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1.0 PURPOSE AND SCOPE

1.1 Purpose

This document provides instructions to Industrial Hygiene Technicians (IHT) under the direction of Industrial Hygienists (IH) for conducting wipe and bulk sampling as a means to assess chemical surface contamination and identify unknown materials. Wipe sampling may be performed to determine the degree of contamination of surfaces which workers may touch (leading to potential exposure via skin absorption or ingestion), and/or evaluate the effectiveness of decontamination of surfaces. Bulk sampling will help determine the chemical identity and concentration of the collected sample.

1.2 Scope

This document applies to all wipe and bulk samples collected by IHTs. This document provides general instructions applicable to the most common types of wipe and bulk sampling.

This procedure can be performed in multiple locations. A work area and/or location specific hazard analysis must be performed prior to starting the activity per TFC-ESHQ-S_SAF-C-02.

Beryllium surface sampling shall be conducted in accordance with DOE-0342-002, “Hanford Site Assessment and Characterization/Verification of Buildings Procedure”, Appendices B-G. This includes the following sample methods:

- Appendix B, Wipe Sampling
- Appendix C, Bulk Sampling by Micro Vacuum
- Appendix D, Bulk Sampling by Brush
- Appendix E, Bulk Sampling by Scraping
- Appendix F, Bulk Sampling by Scooping
- Appendix G, Wipe Sampling by Whatman Filter (Analyzed by Fluorometry.)
## INFORMATION

### 2.1 Terms and Definitions

- **Bulk sample** - A sampling technique used to collect liquid or solid material of concern to determine the chemical identity and concentration of the material collected.
- **Wipe sample** - A sampling technique used for assessing surface contamination. Wipe samples are most often collected to screen for lead, beryllium, other heavy metals, asbestos, and polychlorinated biphenyls (PCBs). Wipe sampling is also referred to as “swipe sampling” or “smear sampling.”
- **SWIHD** - *Site Wide Industrial Hygiene Database*
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 Consult with the job contact, as necessary, to plan for special entry requirements, safety hazards, and scheduling information. Determine if there are special precautions, protective clothing requirements, radiological controls, or other measures to ensure the safety of sampling personnel during wipe or bulk sampling.

3.1.2 Depending on the wipe sampling method employed, caution should be taken in handling the solvent used.

3.2 Radiation and Contamination Control

3.2.1 Planned work in radiological areas must be approved by Radiological Control personnel per the Radiological Risk Screening procedure TFC-ESHQ-RP-RWP-C-01.

3.2.1.1 When performed without a formal work package or approved procedure (i.e., Level 3 or 4 work), this procedure is limited to radiological areas and work activities permitted by a low risk Radiological Work Permit (RWP).

3.2.2 Filtration requirements for air monitoring equipment.

- A radiological particulate pre-filter (1~3 micron pore size, 25 mm diameter) when monitoring in a Contamination Area (CA), High Contamination Area (HCA), or Airborne Radioactivity Area (ARA), if instrument is capable. Not required, but encouraged in posted Radiological Buffer Areas (RBA).

- The “Bacterial Air Vent” filter (manufactured by Pall – Galman Laboratory) ahead of the radiological filter when monitoring from unfiltered tank systems. This is a sealed filter that cannot be opened for radiological survey purposes, in this case, dispose of as low level radioactive material waste if needed.

- The use of parallel, sacrificial sorbent tubes or sample media, or multiple filters may be necessary depending on intended use and equipment parameters. A specific radiological Release Survey Plan (RSP) would need to address this allowance.
3.2 Radiation and Contamination Control (Cont.)

3.2.3 Before conducting sampling or monitoring, contact the responsible Radiological Control personnel for the facility or area to determine any specific survey or monitoring requirements.
- Pre, during, and post contamination survey requirements.
- Any applicable RSP’s for your specific equipment or task.
- Alternative survey or monitoring needs to support the radiological release survey process.

3.2.4 Comply with the requirements set forth by the RWP, HPT coverage, Release Survey Plan (RSP), and any other applicable procedures as determined above.

3.2.5 When exiting radiological areas where no HPT coverage was provided, inform the radiological control personnel of the use/history for the equipment being presented (e.g., only sampled air in the Contamination Area, No known history of contamination based on use, etc.) to aid them in properly evaluating the radiological release criteria needed.

