November 24, 1999

CAO: NTWP: RAS 99-1351 (UFC 5822)

CAO Clarifications of RCRA Permit Requirements

Distribution:

This letter is to inform the generator sites that there is now and herein attached, official CAO guidance letters providing for uniform clarifications in regards to the implementation of the final RCRA Permit recently issued by NMED. Also, please find attached a complete document-controlling list of these clarifications (Please note that the following numbers were not used: 27, 40, 46, and 59).

As of November 26, 1999, the effective date of the NMED Hazardous Waste Facility Permit, all field implementation and subsequent processing for characterization of TRU mixed waste that is to be shipped to WIPP for disposal, must be performed in compliance with this permit.

Additional clarifications of the final RCRA permit requirements will be made from time to time and documented by the CAO. The CAO will establish a World Wide Web site that allows for real time document management for these future updates.

If you have any questions, call Mr. Robert Stroud at (505) 234-7476.

Enclosure(s)

cc:
Steve Zappe, NMED
Grandy, Chris ANL-E
Marshall, G. ANL-W
Eide, Jim Battelle
Crane, Paul Hanford
Arbon, Rod INEEL
Rogers, Pam LANL
Fischer, Robert LLNL
Franz, W. A. MOUND

Dr. Inés R. Triay
Manager
Distribution

Foster, Bruce  NTS
O'Leary, Gerry  RFETS
D'Amelio, Joe  SRS

Distribuition:

Gable, Andrew  ANL-E
Parmley, W.  ANL-W
Bailieul, Tom  BCLDP
French, Mark  Hanford
Wells, Jerry  INEEL
Murnane, Chris  LANL
Kearns, Roy  LLNL
Schmaltz, Frank  Mound
Riner, Gary  ORNL
Xuan, Lam  RFETS
Ormond, Dale  SRS
Armstrong, D.  NTS
### LIST OF CLARIFICATIONS
**AS OF 11/24/1999**

<table>
<thead>
<tr>
<th>Clarification Number</th>
<th>Revision</th>
<th>Date</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA0-00 001</td>
<td>0</td>
<td>11/18/99</td>
<td>Assignment of Hazardous Waste Codes</td>
</tr>
<tr>
<td>CA0-00 002</td>
<td>0</td>
<td>11/18/99</td>
<td>Tentatively Identified Compounds</td>
</tr>
<tr>
<td>CA0-00 003</td>
<td>0</td>
<td>11/18/99</td>
<td>Order of Waste Characterization Activities</td>
</tr>
<tr>
<td>CA0-00 004</td>
<td>0</td>
<td>11/18/99</td>
<td>Calculation Records</td>
</tr>
<tr>
<td>CA0-00 005</td>
<td>0</td>
<td>11/22/99</td>
<td>Use of FTIRS</td>
</tr>
<tr>
<td>CA0-00 006</td>
<td>0</td>
<td>11/18/99</td>
<td>Headspace Gas Venting</td>
</tr>
<tr>
<td>CA0-00 007</td>
<td>0</td>
<td>11/18/99</td>
<td>Side Port Needle -- Seal with Filter Medium</td>
</tr>
<tr>
<td>CA0-00 008</td>
<td>0</td>
<td>11/23/99</td>
<td>Headspace Gas Sampling and Analysis</td>
</tr>
<tr>
<td>CA0-00 009</td>
<td>0</td>
<td>11/23/99</td>
<td>Headspace Gas Equipment Cleaning and Storage and Field Reference Standards</td>
</tr>
<tr>
<td>CA0-00 010</td>
<td>0</td>
<td>11/18/99</td>
<td>Determination of Minimum Detection Level</td>
</tr>
<tr>
<td>CA0-00 011</td>
<td>0</td>
<td>11/18/99</td>
<td>Achieving Completeness</td>
</tr>
<tr>
<td>CA0-00 012</td>
<td>0</td>
<td>11/18/99</td>
<td>On-Line Batch Report Requirements</td>
</tr>
<tr>
<td>CA0-00 013</td>
<td>0</td>
<td>11/23/99</td>
<td>GC/MS Tunes, Initial Calibrations and Continuing Calibrations for VOC SAs</td>
</tr>
<tr>
<td>CA0-00 014</td>
<td>0</td>
<td>11/18/99</td>
<td>Prohibited Items</td>
</tr>
<tr>
<td>CA0-00 015</td>
<td>0</td>
<td>11/18/99</td>
<td>Waste Stream Assignment</td>
</tr>
<tr>
<td>CA0-00 016</td>
<td>0</td>
<td>11/18/99</td>
<td>Determining Physical Waste Form</td>
</tr>
<tr>
<td>CA0-00 017</td>
<td>0</td>
<td>11/18/99</td>
<td>Estimating Material Parameter Weight</td>
</tr>
<tr>
<td>CA0-00 018</td>
<td>0</td>
<td>11/22/99</td>
<td>Radiography Qualifications</td>
</tr>
<tr>
<td>CA0-00 019</td>
<td>0</td>
<td>11/18/99</td>
<td>Visual Examination</td>
</tr>
<tr>
<td>CA0-00 020</td>
<td>0</td>
<td>11/18/99</td>
<td>Radiography Test Drum Requirements</td>
</tr>
<tr>
<td>CA0-00 021</td>
<td>0</td>
<td>11/18/99</td>
<td>Providing Radiography Results to Visual Examination Operators</td>
</tr>
<tr>
<td>Clarification Number CAO-00</td>
<td>Revision</td>
<td>Date</td>
<td>Title</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------</td>
<td>---------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>CA0-00 022</td>
<td></td>
<td>11/18/99</td>
<td>Miscertification Rate Calculation</td>
</tr>
<tr>
<td>CA0-00 023</td>
<td></td>
<td>11/18/99</td>
<td>VOC and SVOC Initial Calibration Acceptance Criteria</td>
</tr>
<tr>
<td>CA0-00 024</td>
<td></td>
<td>11/18/99</td>
<td>Comparability</td>
</tr>
<tr>
<td>CA0-00 025</td>
<td></td>
<td>11/24/99</td>
<td>Sample Tracking, Custody, and Preservation</td>
</tr>
<tr>
<td>CA0-00 026</td>
<td></td>
<td>11/18/99</td>
<td>Clarification for Completeness</td>
</tr>
<tr>
<td>CA0-00 027</td>
<td></td>
<td></td>
<td>Clarification Deleted—Handled with Class 1 Permit Mod</td>
</tr>
<tr>
<td>CA0-00 028</td>
<td></td>
<td>11/18/99</td>
<td>Acceptable Analytical Performance</td>
</tr>
<tr>
<td>CA0-00 029</td>
<td></td>
<td>11/18/99</td>
<td>Control Charting for Newly Generated Waste</td>
</tr>
<tr>
<td>CA0-00 030</td>
<td></td>
<td>11/18/99</td>
<td>Data Review, Validation, and Verification Activities</td>
</tr>
<tr>
<td>CA0-00 031</td>
<td></td>
<td>11/18/99</td>
<td>Data Review</td>
</tr>
<tr>
<td>CA0-00 032</td>
<td></td>
<td>11/18/99</td>
<td>Role of the Site Project QA Officer</td>
</tr>
<tr>
<td>CA0-00 033</td>
<td></td>
<td>11/18/99</td>
<td>Data Summary Reports</td>
</tr>
<tr>
<td>CA0-00 034</td>
<td></td>
<td>11/18/99</td>
<td>Raw Data Reporting</td>
</tr>
<tr>
<td>CA0-00 035</td>
<td></td>
<td>11/18/99</td>
<td>Timing of Waste Stream Characterization</td>
</tr>
<tr>
<td>CA0-00 036</td>
<td></td>
<td>11/18/99</td>
<td>Visual Examination Requirements for Retrievably Stored Waste With Inadequate Acceptable Knowledge</td>
</tr>
<tr>
<td>CA0-00 037</td>
<td></td>
<td>11/18/99</td>
<td>Headspace Gas QA/QC Requirements</td>
</tr>
<tr>
<td>CA0-00 038</td>
<td></td>
<td>11/18/99</td>
<td>Submittal of Data Packages to CAO</td>
</tr>
<tr>
<td>CA0-00 039</td>
<td></td>
<td>11/18/99</td>
<td>Opaque Containers for SVOC Samples</td>
</tr>
<tr>
<td>CA0-00 040</td>
<td></td>
<td></td>
<td>Clarification Deleted</td>
</tr>
<tr>
<td>CA0-00 041</td>
<td></td>
<td>11/18/99</td>
<td>Use of Variances</td>
</tr>
<tr>
<td>CA0-00 042</td>
<td></td>
<td>11/23/99</td>
<td>Use of SW-846 Methods</td>
</tr>
<tr>
<td>Clarification Number</td>
<td>Revision</td>
<td>Dated</td>
<td>Title</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------</td>
<td>-------------</td>
<td>-------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>CA0-00 043</td>
<td>0</td>
<td>11/18/99</td>
<td>Newly Generated vs. Retrievably Stored Waste</td>
</tr>
<tr>
<td>CA0-00 044</td>
<td>0</td>
<td>11/18/99</td>
<td>Responsibilities and Reporting of Non-Conformances and Document Changes</td>
</tr>
<tr>
<td>CA0-00 045</td>
<td>0</td>
<td>11/18/99</td>
<td>Adequacy of Acceptable Knowledge</td>
</tr>
<tr>
<td>CA0-00 046</td>
<td></td>
<td></td>
<td>Title: Clarification Deleted--COMBINED WITH CAO-00-044</td>
</tr>
<tr>
<td>CA0-00 047</td>
<td>0</td>
<td>11/18/99</td>
<td>Developing Acceptable Knowledge</td>
</tr>
<tr>
<td>CA0-00 048</td>
<td>0</td>
<td>11/22/99</td>
<td>Equipment Cleaning</td>
</tr>
<tr>
<td>CA0-00 049</td>
<td>0</td>
<td>11/18/99</td>
<td>Analysis for PCBs</td>
</tr>
<tr>
<td>CA0-00 050</td>
<td>0</td>
<td>11/18/99</td>
<td>Sample Containers</td>
</tr>
<tr>
<td>CA0-00 051</td>
<td>0</td>
<td>11/22/99</td>
<td>Alternate Sampling Methods</td>
</tr>
<tr>
<td>CA0-00 052</td>
<td>0</td>
<td>11/18/99</td>
<td>Core Liner Rotation</td>
</tr>
<tr>
<td>CA0-00 053</td>
<td>0</td>
<td>11/18/99</td>
<td>Collection of Field Blanks</td>
</tr>
<tr>
<td>CA0-00 054</td>
<td>0</td>
<td>11/18/99</td>
<td>Use of Updated Methods</td>
</tr>
<tr>
<td>CA0-00 055</td>
<td>0</td>
<td>11/18/99</td>
<td>OVA Use</td>
</tr>
<tr>
<td>CA0-00 056</td>
<td>0</td>
<td>11/18/99</td>
<td>Headspace Gas Sampling of Overpacked Containers</td>
</tr>
<tr>
<td>CA0-00 057</td>
<td>0</td>
<td>11/18/99</td>
<td>Sampling Under the Drum Lid</td>
</tr>
<tr>
<td>CA0-00 058</td>
<td>0</td>
<td>11/18/99</td>
<td>Visual Examination Technique</td>
</tr>
<tr>
<td>CA0-00 059</td>
<td></td>
<td></td>
<td>Title: Clarification Deleted--COMBINED WITH CAO-00-025</td>
</tr>
<tr>
<td>CA0-00 060</td>
<td>0</td>
<td>11/24/99</td>
<td>Reporting</td>
</tr>
</tbody>
</table>
ISSUE

1. Who is responsible for the assignment of hazardous waste codes?

2. Who is responsible for comparing the VOC constituents to those assigned by acceptable knowledge?

CONCLUSION

1. Under the RCRA regulations, the obligation for assigning hazardous waste codes to waste lies with the generator of the waste.

2. The CAO requires that the generator assign all applicable hazardous waste codes, including those that must be added as a result of sampling and analysis activities used to confirm acceptable knowledge on the waste prior to completing the Waste Stream Profile Form (WSPF). This information will be submitted by the generator on the WSPF, then reviewed and verified by the CAO. If the list of RCRA hazardous waste codes does not appear to be complete based on the data provided with the WSPF, the WSPF will not be approved. This will delay shipment of the generator’s waste streams.

DISCUSSION

1. The issue refers to a paragraph within Section B-3a(i). This paragraph states that a) hazardous waste codes are assigned initially using acceptable knowledge and b) the assignment is verified with sampling and analysis.

   In addition, VOC constituents will be compared to those assigned by acceptable knowledge, and the Permittees will assign hazardous waste codes, as warranted. This comparison may include an analysis of radiolytically derived VOCs. The Permittees may also consider radiolysis when assessing the presence of listed waste, and whether radiolysis would generate wastes which exhibit the toxicity characteristic.

The Permittees commented on this Section of the Permit stating, in part, “Assignment of RCRA hazardous waste codes is the generator’s responsibility and generators should use all available acceptable knowledge, (which may include information regarding radiolytically derived constituents), to support their hazardous waste determinations.” Section B4-3d confirms that CAO’s position that the generator sites must identify and apply the proper codes as follows:
Waste characterization (i.e., radiography or visual examination, headspace-gas sampling and analysis, and homogeneous waste sampling and analysis) will be used to confirm acceptable knowledge information. Figure B4-2 illustrates the process the Permittees shall require sites to use to confirm acceptable knowledge.

2. Figure B4-2 which is to be used by the generator sites shows the steps required when headspace gas contains detectable concentrations of VOCs which are not identified by acceptable knowledge.

Additionally, Permit Section B4-3d also states: (emphasis added)

If the UCL90 for the mean concentration exceeds the PRQL, sites shall reevaluate their acceptable knowledge information and determine the potential source of the constituent. Sites shall provide documentation to support any determination the F-listed organic constituents are associated with packaging materials, radiolysis, or other uses not consistent with solvent use. If the source of the detected F-listed solvents cannot be identified, the appropriate spent solvent hazardous waste code will be conservatively applied to the waste stream. In the case of applicable toxicity characteristic VOCs and non-toxic F003 constituents, generator/storage sites may assess whether the headspace gas concentration would render them non-hazardous for those characteristics and change the initial acceptable knowledge determination accordingly.
CLARIFICATION NUMBER CAO-00-002, REV. 0
TENTATIVELY IDENTIFIED COMPOUNDS
(SECTION B-3a(1))

ISSUE
1. What are the time requirements for reporting TICs?
2. Do previously analyzed containers require reanalysis?
3. How are TICs to be identified using the FTIRS method?
4. What is the impact of adding TICs on a waste stream lot basis?
5. Can SW-846 be used for identifying and reporting TICs?
6. What is the guidance regarding TICs for methods that are not part of SW-846?

CONCLUSION
1. There are no time requirements for adding TICs to waste stream target analyte lists for instances where they are detected in 25% of the samples from given waste streams. When TICs are identified, they should be added to the target analyte list at the earliest practical time.

2. Re-sampling and/or reanalysis of the waste stream is not required.

3. The permit requires the use of Method 8410 for identifying TICs for headspace gas analysis that is performed using FTIRS. However, Method 8410 is incorrect and should be Method 8450. (See Clarification Number CAO-00-005).

4. Characterization of a waste stream is based on sampling a representative portion of the waste stream in accordance with Attachment B2. If TICs occur in 25% of these samples then the TIC must be added as an analyte for subsequent analysis for the containers in the waste stream. If TICs meet the criteria in the permit for hazardous waste, their codes must be added to the waste stream. Subdividing the waste streams into lots may or may not result in additional target analytes. This depends primarily on the homogeneity of the waste stream. Generator sites may use their own knowledge of the waste to segregate waste streams into lots for characterization and sampling. Each lot must be representatively sampled. If the results of this sampling are the same from lot to lot, then new TICs will not necessarily be identified. If characterization results are the same from lot to lot, a new
Waste Stream Profile Form is not needed. TICs identified in one lot shall be added to all future lots from that waste stream.

5. Generator sites are required to implement TIC reporting in accordance with SW-846.

6. SW-846 and the permit provide the appropriate methodology. Non-permit or non SW-846 methods should not be used to demonstrate compliance to the permit.

DISCUSSION
1. Section B-3d, refers to "a statistically selected portion of the waste stream" as follows:

   All waste containers (retrievably stored and newly generated) are sampled and analyzed for VOCs in the headspace gas. A statistically selected portion of each homogeneous solids and soil/gravel waste stream is sampled and analyzed for RCRA-regulated total VOCs, SVOCs, and metals (see Permit Attachment B2).

   This sampled portion of the waste stream or waste stream lot represents the basis for identifying TICs for the waste stream (or waste stream lot). This basis is not time dependent. If TICs are identified in 25% of these samples, they must be added as target analytes for the waste stream.

2. Section B3-1, Page B3-6 states:

   If a target analyte list for a waste stream is expanded due to the presence of TICs, all samples ... will be analyzed for constituents on the expanded list.

   This requirement applies to any future sampling applied to the waste stream. Typically sampling performed after completion of the representative sampling will consist of container-specific sampling required to prepare the waste for shipment to WIPP (e.g., headspace gas sampling). If a TIC is identified in a waste stream lot, CAO requires adding that TIC to future lots of the waste stream in order to assure waste is properly characterized.

3. The NMED stated the need for Method 8410 for FTIR in the following response to comment W.1-10 (Idaho) on the revised draft permit:

   In general the response to this comment is contained in the TIC written testimony. However, the comment did illustrate a difference in
compound identification techniques for GC/MS and FTIR techniques. FTIR compounds are not identified using mass spectrometry. Therefore, the Permit Draft regarding TIC identification as written does not apply to FTIR instrumentation. The Permit has been modified to indicate that the TIC identification criteria currently in the Permit are applicable to GC/MS methods only and that the FTIR TIC identification criteria consists of conducting a library search of the five most likely compounds at each unexpected emission band or band with demonstrated interferences as specified in SW-846 Method 8410.

However, Method 8410 is the incorrect method and it should be specified as Method 8450. A Class 1 permit modification has been submitted changing this reference to the correct method.

