Systematic Evaluation of Aggressive Air Sampling for *Bacillus anthracis* Spores

**Introduction**

The ability to accurately measure contamination in the environment is crucial to reliably assess risk and determine when reoccupation of spaces may occur. Existing surface sampling methods (i.e., wipe, swab, sponge stick) may not be optimum for all situations. The efficacy of existing surface sampling methods varies widely and contaminant recovery can be low. These methods may not be effective for all surfaces, nor can surface sample results be used to infer air contamination levels. Additional sampling methods, capable of yielding consistent and reliable data linked to inhalation, are needed.

AAS involves the use of forced-air equipment such as leaf blowers to dislodge and reaerosolize particulates, and slow-speed fans to keep the particles suspended while air samples are collected. Since 1985, AAS has been recommended by EPA for use in sampling following asbestos remediation; surface sampling is not recommended. Aggressive air sampling has also been used following building decontamination in response to the Amerithrax incidents of 2001 when it was discovered that reaerosolization of *Bacillus anthracis* spores from desks, floors, etc was occurring. However, this AAS method has been used as a supplemental method to surface sampling.

**Aggressive Air Sampling (AAS) Project**

Although AAS has been used for supplemental spore sampling, it has not been rigorously and systematically tested to support use as a primary method. As such, EPA is initiating a study to assess the applicability of AAS to *B. anthracis* spore sampling for clearance and characterization. If AAS is found to be effective for spore sampling when compared to surface sampling, it may enable clearance and characterization with fewer samples than the current surface sampling methods. Also, contractors skilled at asbestos sampling using AAS could be employed during an anthrax response to increase sampling capability. Unlike surface sampling, samples may be directly associated with inhalation risk. The asbestos aggressive air sampling procedure will be applied to *B. anthracis* surrogate spores deposited on to coupons of selected indoor and outdoor surface materials. Varied concentrations of surrogate spores will be deposited onto target surface materials via aerosolization. The tests will be conducted in EPA’s relative humidity and temperature controlled testing chamber. The efficacy of AAS compared to surface sampling for spores will be measured as a function of three surface spore concentrations, deposited on at least three surface types using two dissemination methods.
EPA’s OEM (Office of Emergency Management) and Regions (OSC, On-Scene Coordinator) have requested this evaluation to support potential use of this method for *anthracis* spore sampling during remediation. Both OEM and OSCs are represented on this research team\(^3\). A report on this study is expected early 2013.

**Contacts**

For more information, visit the [EPA Web site](http://www2.epa.gov/homeland-security-research).

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**References**


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