Department of Energy
Albuquerque Operations Office
Waste Isolation Pilot Plant Project Office
P. O. Box 3090
Carlsbad, New Mexico 88221

NOV 25 1992

Ms. Judith Espinosa, Secretary
New Mexico Environment Department
P. O. Box 26110
Santa Fe, NM 87502

Dear Secretary Espinosa:

We are pleased to respond to your comments and questions on the subject plan sent by the New Mexico Environment Department letter dated April 28, 1992. The Waste Acceptance Criteria Certification Committee coordinated the disposition of your comments with Lawrence Livermore National Laboratory.

The disposition of your comments is attached. If you need further clarification please contact Mr. Les Gage of my staff at (505) 845-5389.

Sincerely,

W. John Arthur, III
Project Director
WIPP Project Integration Office

Enclosure

cc w/o enclosure:
H. J. Davis, WPSO

cc w/enclosure:
K. A. Griffith, OCC, AL
WACCC File (2)
C&C File (2)

RESPONSE TO THE NEW MEXICO ENVIRONMENT DEPARTMENT COMMENTS ON THE LLNL TRU WASTE CERTIFICATION AND QUALITY ASSURANCE PLAN, M-078-121, REVISION 1

WASTE CONTAINER AND PACKAGE

1. The TRUPACT-II SARP (No-Migration: DOE/WIPP 89-003) and some LLNL procedures require that waste packages be double bagged and sealed with a twist-and-tape "horsetail". The Certification Quality Assurance Plan (CQAP) does not describe this "routine bag-out procedure" in WAC compliance section 7.5.1, and some observations during the 9/91 audit indicate this method is not routinely followed. Such procedures should become a part of the plan.

   LLNL Response

   We agree that the TRUPACT-II SARP requires twist-and-tape or fold-and-tape horsetail seals, but it does not require double bagging or any particular number of confinement layers. Some LLNL procedures do require double bagging, and this method is used for most LLNL waste forms. However, no confinement layers are used around the metal scrap of Waste Form 3.

   We agree that the packaging of waste parcels, which usually means the bag out method, should be specified in the CQAP. We will do this in the sections describing each waste form, as follows. However, we refer to the procedures already in place in each waste generating facility.

   We will amend §7.1.1, describing Waste Form 1, by adding a paragraph after the existing first paragraph, as follows:

   In the Plutonium Facility (B. 332), waste is bagged out, i.e., it is removed from a glove box in a plastic bag as specified in the Building 332 Facility Safety Procedure, Appendix E-3, and in the B. 332 Hazards Control Book. This requires a twist-and-tape horsetail seal (or seals) to the bag and placement in a second bag that is similarly sealed.

   In the Heavy Element Facility (B. 251), waste is removed from a glove box as specified in the Facility Handbook, Appendix F 1.0 and F 1.1. The waste is put into a container while still in the glove box. This container, usually a paper "ice cream" carton, is then placed into a half-gallon paper "ice cream" carton at the glove box port. This second carton is taped shut. Up to four of these are placed in a single plastic bag that is sealed with the fold-and-tape method.

   We will amend §7.2.1., describing Waste Form 2, by adding a paragraph at the end of the section, as follows:

   In the Plutonium Facility (B. 332), solidified liquid waste is bagged out, i.e., it is removed from a glove box in a plastic bag as specified in the Building 332 Facility Safety Procedure, Appendix E-3, and in the

B. 332 Hazards Control Book. This requires a twist-and-tape horsetail seal (or seals) to the bag and placement in a second bag that is similarly sealed.

In the Heavy Element Facility (B. 251), solidified liquid waste is removed from a glove box as specified in the Facility Handbook, Appendix F 1.0 and F 1.1. The waste is put into a container while still in the glove box. This container, usually a paper "ice cream" carton, is then placed into a half-gallon paper "ice cream" carton at the glove box port. This second carton is taped shut. Up to four of these are placed in a single plastic bag that is sealed with the fold-and-tape method.

