

Environmental Sample Collection Methods

Communications: Whenever a potential BT agent is suspected or isolated, notify your Local Health Department, your Local Law Enforcement and The Ohio Department of Health (ODH) – Bureau of Infectious Disease Control (BIDC). In cases where there is an overt threat, the FBI must be notified.

Sample Questions: Contact 1-888-ODH-LABS (8:00 a.m. to 4:30 p.m.); ODH –BIDC 614-466-0265 (8:00 a.m. to 4:30 p.m.)

Or ODH - Infectious Disease Officer On-Call 614-728-3463 (after hours and weekends).

OHIO DEPARTMENT OF HEALTH LABORATORIES

ENVIRONMENTAL SAMPLE COLLECTION GUIDE

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General Information and Instructions

- 1. General:** The methods presented below are generally accepted methods described by the CDC and others. However, the efficiencies of these methods have not been scientifically validated and published. As methods are validated, this informational sheet will be updated to reflect the most current recommendations for environmental sample collection methods and protocols as applies to collecting samples for detection of BT agents. Refer to the CDC web-site for additional or up-to-date information.
- 2. Communication:** Prior to transporting a sample for testing, call the ODH BIDC at the numbers listed above. This communication is necessary to assure appropriate samples are collected and to assure the appropriate public health response can be implemented in the most time-efficient method as feasible in the event of a real dispersal of a BT agent.
- 3. Field Screening:** Local health and / or law enforcement are responsible for assuring the appropriate screening takes place prior to delivery of samples to the ODHL as follows:
 - a. X-ray or other screening for explosive devices if package is unopened.
 - b. Radiological screening.
 - c. Other screening as deemed necessary and appropriate for the safety of all individuals involved in sample collection, transport and receiving.
 - d. Document all field screening test procedures performed on the ODHL Environmental Sample Submission form.
- 4. Sample Size:**
 - a. Objects larger than 8.5" x11" x 3" will NOT be accepted by the ODHL due to limited space to safely handle such objects. More importantly, large objects cannot be safely packaged and transported. Attempting to package and transport large items may create a hazardous situation for the persons transporting and receiving these items.
 - b. Refer to appropriate methods and types for specific information on sample size. Utilize one of the sample collection methods listed to sample large objects. Examples of such objects: chairs, computer key boards, shipping containers.
- 5. Sample Integrity:** It is extremely important to make efforts to prevent cross-contamination of subsequent samples especially in situations where multiple samples are to be collected.

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General Information and Instructions (continued)

- a. Change gloves after handling each sample.
- b. Over-glove: Use a second pair of gloves over the first pair. This facilitates frequent changing of gloves as well as providing an extra-measure of protection.

6. Sample Labeling:

- a. Sample labeling can be accomplished by applying tape to the primary container (preferred) or marking the primary container with a marker.
- b. When a wetting solution has been used, e.g., swab or wipes, it is important to note on the primary container the type of wetting solution used.
- c. If multiple samples are collected, indicate a unique identifier on each primary container. Make a listing of each sample cross-referencing the unique identifier.

7. Secondary and Containment Packaging: At a minimum - double bag using 'zip-lock' type bags. Garbage bags are NOT satisfactory secondary or containment packaging.

- a. Procedure:
 - i. Place primary container into a secondary 'zip-lock' type bag taking care to minimize or prevent contamination to the outside of this bag;
 - ii. Change gloves or over-glove with a fresh pair of gloves handling next pair of gloves by the cuff;
 - iii. Seal secondary bag;
 - iv. Place secondary bag into a containment 'zip-lock' type bag and seal.
 - v. Change gloves or over-glove.
- b. Alternate "Buddy-System" Procedure:
 - i. First person collects and places sample in a primary container;
 - ii. First person places primary container into the secondary bag being held open by the second person or 'buddy';
 - iii. First person change gloves or over-glove prior to collection of additional samples;
 - iv. Buddy seals secondary bag and places this bag into the containment bag and seals.

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General Information and Instructions (continued)

8. Decontamination: Decontaminate the containment or outer most bag using:

- a. Freshly prepared 10% bleach - aqueous solution (can be prepared by adding 1 part bleach to 9 parts water);
- b. Commercially available chlorine-based product, such as bleach-wipes;
- c. Other commercially available products rated as sporicidal, bactericidal and viricidal; if not rated, use 10% bleach;
- d. Bleach-based decontaminants are recommended since bleach will also inactivate toxins, such as Ricin.
- e. Protocol: Thoroughly wet all external areas of the containment bag and allow to dry;
 - i. Contact time: Minimum 30 minutes;
 - ii. Extend contact time to 60 minutes if significantly contaminated; this may require re-wetting of the surface;
 - iii. If using commercially available product, follow manufacturers instructions for application and contact time;
 - iv. It is not necessary to wipe off the bleach unless the contact time has been reached and the containment bag is still saturated.
- f. Indicate Decontamination information in the appropriate section of the ODHL Environmental Sample Submission Form.

9. Storage and Transport:

- a. Letters, packages, etc., suspected of containing a powder or oily residues, can be transported at ambient temperature.
- b. All other sample types: Refrigerate @ 2-8°C; a cooler with freezer packs is sufficient; Do Not Freeze.

10. Environmental Sample Submission Form:

- a. Complete the ODHL Environmental Sample Submission Form and attach or bring completed form to the ODHL.
- b. Provide all information requested.
- c. A copy of the submission form can be obtained from BIDC by fax.

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General Information and Instructions (continued)

11.References and Additional Information:

Comprehensive Procedures for Collecting Environmental Samples for Culturing *Bacillus anthracis*, Revised April 2002, CDC
Website: www.cdc.gov.