4. Section B-1a, page B-5 states: (emphasis added)

All of the waste within a waste stream may not be available for sampling and analysis at one time. In these instances, generator/storage sites may divide waste streams into waste stream lots based on staging, transportation, or handling issues. Characterization activities shall then be undertaken on a waste stream lot basis. A Waste Stream Profile Form need not be submitted for subsequent waste stream lots unless warranted by the characterization information.

Subdividing waste streams into lots may or may not result in additional target analytes. This depends primarily on the homogeneity of the waste stream. Generator sites may use their own knowledge of the waste to segregate waste streams into lots for characterization and sampling. Each lot must be representatively sampled. If the results of this sampling are the same from lot to lot, then new TICS will not necessarily be identified. If characterization results are the same from lot to lot, a new Waste Stream Profile form is not needed.

5-6. Section II.C.1.b states the following:

"Waste characterization sampling and analytical methods - the Permittees shall require that generator/storage sites comply with the method requirements, quality control, equipment testing, inspection, maintenance, and equipment calibration and frequency standards for the procedures specified in Permit Attachment B1 (Waste Characterization Sampling Methods). For all analytical methods for
waste analysis not otherwise specified in Permit Attachment B1, the Permittees shall require the generator/storage sites to use "Test Methods for Evaluating Solid Waste, Physical/Chemical Method", EPA Publications SW-846."

Based on this, generator sites should not be using non-permit, non-SW-846 methods to analyze VOCs for waste to be shipped to WIPP.

In their written technical testimony, the NMED stated that TIC reporting is to be performed in accordance with SW-846 methods and in, particular, NMED stated the following:

The TIC permit condition criteria are consistent with SW-846 Methods criteria, as they require the Applicants to report clearly identifiable TICs for addition to the target analyte list for specific methods. The SW-846 Methods, which were specifically written for the analysis of RCRA-regulated hazardous waste, do not limit the number of TICs that must be reported and identified.

In addition, the NMED clarified, with regard to TIC reporting, the following:

NMED agrees that TIC identification and reporting should be limited to clearly identifiable TICs, and that the generator/storage sites should not report sample carryover or other laboratory artifacts as TICs. However, the SW-846 criteria address these concerns. First, the generator/storage sites are not required to report TICs that cannot be clearly identified to match the ions and ion intensities of a reference spectrum. Simply, the generator/storage sites have no obligation to report unknown compounds or classes of compounds that do not have a clear reference match spectrum. As a result, the Applicants' concern that generator/storage sites would be required to report the equivalent of instrument noise lacks merit. Second, the generator/storage site are not required to report TICs found at extremely low concentrations, because ions near the ten (10) percent relative abundance threshold are below the ion resolution capability of the GC/MS instrument and the spectra or relative intensities of spectra cannot be distinguished. Third, the generator/storage sites are required to report TICs attributable to GC/MS instrument background or peak coelution. Rather, the generator/storage sites are not required to report TICs which are clearly different than GC/MS instrument background and cannot be attributed to laboratory conditions. Conversely, under the CLP criteria, the generator/storage sites would be required to report unknown compounds or classes of
compounds. In fact, the CLP criteria impose an arbitrary TIC limit as a direct result of this broad reporting requirement. Such a broad reporting requirement would not be consistent with the intent of the TIC condition: while the TIC permit condition is intended to identify hazardous constituents for potential addition to target analyte lists and assessment of hazardous waste codes, the CLP criteria would identify unknown compounds or classes of compounds which cannot be added to target analyte lists, and therefore are not relevant to waste characterization.

In sum, the SW-846 criteria ensures that potentially problematic TICs are reported, while the CLP criteria both overreport and underreport TICs on an arbitrary basis. TIC detection does not automatically result in revision of the target analyte lists. To be added to the target analyte lists, the TIC must be found in twenty-five (25) percent of samples from the waste stream, and must be on the Appendix VIII list.
CLARIFICATION NUMBER CAO-00-003, REV. 0
ORDER OF WASTE CHARACTERIZATION ACTIVITIES
(FIGURES B-2 AND B-3, SECTION B-3d)

ISSUE
1. Is it necessary to perform waste characterization in the order prescribed in Figures B-2 and B-3?
2. Must headspace gas samples be taken prior to visual examination?
3. Is placing waste back into the drum (or into a new drum(s)) after visual examination considered repackaging, thereby requiring the drum to be characterized as newly generated waste?

CONCLUSION
1. It is not necessary that the activities in Figures B-2 and B-3 be performed in the order shown as long as:
   a) All required activities are performed, and
   b) All applicable venting and aging criteria are met.
2. No, however sampling prior to visual examination is stated so that a generator site will not have to resample the container after visual examination.
3. Neither the NMED nor the CAO consider the removal of waste from the container for visual examination and its placement back into the container to be repackaging. The generator should apply the following guidelines:
   a) For cases where the waste is removed, visually examined, and replaced in the same container no resampling is necessary. The headspace gas concentrations determined prior to VE should be reported for the container.
   b) For cases where the waste is removed, visually examined and placed in a new similar container no resampling is necessary. The headspace gas concentrations determined prior to VE should be reported for the new container.
   c) For cases where waste is removed from a container, visually examined and placed in a larger container, no resampling is necessary. The headspace concentrations determined prior to VE should be applied to the new container. This also applies if the larger container is an overpack.
   d) For cases where the waste is removed from a single container, visually examined, and placed in two or more containers, no resampling is necessary. The headspace gas
concentrations determined prior to VE should be applied to each container.

e) For cases where waste is removed from a container visually examined, and placed in a smaller container, or in a container with other waste, resampling of a smaller container and resampling of a combined container are necessary following VE.

DISCUSSION

1. Figures B-2 and B-3 are Process Flow Descriptions that are to be used in Data Characterization Design for Newly Generated and Retrievably Stored Waste. They contain steps that are described in the Permit and steps which are external to the permit. Because of this, they are to be considered as examples of how the process design may be configured. Generators should perform the activities in a sequence that conforms to site design, policy and practice.

2. The NMED has indicated that the order of characterization is not to be constrained by the permit. The requirement is that all of the requisite characterization be performed and reported, regardless of the order.

The NMED has specified headspace sampling prior to VE. This is allowed so that a generator would not have to wait for a container to meet the drum venting and aging criteria in order to be sampled after the container is opened for visual examination. This condition is similar to and consistent with Condition 11.C.5 in the permit regarding derived waste characterization at the WIPP facility.

3. Use of the option to do headspace sampling prior to VE, however, is not mandatory as explained above. Furthermore, limitations are discussed in Conclusion Item 3 above.
CLARIFICATION NUMBER CAO-00-004, REV. 0
CALCULATION RECORDS
(SECTION B-4a(5))

ISSUE
1. Are "calculation records" records of hand calculations only or do they include some form of printout of computer generated calculations?
2. Are calibration records required for laboratory conditions (pressure, vacuum, and/or temperature calibration records)?

CONCLUSION
1. Calculation records include both hand calculations and the printout of computer generated calculations.
2. Calibration records reported in Sampling Batch Data Reports may include measurements taken in the laboratory such as temperature, etc.

DISCUSSION
1. Section B3-10, pages B3-22 and B3-23 state, regarding the review of calculations the following:

Data review, validation, and verification at this level involves scrutiny and signature release from qualified independent technical reviewer(s), technical supervisors(s), and a QA representative, as specified below. Individuals conducting this data review, validation, and verification must use checklists that address all of the items included in this section. Checklists must contain tables showing the results of sampling, analytical or on-line batch QC samples, if applicable. Checklists must reflect review of all QC samples and quality assurance objective categories in accordance with criteria established in Tables B3-2 through B3-9 (as applicable to the methods validated). Completed checklists must be forwarded with testing, sampling, analytical and on-line batch data reports to the project level.

• One hundred percent of the batch data report for each type of analytical, sampling, or testing batch must receive an independent technical review. This review shall be performed by an individual other than the data generator who is qualified to have performed the initial work. The independent technical review must be performed as soon as practicably possible in order to determine and correct negative quality trends in the
sampling or analytical process. However at a minimum, the independent technical review must be performed before any waste associated with the data reviewed is characterized and managed, stored, or disposed at WIPP. The reviewer(s) must release the data as evidenced by signature, and as a consequence ensure the following:

- **Calculations have been verified by a valid calculation program, a spot check of verified calculation programs, and/or 100 percent check of all hand calculations. Values that are not verifiable to within rounding or significant difference discrepancies must be rectified prior to completion of independent technical review.**

2. Section B3-10, page B3-21 refers to the Sampling Batch Data Report as follows: (emphasis added)

- A Sampling Batch Data Report or equivalent includes all field data pertaining to a group of no more than 20 samples that were collected for chemical analysis. **Sampling Batch Data Reports may include chain of custody documentation and any measurements taken in the field such as temperature, pH, conductivity, as well as field notes, logs, and other field documentation.**
ISSUE
Is Fourier Transform Infrared Spectroscopy (FTIRS) approved for use?

CONCLUSION
The use of FTIRS is to be considered approved by the EPA and is a valid technique for characterization of Headspace Gas. Sites using FTIRS should provide documentation of its use in the site QAPP and standard operating procedures. The permit does not need to be modified since the letter cited below makes the method “EPA Approved” for CAO as indicated in Table B-3.

DISCUSSION
On March 21, 1996, Michael Shapiro sent a letter to George Dials approving the use of FTIRS for the measurement of headspace gas in TRU mixed waste. In the approval letter, the EPA stated the following:

... These requirements include the use of multivariant techniques [e.g., partial least squares (PLS)], use of blanks, field reference standards, demonstration of compliance with appropriate QAPP quality assurance objectives and participation in the CAO performance demonstration program as specified in the QAPP. The QAPP must be revised and implemented at the DOE generator/storage sites prior to using FTIRS for the analysis of drum headspace VOCs.

Section B1-1a addresses the sampling requirements associated with FTIRS.¹
Section B1-1b addresses the Quality Control requirements associated with FTIRS.²

Section B3-1, page B3-3 provides requirements for calculating FTIRS MDLs.
Section B3-1, page B3-5 provides specific requirements for determining TICs associated with the FTIRS Method.

¹For example, Section B1-1a, page B1-1, refer to an “on-line integrated sampling/analysis system”.
Section B1-1a(1), page B1-4, provide specific requirements for FTIRS.

²For example, Section B1-1b(1), page B1-9, provide specific requirements with regard to FTIRS field blanks. Likewise, Section B1-1b(2), page B1-9, provide specific requirements with regard to FTIRS equipment blanks.
Section B3-2 and Tables B3-2 and B3-3 provides specific QAOs for the FTIRS Method, including participation in the PDP.

NMED's responses to several comments including E.1-122 (WIPP) indicate that the NMED anticipated the use of FTIRS by the generator sites as a method to determine the concentration of VOCs in the headspace of containers.

The version of the FTIRS Method that was approved by the EPA was included in the Methods Manual as Method 430.7. This method has been posed to the waste characterization WEB Page at: http://www.wipp.carlsbad.nm.us/rcradox/menu.htm.
CLARIFICATION NUMBER CAO-00-006, REV. 0
HEADSPACE GAS VENTING
(SECTION B1-1a))

ISSUE

1. Does the requirement that all waste containers with unvented rigid containers greater than 4-liters shall be subject to innermost layer of containment sampling or shall be vented prior to initiating drum age and equilibrium criteria mean that all the 4-liter plastic jugs in the drums have to be vented before sampling, or is this referring to the venting of the inner drum liner only?

2. If this refers to the drum liner, is it permissible to have the liner vented through the carbon filter?

3. Is a nominal 1-gallon container (with top or lid in place) that will hold 4.1 liters when filled to brim, a > 4-liter container per the permit language?

4. Is a rigid (glass or plastic jug/jar with screw top in place) considered to be sealed container?

5. Is a 8 liter container filled with 6-liters of absorbent (oil dry), with a top or lid in place, considered to be a > 4-liter container?

6. Can a representative sample be obtained between the drum lid and the sealed rigid liner?

7. Can the CAO make any recommendations on meeting the permit’s Section B1-1a(3)(ii) condition for breaching the drum lid with a punch?

CONCLUSION

1. This provision applies to all containers, greater than 4-liters, regardless of their location in the container.

2. Yes, this applies to the sealed rigid liner.

3. If the generator site determines that the container can hold greater than 4-liters, then it is subject to the permit requirements covering >4-liter containers.

4. If the screw top provides an air-tight seal, then a glass or plastic jug/jar with a screw top in place is considered to be a sealed container. In addition, slip
top, clam shell or other similar containers that are taped around the circumference are considered sealed.

5. An 8-liter container, regardless of its contents is considered to be a > 4-liter container.

6. The volume between a drum lid and the rigid liner is considered to be representative if the rigid liner is vented and the drum aging criteria have been met.

7. In the near future, sites should be able to make use of LANL’s self-tapping sampling head. However, the CAO has not, to date, obtained the approval needed from the DOT to allow transportation of drums with the self-tapping heads installed.

DISCUSSION
1, 3, 5, & 6. NMED’s concern is that VOC headspace samples be representative of all sample container volumes within the drum. The threshold for this is 4 liters. This concern is addressed by the Permit’s requirement to vent rigid containers greater than 4 liters prior to drum aging, or to subject the container to separate headspace gas analysis. In addition to meeting these permit requirements, generator sites need to be aware that Revision 17 to the TRUPACT-II SAR, Section 2.8.1 states “Sealed containers greater than 4 liters are prohibited except for Waste Material Type II.2 packaged in a metal container.” Therefore, given that it will seldom ever be permissible for the sites to ship sealed containers greater than 4 liters, it would seem prudent to meet the Permit requirement by venting the container rather than subjecting it to separate headspace gas analysis.

The permit requires that a rigid liner be properly vented to assure representative sampling. For example, Section B1-1a(3)(l), page B1-6 states (regarding sampling through the filter): (emphasis added)

"...A representative sample cannot be collected until the poly-liner has been vented to the drum..."

2. Drum venting can include a hole in the rigid liner with or without a filter installed.

4. Based on hydrogen gas diffusion studies at several sites, sealed containers that are taped around the circumference (as a form of seal) do not diffuse gas as readily as untaped containers. Therefore, such taped containers are considered to be sealed for the purpose of compliance to the permit.
7. The LANL site has a self-tapping sampling head which meets the requirements of B1-1a(3)(ii). The CAO is approaching the DOT to obtain approval that the drum, when the self-tapping head is in place, is still a DOT 7A approved container.
ISSUE
Is the seal made between the needle and the filter medium considered adequate if a side port needle is placed through the drum lid filter?

CONCLUSION
The requirements for the sampling through a carbon filter are specified in Permit Section B1-1a(3)(i). The generator site must document in its QAP and operating procedures, as appropriate, how the filter is sealed to prevent outside air from entering the drum and contaminating the sample during gas extraction. While it is not the goal of the CAO to prescribe the method of obtaining an adequate seal, experience at generator sites is that the contact between the needle and filter media does not create an adequate seal.

DISCUSSION
Permit Section B1-1a(3)(i) describes the acceptable practices for Sampling Through the Carbon Filter. With regard to the required "seal" it states:

- For sample collection, the drum's carbon-composite filter shall be sealed to prevent outside air from entering the drum and diluting and/or contaminating the sample.

Experience has shown that the filter must be completely sealed prior to sampling and the seal maintained during sampling.
CLARIFICATION NUMBER CAO-00-008, REV. 0
HEADSPACE GAS SAMPLING AND ANALYSIS
(TABLE B-1, TABLE B-3, SECTION B1-1a(3)(ii))

ISSUE
1. What analysis method is to be used for alcohols and ketones in headspace gas?
2. What is the meaning of the phrase “as appropriate” with regard to using TO-14 methods?
3. What is the meaning of the word “modified” with regard to the methods for headspace gas sample analysis listed in Tables B-1 and B-3?

CONCLUSION
1. SW-846 does not have a specific method for analysis for alcohols and ketones in headspace gas. The NMED has specified Method 8015 for this purpose. However, this method is not suitable for gas analysis without modification. Therefore, wherever the permit specifies Method 8015, it should be read as Modified Method 8015.
2. In designing headspace gas sampling and analysis programs, generator sites should first apply the requirements specified in the permit. If the site needs additional guidance, then use TO-14.
3. Methods derived from EPA TO-14, SW-846 8240/8260, and SW-846 8015 are to be used for gas headspace analysis. Unless specifically prohibited by the permit, these reference methods may be modified as appropriate for use with gas headspace analysis. “Modified” methods must be documented in site-specific standard operating procedures and must be able to achieve the QAOs for gas headspace analysis provided in Tables B3-2 and B3-3 of the Permit.

DISCUSSION
1. In preparing the final permit, the NMED specified Method 8015 for the analysis of alcohols and ketones in headspace gas samples. Method 8015, however, is a GC/FD method for liquids and solids. However, it is possible to modify Method 8015 for use with gas samples. Therefore, the sites should modify Method 8015 as applicable to make analytical determinations of alcohols and ketones in headspace gas.
2. Section B1-1a(3)(ii), page B1-7 states the following:

To assure that the sample collected is representative, all of the general method requirements, sampling apparatus requirements, and QC requirements specified in EPA's Compendium Method TO-14

November 23, 1999
(EPA 1988) as appropriate, shall be met in addition to the following requirements:

In response to comment E.1-232, the NMED clarified the following:

...On occasion, the text in SW-846 methods does not definitively state a QC requirement through the use of words such as "must" or "shall." Instead, for example, the SW-846 methods will indicate that a QC requirement "should" be performed. This slight variation is a method of bypassing QC requirements unless governing project documents clearly state that these QC elements are mandatory. The governing project document for the WIPP is the RCRA Part B Permit.