3.2.6 Samples collected in a radiological area shall not be removed from the facility, transported by personnel, or submitted to an analytical laboratory until they have been evaluated by an HPT in accordance with approved procedures.
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies are intended for wipe sampling:

- Disposable wipes meeting the following criteria:
  - Contains low background levels of the contaminant to be sampled (<5 μg/wipe) or less than the required method reporting limit for the contaminant of concern
  - If sampling is for lead or other heavy metals, the media needs to meet the requirements established in ASTM 1792-96a per Environmental Protection Agency (EPA) National Lead, Laboratory Accreditation Program (NLLAP) and American Industrialized Hygiene Association (AIHA) Environmental Lead Laboratory Accreditation Program (ELLAP).
  - Is a single thickness
  - Is durable and does not tear easily
  - Does not contain aloe
  - Can be digested in the laboratory
  - Yields 80-120% recovery rates for samples spiked with metal dust (not metal in solution)
  - Remains moist during the wipe sampling process.

- Non-sterilized, powder-free, non-latex disposable gloves to prevent cross-sample contamination from hands

- Tweezers

- Non-sterilized, polyethylene sample vials (30 - 50 ml size), or equivalent hard-shell containers, that can be rinsed quantitatively in the laboratory

**NOTE** - Plastic baggies or paper envelopes are not to be used to transport or temporarily hold wipe samples. The laboratory cannot measure metal left on the interior surface of such containers.

- “Industrial Hygiene Surface Sampling Field Log” form (A-6004-078)
- Disposable templates 100 cm²
- Container labels or permanent marker
- Rack, bag, or box to carry sample containers
- Measuring tape
- Refer to DOE-0342-002, Appendices B-G for additional supplies when conducting beryllium wipe and bulk sampling.
4.2 Performance Documents

The following documents may be needed to perform this procedure:

- TFC-ESHQ-RP_RWP-C-03, “ALARA Work Planning.”
- TFC-ESHQ-S_IH-C-46, “Industrial Hygiene Reporting and Records Management.”
- TFC-ESHQ-S-SAF-C-02, “Job Hazard Analysis.”
- DOE-0342-002, “Hanford Site Assessment and Characterization/Verification of Buildings Procedure”,
  - Appendix B, Wipe Sampling
  - Appendix C, Bulk Sampling by Micro Vacuum
  - Appendix D, Bulk Sampling by Brush
  - Appendix E, Bulk Sampling by Scraping
  - Appendix F, Bulk Sampling by Scooping
  - Appendix G, Wipe Sampling by Whatman Filter (Analyzed by Fluorometry.)
- Site Form A-6004-078 “Industrial Hygiene Surface Sampling Field Log.”
- Site Form A-6001-759 “Industrial Hygiene Wipe Sampling Survey.”

4.3 Field Preparation

4.3.1 \textbf{PERFORM} a review of the applicable industrial hygiene sampling plan if one has been completed.

4.3.2 \textbf{PERFORM} a work area and/or a location specific hazards analysis per TFC-ESHQ-S-SAF-C-02.
5.0 PROCEDURE

5.1 Collecting Wipe Samples

5.1.1 OBTAIN the following supplies:
- Disposable wipes
- Non-sterilized, powder-free, non-latex, disposable gloves to prevent cross-sample contamination from hands
- Tweezers
- Non-sterilized, polyethylene sample vials (30 - 50 ml size), or equivalent hard-shell containers, that can be rinsed quantitatively in the laboratory

NOTE - Plastic baggies or paper envelopes are not to be used to transport or temporarily hold wipe samples. The laboratory cannot measure metal left on the interior surface of such containers.
- “Industrial Hygiene Surface Sampling Field Log” form (A-6004-078)
- Disposable templates 100 cm²
- Container labels or permanent marker
- Rack, bag, or box to carry sample containers
- Measuring tape.

5.1.2 OBTAIN a survey report number from the Site Wide Industrial Hygiene Database (SWIHD).

5.1.3 DOCUMENT results of the wipe sampling survey on the “Industrial Hygiene Surface Sampling Field Log” form (A-6004-078) AND COMPLETE documentation associated with wipe sampling in accordance with TFC-ESHQ-IH-STD-03, and TFC-ESHQ-S_IH-C-46.

5.1.4 CHECK that a SWIHD sample identification number is attached to each sample container AND ATTACH one if necessary.
5.1 Collecting Wipe Samples (Cont.)

