



## ENVIRONMENTAL EVALUATION GROUP



AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER

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SEP 2002

Mr. Steve Zappe, WIPP Project Leader  
NMED Hazardous Waste Bureau  
2905 Rodeo Park Drive East – Bldg. 1  
Santa Fe, NM 87505

Dear Mr. Zappe:

Attached are EEG comments on the Class 2 permit modification request (PMR) submitted by the WIPP permittees on June 28, 2002 entitled "Waste Characterization Updates and Other Process Improvements".

This PMR consists of five separate items. For the first of these, concerning adding the hazardous waste number (HWN) for hydrofluoric acid, the permittees have proposed adding a certification to the Waste Summary Report for waste streams with this HWN that the waste stream contains no corrosive materials. Since corrosive materials are already prohibited in WIPP wastes by the HWFP, and the toxicity of hydrofluoric acid is as least as much of a concern, the EEG suggests that the certification should ensure that chemical processes were performed to eliminate hydrofluoric acid.

The second item addresses the sampling of repackaged wastes. The permittees propose that repackaged waste sampling be expanded to allow the requirements for retrievably stored solidified wastes to be used as an alternative to the currently-required newly generated process, in order to eliminate the need for control-charting of repackaged solidified waste. The EEG agrees that control-charting of repackaged waste is neither useful nor necessary, but suggests that simply changing the requirement so that repackaged solidified waste must be sampled in accordance with the requirements for newly-generated soil/gravel waste should be considered.

The proposed changes for the control of classified information, the third item in this PMR, are supported by the EEG with only minor suggestions, as is the fourth item, addition of HalfPACTs as shipping containers. The fifth item is more problematic. This request would allow radiography to be used instead of the currently required visual verification for newly generated wastes. The EEG believes that visual examination provides a much higher quality evaluation of the waste than radiography. Radiography has only been allowed on containers for which additional radiological risks (and expenses related to those risks) would be incurred in order to



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perform visual examination. Even these containers are randomly sampled and analyzed by visual examination in order to provide some measure of assurance that radiographic interpretations are useable. Item 5 provides little evidence that the quality tradeoff in using radiography in lieu of visual examination for any newly generated waste is balanced by benefits comparable to those for retrievably stored wastes.

Sincerely,

A handwritten signature in black ink, appearing to read "Matthew K. Silva". The signature is fluid and cursive, with a prominent initial "M" and "S".

Matthew K. Silva

Director

MKS:SW:pf

Attachment

The five individual items in the “Waste Characterization Updates and other Process Improvements” Class 2 permit modification request (PMR) submitted June 27, 2002 to the NMED are addressed separately below.

**Item 1: “Add Additional Waste Number” (HWN U134, for Hydrofluoric Acid)**

1. The Item states in the “basis” section that a previous portion of a PMR for adding the U134 hazardous waste number (HWN) had been rejected by the NMED (p. A-12). That March 6, 2001 PMR stated the following (Item 4, p. A-20):

The INEEL facility has requested the addition of hazardous waste number U134 (hydrofluoric acid). Hydrofluoric acid (HF) is listed in 20.4.1.200 NMAC (incorporating 40 CFR Part 261) for its corrosivity and toxicity characteristic.

40 CFR 261.33(f), which lists toxic waste also clearly identifies the toxicity characteristic with the U134 hazardous waste code. However, while Item 1 discusses the corrosivity characteristic and compatibility considerations for hydrofluoric acid, there is no discussion of the toxicity issues posed by the addition of the U134 code to WIPP wastes. The only statement related to toxicity appears to be the following (p. A-13 and A-14):

Even though the concentration of hydrofluoric acid is below detectable limits and even though the toxicity and corrosivity characteristics are no longer applicable to this waste stream, the U134 hazardous waste number must be assigned to all waste, waste residues, contaminated equipment, and debris associated with the waste.

This Item does not supply sufficient evidence that the hydrofluoric acid will be below detectable limits, nor does it supply any evidence that the toxicity characteristics “are no longer applicable”. The National Institute for Occupational Safety and Health (NIOSH) lists air concentrations greater than 30 ppm HF as immediately dangerous to life and health and the recommended exposure limit is only 3 ppm (time weighted average concentration over a 40 hour work week)<sup>1</sup> Discussion of toxicity related to U134 wastes planned for shipment to the WIPP would, therefore, seem to be of importance.