3. Reference methods TO-14, SW-846 8240/8260 and SW-846 8015 do not address analysis of waste container headspace gas samples and cannot be used "as written" for headspace gas analysis. Therefore Permit Tables B-1 and B-3 use the term "modified" in reference to these SW-846 methods. The term "modified" requires that the sites change the specified method to address the analysis of waste container headspace gas to meet the applicable QAQs specified in the permit.
CLARIFICATION NUMBER CAO-00-009, REV. 0
HEADSPACE GAS EQUIPMENT CLEANING AND STORAGE AND FIELD
REFERENCE STANDARDS
(SECTION B1-1b(3), B1-1c(3))

ISSUE
1. Is it necessary to remove the sampling head and replace it with a gas-tight connector in order to perform manifold cleaning after collection of a field reference standard?
2. Must headspace gas sampling manifolds be stored under pressure after cleaning?
3. What is the difference between the collection of field reference standards using a manifold method versus a direct canister method?
4. Can gas standards be produced by expanding samples of manufacturer-certified liquid standard solution into a known volume?
5. Do canister or manifold pressure gauges have to be calibrated?

CONCLUSION
1. It is acceptable to use the sampling head, connected to the standard side of the manifold or a gas-tight connector in place of the sampling head to connect to the purge gas system for cleaning.
2. No. The text regarding pressure applies to the cleaning method and not to the storage method.
3. Only one field reference standard is required for the direct canister method if the QAOs are met. Manifold methods require samples at the frequency provided in Table B1-2 for manifold and on-line sampling systems.
4. Manufacturer-certified liquid solution standards may be used to produce gas standards if the requirements pertaining to gas standards (e.g., NIST traceability) of the WAP are met. Sites must provide the documentation necessary to demonstrate compliance with the NIST-traceability requirement in the WAP for field reference standards.
5. Yes. The NMED added the requirement to the Permit for annual calibration of the pressure gauges.

DISCUSSION
1. The purpose of the sampling and cleaning configuration in Section B1-1a(1) and B1-1c(4) is to assure 1) that all portions are systematically and
adequately cleaned and 2) that contamination during and after cleaning does not occur. Alternative configurations may be used to satisfy these and other headspace gas sampling requirements. Configurations that meet these objectives are acceptable.

Section B1-1b(3), page B1-10, state the following with regard to field reference standards:

...After the initial accuracy check, field reference standards collected through the manifold shall be collected at a frequency of one per sampling batch and submitted as blind samples to the analytical laboratory. For the direct canister method, field reference standard collection may be discontinued if the field reference standard results demonstrate the quality assurance objective (QAO) for accuracy specified in Appendix B3.

2. The text in Section B1-1d(3) of the Permit regarding storage of sampling manifolds is ambiguous. The statement regarding the use of pressure is interpreted to apply to the cleaning of the manifold before storage and not the method of storage. This interpretation is consistent with Compendium Method TO-14. Generator sites must document cleaning and storage practices in site standard operating procedures.

3. The direct canister method utilizes very simple and static stable technology for the collection of headspace gas samples. Collection of a single, acceptable Field Reference Standard serves to demonstrate the efficiency and accuracy of the direct canister method of sampling, as long as the components remain the same and intact.

4. Generator sites may produce field reference gas standards by expanding samples of manufacturer-certified liquid standard solution into a known volume as long as the permit requirements (e.g., certificate of composition) are met. Specific guidance requirements for certified standard materials are given in various parts of SW-846 and in TO-14. The site must establish a program to provide the documentation necessary to demonstrate compliance with the NIST-traceability requirement in the WAP.

5. In the Permit Application, the CAO proposed initial calibration and annual calibration for manifold pressure sensors used in the headspace gas sampling apparatus. This requirement is consistent with EPA Compendium Method TO-14. In drafting the Permit, the NMED added the requirement that canister pressure gauges also be initially certified and annually calibrated to a NIST traceable, or equivalent, standard.
ISSUE

1. Are both IDLs and MDLs required for metals analysis?

2. Do each of the seven measurements have to be run on a non-consecutive day?

3. Do preps have to be done on non-consecutive days?

CONCLUSION

1. Apply the guidance in SW-846 in cases where specific requirements are not provided in the permit. Since SW-846 uses IDL’s and MDL’s inconsistently in some methods, careful documentation of their meaning is required. The detailed procedures for determining MDL’s/IDL’s shall be documented in site procedures.

2. The text regarding MDLs in section B3-1 has two paragraphs. Paragraph 1 applies only to non-FTIRS methods. Paragraph 2 applies only to FTIRS. The seven measurements are to be performed on non-consecutive days, for example, 5 measurements on one day, and 2 measurements two days (or more) following; or 3 measurements on one day, and 4 measurements two days or more following. Laboratory procedures are to specify the timing.

3. Preps may be done at the same time. Note that it is inappropriate to use LCS values to update MDLs on solids analytical procedures.

DISCUSSION

1-3. The language regarding the determination of MDL’s in the permit is confusing. Therefore, CAO has issued this clarification to establish a workable interpretation of MDLs that is consistent with SW-846 and can be implemented by the generator sites.
ISSUE
How do sites achieve the 100% headspace reporting requirement if the completeness requirement is 90%?

CONCLUSION
Generators may put both valid and qualified data in the WWIS to meet the 100% reporting requirement. Generators must still submit data for 100% of the containers into the WWIS with appropriate rationale for any invalidated data. Data that are qualified as invalid data cannot exceed 10% of the total.

DISCUSSION
Section B3-2 requires a minimum of 90% sample completeness for Headspace Gas Sampling. This means that up to 10% of samples considered invalid can be disregarded when evaluating a waste stream. However, Section B-4a(6), page B-22 states:

Data for each container will be transmitted by hard copy and/or electronically (provided a hard copy is available on demand) from the data generation level to the generator/storage site TRU mixed waste characterization project level.

This requires that head space gas data for 100% of the containers in a waste stream be submitted to the WIPP via the WIPP Waste Information System (WWIS). Up to 10% of these data for a waste stream or waste stream lot may be qualified as invalid. This is acceptable as long as the waste stream has been characterized according to the Waste Analysis Plan and meets the 90% completeness requirements delineated in Section B3-2. The invalid data can be submitted to the WWIS along with an appropriate explanation. This will allow generators to meet the 100% WWIS container data requirement.
ISSUE
Can on-line sampling batch reports contain results for more than 20 samples?

CONCLUSION
The on-line equivalent to a sample batch is an on-line batch. There are no maximum number of samples that can be included in an on-line batch. However, it is limited to the samples collected in a twelve hour period. Analytical Batch Sampling Report for an on-line sampling system in an operating period of up to 12-hours contains the data from all of the samples taken by the on-line sampling system.

DISCUSSION
This conclusion is based on the following definition of an on-line sampling batch found in Section B1-1b, page B1-8, which states: (emphasis added)

For manifold and direct canister sampling systems, field QC samples shall be collected on a per sampling batch basis. A sampling batch is a suite of samples collected consecutively using the same sampling equipment within a specific time period. A sampling batch can be up to 20 samples (excluding QC samples), all of which shall be collected within 14 days of the first sample in the batch. For on-line integrated sampling/analysis systems, QC samples shall be collected and analyzed on a per on-line batch basis. Holding times and container requirements for gas sample containers are provided in Table B1-1. An on-line batch is the number of headspace-gas samples collected and analyzed within a 12-hour period using the same on-line integrated analysis system. Table B1-2 provides a summary of field QC sample collection requirements. Table B1-3 provides a summary of QC sample acceptance criteria."
CLARIFICATION NUMBER CAO-00-013, REV. 0
GC/MS TUNES, INITIAL CALIBRATIONS AND CONTINUING CALIBRATIONS FOR VOC GAS (TABLE B3-3)

ISSUE
What are the requirements for "GC/MS tunes, initial calibrations and continuing calibration" for volatile organic compound gas methods?

CONCLUSION
The following should be applied to VOC Gas Analyses in addition to the requirements in Table B3-3:

<table>
<thead>
<tr>
<th>Technique</th>
<th>Procedure</th>
<th>Frequency of Procedure</th>
<th>Acceptance Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>GC/MS</td>
<td>BFB Tune</td>
<td>Every 12 hours</td>
<td>Abundance criteria for all key ions are met</td>
</tr>
<tr>
<td></td>
<td>5-pt initial calibration</td>
<td>Initially, as needed</td>
<td>%RSD of response factor for each analyte ≤ 35</td>
</tr>
<tr>
<td></td>
<td>(5 standards)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Continuing Calibration</td>
<td>Every 12 hours</td>
<td>%D for all compounds ≤ 30 of initial calibration</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GC/FID</td>
<td>3-pt initial calibration</td>
<td>Initially, as needed</td>
<td>%RSD of response factor for each analyte ≤ 30</td>
</tr>
<tr>
<td></td>
<td>(3 standards)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Continuing calibration</td>
<td>Every 12 hours</td>
<td>%D for all compounds ≤ 30 of initial calibration</td>
</tr>
</tbody>
</table>

4-Bromofluorobenzene

DISCUSSION
The permit specifies Table B3-3 as the source for GC/MS calibration information for VOC gases. However, the information does not appear in the table. Therefore the CAO has specified the above values consistent with other tables in the permit.
ISSUE
1. What is the relationship between free liquids and prohibited items such as corrosives, ignitables, or reactives?

2.a What is the significance of the 1% in an inner container limit for liquids in WIPP waste?

2.b Is a volume of liquid within an inner container that is greater than 1% acceptable as long as the payload container meets the 1% limit?

3. How are generator sites to characterize waste for prohibited items?

4. How does a generator site know that waste materials are compatible with backfill, seal, and panel closure materials?

5. How are data confirming the absence of prohibited items to be reported to the WIPP?

CONCLUSION
1. Section B-3c states that the prohibition on liquids and containerized gases prevents the shipment of corrosive, ignitable and reactive wastes. NMED has indicated that the sites are to make statements regarding the absence of prohibited items based on RTR, VE, or acceptable knowledge.

2.a The 1% limit on liquids was chosen as a program limit based on WIPP facility considerations. This represents a limit that: assures compliance to WIPP regulatory performance standards, does not pose a safety threat during operations, and is quantifiable during waste characterization activities.

2.b Yes, an inner container may exceed the 1% criterion as long as the internal container does not contain more than 1 inch of liquid and the payload container does not contain more than 1 percent by volume of liquid.

3. Generator sites are to use acceptable knowledge to identify whether or not waste streams contain prohibited items. Radiography is used to verify the generator site’s conclusions regarding prohibited items.
4. Compatibility issues are handled through the use of approved TRUCON codes.

5. Generator sites are to supply documentation with the Waste Stream Profile Form (WSPF) in the form of a data summary report. The data summary report must state that each container characterized for the WSPF was checked to ensure there are no prohibited items in the container. This information will be verified by the CAO.

DISCUSSION

1. Sections B-1c and B-3c address the requirement to characterize waste to determine the absence of corrosives, ignitable, and reactive waste. Section B-3c states:

   The prohibition of liquids and containerized gases prevents the shipment of corrosive, ignitable, or reactive wastes.

   Therefore, verifying the absence of free liquids during radiography assures the absence of these prohibited items.

   Other prohibited items, such as non-radionuclide pyrophorics and compressed gas are documented through acceptable knowledge. The absence of pressurized containers is verified by radiography.

2. The 1% limit on free liquids was established as a program limit for storage facilities who had no way of removing liquids from waste they were characterizing for WIPP. Generator facilities generally have adopted a no free liquids policy. That is, in the process of filling containers or verifying contents they will remove any liquids (or send the container back to the point of generation for removal).

   If a generator site identifies liquids in a waste and these liquids are within the 1% limit, the generator site should apply acceptable knowledge to identify the liquid.

3. Section B-3 of the permit states the characterization techniques used by generator sites includes acceptable knowledge, which incorporates confirmation by headspace gas sampling and analysis, radiography, and homogeneous waste sampling and analyses.

   The permit details the characterization activities required by the sites in preparing waste for shipment to WIPP.
4. The permit application addressed the issue of compatibility through a chemical compatibility analysis which was carried out with all defense-generated, contact-handled (CH) and remote-handled (RH) transuranic (TRU)-mixed waste streams reported in the Waste Isolation Pilot Plant (WIPP) Transuranic Waste Baseline Inventory Report (WTWBIR). The analysis also accounted for packaging, container, and backfill materials. This compatibility study was performed consistent with EPA guidelines\(^4\) and is documented in the application in Appendix C1. A summary of the waste streams considered is given in Table C-1 of Chapter C of the permit application.

5. In the event a generator finds incompatible waste, the permit requires the waste to be rejected, or the incompatible items be removed. This is found in Section B1-c, page B-7, as follows:

To ensure the integrity of the WIPP facility, waste streams identified to contain incompatible materials or materials incompatible with waste containers cannot be shipped to WIPP unless they are treated to removed the incompatibility. Only those waste streams that are compatible or have been treated to remove incompatibilities will be shipped to WIPP.

Section B-4b(1)(ii), page B-28, clarifies that the Permittees (CAO and WID) will verify three types of data as part of the waste screening and acceptance process. Two of these types of data address prohibited items and includes verifying:

...2) a determination of ignitability, reactivity, and corrosivity; and 3) a determination of compatibility....

The permit further specifies:

The data summary report will indicate if the waste has been checked for characteristics of ignitability, corrosivity, and reactivity....

---

CLARIFICATION NUMBER CAO-00-015, REV. 0
WASTE STREAM ASSIGNMENT
(SECTION B-3c)

ISSUE
1. When would it be necessary to fill out a new Waste Stream Profile Form?
2. If characterization requirements for a waste stream must be applied to each lot, does CAO have any guidance for making statistical sampling determinations and data evaluations (e.g. TICs, VE%)?
3. Does the waste stream have to be completely characterized prior to filling out a Waste Stream Profile Form?
4. How is the decision made regarding the amount of characterization applied to each retrievably stored waste stream?

CONCLUSION
1. There are two parts to this issue:
   a) A Waste Stream Profile Form (WSPF) is required for every waste stream that a generator site intends to ship to WIPP. If in the process of characterizing a waste stream, a site identifies a drum that needs to be reassigned to another waste stream, a WSPF is needed for a new waste stream if the drum cannot be assigned to a waste stream with an approved WSPF.
   b) If a generator characterizes a waste stream in waste stream lots, each lot is subject to representative sampling. A new WSPF is not needed for each lot unless waste characterization information indicate that the lots are different.
2. The use of waste stream lots is an option to divide waste streams into manageable increments for the purpose of characterizing. Each waste stream lot is subject to the statistical sampling requirements of Attachment B2. Other statistically based requirements apply as follows:
   a) If a TIC appears in 25% of the samples in a waste stream lot, it needs to be added to the analyte list for that lot. It is required that it also be added to the analyte list for the rest of the waste stream.
b) The Summary Category Group specific miscertification rate must be applied to the lot. If the lot is the first lot in a Summary Category Group, the site specific rate must be applied until sufficient samples in the lot have been processed to establish a Summary Category Group specific rate.

3. No. The requirement is for the generator site to complete characterization of a representative portion of the waste stream or waste stream lot.

4. Generators use acceptable knowledge to assign waste to a waste stream and to identify the appropriate Waste Matrix Code Group and Summary Category Group. Characterization is determined based on Summary Category Group assignment.

DISCUSSION

1. Section B-4b(1), page B-24, identifies when a WSPF must be completed. The permit requires the following:

   When the required waste stream characterization data have been collected by a generator/storage site and the initial generator/storage site audit has been successfully completed, the generator/storage Site Project Manager can verify that waste stream characterization meets the applicable WAP requirements as a part of the Level 2 data verification (Permit Attachment B3). The generator will then complete a Waste Stream Profile Form and submit it to the Permittees, along with the accompanying waste characterization documentation for that waste stream. All data necessary to check the accuracy of the Waste Stream Profile Form (data summary reports used to compile the form and the waste stream summary report) will be transmitted to the Permittees with the Waste Stream Profile Form for verification by the Permittees.

3. With regard to waste stream lots, the permit specifies that a new WSPF is not needed unless data indicate that a given lot differs from the profile of its associated waste stream. Section B-1a states:

   All of the waste within a waste stream may not be available for sampling and analysis at one time. In these instances, generator/storage sites may divide waste streams into waste stream lots based on staging, transportation, or handling issues. Characterization activities shall then be undertaken on a waste stream lot basis. A Waste Stream Profile Form need not be
submitted for subsequent waste stream lots unless warranted by the characterization information.

Sites are required to characterize a representative sample of each waste stream prior to submitting a Waste Stream Profile Form.

Section B-1a, page B-5, states:

All of the waste within a waste stream may not be available for sampling and analysis at one time. In these instances, generator/storage sites may divide waste streams into waste stream lots based on staging, transportation, or handling issues. Characterization activities shall then be undertaken on a waste stream lot basis. A Waste Stream Profile Form need not be submitted for subsequent waste stream lots unless warranted by characterization information.

4. Section B-3d(2), Page B-16 states:

All retrievably stored waste containers will first be delineated into waste streams using acceptable knowledge. All retrievably stored waste containers will be examined using radiography to confirm the physical waste form (Summary Category Group), to verify the absence of prohibited items, and to determine the waste characterization techniques to be used based on the Summary Category Groups (i.e., S3000, S4000, S5000). Repackaged retrievably stored waste, or any retrievably stored waste with inadequate acceptable knowledge, will be characterized using either the retrievably stored or newly generated waste characterization process, whichever results in greater sampling requirements. Radiographic results will be compared to acceptable knowledge results to ensure correct Waste Matrix Code assignment and identification of prohibited items.

Radiography is used as a confirmation tool to verify the waste stream assignment was correct. Radiography does not determine what characterization is needed for a waste stream.
CLARIFICATION NUMBER CAO-00-016, REV. 0
DETERMINING PHYSICAL WASTE FORM
(SECTION B-3c)

ISSUE

1. How is a waste stream defined?
2. Is it necessary to determine volume percentages of specific matrix parameter categories for each container?
3. What is the radiography operator required to confirm with regard to the waste matrix code?

CONCLUSION

1. Waste streams are not pre-designated by the permit. However, as a general guideline, the designation of waste streams should not deviate from the information given in the permit application. As a minimum, the “single process” or “activity” in the definition of a waste stream should relate to the four broad categories of DOE waste production process. Similarly, the “similar in material, physical form, and hazardous constituents” in the definition should relate to the eleven Waste Matrix Code Groups.