We will amend §7.3.1., describing Waste Form 3, by adding a paragraph at the end of the section, as follows:

In the Plutonium Facility (B. 332) and in the Heavy Element Facility (B. 251), metal scrap waste that has internal contamination only is placed directly into a drum or Standard Waste Box, without being enclosed in a sealed plastic bag, as specified in the Building 332 Facility Safety Procedure, Appendix E-4, or the Heavy Element Facility (B. 251) Handbook, Appendix F 2.0. Externally contaminated scrap, for example, from glove boxes, is packaged the same way as Waste Form No. 1.

We will amend §7.4.1, describing Waste Form 4, by adding a paragraph after the Note, as follows:

In the Plutonium Facility (B. 332), pyrochemical salt block waste is bagged out, i.e., it is removed from a glove box in a plastic bag as specified in the Building 332 Facility Safety Procedure, Appendix E-3, and in the B. 332 Hazards Control Book. This requires a twist-and-tape horsetail seal (or seals) to the bag and placement in a second bag that is similarly sealed.

2. The "Waste Package Verifier" does not verify all parcels. If 100% parcel verification is not prescribed, then a target percentage of parcels which undergo verification should be designated.

LLNL Response

The current method of choosing parcels to be verified results in about 50% of parcels in B. 332 being verified and 100% of those in B. 251. After discussing the verification frequency rate with the management of B. 332, we have decided to move to 100% verification of TRU waste parcels. We are arranging a meeting to discuss how to implement this and to determine a schedule for doing so. We will also discuss the feasibility of providing a sufficient number of non-waste generators, probably Health and Safety Technicians, to do the verification. These technicians already do some verification.

After we work out the details of this, we will modify §3.2.6 to

describe the new verification requirements.

WASTE FORM

3. Section 7.5.11 does not reference to 4,000 lb limit on standard waste box for Waste Form #3.

LLNL Response

We agree and will replace the last paragraph of §7.5.11 with the following two paragraphs:

For Waste Form No. 3, waste packages are weighed after receipt by HWM. The HWM computer is programmed to flag Standard Waste Boxes exceeding 4,000 lbs. Noncomplying loaded boxes are returned to the waste generator for repackaging.

For shipping in TRUPACT-II, the following weight limits are also observed: 7,265 lbs per TRUPACT-II payload (14 drums or 2 Standard Waste Boxes) and 19,250 lbs per TRUPACT-II payload, including the weight of the TRUPACT-II.

WASTE FORM

4. Immobilization: The CQAP indicates that the "absence of fine materials" is certified on the Waste Data Log Card by the Waste Package Verifier. A recurring area of concern is that the Waste Package Verifier is a waste generator, and not an independent overseer.

LLNL Response

We understand the concern about the degree of independence of quality control. We note that not all verifiers are waste generators. Some verifiers in the Plutonium Facility are Health and Safety Technicians from the Hazards Control Department who work in the Facility. The present system allows us to perform waste verification without excessive overhead costs in a relatively small, experimental organization. We have no reason, no incident that leads us to question the quality of the verification.

There is a benefit to the current system in that the verifier is familiar with the operation generating the waste and is therefore better able to verify waste characterization and compliance with waste acceptance criteria than someone who, while independent, is not particularly familiar with the operation.

We are considering the feasibility of providing independent waste verifiers, for example, more Health and Safety Technicians or the Hazardous Waste Management Field Technician assigned to the waste-generating organizations.

5. Physical procedures requiring solidification of powders appear

adequate. Areas of concern include the potential for crust from CaO sludge/solidification process to degrade into particles < 200 microns after the drum is sealed, and the stability of the remaining 70% of pulverized SIS blocks left in the drums (Section 7.4.1).