2. There are some major discrepancies in the type, amount, and source location for waste that Item 1 is meant to address. The rejected March 6, 2001 PMR stated (pp. A-20 and A-21):

The U134 waste from INEEL was used in the zirconium dissolution process. Both used and unused forms of HF were complexed with aluminum nitrate prior to liquid waste treatment at the INEEL facility.

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<sup>1</sup> NIOSH Pocket Guide to Chemical Hazards. ([www.cdc.gov/niosh/npg/npg.html](http://www.cdc.gov/niosh/npg/npg.html))

The complexation of HF with aluminum nitrate forms aluminum fluoride and nitric acid. Once complexed, the hydrofluoric acid does not reform...

Once the HF was complexed with the aluminum nitrate the mixture was discharged into the INEEL wastewater treatment plant where the nitric acid was neutralized. The subsequent sludge is dewatered and prepared for shipment to WIPP. The final waste is a solid which no longer exhibits either the corrosive or toxic characteristic.

Approximately 1,000 containers of waste from INEEL will be assigned to the U134 hazardous waste number.

Note that these statements clearly indicate that the waste to be shipped to the WIPP will be inorganic solidified sludge waste (Summary Category Group 3000). The current PMR states in the "Discussion" section (p. A-13):

INEEL currently has approximately 100 cubic meters of transuranic debris (such as personal protective equipment (**PPE**), analytical tools, clothing, equipment, decontamination media, contaminated job wastes, and High Efficiently Particulate Air filters) contaminated with waste that been assigned the U134 code due to the Resource Conservation and Recovery Act (**RCRA**) mixture and derived from rules.

This debris waste would be in Summary Category Group 5000; 100 cubic meters of debris waste would likely take up 700 or more drums of waste. The current PMR also indicates that an unspecified amount of sludge waste was generated (p. A-13):

U134 is a listed hazardous waste number for unused or off-specification hydrofluoric acid (**HF**). It is necessary that this hazardous waste number be assigned to waste at the Idaho Nuclear Technology and Engineering Center (**INTEC**) due to the past practice in the analytical lab of discarding the unused portion of samples collected to verify the quality of HF received in tanker trucks. The total volume of the unused portion of the samples was approximately 2.5 liters of HF. Laboratory personnel neutralized and complexed the HF with excess aluminum nitrate to form a non-corrosive aluminum fluoride complex in a nitric acid mix and discharged the mixture into the liquid waste storage tanks. Debris associated with this portion will also carry the U134 number.

The solidified liquids from the waste storage tanks at INTEC are likely the approximately 1000 drums of sludge waste described in the rejected PMR. The debris waste described in the previous quotation may be the "Debris associated with this portion", as a statement on page 14 of the PMR does indicate that there is "Debris waste from INTEC...." However, this section

locates the debris waste at “INEEL”, rather than at “INTEC”, where the sludge waste is said to be located. Thus, it is not clear from the two PMRs whether the waste will be only the debris materials or both the debris and solidified sludge.<sup>2</sup>

The permittees also stated at the July 23, 2002 quarterly meeting between the EEG, various state organizations, and the DOE that other sites intend to ship TRU wastes with an assigned U134 hazardous waste number. Item 1 contains no mention of these other wastes, implying that the INEEL U134 waste is the sole reason for adding the code. While there is no regulatory requirement to provide the amounts and locations of the waste in a PMR, the information that is provided in a PMR should be accurately and comprehensibly conveyed.

3. For the debris portion of the proposed waste, it would have been useful for the permittees to have demonstrated that materials such as Kim wipes, gloves, empty containers, and other materials in waste from the INEEL laboratory operations with the hydrofluoric acid had been allowed to dry prior to storage in waste packaging, or that other steps were taken to eliminate the hydrofluoric acid from the waste.

[The following comments use the numbering system in the PMR Item for the actual changes to the HWFP text].

- b.1. Section B3-12b(1), Waste Stream Profile Form and Characterization Information Summary, is augmented by requiring the Characterization Information Summary to include the following (p. A-18):

Certification through acceptable knowledge or testing and/or analysis that any waste assigned the hazardous waste number of U134 (hydrofluoric acid) no longer exhibits the characteristic of corrosivity. This is confirmed by assuring that no liquid waste is present.