2. Yes. The wastes are defined as being divided into streams according to their source process or activity. The streams are grouped into three Summary Category Groups, and each of these may be subdivided into Waste Matrix Code Groups. The Summary Category Group codes are defined by the majority (i.e. at least 50 percent by volume) components of their Waste Matrix Code Groups. This information is defined initially from acceptable knowledge (AK) and confirmed by examination and sampling. Volumetric information is required to characterize waste as belonging to a Summary Category Group. Per Attachment B, Introduction, page B-2, the procedures for waste characterization will be selected according to the Summary Category Group that is the volumetric plurality.

3. The radiography operator will view containers and determine if the contents match the waste stream description. The operator does not view the drum and attempt to determine what the matrix parameter category is. Rather, the operator’s role is one of verification.

DISCUSSION

1. In the permit application, the Permittees provided information regarding the designation of waste streams throughout the DOE system. Table C-1 on the
permit application contained 180 separate waste streams from the various DOE sites.

In negotiating the permit, the Permittees were careful not to be locked into the specific waste stream numbers or designations. The NMED agreed that the designations in Table C-1 were not necessary to accomplish the purposes of the permit and did not repeat them in the permit, nor did the NMED require that the DOE assign waste to any of the specific waste streams in the application.

Based on the permit application the permit described four waste generating processes in the Introduction of Attachment B, Page B-1. These include:

- Production of Nuclear Products—Production of nuclear products includes reactor operation, radionuclide separation/finishing, and weapons fabrication and manufacturing. The majority of the TRU mixed waste was generated by weapons fabrication and radionuclide separation/finishing processes. More specifically, waste consists of residues from chemical processes, air and liquid filtration, casting, machining, cleaning, product quality sampling, analytical activities, and maintenance and refurbishment of equipment and facilities.

- Plutonium Recovery—Plutonium recovery wastes are residues from the recovery of valuable plutonium-contaminated molds, metals, glass, plastics, rags, salts used in electrorefining, precipitates, firebrick, soot, and filters.

- Research and Development (R&D)—R&D projects include a variety of hot cell or glovebox activities that often simulate full-scale operations described above, producing similar TRU mixed wastes. Other types of R&D projects include metallurgical research, actinide separations, process demonstrations and chemical and physical properties determinations.

- Decontamination and Decommissioning—Facilities and equipment that are no longer needed or useable are decontaminated and decommissioned, resulting in TRU mixed wastes consisting of scrap materials, cleaning agents, tools, piping, filters, Plexiglas®, gloveboxes, concrete rubble, asphalt, cinder blocks, and other building materials. This is
expected to be the largest category by volume of TRU mixed
waste to be generated in the future.

These processes result in waste in one or more of the eleven following
Waste Matrix Code Groups: solidified inorganics, solidified organics, salt
waste, soils, lead/cadmium metal, inorganic nonmetal waste, combustible
waste, graphite, filters, heterogeneous debris waste, or uncategorized metal.

The Waste Matrix Code Groups are further categorized as broad Summary
Categories Groups related to:

- S3000—Homogeneous Solids
- S4000—Soils/Gravel
- S5000—Debris Waste

2. Attachment B Introduction, page B-3, states:

If a waste does not include at least 50% of any given category by
volume, characterization shall be performed using the waste
characterization process required for the category constituting the
greatest volume of waste for that waste stream (see Section B-3d).

3. Section B-3d(2), pages B-16 and B-17, states:

All retrievably stored waste containers will be first by delineated into
waste streams using acceptable knowledge. All retrievably stored
waste containers will be examined using radiography to confirm the
physical waste form (Summary Category Group), to verify the
absence of prohibited items, and to determine the waste
characterization techniques to be used based on the Summary
Category Groups (i.e., S3000, S4000, S5000). Repackaged
retrievably stored waste, or any retrievably stored waste with
inadequate acceptable knowledge, will be characterized using either
the retrievably stored or newly generated waste characterization
process, whichever results in greater sampling requirements.
Radiographic results will be compared to acceptable knowledge
results to ensure correct Waste Matrix Code assignment and
identification of prohibited items. If radiographic analysis do not
confirm the physical waste form, waste will be reassigned as
specified in Section B-3c. Generator/storage sites may elect to
substitute visual examination for radiographic analysis.
Under the conditions of the permit, acceptable knowledge (AK) will be used to make the initial designation of a waste stream. Based on this description, the waste stream will be assigned a Waste Matrix Code Group (and a four-digit matrix parameter category). Radiography is used to verify the waste stream description and Waste Matrix Code Group (by the four-digit code) assignment to each container. The waste stream description provided by AK needs to be detailed enough for the radiography operator to match it to the Waste Matrix Code Group assigned to the container. This does not mean that the AK list needs to include every item that could be in the drums, but rather the description needs to be sufficient to give the operator knowledge of what is generally expected and what is not. For example, the description will include the origin of the waste. If the operator sees an item known not to come from that area, he will identify it as a discrepancy. The generator site will investigate each discrepancy and determine if the description was wrong or if the operator called it wrong, and take appropriate corrective actions.
ISSUE
Is there a specific process to be used for estimating material parameter weights?

CONCLUSION
No. The permit allows the sites to develop appropriate processes for estimating material parameter weights. The process must be documented in the site QAPJWP and standard operating procedures.

DISCUSSION
Section B3-4, page B3-11, states that the objective of radiography for the program is to verify the Waste Matrix Code and identify prohibited items for each waste container and to estimate each waste material parameter weight (Table B3-1).

Estimating weight during a radiography examination may be time consuming and may require the use of look-up tables. To address this concern one site has suggested that radiography operators estimate volumes of waste materials during the initial examination. Then another person converts the volumes to weights prior to submission of data. The conversion uses the weight and a conversion algorithm and is performed electronically.

Such an approach is allowable under the permit as long as the process is adequately documented in the QAPJWP and site procedures.
CLARIFICATION NUMBER CAO-00-018, REV. 0
RADIOGRAPHY QUALIFICATIONS
(SECTION B1-3b(2))

ISSUE
1. What are the qualifications and experience of the appointed site radiography subject matter expert?
2. How is he/she appointed?
3. Can the radiography subject matter expert be a subcontractor?
4. What are the qualifications and experience of the radiography technical supervisor?
5. If a site will process only one waste stream at a time, would it be sufficient for the initial radiography operator and visual examiners training to address only the waste types, processes, and packaging configurations for that waste stream?

CONCLUSION
1. Radiographers must meet the training requirements of Permit Section B1-3b.
2. The Permit does not specify the manner in which the subject matter expert is to be appointed. The generator site should document this appointment with a letter to file.
3. The permit does not prohibit the use of subcontractors in the role of the radiography subject matter expert.
4. The training requirements for a radiography technical supervisor are not specified in the Permit, therefore the generator site will specify this training in their training plan.
5. If a site is processing only one waste stream at a time, the site can meet radiography and visual examination training requirements by ensuring that the operators are trained on the types, processes, and packaging configurations for the waste streams that are currently being processed.

DISCUSSION
1. Section B1-3b(2) provides a discussion of radiography qualifications:
These items shall be successfully identified by the operator as part of the qualification process. Qualification of radiography operators shall, at a minimum, encompass the following requirements:

Successfully pass a comprehensive exam based upon training enabling objectives. This exam will be reviewed as part of the Permittees’ Audit and Surveillance Program (Permit Attachment B6). The comprehensive exam will address all of the Radiography operation, documentation, characterization, and procedural elements stipulated in this WAP.

Perform practical capability demonstration in the presence of appointed site radiography subject matter expert. This person is an experienced radiography operator who is qualified as an OJT trainer.

From the permit language above, a radiography subject matter expert is an experienced radiography operator who is qualified as an on-the-job (OJT) trainer. Radiography training requirements are detailed in the complete text of Section B1-3b. Requirements for OJT trainers should be prescribed in the site’s QAPjP and implementing procedures as specified by Permit Section B3-14.

2. The radiography subject matter expert is appointed in accordance with site’s QAPjP or implementing procedures.

3. The Permit does not prohibit the generator sites from using subcontractors to perform the duties of a radiography subject matter expert.

4. According to Section B3-10, the technical supervisor’s signature release ensures, among other considerations, that

“The data are technically reasonable based on the technique used.” The technical supervisor must also ensure that “container-specific data summary packages and waste stream characterization summary packages are prepared as appropriate.”

Radiography technical supervisors are those persons responsible for the overall technical operation of the generator site’s radiography program and their training should be commensurate with this responsibility.

This training should include familiarity with applicable processes and procedures and indoctrination in the QAPjP, QAPP, and WAP. These
training requirements, as well as entry level requirements, must be documented in the site Training Plan.

5. Permit Attachment B1-3b states:

In addition, the particular physical forms and packaging configurations at each site will vary; therefore, radiography operators shall be trained on the types of waste that are generated, stored, and/or characterized at that particular site.

Permit Attachment B1-3b(3) states:

Visual inspectors shall be instructed in the specific waste generating processes, typical packaging configurations, and expected waste material parameters expected to be found in each Waste Matrix Code at the site. The OJT and apprenticeship shall be conducted by an operator experienced and qualified in visual examination prior to qualification of the candidate. The training shall be site specific to include the various waste configurations generated/stored at the site.

The Permit addresses the need for flexibility by the generator site to conducting training specific to the waste streams which are anticipated at the generator sites. If at any given time the generator site’s training program for radiography and visual inspectors includes the types of waste are being characterized at the site, then this is adequate.
CLARIFICATION NUMBER CAO-00-019, REV. 0
VISUAL EXAMINATION
(SECTION B-3c)

ISSUE
1. How is visual examination used in the characterization program?
2. Can historical visual examination of newly generated waste be used?
3. What is the frequency for doing VE?
4. What documentation (e.g., audio/video tapes) is required for visual examination activities?
5. What criteria are defined for determining a "mismatch" between visual or radiography and acceptable knowledge?
6. Do lead lined drums have to be subjected to visual examination?

CONCLUSION
1. VE has three uses in the permit. These are as follows:
   a) It is used to confirm acceptable knowledge at the time of packaging newly generated waste.
   b) It is used in lieu of radiography to verify acceptable knowledge for retrievably stored waste.
   c) It is used as a quality control check on radiography.

2. Waste generators who visually examined their waste as it was generated, and can meet all of the VE data requirements do not have to perform radiography or more VE. In these cases, the acceptable knowledge (i.e., previous visual examination and verification) of the waste is sufficient to meet the primary characterization requirements of the permit. For such waste streams, generators should prepare documentation demonstrating that the waste was visually examined adequately at the time of generation, and that the examination was verified by an independent operator. Furthermore, the generator should document that there will be no additional information gained by performing radiography or additional VE on this waste. Finally, generators should document that even if the waste were being generated after approval of their waste certification program by the NMED, the characterization results would be no different.

3. The frequency varies depending on the specific use. Frequencies are established as follows:
a) As a method of confirming AK for newly generated waste during packaging—100%
b) As a method in lieu of radiographics—100%
c) As a QC check on radiography—a representative number of containers as determined by site-specific miscertification rate (initially set at 11%), for the first Summary Category Group lot, which is to establish the site-specific miscertification rate.

4. The documentation required for VE depends on the specific application and is defined as follows. In all cases, a VE data record is required.
   a) As a method of confirming AK as newly generated waste is packaged—requires two trained observers
   b) As a method in lieu of radiography—audio or video tape for all containers
   c) As a QC check on radiography—audio or video tape for all containers subject to VE.

5. NCRs must be generated in the event that visual examination or RTR fail to confirm acceptable-knowledge characterization for the following criteria:
   • Has the correct Waste Matrix Code been applied?
   • Has the container been assigned to the correct waste stream?
   • Have the appropriate hazardous waste codes been applied?
   • Are prohibited items (free liquids in excess of the permit limits, compressed gas containers, unvented containers greater than 4-liters in size) absent?

6. No. Lead-lined containers need to be visually examined only if the lead prevents full examination of the remaining contents.

DISCUSSION

1, 3. In the permit, VE is used in three contexts. First, VE is portrayed as a primary characterization method for 100% of newly generated waste. This is found in Section B-3c:

   Radiography and/or VE will be used to verify the physical form of retrievably stored TRU mixed waste. For newly generated waste, physical form and prohibited items will be verified during packaging (using the VE technique). ...

   Again, Section B-3d(1), states:

   Verification that the physical form of the waste (Summary Category Group) corresponds to the physical form of the assigned waste...
stream is accomplished during packaging (using the VE technique). This process consists of the operator confirming that the waste is assigned to a waste stream that has the correct Summary Category Group for the waste being packaged. If a confirmation cannot be made, corrective actions will be taken as specified in Permit Attachment B3. A second operator, who is equally trained to the requirements stipulated in Permit Attachment B1, will provide additional verification by reviewing the contents of the waste container to ensure correct reporting.

Note that this text also defines the VE technique which does not require the production of video/audio tape.¹

The second context is as a technique to be used on retrievably stored waste in lieu of 100% radiography to verify and confirm certain acceptable knowledge.² When using VE in lieu of radiography, for retrievably stored waste, the production of a video/audio tape is mandated by the permit. (See Footnote 1) Even though the context of this statement is under the description of VE as a Quality Control QC check for radiography, the introductory paragraph to the section makes it clear that the requirement for video/audio also applies to VE in lieu of radiography.³

The third context is as a technique to perform a QC check on radiography results. Since radiography only applies to retrievably stored waste, this requirement also only applies to retrievably stored waste.⁴ The frequency of

---

¹In his testimony, Kent Hunter described visual "inspection" (which he later clarified was synonymous with visual examination) as follows: "HEARING OFFICER GULIN: Mr. Hunter, excuse me. You said that in some cases there would be 100 percent visual inspection. In which cases would there be and which cases wouldn't there be? THE WITNESS: If you have a process line, for example, where waste is being produced or if you're repackaging waste, then rather than subject an end product to radiography and visual inspection, what we would do or what we would require is that two trained operators visual inspect the waste as it is put into a container. So that inspection rather than being a special visual inspection, it's made during the packaging. Q. (BY MR. KRISTL) Can visual examinations be used during the packaging of wastes that are going to be generated in the future? A. Yes, that's exactly what I was testifying."

²Section B-3c, Page B-12, states: "Generator/storage sites may conduct visual examination of waste containers in lieu of radiography."

³The first paragraph in Section B1-3b(3) begins: "As an additional QC check, or in lieu of radiography, the waste container contents shall be verified directly by visual examination of the waste container contents after completion of the headspace gas sampling."

⁴Section B-3d(2), page B-17, state: "To confirm the results of radiography, a statistically selected number of the TRU mixed waste container population will be visually examined by opening containers to inspect waste contents to verify radiography results."
VE is determined based on the miscertification rate, which, after an initial period of time, is calculated on a waste stream basis.

VE must be able to provide certain data in order for it to be useful as a characterization tool. Specifically, the permit requires that VE discern the physical form of the waste and the status of prohibited items. These requirements are summarized in the following paragraph from Section B-3d, page B-13: (emphasis added)

Radiography and/or VE will be used to verify the physical form of retrievably stored TRU mixed waste. For newly generated waste, physical form and prohibited items will be verified during packaging (using the VE technique). Radiography and/or VE will also be used in conjunction with acceptable knowledge to characterize heterogeneous debris wastes. Radiography and/or VE, and the associated information compiled from acceptable knowledge (e.g., age of the waste, generating process) will be used to determine the RCRA-regulated constituents present in the waste.

This includes the ability to detect liquid and containerized gases as stated in Section B-3c, pages B-11 and B-12, as follows: (emphasis added)

Radiography is a nondestructive qualitative and quantitative technique that involves X-ray scanning of waste containers to identify and verify waste container contents. Visual examination (VE) constitutes opening a container and physically examining its contents. Radiography and/or visual examination will be used to examine every waste container to verify its physical form. These techniques can detect liquid wastes and containerized gases, which are prohibited for WIPP disposal. The prohibition of liquids and containerized gases prevents the shipment of corrosive, ignitable, or reactive wastes. Radiography and/or VE will also be able to confirm that the physical form of the waste matches its waste stream description (i.e. Homogeneous Solids, Soil/Gravel, or Debris Waste [including unclassified metals]).

In addition, the permit requires that VE be used to verify the physical form of the waste stream. Section B-3d(1), page B-14: (emphasis added)

The RCRA-regulated constituents in newly generated wastes will be documented and verified at the time of generation based on acceptable knowledge for the waste stream. Newly generated TRU mixed waste characterization will begin with verification that
processes generating the waste have operated within established written procedures. Waste containers will then be delineated into waste streams using acceptable knowledge. Verification that the physical form of the waste (Summary Category Group) corresponds to the physical form of the assigned waste stream is accomplished during packaging (using the VE technique). This process consists of the operator confirming that the waste is assigned to a waste stream that has the correct Summary Category Group for the waste being packaged. If a confirmation cannot be made, corrective actions will be taken as specified in Permit Attachment B3. A second operator, who is equally trained to the requirements stipulated in Permit Attachment B1, will provide additional verification by reviewing the contents of the waste container to ensure correct reporting. If the second operator cannot provide concurrence, corrective actions will be taken as specified in Permit Attachment B3. The subsequent waste characterization activities depend on the assigned Summary Category Group, since waste within the Homogeneous Solids and Soils/Gravel Summary Category Groups will be characterized using different techniques than the waste in the Debris Waste Summary Category Group.

As a QC tool, VE must be able to address several specific characteristics of a container of waste as required by Section B1-3b(3) as follows: (emphasis added)

Visual examination shall be conducted to describe all contents of a waste container, and includes estimated or measured weights of the contents. The description shall clearly identify all discernible waste items, residual materials, packaging materials, or waste material parameters. ...

2. If, at the time the NMED approves the audit report for a site their approval includes the newly generated waste from an ongoing waste generation process, this approval applies to all waste from that process, including waste in storage. This only applies if it can be demonstrated that the waste in storage was generated by a process that is essentially the same as the approved process. The similarity must be documented.

4. VE must result in an auditable record. There are three kinds of records referenced in the permit. The first is the VE data record, referred to in Section B-1c as follows: (emphasis added)
Before accepting a container holding TRU mixed waste, the Permittees will ensure, through audit and as part of its Level III analysis, that generator/storage sites examine the radiography or visual examination data records (refer to Section B-4b) to verify that the container holds no unvented compressed gas containers and that residual liquid does not exceed 1 percent volume in any payload container.

