



ENVIRONMENTAL EVALUATION GROUP



AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER

7007 WYOMING BOULEVARD, N.E.
SUITE F-2
ALBUQUERQUE, NEW MEXICO 87109
(505) 828-1003
FAX (505) 828-1062

October 31, 2001



Mr. Steve Zappe,
WIPP Project Leader
New Mexico Environment Department
2905 Rodeo Park Drive, Building 1
Santa Fe, New Mexico 87505

Dear Mr. Zappe:

Attached are the EEG comments on the three proposed Class 2 WIPP Hazardous Facility Permit Modifications for which the document period ends on November 2, 2001.

Our review leads to the following observations and recommendations.

- 1) EEG agrees with the permittees that the proposed compositing of headspace gas samples by the generator/storage sites would be useful. EEG recommends that NMED consider our ten detailed comments prior to approval of this item.
- 2) EEG recognizes the merits of allowing a generator/storage site to remove an otherwise statistically selected container from consideration for visual examination if there is legitimate concern that handling material from that particular container would pose a safety hazard. Another randomly selected container would be selected from the general population. The NMED may require the permittees to identify the statistics to support the practice, to avoid bias in the statistical sampling as a result of eliminating entire waste streams ostensibly in the name of safety, and to specify in advance the conditions for which a container would escape visual examination.

011027



Mr. Steve Zappe
Page 2
October 31, 2001

- 3) EEG supports this PMR. We find that the permittee has provided evidence to support taking samples of headspace gas through existing filter vent holes for the pipe overpack containers and the permittee requires generator/storage sites to provide documentation for drums or standard waste boxes. The proposed use of the sampling screw tap appears to be a good idea.

Sincerely,



Matthew K. Silva
Director

MKS:JKC:BW:pf
Enclosure

cc: Inés Triay, CBFO

EEG Comments on August 28, 2001 proposed Class 2 modification to the WIPP HWFP

The following comments are based on Revision 1 to the September 28, 2001 modification request submitted to the NMED, as supplied to the EEG by the DOE on October 6, 2001.

Item 1 - Using Composite Headspace Gas Data and Compositing Up To 20 Samples.

The EEG believes that modification of the WIPP Hazardous Waste Facility Permit (HWFP) to allow compositing headspace gas samples would be useful, and that the modifications proposed under Item 1 would not reduce the HWFP controls established for the safety, health, and environment of the WIPP. The following comments address issues that the NMED may want to take into consideration prior to approving Item 1.

1. The Item 1 "Description" section states (p. A-3):

This PMR item proposes to clarify the conditions under which headspace gas samples may be composited in the laboratory.

The "Basis" section contains a similar declaration of "clarification". The Item 1 Permit Modification Request does not "clarify" the conditions for compositing headspace gas samples--it is a proposal to establish conditions that did not previously exist in the HWFP.

2. As discussed in the "Basis" section of Item 1, there are three analysis procedures that may be used for headspace gas analysis--a modified TO-14, a modified Method 8240 from SW-846, or a modified Method 8260 from SW-846. However, sampling practice taken from the modified SW-846 Method 8260 is the only sampling method discussed, and there is no discussion of possible effects on the analyses performed under Method 8240 or TO-14. While the EEG expects that the composite sampling would have the same effect on analyses performed under the other two methods, the NMED should verify this assumption, or limit the compositing to those headspace samples analyzed using Method 8260.
3. The "Basis" section of Item 1 references the paper included in Appendix B titled *Technical Evaluation of Headspace Gas Compositing* (August, 2001). The EEG believes this to be an excellently written document that provides good support for compositing of headspace gas samples.
4. The "Discussion" section of Item 1 quotes from an EPA SW-846 Methods Information Communication Exchange (MICE) email concerning compositing. The author of the email does not appear to have been aware that the modified Method 8260 used by the WIPP is principally modified through the use of headspace gases in place of the liquid

process specified in the Method. Thus, the MICE email may have somewhat less utility than the prominence given it on pages A-4 and A-5.

5. The “Discussion” section of Item 1 states (p. A-5):

The accuracy and precision of the composited sample results relative to individual container sample results using the modified Method 8260 was corroborated using data from actual waste streams. This was done by evaluating the mean concentrations from data collected using composite samples and the mean concentrations from data collected using individual container samples. The *Technical Evaluation of Headspace Gas Compositing*, attached included [sic] in Attachment B, contains the results of this evaluation and shows that the mean concentrations are equivalent at a 90% confidence level on the mean for up to 20 to 1 composite samples.

