in containers of hazardous waste and MLLW is obtained through generator waste-characterization knowledge, visual examinations, and/or the Paint Filter Liquids Test. MTRUW destined for storage at Area G must meet the following waste acceptance criteria for free liquids: 1) no more than two liters of liquid in a 55-gallon drum; 2) no more than eight liters of liquid in an SWB; and 3) no more than one inch of liquid in the bottom of any container. Waste generators are required to participate in a certification program that documents how the generators ensure that the above criteria are met. Compliance with this requirement is verified through real-time radiography.

Adequacy of Response: The response to the comment appears to be adequate, assuming that the added statements were included in all necessary locations.

55. *Table B-2 is incomplete with respect to waste descriptions. For example, contaminated solid wastes should specify that these include debris waste. Revise Table B-2 to include a more specific waste description where it is not currently included. This is required to understand the proposed basis for characterization and to ensure that the processes generating wastes, resulting wastes, and proposed characterization processes correlate and are appropriate. Revise the WAP Table B-2 to specify the TA where each waste type is generated.*

Response: Debris waste was included on page 7 of Table B-2. Waste descriptions for each entry in the "Waste Description" column of Table B-2 were provided in Section

B.1.2 of the WAP. LANL research activities are numerous and diverse. As a result of these activities, there is the potential for wastes to be generated at any TA location. Therefore, LANL believes that specifying the TAs where each waste type is and will be generated is unnecessarily limiting.

Adequacy of Response: The response to the comment appears to be partially adequate. While it is recognized that the text of the Permit includes descriptions of wastes, inclusion of this information on the table in an abbreviated sense would have facilitated review of the proposed characterization process in the context of the type of waste being characterized. Additionally, the Permittees say that any of these wastes could be generated at any TA, but descriptions within the text imply that this is not the case at least for some of the waste. Additional discussion in the table—even as footnotes explaining the relationship of wastes to Technical Areas--- would have been helpful.

56. *Revise the WAP to include a definition of homogenous and heterogeneous waste, and to ensure that the WAP consistently uses the terminology. The distinction between heterogeneous and homogenous waste should indicate whether the heterogeneous or homogenous waste is comprised of liquid, soil, sludge, or debris waste. NMED interpreted the homogenous and heterogeneous nature of waste to be based on physical characteristics, meaning that there may be homogenous debris waste comprised of all metals, and homogenous sludges comprised of all sludges. However, the WAP is inconsistent. For example, the paint and related waste category on Table B-9 implies that all waste would be liquid in nature, but the discussion at page B-4 indicates that the waste is either heterogeneous or homogenous, implying that this designation would be made based on the chemical composition, not physical characteristics, of the waste. This is important because the inference is that homogenous waste can be sampled and heterogeneous waste is not amenable to sampling, but that may not be the case if, for example, a liquid is considered heterogeneous based on chemical composition.*

Response: Homogeneous waste is defined as waste that contains only one material or substance or waste that has its components mixed so that consistent samples can be drawn throughout. Homogeneous waste streams are either solids or liquids. Heterogeneous waste is defined as waste that contains multiple components that are separate because of density or specific gravity, are located in different places within the mixture, or are discrete and different articles. Sludges and debris are typically heterogeneous.

The distinction between homogeneous and heterogeneous waste has been removed from the waste stream descriptions in the revised WAP in order to alleviate the discrepancies referred to in this comment.

Adequacy of Response: The response to the comment is partially adequate. The Permittees attempted to better distinguish between homogenous and heterogeneous wastes, but the discussion is still confusing in that a “heterogeneous” waste could include, for example, a sludge that is not completely “blended”; as per the WAP, this

waste would not be subject to sampling even though sampling could probably be done. Contrarily, the Permit also implies that homogenous waste will be sampled, but homogenous waste includes items such as lead bricks that are homogenous but probably aren't amenable to sampling. Also, it does not appear that all uses of the terms "homogenous" and "heterogeneous" were examined and removed (as necessary). In short, while an attempt was made to clarify the use of the terms heterogeneous and homogenous, the Permittees changes actually created confusion. Each use of the terms should be examined in the context of the Permittees definitions to ensure that NMED agrees with the resulting impacts on characterization.

57. *WAP Section B.2.1 presents the listing of "analytical parameters and methods" that may be used, and references Tables B-9 through B-12 for additional information. Table B-14 lists characterization methods; however, the language throughout implies that the listed parameters and analytical methods are only examples of parameters, analytes, and methods that may be used. Revise the WAP to include all characterization methods.*

Response: As indicated in LANL's response to Comment No. 5, the WAP has been revised to replace the discretionary terms (e.g., "may") with mandatory terms (e.g., "will").