In addition, when VE is used as a QC check of radiography, or is used in lieu of radiography, a video/audio tape is required in addition to a visual examination data forms as stated in Section B1-3b(3), as follows: (emphasis added)

All visual examination activities shall be documented on video/audio tape and the results of all visual examination shall be documented on visual examination data forms.

The visual examination shall consist of a semi-quantitative and/or qualitative evaluation of the waste container contents, and shall be recorded on audio/videotape. The visual examination program has been developed by the Permittees to provide an acceptable level of confidence in radiography. There is no equivalent method found in EPA sampling and analysis guidance documents. The specific requirements of visual examination are described in this WAP.

It is assumed that visual examination data forms and visual examination data records are the same.
ISSUE
1. Can test drums used for determining radioassay total uncertainty be used to fulfill the radiography test drum requirements?

2. What is the frequency for scanning the test drum?

3. Is there any guidance regarding the sizes of the internal containers used in the training drums?

4. Can a single drum be used to satisfy this requirement?

CONCLUSION
1. Yes, as long as the test drums meet the minimum requirements in the permit.

2. There is a distinction made between qualification/re-qualification and the independent replicate daily/test batch scans.
   a. Radiography operators must scan a training drum biannually to assure interpretations remain consistent and accurate
   b. Test drums, representative of the waste matrix codes for which WSPF is being sought, must be examined and successfully identified prior to shipment.

3. The sizes for the internal containers are as follows:
   Empty ONE GALLON paint can
   ONE GALLON bottle with three tablespoons of fluid
   ONE GALLON bottle with one cup of fluid (upside down)

4. Yes. If a generator site can construct a single drum with sufficient stratification and sufficient variety to meet the permit requirements, it would be acceptable.

DISCUSSION
3. Section B1-3b(2), states:

   A radiography test drum shall include items common to the waste streams to be generated/stored at the generator/storage site. The test drums shall be divided into layers with varying packing densities or different drums may be used to represent different situations that may occur during radiography examination at the site. A test drum or
test drums representative of the waste matrix codes for which Waste Stream Profile Form approval is sought, must be examined and successfully identified prior to waste stream shipment. The following is a list of required elements of a radiography test drum(s):

- Aerosol can with puncture
- Horsetail bag
- Pair of coveralls
- Empty bottle
- Irregular shaped pieces of wood
- Empty one gallon paint can
- Full container
- Aerosol can with fluid
- One gallon bottle with three tablespoons of fluid
- One gallon bottle with one cup of fluid (upside down)
- Leaded glove or leaded apron
- Wrench

These items shall be successfully identified by the operator as part of the qualification process.
CLARIFICATION NUMBER CAO-00-021, REV. 0
PROVIDING RADIOGRAPHY RESULTS TO VISUAL EXAMINATION OPERATORS
(SECTION B1-3b(3))

ISSUE
What items constitute "hazards" which would allow the visual examination operator to see the results of radiography prior to performing VE.

CONCLUSION
The permit does not define which conditions, i.e. which items contained in a drum would pose hazards to VE workers such that radiography results should be relayed to them. Therefore, the definition of hazards is left to the site to determine in accordance with site safety practices. Such conditions should be described in site specific procedures or Job Hazards Analysis.

DISCUSSION
This condition is intended to assure an independent verification of radiography results, by preventing any bias to the visual examination process. However, if some item in the drum, as disclosed by radiography, may present a safety hazard to the visual examination operator, that information may be passed along prior to performing the visual examination.
CLARIFICATION NUMBER CAO-00-022, REV. 0
MISCERTIFICATION RATE CALCULATION
(SECTION B2-1)

ISSUE

1. How does a generator site apply the 11% initial miscertification rate?

2. How does a generator site apply the waste stream specific miscertification rates?

3. When can a generator site change its miscertification rate?

4. What is to be used to determine the drum weighted average: the number of drums within the waste stream or the number of drums that have been visually examined within the waste stream?

5. Can historical data be used to fulfill the initial 11% miscertification rate requirement?

6. Must containers that undergo VE be selected randomly from the entire waste stream?

CONCLUSION

1. The 11% applies to all generator sites. Establishing the site-specific miscertification rate involves a 50 container sample that has been selected from a Summary Category Group.

2. The term waste stream specific miscertification rate refers to a miscertification rate that is determined for each of the Summary Category Groups (i.e., S3000-Homogeneous Solids, S4000-Soils/Gravel, and S5000-Debris Wastes), not to individual waste streams as defined by the information on the Waste Stream Profile Form. The site-specific miscertification rate (or the rate associated with the Summary Category Group, once it has been established) is to be applied to the annual number of containers radiographed from each of the Summary Category Groups. In the first year, the drums used in establishing the initial site-specific miscertification rate may be used to meet the annual VE requirement.

The practice of rolling waste streams up to the Summary Category Group level only applies to establishing a VE miscertification rate as outlined in the Discussion. It does not apply to other waste characterization activities that are based on waste stream designation.

3. A generator must adjust the miscertification rate at the following times:
a) When the initial 11% rate is adjusted to a site specific rate.

b) When a Summary Category Group specific rate is determined based on characterizing 50% of a Summary Category Group or using the first 6 months of a Summary Category Group's characterization.

c) When the site specific rate is reassessed annually.

4. The drum-weighted average miscertification rate will be determined annually based on the total number of drums within each Summary Category Group. The calculations are provided in the discussion.

5. Historical data can be used in three ways as long as the VE method used is consistent with the VE method in the WAP.
   a) If the site has an established annual miscertification rate, this rate should be used in lieu of the 11% initial rate as long as they have performed VE on at least 50 drums in that Summary Category.
   b) If the site has previously performed VE on drums that make up part of the initial 50 drum set, these historical examinations may be used.
   c) If the site specific miscertification rate indicates fewer drums are required to be visually inspected for a particular Summary Category Group than the initial 50 drums visually inspected from that Summary Category Group, then no further VE is required for that Summary Category Group.

6. No. While the permit requires random selection of containers to undergo VE, this selection is made from those drums that have undergone radiography. Generator sites should randomly select drums from those undergoing radiography, at the rate determined for the Summary Category Group.

DISCUSSION

1-5. The path for waste characterization is determined by the Summary Category Group designation for each container. Section B-1b states:

   Once a waste stream has been delineated, generator/storage sites will assign a Waste Matrix Code to the waste stream based on the physical form of the waste. Waste streams are then assigned to one of three broad Summary Category Groups; S3000-Homogeneous Solids, S4000-Soils/Gravel, and S5000-Debris Wastes. These Summary Category Groups are used to determine further characterization requirements.
This indicates that the Permit intends for the "three broad Summary Category Groups" to take precedence over the specific waste stream definition found in the Waste Stream Profile Form for performing waste characterization. Therefore, the term waste stream-specific miscertification rate used in Section B2-1 relates to the Summary Category Group assigned to each waste stream for the purpose of determining characterization requirements, including the VE requirements. This approach is also consistent with Section B-3c, which states:

Radiography and/or visual examination will be used to examine every waste container to verify its physical form. These techniques can detect liquid wastes and containerized gases, which are prohibited for WIPP disposal. The prohibition of liquids and containerized gases prevents the shipment of corrosive, ignitable, or reactive wastes.

Radiography and/or VE will also be able to confirm that the physical form of the waste matches its waste stream description (i.e. Homogeneous Solids, Soil/Gravel, or Debris Waste [including uncategorized metals])

This results in three "waste stream-specific miscertification rates" being calculated for each site; one for each Summary Category Group.

This interpretation is consistent with the NMED views that "Summary Category Groups are used to determine further characterization requirements" and a "stratified strategy allows for checking of problematic waste streams, while allowing much less examination of waste streams that are not problematic." The stratified strategy view is based on the belief that prohibited items are more difficult to identify in some waste forms than others using radiography. Therefore, using waste stream-specific miscertification rates based on the Summary Category Group designation provides assurances that waste forms that are more "problematic" will be subject to more VE than those that are less "problematic" and that the "Summary Category Groups are used to determine further characterization requirements."

In the event that a generator site has not established a site-specific miscertification rate, an eleven-percent (11%) miscertification rate will be used to develop empirical inspection data with which to calculate the site-specific miscertification rate. This will be done by characterizing a single Summary Category Group or Summary Category Group lot of at least 50 containers at the 11% rate. The results of this characterization will be used to calculate the initial site-specific miscertification rate; however, the Summary Category Group lot chosen must be representative of the entire Summary Category Group. Data obtained from the visual examination of
containers within this Summary Category Group prior to permit issuance may be used to obtain the site-specific miscertification rate. In addition, the characterization results from the initial Summary Category Group lot of at least 50 containers may be applied back to that particular Summary Category Group for the first year.

The site-specific miscertification rate, derived from the process described above, will then be applied initially to each waste Summary Category Group or Summary Category Group lot to determine the number of containers requiring visual examination within that Summary Category Group. Once either 1) six months have passed since radiographic characterization commenced or 2) 50% of a particular waste stream has undergone radiographic characterization (whichever occurs first), a Summary Category Group specific miscertification rate must be determined. The Summary Category Group will from then on undergo visual examination according to this new Summary Category Group specific miscertification rate. If a waste stream-specific miscertification rate is calculated to be less than 1%, the site will use a miscertification rate of 1%.

Annually, the site-specific miscertification rate will be reassessed by calculating a drum-weighted average of all historic Summary Category Group specific miscertification rates. This new site-specific miscertification rate will then be applied to Summary Category Groups which have not yet undergone any visual examination. The drum-weighted miscertification rate may be calculated as follows:

\[ R = \frac{X_{S3000}Y_{S3000} + X_{S4000}Y_{S4000} + X_{S5000}Y_{S5000}}{X_{S3000} + X_{S4000} + X_{S5000}} \]


\( X_{S3000}, X_{S4000}, X_{S5000} \) = Population of drums from each Summary Category Group undergoing radiography in a year

\( Y_{S3000}, Y_{S4000}, Y_{S5000} \) = Summary Category Group-specific miscertification rate—The Summary Category Group miscertification rate is calculated as the number of miscertifications in that Summary Category Group divided by the number undergoing VE in that Summary Category Group, in a year. (Must be rounded to the nearest integer and at least 1%).
CLARIFICATION NUMBER CAO-00-023, REV. 0
VOC AND SVOC INITIAL CALIBRATION ACCEPTANCE CRITERIA
(TABLE B3-5, B3-7)

ISSUE
1. When should the average response factor (RRF) be used and when should a linear regression be used for calibration?
2. Can a quadratic regression be used instead of a linear regression?

CONCLUSION
1. Use RRF if %RSD is \( \leq 15 \); use linear regression if the RRF %RSD is >15.
2. The use of a quadratic regression is allowed.

DISCUSSION
The use of RRF is to be determined by the %RSD of the 5 initial calibration analyses. Where the %RSD for an analyte is < 15, use the RRF. If the %RSD for an analyte is > 15, then linear regression is to be used. The use of quadratic regression requires that 6 standards be analyzed for the initial calibration. This exceeds the requirements of a 5-pt initial calibration, so it is acceptable.
CLARIFICATION NUMBER CAO-00-024, REV. 0
COMPARABILITY
(SECTIONS B3-2, B3-6, B3-7, AND B3-8)

ISSUE
1. Will the CAO provide specific guidance on data comparability and usability?
2. Are standardized SW-846 methods, as written in SW-846, sufficient to achieve WIPP QAO requirements?

CONCLUSION
1. Yes. The CAO will prepare programmatic data usability criteria guidance to assure data are comparable from site to site.
2. Yes. Laboratories may tailor the individual SW-846 sample preparation and analytical methods given in the Permit to meet the QAOs in the Permit. Any modifications are to be done prior to preparing or analyzing samples and must be demonstrated and documented to meet the required QAOs. Initial performance demonstration (PDP samples, MDL analyses, etc.) and sample preparation and analysis are to be performed identically.

DISCUSSION
1. SW-846, Chapter 2, Section 2.1 provides guidance on the flexibility regarding SW-846 methods. "Glassware, reagents, supplies, equipment and settings other than those listed in this manual may be employed, provided that method performance appropriate for the intended RCRA application has been documented. ...In response to this inherent flexibility, if an alternative analytical procedure is employed, then EPA expects the laboratory to demonstrate and document that the procedure is capable of providing appropriate performance for its intended application. This demonstration must not be performed after the fact, but as part of the laboratory's initial demonstration at proficiency with the method. The documentation should be in writing, maintained in the laboratory, and available for inspection upon request by authorized representatives at the appropriate regulatory authorities."

The permit lists SW-846 methods which are to be employed by the sites for the preparation and analysis of samples. These methods, exactly as written, may not be sufficient to meet CAO QAOs, but SW-846 as quoted above, provides flexibility so that the methods may be slightly modified and used. If modifications to the SW-846 methods are made, the laboratory is to document and demonstrate the modifications and use the modified method as part of their initial demonstration of proficiency, including PDP sample analysis and the method is to be in a written SOP.
ISSUE
1. Is it required that legal counsel for the generator sites must review site procedures to ensure compliance with completion of chain-of-custody forms in a legally defensible manner?

2. Are unique identification numbers required for all samples and sampling equipment?

3. If sample tags or labels are placed in plastic document protectors attached to the sample canisters, will this practice meet the requirement for the tags and labels to be affixed to the samples?

4. What are the permit's requirements for canister tags?

5. How are generators to interpret the requirements in Section B1-4 pertaining to sample custody for SUMMA® canisters? Although SUMMA® canisters are in a sealed container when they arrive at the laboratory, individual SUMMA® canisters inside of the container are not sealed.

6. Does the Permit require the use of custody seals within the laboratory to meet the requirements of B1-4?

7. What do the sample preservation requirements in Table B1-4 mean relative to the use of SW–846?

CONCLUSION
1. It is not necessary for legal counsel to review procedures for the purpose of meeting WIPP RCRA Permit conditions. The generator sites should complete their own review of the legal ramification of complying with the WIPP permit.

2. Yes. All samples and reusable sampling equipment associated with all types of sampling associated with waste characterization prescribed by the Permit must be identified with unique identification numbers.

3. As long as the tag or label itself is affixed to the sample, whether it is or is not in a plastic document protector will not pose a compliance concern.
4. The permit refers to sample tags and canister tags, often synonymously. The permit discusses canister and/or sample tags in two contexts. First, it requires the laboratory responsible for canister cleaning and certification to maintain canister certification documentation and initiate the canister tags. There is little in the permit regarding what this initiation entails. The CAO interprets that this initiation is the laboratory responsible for cleaning documenting the traceability of a canister to a specific equipment cleaning batch. Second, the permit refers to sample tags, completed by the sampler, which must contain the following information:

- Sample ID number
- Sampler initials and organization
- Ambient temperature and pressure (for gas samples only)
- Sample description
- Requested analyses
- Data and time of collection
- QC designation (if applicable)

Canister tags and sample tags may be combined into a single tag. If laboratories use separate canister and sample tags, however, traceability between sample tags and relevant canister and sample information must be maintained.

The laboratory is responsible for removing the sample tag from the canister and retaining it in the project files. Originals or copies of the gas sample tags are also to be included in batch data reports.

5. The permit requires, in Section B1-4 that sample custody be maintained by ensuring that custody sealed samples are in the possession of an authorized individual, in that individual's view, in a sealed or locked container controlled by that individual, or in a secure controlled access location.

The permit does not define "custody sealed samples". However, Section B1-5 does state that:

All sample containers should be affixed with signed tamper-proof seals or devices so that it is apparent if the sample integrity has been compromised and that the identity of the seal or device is traceable to the individual who affixed the seal. A seal should also be placed on the outside of the shipping container for the same reason. Sample custody documentation shall be placed inside the sealed or locked shipping container, with the current custodian singing to release custody. ...
Therefore, samples that are shipped require two levels of security. One on the sample container and one on the shipping container. Both should be traceable to the person who attached them and both must be such that they can be used to verify the integrity of the sample.

6. Compliance with the requirements of Section B1-4 is achieved by meeting the sample integrity assurance requirements in Section B1-5. Site procedures should document how these requirements are met.

Section B1-4 pertains to field samples. Once the samples are transferred to the laboratory for analysis, laboratory sample control procedures come into effect and are to be detailed in site SOPs.

7. The sample preservation requirements in Table B1-4 specify the use of SW-846. These shall be specified as follows:

a. The requirement to cool to 4°C is consistent with SW-846.

b. "Cool to 4°C" will mean that the samples will be placed in an insulated container and packed with frozen chemical ice. Sufficient ice will be used to ensure the samples remain cool until analyzed or stored in a refrigerated unit. Sites will not be required to produce temperature records for the samples if they document that the ice is still cool when the sample is unpacked.

c. If a refrigerator is used for interim storage of samples, the temperature in the refrigerator should be recorded periodically to assure adequate cooling. Site procedures should specify the use of refrigerators and recording temperatures.

DISCUSSION

1. The WIPP RCRA Permit does not require the generator sites to review the legal issues pertaining to the sites' compliance with the permit terms. That kind of review is in the purview of the generator sites' management teams.

2. Section B1-4 states, "All samples and sampling equipment will be identified with unique identification numbers. Sampling coring tools and equipment will be identified with unique equipment numbers to ensure that all sampling equipment, coring tools, and sampling canisters are traceable to equipment cleaning batches."
Neither the first or second sentence in this paragraph are referring only to sampling equipment for solid materials. The second sentence states that the reason for the unique ID numbers is to ensure that all sampling equipment is traceable to the equipment cleaning batches.

3. Section B1-4 states "Sample tags or labels will be affixed to all samples and will identify at a minimum:...." There is no requirement prohibiting the use of a plastic document protector for the sample tag or label.

4. The permit refers to sample tags and canister tags, often synonymously. Section B-4a(3) requires generator/storage sites to implement a sample handling and control program which includes labeling and/or tagging covering:

   sample numbering, sample ID, sample date, sampling conditions, and analysis requested.