LLNL Response

We acknowledge this concern. We plan to address the issues of stability and durability of this waste form and of Waste Form 2 (Solidified Liquids) when we write a Quality Assurance Project Plan to comply with the WIPP Waste Characterization Program and its Plan, which we have reviewed in draft form.

6. Liquid Wastes and Sludges: Waste Form #2: Tipping or hitting a paint can with a hammer to verify absence of free liquid is not an acceptable form of verification. Actually, MM-03 only directs "hitting" with a hammer to check for hardening, not the absence of liquids.

LLNL Response

We agree that MM-03 only requires that "Liquid waste generated in Building 332 containing ^{239}Pu must be solidified and liquid free before it can be discarded." It does not specify how to assure that the waste is liquid free.

LLNL is changing its method of TRU liquid waste solidification. We will be using Aquaset and Petroset solidification agents. A new procedure MM-03 has been drafted to describe the method, including a paint filter test for freedom from free liquids. The procedure has been validated by tests and is awaiting final approval.

We will change §7.5.5 of the CQAP to read:

In the past, Waste Form No. 2 consisted of liquids, containing < 2 mg/l of Pu, that had been transferred from B. 332 or B. 251 to B. 419 and solidified there. Such wastes are in storage at LLNL, awaiting shipment to WIPP. Small amounts of liquids, e.g., with higher activity, were solidified at the generating facility and included in Waste Form No. 1.

At present, all liquid TRU wastes being generated are solidified in the generating facilities, namely Buildings 332 and 251, and are included in Waste Form No. 2.

In the past, water-based wastes were solidified using Portland cement, and oil- or solvent-based liquids were solidified using Envirostone. They were allowed to cure and were tipped as a check for free liquids before final sealing of the waste parcel. Such wastes are in storage at LLNL, awaiting shipment to WIPP.

At present, for Waste Form No. 2, TRU liquids are solidified according to Procedure MM-03, which has been altered to use a new solidification method. Aquaset is used to solidify water-based liquids and Petroset is used to solidify oil- or solvent-based liquids. A paint filter test

is used to verify the absence of free liquids. No more than 1% residual liquids are allowed, in order to meet the WIPP WAC.

Bottles, cans, and similar containers are drained and may be disposed of with solidified liquids in the same waste parcel.

For Waste Form No. 3, liquids are removed and disposed of with the liquid waste stream. No more than 1% residual liquids are allowed, in order to meet the WIPP WAC. Bottles, cans, and similar containers are also removed.

The waste generator certifies the absence of free-flowing liquids on the Waste Parcel Log Card. A Waste Parcel Verifier verifies this action whenever a parcel is verified.

7. Waste Form #1: Prior CQAPs and the DOE/WIPP (89-003) No-Migration Petition both state that waste form #1 includes small quantities of solidified solvents and oil-based liquids or sludges. The current CQAP implies that waste form #1 contains no liquids; "no other processing is required other than routine bagout procedures." This discrepancy should be explained.

LLNL Response

See the revision of §7.5.5 in the response immediately above for an explanation. We will revise §7.1.1 on Waste Form No. 1 by adding, after the existing first paragraph, the following explanation:

In the past small amounts of liquid TRU wastes, both water-based and oil- or solvent-based, were solidified in Buildings 332 and 251, where they were generated, using Portland cement and Envirostone, respectively, and were included in Waste Form No. 1. Such wastes are in storage at LLNL, awaiting shipment to the WIPP. All liquid TRU wastes currently being generated are solidified in those generating facilities and constitute Waste Form No. 2.

8. Waste forms #1 and #3 are identical except that waste form #3 is oversized. Yet the CQAP specifies a requirement only from draining the liquid. Why is there not also a solidification requirement?

LLNL Response

Waste Forms Nos. 1 and 3 are not identical. Waste Form No. 1 consists of glove box trash, such as paper tissues, glassware, and plastic bags. Waste Form No. 3 consists primarily of discarded machinery, such as vacuum pumps, decommissioned glove boxes, and other metal scrap. Liquids from Waste Form No. 3 consist primarily of vacuum pump oil. These liquids are removed and solidified, becoming part of Waste Form No. 2.