Adequacy of Response: The response to the comment appears adequate, in that many discretionary terms have, indeed, been changed. However, NMED should carefully examine those instances where the terms were retained to ensure appropriateness. Additionally, TLI did not receive Tables B-11- B-20, so revisions to these tables could not be assessed.

58. *Revise the WAP to ensure consistency and completeness between different tables and between tables and text. Section B.2.1 states that Tables B-9 through B-12 present analytical parameters and characterization methods that may be used for hazardous, low-level, mixed TRU and He and HE-contaminated wastes generated at LANL. The Permittees also state that some or all of a listing presented in Section B.2.1 will be used to determine the regulatory status of wastes (i.e. AK, sampling and analysis, headspace gas/physical form, flashpoint, pH, and "additional characterization data"). However, comparison of the listings presented in Tables B-9 through B-12 and these tables indicate that some parameters on the listings are not reflected in the individual parameter discussion (although they may be discussed in the rationale section). Not all hazardous wastes presented in Tables B-2 through B- 7 are represented in Tables B-9 through B-12. Revise the WAP so that all hazardous wastes and parameters presented in Section B.2.1 and Tables B-2 through B-7 are represented in Tables B-9 through B-12.*

WAP Section B.2.2 and the referenced Tables, together, do not always clearly explain the rationale for parameter selection. For example, Table B-10 states that the parameter of interest for Noncombustible Debris is RCRA-regulated metals, but it is unclear how this will assess reactivity, which is included in the Table as a rationale for

the parameter selection. Also, the referenced Tables do not address the sampling method, sample frequency, and sample selection.

Response: The WAP tables have been reviewed and revised for consistency.

Adequacy of Response: TLI was not provided all tables, so comparison of tables to text could not be performed.

59. *Delete or explain the statement in WAP Section B.3.2 that characterization by process knowledge is "suitable for safe storage" of mixed TRU waste.*

Response: The verbiage "which is suitable for safe storage of these waste streams" has been deleted from this sentence in Section B.3.2 of the WAP. The revised WAP is included herein as Appendix C.

Adequacy of Response: The response to the comment appears adequate.

60. *Clarify whether untreated HE undergoes sampling and analysis, as this Section implies that this characterization does not occur. While Tables B-17 and B-18 presents sampling methods, but does not address sampling frequency, sampling methodology, and sample selection as required.*

Response: As explained in Section B.3.3 (now Section B.3.1), low concentration untreated HE waste and HE-contaminated waste are characterized by process knowledge, screening methods, visual examination, and/or sampling and analysis to determine if the waste is detonable. The screening methods include the DX-2 Spot Test or DeTech methods. Visual examination is conducted on heterogeneous waste only. Sampling and analysis may be conducted on homogeneous wastes only to determine if the waste is likely to be reactive and require treatment.

Low concentration, untreated, homogeneous HE waste and HE-contaminated waste are characterized by sampling and analysis only when the characterization data are needed to determine if the waste is reactive. In these circumstances, sampling and analysis is done on a case-by-case basis. Characterization of the ash generated by open burning is conducted on all ash residues. Therefore, Tables B-17 and B-18 (now Tables B-13 and B-14) have not been revised to address sampling frequency.

Sampling methodology is described in Sections B.3.1.2.1 and B.3.1.2.2. These sections also inform the reader that the sampling protocol, including sample selection, is based on sampling methods approved by EPA for solid waste and soil sampling in *SW-846*, as well as methods approved by the ASTM. Therefore, Tables B-17 and B-18 (now Tables B-13 and B-14) have not been revised to address sample selection.

Adequacy of Response: The response to the comment is partially adequate in that the Permittees do point to sections of the text that explain which HE wastes undergo sampling and analysis. However, the text is not as detailed as the explanation in the

response to comments, and the text referenced for sampling methodology lacks detail (see Comment No.51).

61. *Revise the WAP to specify that the Permittees will comply with all accepting facility requirements for meeting LDR standards when shipping hazardous waste off-site for disposal.*

Response: TA-54 procedures require that the waste stream manager reviews the LDRs as they relate to the off-site shipment and to the disposal of the waste stream. Part of this review includes evaluating the waste stream for UHCs and Universal Treatment Standards (UTS) and documenting the results of the evaluation as part of the certification process. UHCs must be declared on D001 through D043 waste streams. Finally, an LDR form is completed and accompanies the Uniform Hazardous Waste Manifest as part of the shipping documentation to the TSDF. HE waste residues from OB are considered newly-generated wastes; therefore, a waste profiling document is prepared, which includes the identification of UHCs.