Although the HWFP already prohibits corrosive materials and liquids in WIPP wastes, the actual limit allows up to a maximum of 1% by volume of liquids in shipping containers (verified by RTR and VE), which may be a considerable quantity of U134 waste. Therefore, this proposed certification would not add any significant assurance concerning hydrofluoric acid.

Since the potential toxicity characteristic is at least as important as the corrosive potential for hydrofluoric acid, the certification should also address the toxic potential. The EEG suggest that a better certification would be to certify that the acceptable knowledge

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<sup>2</sup>During the July 30, 2002 public meeting on this and other PMRs the permittees indicated that only debris waste created during handling of the sludge waste after the chemical reduction of the hydrofluoric acid would be shipped to the WIPP.

contain objective evidence that processing to remove hydrofluoric acid from the waste stream was planned and implemented, and that the processed waste was subsequently tested. Acceptable knowledge based on chemical sampling and analysis which shows that the hydrofluoric acid was converted would be acceptable, or that clearly states that excess reactants had been thoroughly mixed with the hydrofluoric acid, but chemical testing would seem to be necessary if the acceptable knowledge does not show that one of these was performed.

## **Item 2 - Characterizing Repackaged Homogenous Solids as Retrievably Stored Waste with Regard to Solid Sampling**

1. The EEG agrees with the Item 2 statement that the HWFP requirements for sampling of homogeneous solids that are repackaged are somewhat ambiguous. However, it is clear both in the HWFP and in the NMED response to the Savannah River Citizens Advisory Board comment during the initial HWFP development (cited on p. A-32 of the PMR) that the “most conservative” sampling approach was intended to be used. Item 2 appears to change that approach, so that the minimum number of samples possible for either retrievably stored or newly generated wastes would be the number used.
2. For the most part the introductory section of Item 2 appears to be well-developed. The one significant difference the EEG has with the introductory material occurs in the section titled “Sample Size for Retrievably Stored Waste”, which summarizes the Section B2-2a requirements for determining the number of samples to be collected and analyzed from a waste stream. The final bullet in this section states (p. A-30):

If the generator chooses to assign the toxicity characteristic number to the waste stream, the sample is limited to the minimum five sample population, chosen randomly from the waste stream.

The intent of the HWFP (and of 40 CFR 261) appears to be that a waste generator is not to “choose” to assign the toxicity characteristic, but to determine if it should be assigned, for each of the possible contaminants of interest. No part of Section B2-2a promotes the concept that a generator can choose to assign D-codes. Thus, the number of samples is not necessarily “limited to the minimum five sample population”.

It may be that the NMED can accept assignment of D-codes when sampling indicates that the D-code material is present in the waste, without requiring measurements to determine if the material is present in sufficient quantity to apply the D-code. If so, then the HWFP text should be amended to state this allowance.

3. The EEG agrees with the permittees that control charting for repackaged homogeneous solid waste would not be of value unless the entire waste stream undergoes a chemical treatment process. The requirements for soil/gravel sampling as described in Section B-3d(1)(b) would appear to be sufficient for these repackaged homogeneous solid wastes,

and the permittees state in the “Basis” section the belief that their approach is consistent with the soil/gravel requirements (p. A-29). The simplest resolution of the problem the permittees outline in Item 2 would appear to be to add text to the HWFP which states that for repackaged solidified wastes, the sampling requirements for newly generated soil/gravel waste are to be followed. The NMED may want to consider whether or not this possible resolution would effectively address the permittees’ stated concerns, and the expressed intent of the Item 2.

Perhaps the following language offered by the permittees<sup>3</sup> could be reflected in the permit:

The permit requires that all newly generated homogeneous solids (Summary Category Group S3000) be subjected to the control charting process. Retrievably-stored homogeneous solids that are repackaged must be charted. However, if it is not feasible to develop meaningful control charts because procedurally established bounds are exceeded or conditions of normal operations are not being met, an increased sampling frequency must be implemented. Under such conditions, sites must document what the increased sampling frequency is and its rationale, including a discussion of the baseline sampling results.

DISCUSSION: B2-4 requires control charting for newly generated waste. Samples must be taken prior to solidification or packaging. This section also applies to retrievably-stored waste that is repackaged. This section requires the data to have a constant mean and constant variance in order to use control charts. Newly generated soils/gravel shall not use control charting, as specified in B-3d(1)(b).