Section B1-1c(1) states:

The Permittees shall require the laboratory responsible for canister cleaning and certification to maintain canister certification documentation and initiate the canister tags as described in Permit Section B3.

However, Section B3 does not expound on what this initiation entails. The CAO interprets that this initiation is the laboratory documenting the traceability of the canisters to equipment cleaning batches. Section B1-4 requires that samples and sampling equipment be identified with unique identification numbers. This ensures that all sampling equipment, coring tools, and sampling canisters are traceable to equipment cleaning batches. Section B3-10 requires the laboratories to remove sample tags and retain them in the project files after they receive notification that the data have been validated and verified. This section also requires that copies or originals of gas canister sample tags are to be included in batch data reports.

Section B1-4 requires specific information to be included in each sample tag/label:

- Sample ID number
- Sampler initials and organization
- Ambient temperature and pressure (for gas samples only)
- Sample description
- Requested analyses
5 & 6. The permit requires seals on both samples and sample containers that are used for shipping samples. Meeting these requirements assures that samples cannot be tampered with without there being visible evidence of such tampering. Each sample must always have a custody seal except when the sample is undergoing analysis, or until it has been expended or removed from the sample analysis program. In addition, a sealed sample must always be in the possession of an authorized individual, in that person’s view, in a sealed or locked container controlled by that individual, or in a secured controlled access area. Custody seals are also used to maintain sample integrity during transport to the lab.

7. The generally accepted practice for sample preservation is that shipments are considered adequately cooled if ice remains when the shipment is unpacked or if the temperature is measured to show that the criterion is met.

It is not possible to make a general statement, based on SW-846, that either allows or disallows freezing. If a generator desires to freeze samples, they must provide documentation that freezing does not impact the sample integrity.
CLARIFICATION NUMBER CAO-00-026, REV. 0
CLARIFICATION FOR COMPLETENESS
(SECTION B3-1, B3-3)

ISSUE
1. Who has responsibility for calculating completeness?
2. Should completeness be calculated on an analyte basis or on a sample basis?

CONCLUSION
1. Completeness can be calculated either at the data generation or project level.
2. Completeness will be calculated for both samples and individual analytes. In addition, Section B3-3 requires the calculation of sampling completeness.

DISCUSSION
1. At the data generation level, sites may choose to calculate completeness or to simply provide the data which will be used to calculate completeness. Completeness can be calculated at the project level if the site so chooses.
2. Completeness consists of the following:
   a) how many samples were successfully analyzed compared to how many samples were received;
   b) how many individual target analytes achieved valid results; and
   c) the number of valid samples collected as a percent of the total number of samples collected for each waste stream.
CLARIFICATION NUMBER CAO-00-028, REV. 0
ACCEPTABLE ANALYTICAL PERFORMANCE
(SECTION B3-6, B3-7, B3-8)

ISSUE

1. Are methods judged to be performing unacceptably and is corrective action required (beyond flagging data) every time there is a matrix related QC failure?

2. Which MDL should be used to determine acceptance criteria for total VOCs, SVOCs and Metals laboratory blanks to ensure data comparability between generator sites?

3. What are the specific Acceptance Criteria for calibration blanks for total metals analyses?

4. Are all QC criteria in Tables B3-5, B3-7, and B3-9 included in the definition of completeness, including matrix dependent QC?

5. Will CAO allow the use of matrix spike duplicates in lieu of laboratory duplicates?

6. What specific requirement should be used for surrogate evaluation?

7. What are the CVAA and HGAA serial dilution acceptance criteria?

8. Does CAO require, as stated in Tables B3-5, B3-7 and B3-9, that laboratory control samples meet a 80 – 120% requirement for percent recovery or is the 120% a typo?

CONCLUSION

1. Acceptable method performance is defined by results of QC parameters in Tables B3-5, B3-7, and B3-9 that are not influenced by sample matrix. Footnote a on each table specifies that "Nonconformances do not apply to matrix-related exceedences."

2. Laboratory blank acceptance criteria are as follows:

   Table 3-5 for VOCs use Table 3-4 MDLs
   Table 3-7 for SVOCs use Table 3-6 MDLs
   Table 3-9 for Metals use Table 3-8 PRDLs¹

¹This applies until a permit mod is approved which changes PRDL to the MDL with appropriate criteria.
3. Use the appropriate SW-846 metals analytical method for determining calibration blank acceptance criteria and corrective actions.

4. In Tables B3-5, B3-7 and B3-9, footnote a, specifies that "Non conformances do not apply to matrix related exceedences". In addition, these do not apply to the calculation of completeness.

5. The permit allows matrix spike duplicates in lieu of laboratory duplicates.

6. Use the SW-846 methodology, until 30 samples, have been analyzed calculating %R only. Following analysis of the 30th sample, calculate the three sigma value and use that combined with the average %R of the 30 samples for subsequent analyses evaluation of surrogates.

7. The CVAA and HGAA serial dilution acceptance criteria are to be taken from SW-846 Methods.

8. The 80 – 120% range is the requirement. "120%" is not a typo.

DISCUSSION

Module II.C.1.b states the following:

Waste characterization sampling and analytical methods - the Permittees shall require that generator/storage sites comply with the method requirements, quality control, equipment testing, inspection, maintenance, and equipment calibration and frequency standards for the procedures specified in Permit Attachment B1 (Waste Characterization Sampling Methods). For all analytical methods for waste analysis not otherwise specified in Permit Attachment B1, the Permittees shall require the generator/storage sites to use "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA Publication SW-846.

Based on this, it is appropriate to apply the guidance in SW-846 for those requirements that are not dealt with specifically in the permit.

Sections B3-6, B3-7 and B3-8 address precision as follows:

Precision shall be assessed by analyzing laboratory duplicates or matrix spike duplicates, replicate analyses of laboratory-control samples, and PDP blind audit samples. Results from measurements on these samples must be compared to the criteria listed in Table B3-4. These QC measurements will be used to demonstrate
acceptable method performance and to trigger corrective action when control limits are exceeded.

8. Laboratory Control Samples are prepared in the laboratory from similar but clean matrices and are used to verify that the laboratory can perform the analysis in a clean matrix. Laboratory analysis on clean, spiked matrices are considered to be "in control" if the results are within ±20% or ±30% of the true value depending on the analyte categories. A permit modification may be submitted to the NMED in the future, provided sufficient data are available, to allow the laboratories to calculate the requirements from in-house studies of the analysis of 15-20 samples, with the requirements coming as stated in SW-846.
CLARIFICATION NUMBER CAO-00-029, REV. 0
CONTROL CHARTING FOR NEWLY GENERATED WASTE
(SECTION B-3d(1))

ISSUE
Is control charting to be used for all newly generated waste?

CONCLUSION
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 frequency is and its rationale.

DISCUSSION
B-2-4 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.

Control charting is not acceptable for uncontrolled processes, and therefore wastes from such processes must be sampled using the requirements in B-2-2, 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 B-2-2 and document that control charting was unuseable.
DATA REVIEW, VALIDATION, AND VERIFICATION ACTIVITIES  
(SECTION B-4a(5))

ISSUE

1. Are the data listed in Section B-4a(5) only WWIS data?

2. How are batch data reports defined?

3. Do batch data reports have to include raw analytical data as indicated by Section B-4a(5), page B-22?

4. Will CAO allow sites to combine checklists, specifically, the technical supervisor and QA review checklists?

5. Does CAO require data and reports to be reviewed using the requirements and procedures specified in Section B-4a(5), Pages B-21 and B-22, for data usability and DQOs, or by from those in Section B3-10 which require project level verification to ensure QAOs are met?

CONCLUSION

1. The data in question include all of the raw data pertaining to waste characterization in compliance with the Permit. These data are presented in reports for validation, verification, and quality assurance, including batch data reports.

2. The definition of batch data reports (testing, sampling, and analytical) is provided in Section B3-10.

3. Section B3-10 page B3-24 states that analytical batch reports may include raw analytical data.

The listing in Section B3-10 provides flexibility in what the site calls the particular report, however, there is little flexibility regarding the type and amount of data that must be maintained and verified. The generator sites must provide an auditable record that identifies the location of the raw data and how the data were reviewed, validated, and verified in accordance with the requirements of the permit. Replicating data for inclusion in separate reports is not a requirement.

4. Checklists may be combined, as appropriate. However, the two reviews must be clearly delineated on the checklists. Note the basis for completion of the checklists in Standard Operating Procedures.
5. These are two separate, distinct reviews covering separate, distinct requirements. Section B-4a(5) refers to review of completed data reports for data usability and DQOs, while B3-10 refers to review of the data itself. DQOs are programmatic requirements; QAOs are data requirements.

DISCUSSION

1. The data in question include all of the raw data pertaining to waste characterization in compliance with the Permit. Permit Attachment B-4a(5) states:

Data review, validation, and verification procedures used by the generator/storage sites are required to ensure that 100 percent of the data reported has received an independent technical review to assure that data generation and reduction were conducted in a technically correct manner, calculations have been verified correct, and all variances from accepted analytical methods (appropriate to the waste type being analyzed) have been documented and approved. Batch data reports will be reviewed by generator/storage sites for completeness to verify that they include field sampling records, raw analytical data, calculation records, COFC documentation, calibration records, QA sample results, and that sample holding times and preservation methods were met or exceptions documented.

2, 3. The data referred to in Section B-4a(5) for verification are discussed in greater detail in Permit Section B3-10 which states:

The Permittees shall require the sites to generate the following reports for data validation, verification, and quality assurance activities:

A Testing Batch Data Report or equivalent includes all data pertaining to radiography and visual examination for up to 20 waste containers without regard to waste matrix. It includes data collection and results, the videotapes of the actual examination, and the appropriate data form.

A Sampling Batch Data Report or equivalent includes all field data pertaining to a group of no more than 20 samples that were collected for chemical analysis. Sampling Batch Data Reports may include chain of custody documentation and any measurements taken in the field such as temperature, pH,
conductivity, as well as field notes, logs, and other field documentation.

An Analytical Batch Data Report or equivalent includes analytical and on-line data from the sampling and analysis of TRU-mixed waste for an analytical batch of up to 20 samples. Totals/TCLP analyses results and headspace gas sampling and analyses results are in the Analytical Batch Data Reports, which may also include summarized sample results, summarized QA sample results and recoveries, raw data, dates and times of analysis of all samples, and a case narrative describing any problems encountered or deviations from the approved analytical methods that occurred during the preparation and analysis of all samples.

Raw data may include all analytical bench sheet and instrumentation readouts for all calibration standard results, sample data, QC samples, sample preparation conditions and logs, sample run logs, and all re-extraction, re-analysis, or dilution information pertaining to the individual samples. Raw data may also include any qualitative or semi-quantitative data collected for a sample and that has been recorded on a bench sheet or in a log book.

Data Summary Reports or equivalent include all of the final reported results for analytical and testing data and all associated field and laboratory quality control sample results for a container. Data summary reports may also include a narrative summarizing the field sampling conditions, any information needed to correctly interpret the reported data, and notes regarding any deviations from standard analytical methods that were encountered as a result of sample matrix or field and/or lab QC problems. A data validation summary may also be included so that the qualification and usability of the data can be ascertained. A complete list of the elements required in the Data Summary Reports is in Section B3-10.

Waste Stream Characterization Summary Packages or equivalent include a compilation of data summary reports for all sampling, testing, analytical data, and acceptable knowledge documentation available for waste containers and/or waste generating processes for a waste stream.
contents of the waste stream characterization summary package are listed in Section B3-12.

Batch data reports must identify the location of raw analytical data and demonstrate that the data were reviewed, validated, and verified in accordance with the requirements of the permit.

4. Section B3-10 states that data review, validation, and verification at this level involves scrutiny and signature release from qualified independent technical reviewer(s), technical supervisor(s), and a QA representative. Individuals conducting this data review, validation, and verification must use checklists that address all of the items included in this section. Note that the NMED commented in the response to comments that the technical supervisor review and the Quality Assurance officer review cannot be combined into a single review. Therefore, while a single person may conduct this review, the two reviews must be clearly delineated in the checklists.

5. There was concern that there was inconsistency between the need to review for DQOs, data usability and QAOs, between sections of Attachment B and Attachment B3.

Attachment B refers to overall Program reports, which have been completed and the data have undergone validation and verification.
CLARIFICATIONS NUMBER CAO-00-031, REV. 0
DATA REVIEW
(SECTION B3-10)

ISSUE

1. Will sites be allowed to combine the Technical Supervisory and the QA review data review validation and verification?

2. Are checklists required to address each specific item regarding completeness, comparability and representativeness or will sites be allowed to reference tables of data to avoid the possibility for transcription errors?

CONCLUSION

1. Yes. Only to the extent that the same person may perform both reviews. The QA Officer may designate that the technical supervisor also perform the data generation level QA review. These reviews, however, are separate. (See CAO-00-030)

2. The QA checklists must contain at least a reference to the specific tables (e.g., results of sampling, analytical, or on-line batch QC samples, if applicable). Checklists must reflect review of all QC samples and quality assurance objectives categories in accordance with criteria established in Tables B3-2 through B3-9 (as applicable to the methods validated).

DISCUSSION

1. Section B3-10 requires that data review, validation, and verification at the data generation level involve scrutiny and signature release from qualified independent technical review(s), technical supervisor(s), and QA representative. Furthermore, the condition requires that individuals conducting this data review, validation, and verification must use checklists that address all of the items included in this section.

2. There is no guidance in the permit as to whether or not these functions can be combined. They are listed as three separate functions to reflect the level of review that is needed and to capture the review requirements associated with each level. If the function of technical supervisor and QA representative are combined, documentation of adequate documentation of training must exist.
ROLE OF THE SITE PROJECT QA OFFICER
(SECTION B3-10)

ISSUE
Can the site Project QA Officer delegate the responsibility for calculating and reporting the miscertification rate of waste containers that require assignment to a different waste matrix code or are found to contain prohibited items after visual examination?

CONCLUSION
Permit compliance may be ensured at the generator sites by multiple individuals carrying out the responsibilities of the Site QA Officer.

DISCUSSION
The title Site Project QA Officer refers to a functional role and not necessarily an individual site position title. The generator/storage sites should indicate in their implementing procedures how the responsibilities of the Site Project QA Officer, as identified in the Permit, are carried out.
ISSUE
Is it necessary to provide hard copies of information that is transmitted via the WWIS, i.e., the information required by Section B3-10?

CONCLUSION
When the Waste Stream Profile Form is transmitted to the Permittees for approval, data summary reports are to be transmitted in hard copy for use by the Permittees in the review and approval process. This is in addition to the data in the WWIS. Subsequent data for the same waste stream, transmitted in the WWIS does not need the transmittal of data summary report in hard copy unless specifically requested by the Permittees. The Permittees need to be able to verify the contents of all data summary reports during audits and surveillances of generator sites as appropriate.

DISCUSSION
The following Sections provide additional discussion regarding the submittal of the Waste Stream Profile Form along with accompanying data:

The CAO must verify that each data summary report and waste stream characterization summary report is complete and notify the originating site in writing of the acceptance status of the data within two weeks of waste stream characterization summary package receipt. The Permittees will maintain the data as appropriate for use in the regulatory compliance programs.
ISSUE
Does CAO require that machine code files be included and considered as raw data which is to be included in the analytical batch report?

CONCLUSION
In order to meet the requirements of the permit, raw data must be in the form of a printed record that can be verified at several levels. Data in machine code does not qualify as such a record, however, the report generated from that code does.

DISCUSSION
Section B3-10, page B3-20, state the following:

Data review, validation, and verification requirements include procedures for the review, validation, and verification of data at the data generation level; the validation and verification of data at the project level; and the verification of data at the Permittees' level. Data review determines if raw data have been properly collected and ensures raw data are properly reduced. Data validation confirms that the data reported satisfy the requirements defined by the user and is accompanied by signature release. Data verification authenticates that data as presented represent the sampling and analysis activities as performed and have been subject to the appropriate levels of data review. The procedures presented in this section ensure that WAP records furnish documentary evidence of quality.

On VOA and SVOA instrument a .MS file is generated from the analysis of a sample. The chemist then generates results from the .MS file. This .MS file is in machine code and not printable.
CLARIFICATION NUMBER CAO-00-035, REV. 0
TIMING OF WASTE STREAM CHARACTERIZATION
(SECTION B-4a(2))

ISSUE
1. Does an entire waste stream need to be characterized up front for the generator/storage site project manager to “conclude that all of the DQOs have been met for the characterization of the waste stream prior to submitting a waste stream profile form to the permittees for approval....” in accordance with Section B-4a(2)?

2. Does this characterization include completing all VE associated with the waste stream?

CONCLUSION
1. Waste streams may be subdivided into waste stream lots which must be representatively sampled prior to completing and submitting a Waste Stream Profile Form. If the results of this sampling do not vary from lot to lot, a new Waste Stream Profile Form is not needed.

2. See clarification CAO-00-022 with regard to the criteria for establishing the miscertification note.

DISCUSSION
1. Sites are required to characterize a representative sample of each waste stream prior to submitting a Waste Stream Profile Form.

   Section B-1a, page B-5, states:

   All of the waste within a waste stream may not be available for sampling and analysis at one time. In these instances, generator/storage sites may divide waste streams into waste stream lots based on staging, transportation, or handling issues. Characterization activities shall then be undertaken on a waste stream lot basis. A Waste Stream Profile Form need not be submitted for subsequent waste stream lots unless warranted by characterization information.

2. Performing VE as a Quality Control check on radiography is not required as a pre-requisite for filling out a Waste Stream Profile Form. However, a site specific miscertification rate will have to be established and implemented (either as the initial 11%, the initial site-specific rate, or the Summary Category Group specific rate). In order for the site to approve to ship waste. While this rate must be established and implemented, not all VE need be accomplished.
ISSUE
Must all waste with inadequate AK be managed as newly generated waste?

CONCLUSION
If there is inadequate acceptable knowledge associated with retrievably stored waste, the generator sites must characterize the waste in accordance with the requirements for newly generated waste until such time as they have assembled adequate acceptable knowledge as defined in Permit Attachment B4-2a.