While the process described can provide data that could be used to establish the overall precision of the two methods, it does not provide any measure of accuracy. Accuracy is the comparison of a measurement to a “true” value; the “true” values for the analytes in the containers used in the Attachment B study is not known.

The comparison used in the Attachment B study does provide a measure of the precision from the two methods, but the study does not express precision as specified in the WAP (Section B3-1):

Precision is a measure of the mutual agreement among multiple measurements of a single analyte, either by the same method or by different methods. Precision is either expressed as the relative percent difference (**RPD**) for duplicate measurements or as the percent relative standard deviation (**%RSD**) for three or more replicate measurements. For duplicate measurements, the precision expressed as the RPD is calculated as follows:

$$RPD = \frac{C_1 - C_2}{\frac{(C_1 + C_2)}{2}} \times 100 \quad (B3-1)$$

where C_1 and C_2 are the two values obtained by analyzing the duplicate samples. C_1 is the larger of the two observed values.

While it would not appear to be absolutely necessary to use the expression of precision established in the WAP, use of equation B3-1 would not only have enhanced the presentation of the data but would also have demonstrated a familiarity with the HWFP.

6. The "Discussion" section of Item 1 states that the proposed modification would also add criteria to the WAP for identifying tentatively identified compounds (TICs) that formerly existed only as Clarification CAO-065 (p. A-6 and A-7). The EEG applauds the effort to establish clear criteria for TIC identification in the WAP. However, establishment of the TIC criteria is a different issue than the compositing of headspace gas samples that Item 1 is meant to address. The EEG has noted in comments on other modification requests that the bundling of multiple modification concepts into a single Item is not a particularly efficacious process, and those comments would seem to apply to this combination of concepts also.

The proposed criterion is that an attempt must be made to identify each chromatographic peak which is greater than 10% of the area nearest internal standard. This criterion is said to be "...based on the requirements for the Superfund Contract Laboratory Program, Exhibit D - Volatiles, Section 11.1.2.2" (p. A-7). The modification request would have been enhanced by the inclusion of the text of the Superfund document's discussion of TICs.

7. In the proposed revision of the HWFP text, modification a.1 adds the following sentence to Section B-3a(1):

If composite samples are used, containers used in the composite sample must be from the same waste stream with no more than 20 containers being included in a single composite sample.

Headspace gas data collected to verify the establishment of Waste Stream Profile Forms occasionally results in separation of a waste stream established by acceptable knowledge into two or more waste streams. The NMED may want to consider whether headspace gas samples used to verify the establishment of waste streams should be allowed to be composited.

8. The proposed text modification c.2 would add the following sentence to Section B3-5 (text added by the modification in double underline):

Laboratory completeness shall be expressed as the number of samples analyzed with valid results as a percent of the total number of samples submitted for analysis. A composited sample is treated as one sample for the purposes of completeness, because only one sample is run through the analytical instrument.

The initial sentence also appears in Section B3-1 (with the word "shall" replaced by the word "must"). The phrase "submitted for analysis" in this sentence could be taken to mean those samples submitted by the sampling program for analysis; under that interpretation, the added sentence would conflict with the initial

sentence and Section B3-1. If 20 samples were submitted for analysis by the sampling program and ten were composited, perfect analysis would result in 11 valid results for the 20 samples. The calculated completeness would be 55%, far less than the 90% QAO currently specified in Table B3-2.

The substance of this modification could be better met by altering the initial sentence, rather than creating the potential for confusion the proposed addition supplies. The modification could read as follows:

Laboratory completeness shall be expressed as the number of samples analyzed with valid results as a percent of the total number of samples ~~submitted for~~ that undergo analysis.

The sentence in Section B3-1 would need to be similarly modified.

9. Proposed text modification c.3 adds the following sentence to Section B3-10 (p. A-13):

Because Analytical Batch Data Reports are generated based on the number of samples analyzed, an Analytical Batch Data Report may contain results that are applicable to more than 20 containers depending on how many composite samples are part of the report, but may not exceed 20 samples analyzed.