Adequacy of Response: The response to the comment appears adequate because the redlined text, above, has been added to Section B.5.3.

62. *A Federal Facility Compliance Order (FFCO) issued by NMED to Permittees on October 4, 1995, exempts mixed waste storage at LANL from LDR storage time limits under 20.4.1.800 NMAC (incorporating 40 C.F.R. § 268.50), if Permittees have in place and are in compliance with a Site Treatment Plan (STP) for storage and treatment of mixed waste. The exemption applies to mixed waste listed in the STP. The FFCO allows LANL to avoid the 20.4.1.800 NMAC (incorporating 40 C.F.R. §§ 268.7 and 268.50) waste testing or analysis requirements for the wastes listed in the STP. The FFCO has significant impact on waste analysis requirements for the Permittees, yet is insufficiently addressed in the WAP. Revise the WAP to address the FFCO, the STP, and their effect on waste analysis requirements.*

Response: The FFCO issued by NMED exempts mixed waste storage at LANL from LDR storage time limits under 20.4.1.800 NMAC if Permittees have in place and are in compliance with a Site Treatment Plan (STP). Regardless of the FFCO exemption, LANL, as a generator of solid waste, must still adequately characterize waste to determine whether it is hazardous or not. FWO-SWO has a procedure by which the waste stream manager certifies MLLW for off-site treatment or disposal. If, during the process of preparing a waste stream for off-site shipment, the waste stream manager does not have sufficient information to profile the waste, then sampling and analysis is performed to obtain the required information. The FFCO and STP have no effect on waste analysis requirements because if FWO-SWO doesn't have all the information necessary to ship waste off-site for treatment and/or disposal, they must obtain it before the waste stream can be approved by an off-site facility.

Adequacy of Response: The response to the comment appears adequate because the redlined text, above, has been added to Section B.5.3.

63. *Revise the WAP to specify where WAP records, required by 20.4.1.500 NMAC (incorporating 40 C.F.R. § 264.73(b)(3)), are stored and that those records shall be made available to NMED upon request. LIR 2.3, General Waste Management Requirements, Section 5.5.3, provides that the Hazardous and Solid Waste Group (ESH-19) will maintain these records. LIG 2.0, Section 8.0, provides that these records will be kept by the generator for a period of three years and by the TSD unit for the life of the unit. The WAP does not address this issue.*

Response: LIR 404-00-02.3 (as included in the November 2001 response) states that the Hazardous and Solid Waste Group (ESH-19, now referred to as SWRC) shall “maintain required records and data.” This requirement was not intended to be inclusive of all record-keeping at LANL. Record-keeping requirements for specific waste management organizations are spelled out in other LIRs and LIGs. Section 8.0 of LIG 404-00-02.0 (as included in the November 2001 response) was intended to describe the process by which generators will archive AK documentation beyond the three years required by 20.4.1 NMAC § 262.40(c). The generators’ waste characterization records included with the TSD’s waste acceptance and shipping documentation become part of the operating record upon receipt of the waste at FWO/SWO’s Records Management and Document Control. Sections B.3 and B.3.1.1.2 of the WAP has been revised to address the issue raised in this comment. The revised WAP is included herein as Appendix C.

Adequacy of Response: The response to the comment appears adequate, assuming that NMED meant the comment to apply only to AK records.

64. *Provide an explanation of why Waste Profile Forms (WPF) are listed in WAP Section 8.2 as documents required of the generators, yet Section 8.3 says that the storage facility will not “usually need” the WPF.*

Response: There are no Sections 8.2 and 8.3 in the WAP. All WAP sections begin with a “B”, and there is no discussion of Waste Profile Forms in Sections B.2 and B.3 of the WAP. An electronic search of the words “WPF,” “waste profile,” “generator,” and “usually need” was conducted on the WAP. The terms “WPF,” “waste profile,” and “usually need” were not found. The term “generator” is used several times; however, its use is not found with any text discussing waste profiles and/or WPFs. Therefore, LANL cannot respond to the issue raised in this comment.

Adequacy of Response: It appears that the comment did not adequately specify the document that contains the disparate information regarding provision of WPFs. NMED should identify the document and resubmit the question to the Permittees because the issue raised has merit; the Permittees must clarify the circumstances under which a WPF is submitted.

ADDITIONAL OTHER COMMENTS

65. *(Comments 50, 54, and 58) Add to the list of parameters "RCRA characteristics of hazardous waste under 40 C.F.R. Part 261, Subpart C" and delete "reactivity."*

Response: See LANL's responses to Comment Nos. 15 and 21.

Adequacy of Response: See response to Comment Nos. 15 and 21.