

Collection of Air Samples Using OVS Tubes

Chapter 8: MATRIX SAMPLES
AHETF-8.D.1.

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1.0 PURPOSE AND SCOPE

- 1.1 This Standard Operating Procedure (SOP) provides a description of procedures for collecting air samples using OSHA Versatile Sampler (OVS) tubes during the Agricultural Handlers Exposure Task Force (AHETF) exposure studies.
- 1.2 The OVS tube will be positioned in the breathing zone of the worker. The air will be sampled at a flow rate applicable to the characteristics of the OVS tube. A plastic tube holder will be used to position and protect the OVS tubes on the worker.
- 1.3 This SOP was revised to clarify the air sampling pump procedure in Section 3.0, and to reword the language.

2.0 MATERIALS REQUIRED

- 2.1 The following materials are required for collecting air samples from each worker/replicate:
 - a. OVS Tubes, 13 mm glass tubes [e.g.; mfr. SKC, Inc. with 270 mg & 140 mg absorbent beds separated by polyurethane plug, and glass fiber filter at the inlet], or equivalent
 - b. Plastic OVS tube holder

- c. Tygon® or equivalent tubing and clips for securing tubing to the worker (a minimum of two required)
- d. Low volume personal air-sampler pump (battery operated)
- e. Air flow meter (e.g., Kurz Mass Flow Meter, rotameter, bubble flowmeter, or equivalent)
- f. Sealable bags (e.g., Ziploc® freezer bags)
- g. Disposable gloves (i.e., latex)
- h. Cooler with dry ice, or freezer

3.0 AIR-SAMPLER PUMP PREPARATION

- 3.1 Place air-sampler pumps on chargers before each use. If the pump is fully charged proceed to 3.2.
- 3.2 Adjust air-sampler pump flow rate before use in each monitoring replicate. Air sample pump flow rate adjustment will take place on the day prior to or the same day the pumps are to be used.
- 3.3 Adjust air pumps to the targeted airflow rate with the appropriate OVS tube/ sampling train attached.
- 3.4 Follow appropriate contractor SOPs for the individual calibration methods for contractor equipment.
- 3.5 Adjust the airflow rate to appropriate target rate as defined in the study protocol [e.g., 2 liters per min (L/min)] and document the flow rate and pump number in the raw data.
- 3.6 Turn off the air-sampler pump and set aside. Repeat steps 3.3 and 3.5 until all needed sampling pumps (including backups) have been adjusted.

4.0 SAMPLING PREPARATION

- 4.1 Remove the outlet cap from the OVS tube and connect the outlet of the tube (the smaller 6 mm end) to the end of the air tubing that is connected to an adjusted personal air-sampler pump. Be sure the glass fiber filter is attached to the inlet (the larger 13 mm end) and is left open.
- 4.2 Position a belt snugly around the worker's waist, or use that worker's belt (if appropriate) to support the sampling pump. Attach the pump to the belt using the clip on the pump. Position the pump wherever it feels most comfortable to the worker.
- 4.3 Place the OVS tube over the shoulder of the worker (to the front of the torso) in the approximate position for sampling (in the breathing zone of worker)
- 4.4 Use a binder clip to attach the tubing, approximately at its midpoint, to the worker's clothing so that it will not interfere with the normal work operations nor catch on anything. The tubing may be run inside the worker's clothes. If tubing is run inside, ensure that clean, decontaminated tubing is used. **Do not reuse contaminated tubing!**
- 4.5 Remove the inlet cap and start the pump. Check the flow rate with a calibrated rotameter (Please refer to the AHETF or appropriate contract testing facility SOP). Adjust the air-sampler pump flow rate if the measured flow rate deviates greater than $\pm 5\%$ from the target flow rate.
- 4.6 Document the pump number, start time and the flow rate measured with the rotameter in the raw data.
- 4.7 Place the OVS tube in the plastic holder and clip the holder to the workers' collar (in the breathing zone). If the holder does not have an integral clip, use a binder clip, wire or plastic tie to attach to the worker's collar or lapel. Be sure the tubing is not crushed or restricted when attached. The inlet must face downward, in a vertical orientation.
- 4.8 Observe the worker for a few minutes upon starting to work to ensure the sampling apparatus is functioning properly, and is not interfering with the worker. Periodically monitor the pump during the replicate to ensure it is

functioning properly.

- 4.9 Pumps will run continuously throughout the duration of the monitoring replicate, including lunch and other breaks.
- 4.10 Should a pump malfunction during a replicate, it will be replaced immediately with a new, prior adjusted pump (section 3). Remove the OVS tube from the old pump and attach it to the new, adjusted pump, and repeat steps 4.6 through 4.9. These activities will be documented in the appropriate study file(s) and include (at a minimum) the time the malfunction was discovered, the time reading on the pump (if available), the time the new pump was started and the new measured flow rate.
- 4.11 At the end of the sampling period, remove the OVS tube from the plastic protective holder, measure the terminal flow rate with the rotameter, turn off the pump, record the stop time and flow rate, and remove the pump, tubing and OVS tube from the worker.

5.0 SAMPLING PROCEDURE

- 5.1 Upon completion of the replicate, remove the OVS tube from holder, cap both ends and place into frozen storage (*i.e.*, on dry ice or in a freezer).
- 5.2 Clean disposable gloves will be worn by sampling personnel to minimize any contamination of the OVS tube. Gloves will be changed after handling each tube.

6.0 SAMPLING INTERVALS

- 6.1 OVS tubes will be collected at the end of the monitoring replicate, unless otherwise instructed by the protocol.

7.0 FIELD STORAGE

- 7.1 Place samples collected during the study in the field in a cooler with dry ice or portable freezer until processed and placed into "permanent" frozen storage for shipping at the end of the monitoring day (or as soon as practical). If dry ice is not available, the Study Director must be notified before sample collection and other suitable storage conditions must be noted in the raw data.