NOTE - For general wipe sampling surveys, floors, countertops, tops of furniture, and other flat surfaces where airborne contaminants may settle are common sampling sites. Wipe sampling is inappropriate for rough surfaces such as corrugated metal, wood or other materials that may tear the wipe. Wipe sampling is also inappropriate for surfaces such as carpeting or fabric.

- Areas in which workers are likely to have contact are important to sample.

5.1.5 **DO NOT** walk on or touch the surface to be wiped **AND**

**IF** the locations have not been predetermined, **INSPECT** the area to be sampled to determine the sampling locations.

NOTE - As a rule of thumb, a surface is considered to have gross contamination if a person performing a swipe in the accumulated material would leave a visible trail.

5.1.6 **IF** gross contamination appears on the surfaces, **CONSULT** with the Industrial Hygienist to determine if bulk sampling should be conducted.

5.1.7 **PREPARE** a sketch of the area to indicate the locations where samples are collected.

5.1.8 **PLAN** a sequence of sampling sites beginning away from the most likely areas of contamination and proceeding to those areas likely to contain heavier levels of contamination.

NOTE - Gloves should be worn even if tweezers or forceps are used to handle the sampling media. The sampling method for the analyte of interest will specify whether tweezers and/or a gloved hand alone should be used to handle the media.

- If organic solvents will be used as a wetting agent for the wipes, tweezers or forceps must be used.

5.1.9 **WEAR** a disposable, non-latex or nitrile glove on the hand that handles the filters or other wipe media.
5.1 Collecting Wipe Samples (Cont.)

NOTE - The number of blanks to be used will be dictated by the sampling method and/or IH sample plan.

5.1.10 PREPARE field blanks as follows:

5.1.10.1 REMOVE a wipe from its container with forceps or the gloved hand.

5.1.10.2 DO NOT ALLOW the wipe to touch any other surfaces.

5.1.10.3 UNFOLD the wipe.

5.1.10.4 FOLD the wipe in half three times.

5.1.10.5 PLACE the wipe in the sample bottle or tube.

NOTE - The standard area sampled with wipe samples is 100 cm².

5.1.11 TAPE a disposable template on the first surface to be sampled

OR

IF the surface area is too small, irregular, or curved to allow a template to be used, ESTIMATE the area wiped using a measuring tape when possible.

5.1.12 PICK up the sampling wipe with tweezers or the gloved hand.

5.1.13 PLACE the wipe flat on the surface to be wiped.

5.1.13.1 TAKE care not to tear the wipe AND

PRESS down firmly and evenly.

5.1.14 ALLOW only one side of the wipe to contact the surface AND

WIPE side to side over the sampling area, starting at the outside of the template and using “S”-like motions to completely cover the area.

5.1.15 FOLD the wipe in half with the contaminated surface facing inward using tweezers or the gloved hand, as appropriate.
5.1 Collecting Wipe Samples (Cont.)

5.1.16 USE a “S” or “Z”-like motion perpendicular to the original direction, completely AND WIPE the area again.

5.1.17 FOLD the wipe in half two times with the contaminated side in first.

5.1.18 USING the twice folded media, WIPE the same area one more time, focusing on the edges and the corners of the selected surface area.

5.1.18.1 Fold in the exposed side of the wipe.

5.1.19 PLACE the wipe in the sample bottle or tube, using a separate bottle or tube for each wipe sample.

5.1.20 REPEAT Steps 5.1.11 through 5.1.19 for each successive wipe sample, using a new disposable glove with each wipe AND RETURN to Step 5.1.21.

5.1.21 DISPOSE of sampling waste such as gloves, templates, masking tape, etc., in accordance with facility policies.

5.1.22 FOLLOW the guidance in TFC-ESHQ-S_IH-C-46 when collecting wipe samples in radiological areas.

5.1.23 CONFIRM that all wipe sampling documentation collected by the IHT is received by the IH within two working days.
5.2 Special Techniques for Wipe and/or Bulk Sampling

5.2.1 IF sampling for Polychlorinated Biphenyls (PCBs), **PERFORM** the following:

**NOTE** - The PCB wipe sample kit should contain non-sterilized glass tubes (1 x 12 cm size) with Teflon lined caps, each containing approximately 1” gauze pad wetted with approximately 1 mL hexane (tubes are kept in a rack to hold them upright and to prevent spillage).

5.2.1.1 **REQUEST** a PCB wipe sample kit from the analytical laboratory that will do the analysis.