The sense of sentence might be transmitted more simply as follows:

Headspace gas samples analyzed as a composite are to be considered a single sample in Analytical Batch Data Reports.

10. Headspace gas sampling and analysis is also used to meet transportation requirements for flammable VOCs as well as RCRA storage and disposal requirements (see DOE/WIPP-069, *Waste Acceptance Criteria for the Waste Isolation Pilot Plant*, Revision 7, section 3.6.4, p. 3-24). The requirement is also expressed in the TRAMPAC portion of the *TRUPACT-II Safety Analysis Report for Packaging*, Section 5.4.2, which states that to address the 500 ppm limit for flammable VOCs established in the SARP (Revision 18¹, pp. 1.3.7-53 and 54):

Compliance shall be by headspace sampling or records of process knowledge...For content codes that do not identify any of the flammable

¹Revision 19 to the SARP (current as of July 27, 2001) does not alter Section 5.4--the information quoted is still in effect.

VOCs in the chemical lists, no additional controls to meet this requirement need to be implemented.

For content codes that identify flammable VOCs as part of the waste, the following options exist...For retrievably stored waste, headspace sampling for potentially flammable VOCs shall be an added parameter for waste sampling programs. Newly generated waste sites shall meet compliance for content codes by establishing of sampling programs for waste streams

and/or payload containers, by content code, at the 95 percent confidence limits.

The 500 ppm limit is on a container-by-container basis, and composites of multiple container samples would not supply the needed data for individual containers unless the average flammable gas concentration for the 20 drums is less than 25 ppm. The Permittees would seem to need to establish a non-HWFP requirement and process for ensuring that it has been implemented should this modification be approved.

Item 2 - Establishing Safety Conditions for Visual Examination (VE) of Waste Containers

The CBFO proposes a modification to the permit requirements for visual examination (VE) of waste containers. As a quality control, the permit requires VE for a statistically determined portion of waste containers to ascertain the miscertification rate for radiography. The CBFO proposal would allow the generator/storage site to remove an otherwise statistically selected container from consideration for VE if there is a concern that handling material from that particular container would pose a safety hazard. There would be no reduction in the number of containers that needed to be examined. Rather, a statistically selected container from the same population would be substituted.

This is the second modification proposed to the visual examination requirement. The first proposed modification requested that the radiography miscertification requirement be modified so that the rates are based on Summary Category Groups (homogeneous solids, soil/gravel, and debris categories) rather than individual waste streams. After its own analyses, EEG agreed with the DOE proposal that the miscertification rate can be determined by Summary Category Groups. But EEG also recommended that the selection of containers should reflect an effort to obtain a representative sample of the waste streams within each Summary Category Group for which characterization during the initial year is planned. EEG was concerned that the sites might select a single waste stream within the summary category group for which miscertification was unlikely (Silva to Zappe letter, June 23, 2000).

EEG has the following recommendations with respect to the latest CBFO proposal.

1. The CBFO needs to demonstrate that it is statistically defensible to withdraw a container from consideration and substitute another container selected from the general population.

The hypergeometric distribution that establishes the number of visual examinations necessary may need to be adjusted if the selection is not truly random. Moreover, if the subsequent random selection is from the large population defined as the Summary Category Group rather than from the same Waste Stream of the disqualified container, it might be argued that the results are biased against including that waste stream. The CBFO proposal would be strengthened if it provided the statistical details and references to clarify and support its requested methodology for selecting the replacement waste containers.

2. The “Discussion” section of Item 2 states that (p. A-20):

Each site operates within specific conditions that are related to the VE facility operational limitation, site-specific regulatory compliance requirements, and waste composition.

However, Item 2 does not describe any VE operation that has led to a violation of these specific conditions, nor does it document any concern by a waste generator/storage site related to these conditions. “VE facility operation limitations” would seem to need to meet the HWFP requirements for VE, rather than that the HWFP be altered to meet the VE facility limitations, as the function of the VE facilities is to meet requirements of the HWFP.