DISCUSSION
The purpose of subjecting retrievably stored waste with inadequate information to the characterization requirements for newly generated waste is to ensure that the waste disposed of at WIPP meets the Permit's conditions (e.g., does not contain any of the prohibited items/waste types listed in Permit Attachment B-1c.)

Permit Attachment B4-2b addresses the information that must be available to satisfy Acceptable Knowledge requirements. It states:

For each TRU mixed waste stream, the Permittees shall require sites to compile all process information and data that support the acceptable knowledge used to characterize that waste stream. The type and quantity of supporting documentation will vary by waste stream, depending on the process generating the waste and site-specific requirements imposed by the Permittees.

This section proceeds to identify the minimum waste process information to be available, including the area(s) and/or building(s) where the waste stream was/is generated, the waste stream volume and time period of generation, the waste generating process, process flow diagrams or a description of the waste generating processes, and the material inputs or other information that identifies the chemical content of the waste stream and the physical waste form.

If a generator site is unable to satisfy the acceptable knowledge information requirements for a waste stream described in Permit Attachment B4-2a, then that stream must be characterized in accordance with the requirements for newly generated waste until the required acceptable knowledge is available. This method is appropriate and necessary to ensure that the drums in question have been categorized into the correct Waste Summary Category Group; that the
proper hazardous waste codes have been applied; and that the status of prohibited items has been determined.

Subjecting retrievably stored waste with inadequate acceptable knowledge to the requirements for newly generated waste minimally consists of repackaging the waste, identifying the Summary Category Group during repackaging, removing prohibited items, and then performing the other types of waste characterization activities that are required dependent on the Summary Category Group.
CLARIFICATION NUMBER CAO-00-037, REV. 0
HEADSPACE GAS QA/QC REQUIREMENTS
(SECTIONS B1-1a(1); B1-1b(3); B1-1c(3); B3-2)

ISSUE
1. Are manifold systems to collect duplicate samples simultaneously, or sequentially?

2. What is the meaning of "blind to the lab" in the context of Section B1-1b(3) condition for field reference samples to be submitted blind to the lab?

3. What time-frame is available for suspending sampling if the blank fails to meet acceptance criteria, as required by Section B1-1c(3)?

4. Is an NCR required by Section B1-1c(3) if a leak test fails, but the equipment is repaired as soon as the leak is discovered?

5. Is there a relationship, in terms of numbers of drums sampled, between a sampling batch and an equipment cleaning batch?

CONCLUSION
1. Sites are allowed to collect duplicates either simultaneously or sequentially, depending on the configuration of their manifold.

2. NMED stated that "blind to the analyst" means that the concentrations of the analytes in the Field Reference Standard are unknown to the person conducting the chemical analyses. As long as the analyte concentrations are not available to the analyst, the sample can be considered "blind" to that analyst.

3. Laboratories will not know until after the blank has been analyzed whether it has failed to meet the acceptance criteria. That will trigger suspension of sampling.

4. No. An NCR is not required if the equipment is repaired as soon as the leak is discovered. However, an evaluation should be performed to assure that equipment problems did not affect previous data.

5. No. There is not a relationship, in terms of numbers of drums sampled, between a sampling batch and an equipment cleaning batch.
DISCUSSION

1. Section B1-1a(1), 4th bullet, allows manifold systems to collect duplicate samples simultaneously. Section B3-2, Precision, requires duplicates to be collected sequentially for manifold operations. Because simultaneous collection will provide a better comparison sample, and because it is allowed in B1-1a(1), sites will be allowed to collect duplicates using either simultaneously or sequentially, depending on the configuration of their manifold.

2. Section B1-1b(3) requires field reference samples to be submitted blind to the lab. B1-4 specifies the sample tag to include the "QC designation (if applicable)." When the sample team consists of personnel who analyze the samples, the Field Reference Standard cannot be submitted blind. The lab must know which sample is the Field Reference Standard to determine if it meets acceptance criteria. Because under these conditions there is no way to submit the sample blind, the Field Reference Standard designation on the sample will be allowed.

3. Section B1-1c(3) requires sampling to be suspended if the blank fails to meet the acceptance criteria. Corrective actions are required if a blank fails or if there is an equipment leak. Sampling will be suspended if a blank fails to meet acceptance criteria. This will not be known until after the blank has been analyzed; therefore, once the results are known, sampling will be suspended. An NCR is only required if an equipment leak cannot be repaired when it is discovered.

5. Section B3-2 states: "Equipment blanks must also be collected at a frequency of 1 equipment blank for each equipment cleaning batch to assess possible contamination in the equipment cleaning method." An equipment cleaning batch refers to a set number of canisters that is cleaned at the same time. An equipment cleaning batch is not limited to a specific number of canisters as is the case with a sampling batch.
ISSUE
Does this condition require submittal of all data packages to CAO?

CONCLUSION
The generators do not report all data to WIPP nor to the WWIS. The reporting requirements are comprehensively covered in Sections B-4a(5), B-4a(6), B-4b, B3-10, B3-12, B3-13, and B4-4.

DISCUSSION
The entire data package is not required.

Section B-4(6) defines records that shall be submitted to WIPP (and thereby to CAO) to develop the basis for WIPP to determine a site’s waste stream(s) qualify for disposal at WIPP.

Section B3-10 defines the specific aspects of data management in order to report to WIPP for qualification of wastes for on-site disposal. These include:

- Reports for data validation, verification, and quality assurance activities
- Data-generation level collection and management activities.
- Project-level collection and management activities.
- Permittees’-level collection and management activities.

The generators must maintain the full data packages in their records, as defined in Section B-4a(7).
CLARIFICATION NUMBER CAO-00-039, REV. 0
OPAQUE CONTAINERS FOR SVOC SAMPLES
(TABLE B1-4)

ISSUE
Are clear glass containers acceptable for SVOC samples?

CONCLUSION
Use of clear glass containers is acceptable.

DISCUSSION
Table B1-4 lists opaque glass containers in use for SVOC samples. However, Table 4-1 of SW-846, Chapter 4 only specifies the use of amber glass bottles for aqueous samples, 1 gallon sample size. All other sample containers are glass, with either Teflon-lined lids or Teflon-lined septum caps.
CLARIFICATION NUMBER CAO-00-041, REV. 0
USE OF VARIANCES
(SECTION B3-13)

ISSUE
What mechanisms are available to the generator sites to address non-routine/temporary processes that impact operations but not the ability to achieve performance standards or quality requirements?

CONCLUSION
The sites may address non-routine/temporary processes by making temporary changes in procedures and plans that are related to compliance with the WAP. These changes are to be reported to the CAO. See CAO-00-044 for further clarification.

DISCUSSION
To compensate for deleting the use of operational variances, which was done at the Permittees request, the NMED added a condition requiring controlled changes to WAP-related plans or procedures to be addressed in a manner similar to how nonconformances are handled. This condition is to assure that temporary variations to operational procedures and practices were adequately reported. The NMED's rationale for the new condition is given in their response to comments as follows:

... The references to the Operational Variance requirements have been removed from the Permit. However, the Permit requirements for nonconformance will be modified to indicate that controlled changes to WAP related procedures and plans will be addressed as part of the site nonconformance and corrective action process.
CLARIFICATION NUMBER CAO-00-042, REV. 0
USE OF SW-846 METHODS
(SECTIONS B3-5, B3-6, B3-7 AND B3-8)

ISSUE
Can methods in SW-846 be used and modified, as appropriate?

CONCLUSION
There are several parts to this conclusion

a. Methods required by the permit must be used.

b. If a permit required method is also an SW-846 method, the flexibility in SW-846 can be used as appropriate, as long as the permit does not direct otherwise and as long as the modified method can be shown to meet QAOs.

DISCUSSION
The NMED has indicated in their response to comments on the draft permit that they have carefully reviewed and specified appropriate methods for sampling and analysis. In some cases, the NMED has limited some of the flexibility available in SW-846. In other cases, this flexibility is available.

For example, Chapter 2, Section 2.1 of SW-846 specifies that the methods have built into them an “inherent flexibility” provided that “method performances appropriate for the intended RCRA application has been documented.” This chapter states: “Glassware, reagents, supplies, equipment and settings other than those listed in this manual may be employed, provided that method performance appropriate for the intended RCRA application has been documented."
CLARIFICATION NUMBER CAO-00-043, REV. 0
NEWLY GENERATED VS. RETRIEVABLY STORED WASTE
(SECTION B-INTRODUCTION)

ISSUE
1. What is the difference between retrievably stored versus newly generated waste?
2. What are the impacts on characterization?
3. Must all newly generated waste be characterized accordingly?

CONCLUSION
1. According to the permit, newly generated waste is any waste that is generated after the NMED approves the final audit report for a site.
2. The permit requires that newly generated waste and retrievably stored waste be characterized differently, as defined in Table B-6. The fundamental difference is that the development of a complete and verified acceptable knowledge record during waste generation allows for a reduction in characterization activities.
3. No. It is possible that a waste generator cannot accurately document the contents of a container at the time of generation. In this case, the waste stream would be subject to the more rigorous sampling of retrievably stored waste including 100% radiography and associated visual examination.

DISCUSSION
1. Section B-Introduction, page B-2 distinguishes between retrievably stored waste and newly generated retrievably-stored waste and newly generated waste as follows:

Some TRU mixed waste is retrievably stored at the DOE generator/storage sites. Additional TRU mixed waste will be generated and packaged into containers at these generator/storage sites in the future. TRU mixed waste will be retrieved from storage areas at a DOE generator/storage site. Retrievably stored waste is defined as TRU mixed waste generated after 1970 and before NMED notifies the Permittees, by approval of the final audit report, that the characterization requirements of the WAP at a generator/storage site have been implemented. Newly generated waste is defined as TRU mixed waste generated after NMED approves the final audit report for a generator/storage site.
Retrievably stored TRU mixed waste will be characterized on an ongoing basis, as the waste is retrieved. Newly generated TRU mixed waste shall be characterized as it is generated. Waste characterization requirements for retrievably stored and newly generated TRU mixed wastes differ, as discussed in Sections B-3d(1) and B-3d(2).

The purpose for this distinction is two fold. First, it assures that as waste is generated, the proper information (as defined by the WAP) is collected to assure that the waste will be suitable for disposal of in WIPP. When such information is generated, some subsequent characterization (i.e., radiography) is unnecessary. Second, it assures that previously generated waste are characterized to an established set of requirements, which, when followed will assure that sufficient information is collected to determine if the retrievably stored waste can be disposed of in WIPP.

2. Generally, implementing these requirements relative to the date of program approval does not cause problems. However, there are cases where waste streams are in the process of being generated at the time approval occurs. This creates a time boundary between retrievably-stored waste and newly generated waste. CAO, however, has interpreted the permit to allow that any waste stream that is approved as a newly generated waste stream at the time of audit approval includes previously generated containers as long as the previously generated containers can be shown to conform to the requirements of the on-going program. If this conformity cannot be documented, the previously generated waste must be managed as retrievably-stored waste.
ISSUE

1. Does the requirement for reporting certain nonconformances to the CAO within 5 days apply only to the NCRs identified at the Site Project Manager signature release level?

2. Does the requirement for notifying CAO apply to all NCRs including those that do not pertain to characterization data?

3. Can the Site Project QA Officer (SQAO) delegate the verification of corrective action completions for NCRs?

4. Is it necessary to use NCRs for reporting changes to controlled procedures?

5. Which document changes by the generator sites must be reported to the CAO or gain CAO approval for prior to implementation?

CONCLUSION

1. The permit specifies in two places\(^1\) in Attachment B3 that certain nonconformances be reported to CAO within 5 days. The permit states that these requirements apply only to NCRs identified at the site project manager signature release level. Compliance with the NCR notification requirement is achieved by reporting non-administrative nonconformances to the CAO when they are first identified at the site Project Manager signature release level, within 5 days.

2. Text in the permit regarding the nature of NCRs limits the nonconformances

---

\(^1\)Section B3-1, page B3-5, states: For any non-administrative nonconformance related to applicable requirements specified in this Waste Analysis Plan (WAP) which are first identified at the site Project Manager signature release level (i.e., a failure to meet a DQO), the Permittees shall receive written notification within five (5) calendar days of identification and shall also receive a nonconformance report within thirty (30) calendar days of identification of the incident.

\(^2\)Section B3-13, page B3-34, states: The Permittees will receive written notification of all non-administrative nonconformances (i.e., a failure to meet a DQO) first identified during the Site Project Manager Review within five (5) days of identification. The Permittees will also receive a nonconformance report within thirty (30) days of identification. The generator/storage site will implement a corrective action process and resolve the identified nonconformance prior to the Permittees management, storage, or disposal of TRU mixed waste at WIPP.
of interest to those that are non-administrative and those that are related to applicable requirements of the WAP. The requirement to report NCRs to the CAO does not apply to NCRs outside of this category.

3. The SQAO is responsible for tracking of nonconformances, but this responsibility may be delegated provided that the SQAO remains accountable.

4. Sites must have a method of notifying the CAO anytime they make a non-administrative change to the controlled procedure that affects compliance with the WAP. However, certain changes require approval prior to implementation as discussed in item 5.

5. Certain document changes which have the potential to affect WAP compliance because they alter process requirements must be submitted to CAO for review and approval. The CAO will provide definitive guidance regarding what procedures or portions of procedures must be reported.

DISCUSSION

1. Section B3-13, page B3-34, requires that

   ...for any non-administrative nonconformance related to applicable requirements specified in the WAP which are first identified at the site Project Manager signature release level, the Permittees shall receive written notification within five calendar days.....

2. The NMED believes that failure to identify a nonconforming item early in the QA/QC process represents a serious deficiency in the waste approval/waste acceptance process and therefore requires scrutiny by both the CAO and the NMED. All non-administrative, non-conformances are reported to the Permittees. Non-administrative non-conformances first identified at the Site Project Manager review level will be reported, in writing, to the Permittees within 5 calendar days.

   Section B3-13, page B3-34, state the following:

   The Permittees shall require the Site Project QA Officer to oversee the nonconformance report process and be responsible for developing a plan to identify and track all nonconformances and report this information to the Permittees. Documentation of nonconformances shall be made available to the Site Project Manager, who in turn is responsible for notifying project personnel of the nonconformance. Completion of the corrective action for
nonconformances must be verified by the Site Project QA Officer. This means that the responsibility for developing and implementing the nonconformance resolution process belongs at the site QA level and not the data generation level. The term "oversee" provides a great deal of flexibility in the implementation process and can be taken to mean that the SQAO may delegate responsibility as appropriate as long as accountability is to the SQAO.

Text in the permit regarding the nature of NCRs (see footnote 5) limits the nonconformances of interest to those that are non-administrative and those that are related to applicable requirements of the WAP.

4. The NMED requires the Permittees to assure that generator site programs remain aligned with the Waste Analysis Plan. In this regard, the NMED requires that non administrative changes to controlled procedures be reported in accordance with Section B3-1 of the permit. These changes do not need to be reported as non conformance unless the change leads to non conforming conditions. This is a reporting requirement only. Some procedure changes also require approval of the CAO as defined in Section B5-2 as follows:

The Permittees shall ensure that changes that affect performance criteria or data quality, such as sample handling and custody requirements, sampling and analytical procedures, quality assurance objectives, calibration requirements, or QC sample acceptance criteria comply with the WAP (Permit Attachment B) and shall not be made without prior approval of the Permittees.

5. If a site changes a document such as the QAP/J or SOP in such a way that affects WAP performance criteria or data quality, CAO must review it, assess potential impacts and approve the changes prior to implementation.

Generator sites should document in their QAP/J’s and operating procedures the process for reporting non-administrative changes to controlled procedures. Changes should be reported within 5 days to be consistent with the permit.
ISSUE
1. What is considered “inadequate” acceptable knowledge.
2. If the waste was characterized when it was repackaged, will it have to be characterized a second time?
3. Is it acceptable to select a waste stream, develop acceptable knowledge for it, and then identify which containers will make up the waste stream?

CONCLUSION
1. Acceptable knowledge is inadequate if it fails to contain any of the data specified in Section B4-2 of the permit. The adequacy of acceptable knowledge is verified by the Permittees when conducting audits. Section B4-3e states “The acceptable knowledge record shall contain 100 percent of the information specified in Section B4-2. The usability of the acceptable knowledge information will be assessed for completeness during audits.”
2. If the waste was characterized when it was repackaged, but the acceptable knowledge was inadequate, it must be recharacterized so the acceptable knowledge requirements are met.
3. It is acceptable to select a waste stream, develop acceptable knowledge for it, and then make a final determination of which containers will make up each waste stream.

DISCUSSION
1. Attachment B4-2 states, “The Permittees shall obtain from each Department of Energy (DOE) TRU mixed waste generator/storage site (site) a logical sequence of acceptable knowledge information that progresses from general facility information (TRU Mixed Waste Management Program Information) to more detailed waste-specific information (TRU Mixed Waste Stream Information). Traceability of acceptable knowledge information for a randomly selected drum in the audited Waste Summary Category Group(s) will be examined during the Permittees’ audit of a site (Section B4-3f). The consistent presentation of acceptable knowledge documentation among sites in auditable records\(^1\) will allow Waste Isolation Pilot Plant (WIPP)

\(^1\) “Auditable records” mean those records which allow the Permittees to conduct a systematic assessment, analysis, and evaluation of the Permittees' compliance with the WAP and this Permit.
personnel to verify the completeness and adequacy of acceptable knowledge for TRU mixed waste characterization during the audit process."

2. Permit Attachment B-3d(2) states:

Repackaged retrievably stored waste, or any retrievably stored waste with inadequate acceptable knowledge, will be characterized using either the retrievably stored or newly generated waste characterization process, whichever results in greater sampling requirements.

If the waste was characterized when it was repackaged, but the acceptable knowledge is later found to be inadequate, the waste must be recharacterized so the acceptable knowledge requirements are met.

3. Section B-3d(2) states:

All retrievably stored waste containers will first be delineated into waste streams using acceptable knowledge.

