

Department of Energy
Carlsbad Field Office
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16 JUN 2003



ENTERED



Mr. James Bearzi
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe, NM 87505-6303

Subject: Response to NMED Observer Inquiry Regarding the Target List for Matrix Spikes/Laboratory Control Samples in Organic Solids Sampling Program at INEEL

Dear Mr. Bearzi:

During Audit A-03-15 of Idaho National Engineering and Environmental Laboratory (INEEL) Analytical Laboratory Division, the New Mexico Environment Department (NMED) observer requested that the Carlsbad Field Office (CBFO) clarify how the accuracy quality assurance objective (QAO) for volatile organic compound (VOC) and semi-volatile compound (SVOC) solids are met. The accuracy requirement is found in sections B3-6 and B3-7 of the Waste Isolation Pilot Plant "Waste Analysis Plan" (WIPP WAP).

The purpose of matrix spike (MS) and laboratory control sample (LCS) compounds is to provide an indication, by class or group of compounds, of how the various types of compounds behaved during the extraction and analysis of a larger set of compounds. The results of the selected compounds are considered to be representative of the entire class or group of compounds. Table B-4 of the WIPP WAP organizes the analytes into "Groups".

The selection of MS and LCS compounds is governed by the analytical methods in SW-846. For VOCs, Method 8260b, section 5.13 requires that the "Matrix spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigated." This means that all the target compounds are not expected to be included in the MS and LCS sets. Section 8.4.3 requires the LCS set to be the same as the MS set.

SW-846 Method 8270c sends the analyst to preparation Method 3500B to determine MS and LCS requirements. Method 3500B, Section 5.5.3 states "For methods with no guidance, select five or more analytes (select all analytes for methods with five or less) from each analyte group for use in a spiking solution." (Method 8270c is one of those methods with no guidance.) Method 3500B also requires the LCS set to be the same as the MS set.



16 JUN 2003

While the WIPP WAP Tables B3-4 and B3-6 provide %R values for all of the compounds, this cannot be used to imply that the WAP requires all of the compounds to be used in the MS and LCS sets. Both WAP sections B3-6 and B3-7 say the MS results are to be compared to the %R values on those tables. Since the site can select any one of the target analytes, it is expected that a %R value would be provided for every one of them. It is our understanding that the sites are to follow the directions of the SW-846 Method unless the WAP explicitly specifies otherwise.

Analytical accuracy on a batch-by-batch basis is therefore evaluated using the MS and LCS results for sets of compounds that are representative of the expected target analytes. The laboratory demonstrates that the method is under control by measuring a continuing calibration sample that includes all of the target analytes. These three quality control checks establish the ability of the instrument to quantitate the target analyte in the sample matrix. Therefore, CBFO maintains that the use of representative compounds is what the SW-846 methods and the WAP requirement for demonstration of the accuracy of the method, and hence the WAP accuracy QAO.

Review of data from INEEL provides the following information:

1. For VOCs, a total of 12 compounds are used in the MS and LCS. They are divided between the VOCs and non-halogenated VOCs (NHVOCs).
2. A total of 3 SVOC compounds are used for the MS and LCS.

The INEEL uses 3 SVOC compounds: a chlorinated cyclic, a nitrated cyclic and a substituted phenol. The Target Analyte List (TAL) of 10 SVOCs in the WIPP WAP consists of chlorinated cyclic compounds, substituted phenols, and nitrated cyclic compounds. This selection gives a representative sampling of how the entire list of compounds on the TAL will behave during extraction and analysis.

For NHVOCs, the MS and LCS contain all 7 of the VOC compounds of interest analyzed by this method.

For VOCs, INEEL uses 5 compounds: 2 halogenated straight chain compound, 2 cyclic compounds and a chlorinated cyclic compound. The TAL for the VOCs analyzed by INEEL using this method contains halogenated straight chain compounds and cyclic compounds (both chlorinated and nonchlorinated). Once again, INEEL has covered all classes of compounds in this group. INEEL's selection of compounds for MS and LCS mixtures covers all required classes of compounds in the TAL.

As a direct comparison, the TAL for headspace gas VOCs contains 29 compounds, but only 6 compounds are required by the WIPP WAP, Section B1-1b(3) to be present in a field reference sample. Using this reduced number of compounds from the entire TAL acceptably measures the performance of the sampling and analytical system without using the entire TAL.

Mr. James Bearzi

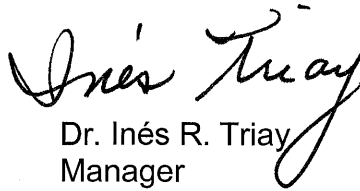
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16 JUN 2003

From the above information, the CBFO believes that the current selection of representative compounds from analyte "classes" and "groups" by INEEL serves the function of providing adequate information regarding recovery and the results gives adequate accuracy information to meet the requirements of the WIPP WAP.

If you have any questions concerning these responses, please contact Mr. Kerry Watson at (505) 234-7357.

Sincerely,

A handwritten signature in black ink that reads "Inés R. Triay". The signature is written in a cursive style with a large, sweeping flourish at the end of the name.

Dr. Inés R. Triay
Manager

cc:

K. Watson, CBFO
S. Zappe, NMED
J. Kieling, NMED