5.2.1.2 **OBTAIN** the following supplies prior to sampling:

- Non-sterilized, powder-free, non-latex disposable gloves chemically resistant to hexane to protect and prevent cross-sample contamination from hands
- Metal tweezers
- Plastic wash bottle containing de-ionized water for cleaning tweezers
- Disposable templates of 100 cm²
- Container labels or permanent marker
- Measuring tape
- Kimwipes.

5.2.1.3 **PROCEED** with sampling using a gloved hand with or without tweezers as outlined in Steps 5.1.2 through 5.1.19 **AND**

**RETURN** to Step 5.2.1.4.

5.2.1.4 **PLACE** the wipe back into the uniquely labeled container it came from.

5.2.1.5 **REMOVE** the template, the masking tape used to hold the template in place (if any), and the disposable gloves **AND**

**PLACE** them in the proper waste receptacle after each sample.

5.2.1.6 **CLEAN** the tweezers with a clean wipe moistened with de-ionized water.
5.2 Special Techniques for Wipe and/or Bulk Sampling (Cont.)

5.2.1.7 **REPEAT** Steps 5.2.1.3 through 5.2.1.6 for each surface to be sampled, making sure to replace the disposable gloves between samples.

5.2.2 **IF** collecting wipe samples for beryllium, **PERFORM** sampling in accordance with DOE-0342-002, Appendixes B and/or G.

5.2.3 **IF** collecting bulk samples for beryllium, **PERFORM** sampling in accordance with DOE-0342-002, Appendixes C-F.

5.2.4 **FOR** waste generated during field wipe sampling in Beryllium Controlled Areas or Beryllium Regulated Areas, **PERFORM** the following:

5.2.4.1 **DOUBLE WRAP** the waste in 6 mil plastic.

5.2.4.2 **AFFIX** a “DANGER – Contaminated with Beryllium…” label.

5.2.4.3 **DISPOSE** of waste in a designated beryllium waste container.

5.2.4.4 **IF** a beryllium waste container cannot be located, **CONTACT** the IH for assistance.
5.3 Collecting Bulk Samples

5.3.1 CONSULT with the job contact to plan for special entry requirements, safety hazards, and scheduling information.

NOTE - Methods used for bulk sampling metals include using a brush, non-metal spoon or knife, spatula, or micro-vacuuming.

5.3.2 OBTAIN bulk sampling supplies and sample containers.

5.3.3 OBTAIN a survey report number from the SWIHD.

5.3.4 APPLY a unique sample identification number on each sample container.

5.3.5 IF the locations have not been predetermined, INSPECT the area to be sampled to determine appropriate sampling locations.

5.3.6 PREPARE a sketch of the area on the “Industrial Hygiene Wipe Sampling Survey” form (A-6001-759) or an approved equivalent to indicate the locations where samples will be collected.

5.3.7 WEAR appropriate protective clothing but, as a minimum, disposable non-latex or nitrile gloves should be worn while collecting the bulk sample to prevent any skin contamination.

5.3.8 CHANGE gloves prior to collecting additional samples to prevent cross contamination of the samples.

5.3.9 COLLECT the bulk sample(s) in accordance with the recommended sampling method or plan or follow the direction of the Project IH.

5.3.10 PREPARE the samples for transportation to the analytical lab after samples are collected.
5.3 Collecting Bulk Samples (Cont.)

5.3.11 **DISPOSE** of sampling waste such as gloves and collecting devices, in accordance with facility policies.

5.3.12 **DOCUMENT** results of the bulk sampling on the “Industrial Hygiene Wipe Sampling Survey” form (A-6001-759), or an approved equivalent **AND**

**COMPLETE** documentation associated with the sampling in accordance with TFC-ESHQ-IH-STD-03, and TFC-ESHQ-S_IH-C-46.

5.3.13 **PROVIDE** the completed survey forms and associated field records to the Project IH within two working days.

5.4 Records

5.4.1 **PERFORM** the following for records identified within this procedure.

5.4.1.1 **RECORD** the number of times the record was generated in applicable column

**OR**

**PLACE** a check mark (✓) in the N/A column.

5.4.1.2 **SUBMIT** the package to IH.

<table>
<thead>
<tr>
<th>Records Submittal Checklist</th>
<th>Number of times completed</th>
<th>N/A (✓)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FORMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Hygiene surveys (including applicable forms and data.)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SEND** the completed records with Records Submittal Checklist attached to the Safety and Health Program for records retention.

____________________ / __________________ / ________________
Signature, IH Print (First and Last) Date

The record custodian identified in the Company Level Records Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.