Some degree of acceptable knowledge will always be used at the outset of the waste characterization process to make a preliminary determination of waste stream Summary Category Groups. This first level determination, however, does not imply that all acceptable knowledge required by the Permit is available at the time the waste is first delineated into waste streams nor does it assume that, as additional acceptable knowledge documentation is assembled, the sites will not need to revise their determinations relative to which drums belong in which waste streams.
CLARIFICATION NUMBER CAO-00-047, REV. 0
DEVELOPING ACCEPTABLE KNOWLEDGE
(SECTION B-3d(1))

ISSUE
1. Do the generators require a certification program and a developed acceptable knowledge program prior to generating TRU mixed waste?

2. Does the data form for newly-generated waste have to identify the Summary Category Group as well as matrix parameter category or would it be acceptable for the second operator to merely confirm matrix parameter category (which is an acceptance criteria, data validation criteria, and is reported via WWIS)?

CONCLUSION
1. No. A certified program is not required, however an acceptable knowledge documentation program should be established prior to the generation of TRU-mixed waste. Acceptable knowledge is required for newly generated waste prior to and during the packaging of the waste.

2. The data form for newly-generated waste must identify the Summary Category Group, since the appropriate characterization techniques are determined by the Summary Category Group.

DISCUSSION
1. Permit Attachment B-3d(1) states:

   The RCRA-regulated constituents in newly generated wastes will be documented and verified at the time of generation based on acceptable knowledge for the waste stream.

   Appropriate acceptable knowledge is described in Attachment B4 which states the requirements for acceptable knowledge that is to be developed prior to generating "newly generated" waste.

   Permit Section B4-3d states:

   for newly generated wastes, sites shall have written procedures to document the confirmation of acceptable knowledge information with visual examination prior to or during waste packaging.

   Generator sites generating TRU mixed waste before obtaining site certification under the requirements of the WIPP Permit should have an
acceptable knowledge program to generate and document appropriate acceptable knowledge.

2. Permit Attachment B-3d(1) states:

Verification that the physical form of the waste (Summary Category Group) corresponds to the physical form of the assigned waste stream is accomplished during packaging (using the VE technique). This process consists of the operator confirming that the waste is assigned to a waste stream that has the correct Summary Category Group for the waste being packaged. If a confirmation cannot be made, corrective actions\(^2\) will be taken as specified in Permit Attachment B3.

The subsequent waste characterization activities depend on the assigned Summary Category Group, since waste within the Homogeneous Solid and Soils/Gravel Summary Category Groups will be characterized using different techniques that the waste in the Debris Waste Summary Category Group.

Since the appropriate characterization techniques are determined by the Summary Category Group, the data form for newly-generated waste must identify the Summary Category Group.

\(^2\) "Corrective action" as used in the WAP and its attachments does not mean corrective actions as defined under HWA, RCRA, and their implementing regulations.
CLARIFICATION NUMBER CAO-00-048, REV. 0
EQUIPMENT CLEANING
(SECTION B1-2b(2))

ISSUE
1. Is it necessary to have the results of equipment cleaning blanks back from the laboratory prior to using the equipment?
2. Are the cleaning procedures per the Method Manuals required?
3. Does a fully assembled coring tool include the liner and tip? Does it include fixed equipment like drive motors?

CONCLUSION
1. Results from equipment cleaning blanks do not have to be returned from the lab prior to equipment use, however, results that fail the cleaning criteria may invalidate any subsequent samples taken prior to successful cleaning.
2. No. The permit requirements supercede any previous instructions provided in the Methods Manual. The permit provides performance goals for cleaning. These must be implemented at the sites using good management practices and must be documented in site standard operating procedures.
3. The requirements are aimed at assuring that potential sources of contamination are eliminated by adequate cleaning before sampling. Portions of equipment that do not pose a threat for contaminating samples need not be cleaned unnecessarily. Cleaning should be performed in accordance with EPA protocols (if applicable) or the manufacturer's recommendations.

DISCUSSION
1. The following are statements from the permit germane to cleaning the coring equipment.

Section B1-2a(1):

Liner outer diameter is recommended to be no mor than 2 in. and no less than one in. Liner wall thickness is recommended to be no greater than 1/16 in. Before use, the liner shall be cleaned in accordance with section B1-2b...

After disassembling the coring tool, a device (extruder) to forcefully extrude the liner from the coring tool shall be used if the liner does not
slide freely. All surfaces of the extruder that may come into contact with the core shall be cleaned in accordance with requirements in Section B1-2(b) prior to use...

All surfaces of the coring tool that have potential to contact the sample core or sample media shall be cleaned in accordance with the requirements in Section B1-2(b) prior to use.

Section B1-2b:

QC requirements for sampling of homogenous solids and soil/gravel include collecting co-located samples from cores or other sample types to determine precision; equipment blanks to verify cleanliness of the sampling and coring tools and sampling equipment; and analysis of reagent blanks to ensure reagents, such as deionized or high pressure liquid chromatography (HPLC) water, are of sufficient quality. Coring and sampling of homogenous solids and soil/gravel shall comply, at minimum, with the following QC requirements.

The EPA's Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA Publication SW-846, Volume 1, Section 3.3.3 states:

The procedures describing decontamination of field equipment before and during the sample collection process should be specified. These procedures should include cleaning materials used, the order of washing and rinsing with the cleaning materials, requirements for protecting or covering cleaned equipment, and procedures for disposing of cleaning materials.

Additionally, the generator sites should note that it is not necessary to clean the sampling equipment during collection of one sample batch, except for the removal of residual sludges etc. (The type of activities that were discussed in Methods Manual Procedure 120.1, Section 9.4.)

Following equipment cleaning and prior to use, the equipment blanks must be collected and analyzed at the frequency specified in B1-2b(2), i.e., one per equipment cleaning batch.
CLARIFICATION NUMBER CAO-00-049, REV. 0
ANALYSIS FOR PCBs
(SECTION B-3a(2))

ISSUE
Is it intended that TCLP is allowed as an optional method for determining the concentration of PCBs?

CONCLUSION
No. The method for PCB determination is EPA Method SW-846 8082 and not TCLP (SW-846 1311).

DISCUSSION
The wording in Section B-3a(2) implies that TCLP could be used for PCB analysis, however such an application is inappropriate.
CLARIFICATION NUMBER CAO-00-050, REV. 0
SAMPLE CONTAINERS
(SECTION B1-2b(3))

ISSUE
Are purchased sample containers that meet EPA Specifications and Guidance for Contaminant-Free Sample Containers, 9240.0-5A useable under the permit?

CONCLUSION
Yes. The practice of purchasing certified clean containers satisfies the Permit requirement.

DISCUSSION
Although the permit provides requirements for cleaning sample containers, it is appropriate for the generator sites to use EPA Specifications and Guidance for Contaminant-Free Sample Containers, 9240.0-5A. SW-846, Section 9.2.2.4 states: The choice of sampling equipment and sample containers will depend upon the previously described waste and site considerations. For the following reasons, the analytical chemist will play an important role in the selection of sampling equipment:

1. The analytical chemist is aware of the potential interactions between sampling equipment or container material with analytes of interest. As a result, he/she can suggest a material that minimizes losses by adsorption, volatilization, or contamination caused by leaching from containers or sampling devices.

2. The analytical chemist can specify cleaning procedures for sampling devices and containers that minimize sample contamination and cross contamination between consecutive samples.

3. The analytical chemist's awareness of analyte-specific properties is useful in selecting the optimum equipment (e.g., choice of sampling devices that minimize agitation for those samples that will be subjected to analysis for volatile compounds). The final choice of containers and sampling devices will be made jointly by the analytical chemist and the group designing the sampling plan.
CLARIFICATION NUMBER CAO-00-051, REV. 0
CORING AND SAMPLING OF SOLIDS
(SECTION B-2a(2))

ISSUE
1. Can alternate sampling methods be used for waste forms that cannot be cored?

2. Can alternate sampling methods (e.g., ASTM methods) be used to extract subsamples from a core?

CONCLUSION
1. Yes. If the generator site can document that A) the method specified in the permit cannot be used, and B) that the method used for sampling sludge is consistent with SW-846, then there is no need for a permit modification. However, the use of the coring device specified in Figure B1-4 is likely to work for all drum-scale coring needs.

2. Yes, however the demonstration of equivalency in terms of meeting all QAOs and minimizing loss of VOCs is the responsibility of the site.

DISCUSSION
1. Section B-3a(2) states the following with regard to sampling: (emphasis added)

   Sampling of homogeneous and soil/gravel wastes shall result in the collection of a sample that is used to confirm hazardous waste code assignment by acceptable knowledge. Sampling is accomplished through core or other EPA approved sampling, which is described in Permit Attachment B1.

   Section II.C.1.b., pages II-1 and 2 states the following: (emphasis added)

   Waste characterization sampling and analytical methods - the Permittees shall require that generator/storage sites comply with the method requirements, quality control, equipment testing, inspection, maintenance, and equipment calibration and frequency standards for the procedure specified in Permit Attachment B1 (Waste Characterization Sampling Methods). For all analytical methods for waste analysis not otherwise specified in Permit Attachment B1, the Permittees shall require the generator/storage sites to use “Test Methods for Evaluating

The NMED requires that the methods in Attachment B1 be used unless flexibility is granted in the permit for deviation from the specific methods. With regard to sampling of cores, the NMED has granted such flexibility as long as the adopted method is consistent with SW-846.

2. Section B1-2a(2) states as follows:

...A sampling device such as the metal coring cylinder described in EPA's SW-846 Manual (1996), or equivalent, shall be immediately used to collect the sample once the core has been exposed to air....

Therefore, a demonstration of equivalency is needed to use a device other than the metal coring cylinder. EPA is working under the Technology Transfer and Improvements Act of 1995 (PL 104-113) to use consensus standards whenever possible. In this regard, OSW is working with ASTM in developing improved sampling standards and methods. Sites are urged to check with both ASTM and EPA for assistance in establishing equivalency.
CLARIFICATION NUMBER CAO-00-052, REV. 0
CORE LINER ROTATION
(SECTION B1-2a(1))

ISSUE
What are the performance specifications for minimizing core liner rotation?

CONCLUSION
This requirement will be satisfied by the sites use of good mechanical design, good maintenance (cleaning of core tool), and attention to steady operation of the tools during core recovery.

DISCUSSION
Section B1-2a(1) states:

rotational coring tools shall have a mechanism to minimize the rotation of the liner inside the coring tool during coring activities, thereby minimizing physical disturbance to the core and that rotational coring shall be conducted in a manner that minimizes transfer of frictional heat to the core, thereby minimizing potential loss of VOCs.

This Permit requirement does not provide measurement criteria. This specification is a generic qualitative directive.

The two elements in the requirement are intended as guidance for taking core samples in a way that maximizes the integrity of the sample. The removable coring tool liner should move minimally with respect to the core sample. Friction between the rotating core tool and the liner should be minimized in order to minimize heating of the sample.
ISSUE
Should Headspace Gas Sampling System field blanks be collected through the manifold system or directly into a container?

CONCLUSION
Either is acceptable, however if sampling without the manifold is possible, it is preferred. In any case, the sampling process must be documented.

DISCUSSION
Section B1-1a(1) states that when using a manifold system, field blanks will be collected directly into a canister without using the manifold. B1-1c(3) states that field blanks will be collected through the manifold. Because the field blank is used to determine the effect of the sampling area environment, the field blank will be collected without use of the manifold when this is possible, but blank collection using the manifold will be allowed if the sampling equipment is designed to collect this QC sample.
CLARIFICATION NUMBER CAO-00-054, REV. 0
USE OF UPDATED METHODS
(SECTION B1)

ISSUE
Are analyses that were conducted under versions of SW-846 that have since been superceded acceptable?

CONCLUSION
Yes. Analyses conducted using versions of SW-846 methods that were in effect at the time are valid.

DISCUSSION
EPA periodically updates their compendium of sampling and analyses methods. Updates are issued as new or improved methods are identified, as equipment improvements mandate updates to existing methods and as experience is gained using approved methods. Improvements and changes do not invalidate previous results.
CLARIFICATION NUMBER CAO-00-055, REV. 0
OVA USE
(SECTION B1-1a(1))

ISSUE
Is any detector capable of detecting all analytes to levels below the PRQL allowed, or can only an organic vapor analyzer (OVA) be used?

CONCLUSION
The term "OVA" can mean one instrument/detector or a combination of several, as long as the site practices meet the requirement to detect the 29 organic compounds targeted in Table B3-2.

DISCUSSION
The method description in B1-1a(1) defines the use of an organic vapor analyzer (OVA) to compensate for real-time equipment blanks being unavailable. The requirement specifies that the OVA must detect all analytes in Table B3-2 of Attachment B-3.

"OVA" should be taken generically. The observation in the article that a photoionization detector (PID) may not detect one isomer of trichloro-tetrafluoroethane notes a limitation of PIDs, one of several possible detector types. The method requires checking the on-line equipment blank data by periodically confirming the OVA measurements with equipment blanks as per Section B1-1.
ISSUE

Is headspace gas sampling necessary when multiple drums which have valid headspace gas analysis are overpacked into a larger container?

CONCLUSION

No. However, the headspace gas concentration in the overpack must be conservatively calculated and the calculation documented.

DISCUSSION

Headspace gas sampling is required for every container to be shipped to the WIPP facility. Section B-3a(1) requires this sampling for the following reasons:

1. determine the types and concentrations of VOCs;
2. perform comparisons, based on concentrations, to assure there are no worker or public related health impacts;
3. identify additional hazardous waste codes, as appropriate; and
4. identify TICs.

Section B-4a(1) requires VOC concentration data to assure compliance with environmental performance standards.

Measuring VOCs in each container assures that the identification requirements are met. Conservatively determining the combined concentration within the overpack assures that the quantification requirements are met.

Site procedures must document how the combined concentration is calculated and why such calculations are conservative.
ISSUE
Is it necessary to prepare a non conformance report (NCR) for discarded samples taken under the drum lid when the rigid liner is unvented?

CONCLUSION
No. The NCR is only needed if the sample is retained for analysis.

DISCUSSION
In cases where generators are not sure that a rigid liner is vented, they have established procedures which allow them to sequentially take a sample from under the drum lid, then open the lid to determine if the rigid liner is vented. If not, a subsequent sample is taken from under the rigid liner.

The original sample from beneath the drum lid is considered to be non representative and is discarded.

As long as these steps are written in site procedures and the procedures are followed an NCR is not needed.
CLARIFICATION NUMBER CAO-00-058, REV. 0
VISUAL EXAMINATION TECHNIQUE
(SECTION B-3d(1))

ISSUE
What information should the VE Technique for newly generated waste produce?

CONCLUSION
The VE operator shall verify the following when using the VE technique for newly generated waste:

a) Inventory of contents and weights
b) Identification of hazardous waste codes
c) Absence of prohibited items

DISCUSSION
The requirements for data from the VE Technique is described in Section B-3d, Page B-13 as follows:

Radiography and/or VE will be used to verify the physical form of retrievably stored TRU mixed waste. For newly generated waste, physical form and prohibited items will be verified during packaging (using the VE technique). Radiography and/or VE will also be used in conjunction with acceptable knowledge to characterize heterogenous debris wastes. Radiography and/or VE, and the associated information compiled from acceptable knowledge (e.g., age of the waste, generating process) will be used to determine the RCRA-regulated constituents present in the waste.
CLARIFICATION NUMBER CAO-00-060
REPORTING
(SECTION B3-10, B3-12, B-4a(5), B-a(6), B-4b(1))

ISSUE
1. What reports must be prepared at the Data Generation Level?
2. What reports must be prepared at the Project Level?
3. What reports must be sent to the permittees for review?

CONCLUSION
1. The following reports must be prepared at the Data Generation Level:
   a. Testing Batch Report
   b. Sampling Batch Report
   c. Analytical Batch Report
2. The following reports must be prepared at the Project Level:
   a. Data Summary Reports
   b. Waste Stream Characterization Summary
   c. Data Validation Summary
   d. Summary Data Report
   e. Summarized waste stream characterization information
3. The following reports must be submitted to the Permittees:
   a. Batch data (if requested) (Section B-4a(5))
   b. Summary data (if requested) (Section B-4a(5))
   c. Batch data for each container (via the WWIS) (Section B-4a(6))
   d. Summarized container characterization information (Sections B-4a(6), B-4b(1), B-4b(1)(ii))
   e. Waste stream characterization information (Sections B-4(1), B-4b(1)(ii))

CAO-00-060.wpd

CAO-00-060

November 24, 1999
DISCUSSION

Reporting requirements in the permit are confusing due to an incorrect use of terminology. In interpreting the permit, the following general principles apply:

1. The most detailed reporting is at the data generation level.

2. Reporting becomes less detailed at higher levels of review and approval.

3. The Project level is responsible for summary reports that encompass data from multiple sources at the data generation level.

4. The Permittees only need summary information to accomplish their review, although detailed information is available upon request.

5. The term Batch Data Reports refers collectively to the Testing Batch Report, the Sampling Batch Report and the Analytical Batch Report. The content of these reports is defined in Section B3-10.

6. The term Data Summary Reports refers to the container specific data report prepared at the Project level based on data from the Data Generation level. These are also referred to as Data Summary Packages in Section B3-12 and contain the Summary Data referred to in Section B-4b(5). The content of these reports is found in Section B3-10.

7. The Summary Data Report refers to a summary report that accompanies the WSPF and allows the Permittees to check the accuracy of the information on the WSPF with regard to sampling, testing, and analytical data as found in Section B-4b(1). This report contains information supporting the specific data values presented on the WSPF (such as tabulated results of analysis and a summary of acceptable knowledge).

8. Summarized Waste Stream Characterization Information referenced several places in Sections B-4a and B-4b is the summarized characterization information referred to in Section B-4a(6) of the permit. It refers to information that accompanies the WSPF and allows the Permittees to check the accuracy of waste stream information on the WSPF. This report also allows the Permittees to verify that all the required elements of a waste stream characterization summary package are present. This is the same as the Waste Stream Summary Report in Section B-4b(1). This report includes the following information:

- generator site name
- program identification
- waste container numbers
• release signatures from the Site Project Manager and the Site QA Officer
• concise narrative summarizing the results of the project level review (e.g., reconciliation with DQOs)

9. **Batch Data** refers to information supplied to the Permittees via the WWIS.