

APPENDIX F

Soil and Bulk Item Headspace Analysis Procedures

SOIL: Under normal conditions soil sample headspace analysis will be conducted using the Miniature Chemical Agent Monitoring System (MINICAMS). If Depot Area Air Monitoring System (DAAMS) tubes are used in place of MINICAMS, start the following sequence at step 12. DAAMS tubes must be used to confirm all positive MINICAMS results above 0.2 Airborne Exposure Limit (AEL). This monitoring shall be used to screen soil samples for H, HN1, HN3, and L contamination. Headspace monitoring for Phosgene (CG), Chloropicrin (PS), Cyanogen Chloride (CK), or chloroform is not necessary due to the extreme volatility of these compounds. Headspace Monitoring Procedures of soil samples using the MINICAMS and DAAMS are as follows:

1. Contractor delivers soil sample to monitoring personnel with proper CoC documentation.
2. Don protective gloves. Don protective mask when soil sample is collected by personnel wearing Environmental Protection Agency (EPA)/ Occupational Safety and Health Administration (OSHA) Level C Personal Protective Equipment (PPE) or above.
3. Place up to six samples in a heated sample box. Open bags and remove sample jar lids. Insert temperature probe into a selected soil sample. Close sample box lid and allow samples to equilibrate at 90°F (plus or minus 10°F) for 15 minutes.
4. Insert MINICAMS probe into the heated sample box. Monitor headspace for two complete cycles on the MINICAMS.
 - a. If MINICAMS result is below a 0.2 AEL reading, go to step 13.
 - b. If MINICAMS result is above the alarm set point or the result is above 0.2 AEL reading, go to step 5.
5. Don Mask and Gloves.
6. Open sample box and replace lids on sample containers and close bags.
7. Allow sample box to re-equilibrate for 15 minutes.

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8. Insert MINICAMS into heated sample box and monitor headspace. Once the MINICAMS result is below the alarm set point go to step 9.
9. Don mask and gloves, open lid of sample box. Samples will be monitored one at a time.
10. Open bag and remove lid from a single sample container. Insert temperature probe into soil sample. Close sample box lid and allow sample to equilibrate at 90 degrees (plus or minus 10 degrees) Fahrenheit for 15 minutes.
11. Insert MINICAMS probe into the heated sample box. Monitor the headspace for two complete cycles on the MINICAMS.
 - a. If MINICAMS result is below the alarm set point, replace lid and close bag, go to step 9 for next sample container.
 - b. If MINICAMS result is above the alarm set point for agent or the result is above 0.2 AEL, sample must be confirmed with DAAMS tubes. Go to step 12.
12. Allow samples to re-equilibrate at 90 degrees (plus or minus 10 degrees) Fahrenheit for 15 minutes. Collect DAAMS tubes at 400 milliliters per minute for 60 minutes. Transport DAAMS tubes to the MAP for analysis by Dynatherm/GC/MS.
 - a. If agent is detected from the DAAMS tubes analysis, the U.S. Army Engineering and Support Center, Huntsville (USAESCH) On-Site Safety Specialist must be immediately notified.
 - b. If DAAMS analysis results in a non-detect for agent the go to step 13.
13. Give clear samples to the contractor for proper disposition.

Soil Headspace Data Notification. The USAESCH On-Site Safety Specialist will be notified of all confirmed detection's. This includes concentration levels below the AEL value.

Soil Resample Procedure: In the event that soil has been decontaminated, the soil can not be re-sampled using the headspace analysis procedure. Therefore, the ECBC shall request a sample of the decontaminated soil for extraction and subsequent analysis for H, HN1, HN3 and L by GC/MS to confirm complete decontamination.

Soil Headspace Sampling Records. Copies of all soil headspace air sampling results will be maintained.

SCRAP/PPE/BULK ITEM: A sample of scrap, PPE, or a bulk item must be contained in an environment heated to a minimum of 70 degrees (plus or minus 10 degrees) Fahrenheit for four hours prior to monitoring with the MINICAMS/DAAMS. The item may be monitored at temperatures of at least 50 degrees Fahrenheit if the item is under full sunlight for four hours. However, the use of a heated box may be used to raise the temperature of the items in the case of inclement weather. Once the item has been contained for four hours and meets the referenced temperatures, monitoring may. Any items suspected of CWM contamination must follow the procedures using the DAAMS tubes rather than screening with MINICAMS.

1. Contractor delivers scrap/PPE/bulk sample to monitoring personnel with proper CoC documentation.
2. Utilize heated sample box, if necessary, to achieve temperature requirements stated above.
3. Don protective gloves and safety glasses. Don protective mask when sample is collected by personnel wearing EPA/OSHA Level C PPE or above.
4. Insert MINICAMS probe directly into single sample bag or container. Monitor headspace for two complete cycles on the MINICAMS.
 - a. If MINICAMS result is below a 0.2 AEL reading, go to step 6.
 - b. If MINICAMS result is above the alarm set point or the result is above 0.2 AEL reading, go to step 5.
5. Allow samples to re-equilibrate at 70 degrees (plus or minus 10) degrees Fahrenheit for four hours. Collect DAAMS tubes at 400 milliliters per minute for 60 minutes. Transport DAAMS tubes to for analysis by Dynatherm/GC/MS.
 - a. If agent is detected from the DAAMS tubes analysis, the USAESCH On-Site Safety Specialist must be immediately notified.
 - b. If DAAMS analysis results in a non-detect for agent the go to step 6.
6. Give clear samples to the contractor for proper disposition.

Headspace Data Notification: The USAESCH On-Site Safety Specialist will be notified of all confirmed detection's. This includes concentration levels below the AEL value.

Headspace Sampling Records: Copies of all headspace air sampling results will be maintained.