Unless a waste generating process is designed to control the RCRA parameters, it will not be possible to demonstrate that the waste stream has a constant mean and constant variance, and as a result would not be feasible to develop meaningful control charts. Baseline sampling and acceptable knowledge may be used to demonstrate this lack of feasibility.

Control charting is not acceptable for uncontrolled processes, and therefore wastes from such processes must be sampled using the requirements in B2-2, Approach for Statistically Selecting Retrievably Stored Waste Containers for Totals Analysis. Because control charting will not be useful in controlling hazardous waste constituents in such cases, CAO will require sites to characterize these homogeneous wastes in accordance with Section B2-2 and document that control charting was unusable.

It should be noted that the baseline sample is not required to be a statistically representative sample. However, for those generator sites that can use

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<sup>3</sup> Clarification No. CAO-00-029, Rev. 1, Item 1, Date 1/21/00, Section B2-Introduction, ISSUE: Is control charting to be used for all newly generated waste?

a statistically representative sample (per the requirements of Section B2-2) to select the containers for baseline sampling, these samples can also be used to meet the retrievably-stored waste sampling requirements.

[The following comment uses the numbering system in the PMR Item for the proposed changes to the HWFP text]

- a.1. The proposed change to Module II.C.1.c would add the phrase “when appropriate” to the requirement to use control charting for newly generated wastes. Item 2 is said to be needed for repackaged wastes, not newly generated wastes (see bolded item 3 on p. A-22), and this alteration would address more than just repackaged wastes.

The EEG agrees that the text at II.C.1.c should be amended, but also believes that criteria should be given as what is to be considered “appropriate”. Simply changing the requirement so that control charting is used for all newly generated Summary Category Group 3000 waste streams may be a sufficient criterion.

- b.2. Section B-3d is altered as follows:

Waste characterization solid sampling and analysis activities may differ for retrievably stored waste and newly generated waste.

This also appears to be a change that is beyond the scope of Item 2, in that it affects more than repackaged wastes. The text to be modified should relate to repackaged wastes, whereas this alteration would affect newly generated wastes, a different, and major, aspect of the HWFP.

### **Item 3 - Classified Information Recordkeeping and Audit Requirements**

The EEG believes that Item 3 represents a reasonable approach to the problem of control of videotapes of classified shapes in WIPP wastes—but notes that for years the expressed intent of the DOE was to eliminate classified shapes prior to packaging these materials for shipment to the WIPP, to keep the WIPP free of classified material considerations.

1. The permittees have presented an adequate methodology for dealing with the classified information that might appear on radiography videotapes. However, it was not made clear how videotapes of visual examination of a classified shape container would be handled. Section B1-3b(3), Visual Examination, requires that a randomly selected sample of radiographed containers be visually examined for confirmation, and that these visual examinations be videotaped. It is possible that a classified shape-container would be randomly selected for visual examination and the shape could be videotaped. One way to prevent possible future problems would be to add the term “and visual examination” wherever the terminology in the proposed changes refers to radiography videotapes.

2. The proposed revised text at b.1 and b.2 adds extensive information to existing paragraphs. The EEG suggests that since the information supplied is a component that may seldom be sought, these added statements could be placed in separate paragraphs to facilitate scanning these portions of the document.

#### **Item 4 - Addition of HalfPACTs**

The EEG believes that the smaller capacity is the only functional difference between the HalfPACT and TRUPACT-II for activities controlled by the WIPP HWFP, and consequently supports the intent of Item 4.

1. Section B-4b(1)(i) is altered to indicate that the Shipment Summary Reports will (p. A-66):

...contain the container IDs of every container in the shipment, listed by Contact Handled Packaging TRUPACT-II number and by assembly number (for seven packs and 4-packs), for every assembly in the Contact Handled Package.

To facilitate integration of other multi-container packs that may be introduced in the future (such as 3-packs of 100-gallon drums),<sup>4</sup> the EEG suggests that rather than continually adding the assembly type to the parenthetical expression that a generic expression be used. Perhaps "...and by assembly number for multi-drum assemblies..." would seem to adequately convey the requirement.

Modifications d.5 also has several instances where the same suggestion could be applied, and more general application of the concept may be useful.