3. The EEG recognizes the application of the “As Low As Reasonably Achievable” (ALARA) concept to consider alternatives for mandated procedures. The Permittees reference 10 CFR 830 and DOE Order 435.1 in Item 2 as requiring use of the ALARA concept for radiation control during waste characterization activities (p. A-20). Discussions, within both these documents, indicate that whenever possible, compliance with the requirements is to be based on physical design features, rather than administrative controls. For example, 10 CFR 830.1001, Design and Control, states:

(a) Measures shall be taken to maintain radiation exposure in controlled areas ALARA through physical design features and administrative control. The primary methods used shall be physical design features (e.g., confinement, ventilation, remote handling, and shielding). Administrative controls shall be employed only as supplemental methods to control radiation exposure.

Item 2 offers only the two examples of broken glass and high radiation in the containers as specific examples of the types of conditions that would lead to container rejection under the proposed modification. Broken glass in containers could obviously penetrate normal radiation protection gloves; however, use of leather gloves over radiation protection gloves is an established practice at waste generator/storage sites when

penetration of the gloves is possible, and this physical design feature has been observed in use in handling WIPP wastes at the RFETS in the past.

The highest transuranic radiation levels from WIPP waste is likely the residues from RFETS, which were “blended down” to the maximally allowed 10% weapons grade plutonium in the waste. Nearly all residue waste streams were processed using 100% VE, rather than radiography, yet the Permittees have provided no evidence that non-compliance with the ALARA concept was a concern during the VE for these waste streams.

4. The Proposal lacks specificity with respect to which containers will be removed from consideration because they pose an unacceptable hazard. The new DOE proposal would allow each site, with approval of their documentation by CBFO, to establish the safety conditions that must be met prior to opening containers for VE. Again, only broken glass and high radiation are mentioned. Without a complete list, the concern is that a site has the discretion to establish a safety condition that could result in rejecting entire Waste Streams within a Summary Category Group, thus resurrecting EEG’s concern that the sampling would be skewed towards Waste Streams less likely to have miscertified containers. Several facilities currently have visual examination capabilities (e.g. INEEL, RFETS, LANL). These facilities should be in compliance with ALARA. Based on existing Hazard Analysis at these sites, CBFO should expect that each facility already possesses a list of safety conditions that disqualify a container from further consideration. Hence, NMED may wish to require that list along with supporting references to the existing Generator/Storage site documentation.
5. The Permittees cite and quote the *Joint NRC/EPA Guidance on Testing Requirements for Mixed Radioactive and Hazardous Waste* (62 FR 62079, November 20, 1997) in the “Basis” and the “Discussion” sections of Item 2, and the document itself is included as a part of Attachment B to the modification request. The EEG noted in comments on another proposed HWFP modification several reasons why the NRC/EPA guidance would not seem to apply to the WIPP waste characterization process (September 27, 2001 Silva-to Zappe letter.) The guidance is cited by the Permittee to support using AK as the sole waste characterization methodology. While a surficial glance at this document would indicate support for the Permittee’s argument, the relevance of the document to waste characterization for the WIPP becomes much more questionable on closer examination.

This joint guidelines summarize the contents as follows (p. 62080):

The guidance emphasizes the use of process knowledge, whenever possible, to determine if a waste is hazardous as a way to avoid unnecessary exposures to radioactivity. The guidance also

provides guidelines for generators wishing to rely on process knowledge as the basis for evaluating their waste.

This appears to be a strong statement in support of using AK (which includes process knowledge) for RCRA waste characterization. However, there are also several caveats in using this NRC/EPA guidance. For instance, the Guidance contains a fairly strong disclaimer (p. 62080):

The policies discussed in this document are not final Agency actions, but are intended solely as guidance. They are not intended, or can they be relied upon, to create any rights enforceable by any party in litigation with the United States. The Environmental Protection Agency and Nuclear Regulatory Commission may follow the guidance, or act at variance with the guidance, based on an analysis of specific site circumstances.

The Guidance also limits its scope (p. 62080):

The information below is intended for use by Nuclear Regulatory Commission (NRC) licensees that may not be familiar with the hazardous waste characterization and testing requirements that apply to mixed waste.

The WIPP project is not subject to NRC license. On the WIPP, the EPA's involvement is more what the NRC's normal role is--regulation of radiation control-- and the NMED is responsible for regulating the RCRA component. Therefore neither the NRC nor the EPA is performing the roles that this joint interpretation of the regulations was meant to cover.