9. A 9/91 LLNL auditor indicated that Los Alamos National Laboratory has used Envirostone to solidify waste, but that subsequent destructive examination has indicated a problem with the generation of H_2O potentially caused by a waste/matrix interaction. Has waste/matrix

interaction been considered with Envirostone or Portland cement (Bldg. 332) or aquasorb (Bldg. 251.)

LLNL Response

We are aware of these problems and are presently switching form Evirostone to Petroset for solidifying oil and solvent-based liquids. While we have not noticed these problems in waste we have solidified at LLNL, we will be looking for signs of them when we sample and analyze this homogeneous waste form as part of the WIPP Waste Characterization Program. (Note that aquasorb has not, to our knowledge, been used to solidify waste in B. 251.)

10. The CQAP and MM-03 procedures do not specify 1% residual liquid criteria, only that containers and bottles are well drained. This lack of quantification is of particular concern given that the verification will be performed by a waste generator, not an unbiased QA specialist.

LLNL Response

We agree that this WIPP waste acceptance criterion should be included in the CQAP and in MM-03. We will assure that the revision of MM-03 includes it. We will revise §7.5.5 of the CQAP to include it, as indicated in the response to a comment, above.

11. Waste Composition: There is no procedure or CQAP reference for hazardous waste sampling requirements to supplement process knowledge. This should be part of QAPP, as well as QAPjP, and RCRA analysis and waste profile plans.

LLNL Response

This will be part of LLNL's QAPjP, rather than the CQAP.

EXPLOSIVES AND COMPRESSED GASES

12. Punctured aerosol cans are not routinely and independently verified through any nondestructive examination by a non-waste generator. The plan should be amended to include such verification.

LLNL Response

Puncturing of aerosol cans is currently checked when waste parcels are verified. Verification by non-waste generators will become the norm. See response to comment #2.

LLNL will be using real time radiography to assure that aerosol cans have been punctured. See response, below, to comment #19.

13. Are rigid liners designed to prevent unauthorized puncture by sharp edges of the punctured cans?

LLNL Response

Cans are punctured in a way that drives any sharp edges inward, preventing them from puncturing anything else.

14. Prior descriptions of waste form #4 include reference to aerosol cans which are to be punctured. Are they now segregated from waste form #4?

LLNL Response

We cannot find a prior description of Waste Form No. 4 that includes aerosol cans. Please provide a reference. Waste Form No. 4 consists only of the pyrochemical salt blocks. Any aerosol cans would be Waste Form No. 1 and would not be packaged with the salt blocks.

MIXED WASTE

15. The term "Radioactive Mixed Waste" is redundant. By definition, mixed waste contains both a hazardous and a radioactive constituent(s).

LLNL Response

We agree, and will remove the term "radioactive" from the title and body of §7.5.9. The title will now read:

7.5.9 Mixed Waste

and the last paragraph will read:

Mixed waste shall be segregated from nonmixed waste. Mixed waste parcels shall not be placed in a container with nonmixed waste parcels.

16. All originally hazardous constituents continue to be so designated, regardless of treatments employed, especially given the verification concerns observed in the LLNL system during prior audits.

LLNL Response

TRU wastes are not treated at LLNL for the purpose of removing hazardous characteristics. (Non-neutral liquids are, however, neutralized as part of the solidification process.)

GAS GENERATION

17. TRUPACT-II SARP requires that drums be vented with a carbon composite filter in the lid. The audit on 9/12 reveals that many older drums have been retrofitted with bung holes for the carbon composite filter. Was this process QA'd?

LLNL Response

Yes. On April 6, 1990, after the retrofitting of filter vents, LLNL performed a documented surveillance of Nuclear Filter Technology in Golden, CO, to satisfy us that the filters would perform as specified.