#### **Item 5 - Use of Radiography for Newly Generated Wastes**

1. The "Discussion" section of Item 5 states (p. A-103):

Conducting VE during packaging to confirm AK was included in the permit application and in the WIPP HWFP as a means of reducing waste confirmation activities...Applying the radiography method specified for retrievably stored waste in the WIPP HWFP results in the same information regarding the waste as performing the VE Technique during packaging of newly generated waste.

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<sup>4</sup> A PMR for adding 100-gallon drums to the HWFP ("Adding Waste Containers", submitted under a permittee letter dated June 27, 2002) does not propose changes to this portion of the HWFP.

This statement makes it seem as if radiography was originally the preferred method of establishing the physical parameters of the waste, and that radiography is at least the functional equivalent of visual examination. Neither of these is true. Radiography, while not as robust as VE, was allowed to be used on retrievably stored wastes to eliminate costs and worker risk entailed by reopening sealed containers of waste. In this compromise, the higher quality data provided by visual examination was exchanged to eliminate the reworking of waste containers that were already likely to be acceptable for shipment to the WIPP.

Newly generated waste is not a rework process, and direct visual examination of the wastes and packaging materials as it is placed into the containers is of much higher quality than is a radiographic image. It is this difference which led to the visual examination of a statistical sample of radiographed retrievably stored waste—the visual inspection is used to check the quality of information gleaned by the less reliable radiography. It is also obvious that other than visual tactile senses can be involved in a “visual” examination—if a liquid container “feels” like it is full as it is placed in the waste container, then further investigation by a properly trained operator would likely ensue. Radiographers are limited solely to visual examination of a translated image on a reduced-size video screen.

An example of where this difference in quality would be critically important is in verification of the number of layers of packaging and liner lid vent diameter that is critical to the proposed modification to the drum age criteria (DAC) that is currently also under review by the NMED. Current radiographic equipment in use for WIPP waste characterization does not provide clear evidence of the layers of packaging, and cannot be used to determine liner lid vent diameters. The permittees have accepted during consideration of the DAC PMR that radiography is not to be utilized to determine these factors. If Item 5 is accepted, then there will be no verification of these DAC parameters. Other obvious advantages are available when visual verification is performed. Weights can be physically checked, instead of estimated from the image; types of metals can be more accurately identified, as can other materials; descriptions of the waste will be more reliable; labels on disposed containers can be read. In considering Item 5, the NMED should be aware that there is a difference in both quality and quantity of the data obtained by radiography from that obtained by visual examination.<sup>5</sup>

2. For newly generated waste, the use of radiography will require operations that will create additional risk to workers (e.g., the containers will need to be moved to and from the radiography facility by personnel and the container identification will need to be verified

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<sup>5</sup>The “Discussion” section also states that “The information collected by these two methods...result in essentially the same information and records being collected ” (p. A-103). This is true of the information *recorded*; the information *collected* in order to create the record can be substantially different.

by radiography personnel). Some intentions of the visual verification for newly generated wastes were that the operators<sup>6</sup> performing waste container loading could also perform the visual verification activities, thus reducing the time of exposure and number of personnel involved.

3. Item 5 provides only a general statement as to the need for the proposed change, citing generator site flexibility. The following is the sole example, in the “Discussion” section (p. A-103):

For example, sites that have ongoing waste generation activities in multiple locations have indicated that there are some cases where it is not logistically or economically feasible to provide sufficient trained personnel at each waste production area to collect and verify the permit required information during packaging of newly generated waste.

The HWFP does require two persons to perform the visual verifications during packaging of newly generated wastes. This may be overkill; the HWFP could be modified to require generator site procedures be developed and implemented that would require, for each waste container, that a data form be used to document the contents of the container, and then require a single verification of the information on the data form. The data form should include the waste stream number, waste material parameter weights, that contents include no prohibited items, and a description of the waste container contents. A visual verification that comparing the information on the form with the contents of the container would then provide a single second level of review, as is the process for other verifications in the HWFP. A minimum of two people would still be involved—one to load the container according to the procedure, and fill out the form, the second a trained visual examiner—but it would eliminate the requirement for two fully trained visual examination personnel found in Section B-3d(1).

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<sup>6</sup>The discussion of newly generated waste visual verification in the HWFP used the term “operator” (Section B-3d(1)) , whereas the term “visual inspector” was used in the discussion of visual examination of retrievably stored waste (Section B1-3b(3)).