The EPA/NRC joint regulation the guidance is designed to support appears primarily over commercial utility wastes, over which the NRC has imposed stricter controls from the beginning than what was required in the AEC/ERDA/DOE complex; the EPA has noted the quality of past management of NRC-regulated mixed wastes in proposing a conditional relaxing of RCRA requirements at NRC-regulated LLW sites (64 FR 63470, November 19, 1999). As has been noted elsewhere in these comments, the controls on DOE's retrievably stored wastes, and controls on the data previously generated on that waste, do not appear to be of comparable quality (see Attachment 1). The utility of joint NRC/EPA guidance for the concerns of the WIPP would seem to be somewhat peripheral.

The Guidance also identifies itself specifically with low-level radioactive mixed waste, as separated from transuranic or high-level mixed wastes (p. 62080):

This guidance addresses testing activities related to mixed low-level waste (LLW), which is a subset of mixed wastes. Additional information on the testing of hazardous wastes, which could apply to both mixed LLW and other types of mixed waste (e.g. high-level and transuranic mixed waste), is found in Appendix A.

Appendix A is titled "RCRA Regulations That Require Specific EPA Test Methods"--test methods meaning sampling of the waste and performing chemical analysis of the samples. Of the 14 listed regulations in Appendix A, two seem to be applicable to CH-TRU and RH-TRU waste bound for WIPP (p. 62093):

Section 261.22(a)(1) and (2)--Evaluations of waste against the corrosivity characteristic;

Section 261.24(a)--Leaching procedure for evaluation of waste against the toxicity characteristic...

Use of AK as the sole analysis tool would therefore seem to be in conformance with the joint EPA/NRC guidance only insofar as the AK includes tests performed to the methods specified in the sections of RCRA CFRs listed above. The Permittees apparently do not intend to provide any evidence that CH-TRU slated for shipment to the WIPP has undergone corrosivity or leach testing in accordance with SW846 methods specified in 40 CFR 261, nor is it likely that any significant part of stored RH-TRU wastes have undergone such testing. Thus, the "acceptability of relying on AK as the sole analysis tool" for WIPP wastes would not seem to be consistent with this portion of the joint EPA/NRC interpretation.

If one accepts some sort of equivalency between the NRC and the EPA, the EPA and the NMED, as well as CH-TRU wastes with LLW, then the Joint NRC/EPA Guidance supplies the following statement (p. 62082):

Hazardous waste, including mixed waste, may be characterized by waste knowledge alone, by sampling and laboratory analysis, or a combination of waste knowledge, and sampling and laboratory analysis. The use of waste knowledge alone is appropriate for wastes that have physical properties that are not conducive to taking a laboratory sample or performing laboratory analysis. As such the use of waste knowledge alone may be the most appropriate method to characterize mixed waste streams where increased radiation exposures are a concern. Mixed waste generators should contact the appropriate EPA regional office to determine whether they possess adequate waste knowledge to characterize their mixed waste.

This modification request provides no indication that the appropriate EPA regional offices have been contacted to determine whether or not sites possess adequate waste knowledge to characterize debris TRU wastes. The “acceptability of relying on AK as the sole analysis tool” will be consistent with the joint EPA/NRC interpretation would seem to depend on the quality of the AK data. There has been little reliance on AK as the sole analysis tool for WIPP wastes in the past, and the descriptions from some DOE documents (see statements in Attachment 1) do not appear to support such reliance.

It appears that the Joint NRC/EPA Guidance (1) was not meant to apply to the WIPP or any other DOE waste characterization process; (2) was written for wastes for which excellent data has been maintained, which is not the case for retrievably stored WIPP wastes; (3) lists stricter requirements for TRU wastes than what is currently required of WIPP wastes; and (4) suggests that waste generators use EPA regional offices to determine the adequacy of their AK, a process which has not been performed in order to support this modification request.

Item 3 - Taking Samples of Headspace Gas Through Existing Filter Vent Holes

1. Item 3 provides supporting evidence to show that removal of filters for headspace gas sampling in pipe overpack containers (POCs) is justified, but does not provide any studies related to drums or standard waste boxes. While the four millimeter-sized openings under the filters in POCs are unlikely to produce much mixing, the much larger opening that would be exposed by removal of drum and SWB filters would be much more likely to dilute the headspace gases prior to sampling. The PMR recognizes this in Section B1-1a(3) iii which requires generator/storage site documentation.
2. The use of the sampling screw proposed in Item 3 appears to be a good idea.