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This included "verify(ing) the filter efficiency and seal tightness in accordance with DOT specification for 17C drums."

Nuclear Filter Technology also took ten of the retrofitted lids back to Golden and tested them. They provided LLNL with a certification, on file, that the lids and filters complied with specifications.

18. TRUPACT-II SARP prohibits sealed containers greater than 1 gallon in volume. The CQAP waste form #2 description states that lids are installed on 1 gallon, 165 oz., 2 1/2 gallon, or 5 gallon PVC jugs after verifying absence of free liquids. Does this violate TRUPACT-II SARP?

LLNL Response

The June 1990, version of the CQAP mentions lids, but the December 1991, version under review does not. No lids are currently used when TRU liquids are solidified.

In the past, when liquids were solidified in B. 419 by Hazardous Waste Management, 1 gallon paint cans were used, and the lids were put on by tapping with a ball peen hammer after the contents had solidified. These lids do not constitute a seal, or gas confinement layer, for the purpose of shipping in TRUPACT-II.

19. Real time radiography or equivalent method is listed as a requirement in Revision 4 of (WIPP) WAC. How will LLNL conform to this requirement?

LLNL Response

LLNL currently has a real time radiography project. The project is completely funded, including staff time for development, for support utility modifications, and for equipment. The budget is $788,000 for capital costs and $500,000 a year for operation, once construction is completed. The targeted completion date, when testing of the unit can begin, is September 30, 1996.

20. Head space analysis is required in Rev. 4 WAC, but is not yet addressed in CQAP.

LLNL Response

The WIPP has not yet established a schedule for implementation of Revision 4 of the WIPP WAC at generating sites. We prepared this version of the CQAP before Revision 4 was issued. We will address head space analysis in LLNL's QAPjP. We have recently informed the WIPP Project Integration Office (WPIO) of the budgetary and schedule impact of implementing this requirement and other new requirements of Revision 4.

QUALITY ASSURANCE/VERIFICATION

21. SOPs for physical examination before waste parcel packaging, representative examination of waste parcels, and routine surveillance of waste generator packaging operations need to be improved. There are no hold points for verification listed in CQAP or SOPs referenced therein, which undermines the credibility of the verification procedures.

LLNL Response

LLNL will develop a TRU waste procedure or procedures for characterizing and verifying TRU waste parcels. Verification of 100% of waste parcels will include a hold point, requiring the presence of a waste parcel verifier before packaging operations may begin.

22. Only one package per week, or one package per 55 gallon drum is verified, in which a fellow worker with equal qualifications watches packaging and placement of a parcel in a waste drum. Procedures should be improved to represent a statistically valid method, such as random sampling of a specified percentage of parcels/packages placed in the drums.

LLNL Response

LLNL will be moving to 100% verification of TRU waste parcels by independent verifiers. See the response to comment #2.

23. The 9/91 audit revealed a reliance on individual training and lack of adherence to written procedure. Procedures and quality control differ from building to building. Consistent application of SOPs should be improved, if possible, through incorporation of NQA-1 guidelines. Procedures should be evaluated on a more frequent basis, thereby ensuring greater congruence with the current CQAP.

LLNL Response

NQA-1 guidelines for procedures, as we understand them, involve the following:

- Listing quality-affecting activities in each of the 18 NQA-1 areas.
- Listing (or if necessary, developing) the procedures governing these activities.
- Making sure the procedures are reviewed periodically and when related documents change.
- Making sure procedures are distributed to the people who need them.
- Making sure that training personnel know about procedures and their revisions so that people performing the procedures are properly trained.

LLNL will undertake a review of TRU waste procedures to better implement these guidelines.

All TRU waste-generating organizations review the CQAP. When this revision is approved and issued, we will ask them to review and revise their procedures as needed to comply with the new CQAP. The Certification Officer reviews the TRU waste procedures of all LLNL organizations as they are issued or revised. This provides a further check for consistency.

RECORD