Protecting Investigators Performing Environmental Sampling for *Bacillus anthracis*: Personal Protective Equipment. CDC
Website: www.bt.cdc.gov.

American Industrial Hygiene Association (AIHA) Field Guide for the Determination of Biological Contaminants in Environmental Samples. Fairfax, VA., 1996.

American Conference of Governmental Industrial Hygienists (ACGIH) Bioaerosols: Assessment and Control. Cincinnati, OH. 1999.

USAMRIID's MEDICAL MANAGEMENT OF BIOLOGICAL CASUALTIES HANDBOOK (Blue Book). USAMRIID Website:
www.usamriid.army.mil.

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<u>Type or Method</u> ²	<u>Use For</u>	<u>Primary Container</u> ¹
<p>Wet Swab³</p> <ul style="list-style-type: none"> Wet (but do not saturate) a sterile swab using sterile phosphate buffered saline or normal saline (0.85% NaCl aqueous). In general, avoid use of water - creates a hypotonic environment that can be detrimental to some bacterial agents. Use sterile water to collect an additional sample if testing for Ricin is indicated. 	<ul style="list-style-type: none"> Sampling small (up to 100 sq. in.) non-porous surfaces. Sampling hard to reach areas. Minimal powder / material present or visible. 	<ul style="list-style-type: none"> Sterile, 15- to 50-ml, <u>polypropylene</u> screw-cap tubes. Sterile water should NOT be stored in glass containers. Sterile containers made of polypropylene are recommended.
<p>Wet Wipe</p> <ul style="list-style-type: none"> Wet (but do not saturate) a sterile 2"x2" non-cotton gauze pad using sterile phosphate buffered saline or normal saline (0.85% NaCl aqueous). In general, avoid use of water - creates a hypotonic environment that can be detrimental to some bacterial agents. Use sterile water to collect an additional sample if testing for Toxin is indicated. 	<ul style="list-style-type: none"> Sampling larger (up to 8 sq. ft.) non-porous surfaces. Minimal powder / material present or visible. 	<ul style="list-style-type: none"> Sterile, <u>polypropylene</u> wide-mouth screw-cap sample container, minimum 4 oz. capacity. 50-ml polypropylene screw-cap tube.
<ul style="list-style-type: none"> HEPA (High Efficiency Particulate Air) vacuums fitted with HEPA-vacuum socks. 	<ul style="list-style-type: none"> Very large areas and / or extensive sampling. Porous surfaces, e.g., carpet, and ceiling tile. 	<ul style="list-style-type: none"> Sterile, <u>polypropylene</u> wide-mouth screw-cap sample container, minimum 4 oz. capacity.

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<u>Type or Method</u> ²	<u>Use For</u>	<u>Primary Container</u> ¹
<p>Bulk Sampling</p> <ul style="list-style-type: none"> • Collect up to 5-grams of dry material. Use a disposable spoon for collecting and placing material into a primary container. • Collect 500 to 1000 ml of liquid material. Use a sterile primary container to collect the sample and transfer to a second primary container. Do not submit a primary container that has been submerged into the suspect liquid. 	<ul style="list-style-type: none"> • Collection of bulk materials, e.g., powders, dusts, soils, liquids. 	<ul style="list-style-type: none"> • Sterile, 15- to 50-ml, <u>polypropylene</u> screw-cap tubes. • Sterile, <u>polypropylene</u> wide-mouth screw-cap sample container, minimum 4 oz. capacity. • Delivery container, such as, a 1-gallon milk container.
<ul style="list-style-type: none"> • Letters, envelopes and packages containing powder or demonstrating oily-residues or uncharacteristic smudges. 	<ul style="list-style-type: none"> • Letters, envelopes, packages. 	<ul style="list-style-type: none"> • Envelope or package used as delivery device.
<ul style="list-style-type: none"> • Air samples: Numerous air sampling devices are designed, commercially available and generally accepted for sampling air. • The ODHL accepts the following types: <ul style="list-style-type: none"> ○ Sample collected on a filter, appropriate filter size: 0.8-µm ○ Samples collected in a sterile fluid. 	<ul style="list-style-type: none"> • Collection of air samples. 	<ul style="list-style-type: none"> • Sterile, 15- to 50-ml, <u>polypropylene</u> screw-cap tubes. • Sterile, <u>polypropylene</u> wide-mouth screw-cap sample container, minimum 4 oz. capacity. • Filters: Aseptically transfer the filter to a Primary Container; do not wet unless instructed by the manufacturer of the device. • Liquids: Seal and submit the liquid collection container.

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Environmental Sample Collection Method Notes:

1. Primary Container: Item used to collect suspect material; Secondary Container: Item, e.g., 'zip-lock' type bag used to hold the primary container; Containment: Item' e.g., 'zip-lock' type bag, used to transport the primary / secondary containers.
2. It is critically important to submit as much powder / material available, up to the stated limits, to maximize the opportunity to detect an agent if present. In the event minimal material is detected, collect an additional surface sample. For instance, upon opening an envelope, an individual detects an unexpected but minimal amount of powder. The surface area (desk, counter-top) immediately below the work area should be sampled per procedures described above and submitted in addition to the letter / envelope.
3. METHOD NOTE: A study in a recent article of the CDC publication Emerging Infectious Diseases indicates that macro-foam (foam-headed) swabs are more efficient for the collection and elution of spores than cotton or Rayon / Dacron swabs. (*Swab Materials and Bacillus anthracis Spore Recovery from Nonporous Surfaces*, June 2004, www.cdc.gov/ncidod/EID/). To date, CDC has not issued a recommendation for use of macro-foam swabs for collection of all bacterial agents. At this time, macro-foam swabs not exceeding ¾" inches in width are accepted by the ODHL.