

SECTION 5 - SAMPLING & ANALYSIS

BULK SAMPLING

Asbestos bulk sampling is done at District 91 to determine whether or not a material is asbestos containing or to confirm previous analytical results. Since the AHERA regulations have been in effect since 1988, many homogeneous areas have been sampled although some areas are still assumed. Therefore, much of the sampling currently being performed is to confirm previous results or to further characterize a facility to prepare for renovation or demolition, as required by NESHAPS and OSHA.

Asbestos samples are collected by an accredited AHERA inspector and analysis is performed by an accredited laboratory. Accreditation certificates for analytical laboratories are located in the sampling and analysis binder in the Environmental Safety and Health Specialist's office. A list of accredited inspectors is located in Section 9; accreditation certificates for inspectors are located in the Environmental Safety and Health Specialist's office.

Prior to collecting any samples, suspect materials are grouped into "homogeneous" sampling areas. A homogeneous sampling area contains material that is uniform in texture, color, date of application, and appears identical in every other respect. Materials installed at different times belong to different homogeneous sampling areas.

Bulk samples are collected in a randomly distributed manner to ensure the sample(s) accurately represent the homogeneous area. Bulk sampling for confirmation purposes or for NESHAPS or OSHA evaluations may be done randomly or in a biased fashion, depending on the project needs. It is imperative that the sample collector use a sample device appropriate for the type of material being sampled to ensure a representative sample is collected (i.e. down to substrate) and that proper sampling technique is used to avoid any release of fibers or sample contamination. Sample collection locations should be repaired as needed to prevent further damage. Samples cannot be composited.

NUMBER OF SAMPLES

Asbestos containing or suspect materials are divided into three categories per AHERA, Surfacing Materials, Thermal System Insulation (TSI), and Miscellaneous Materials. Each of these three categories has different requirements for the minimum number of samples to collect. Note that these are minimum requirements; it may be advisable to collect more samples in some instances.

SURFACING MATERIAL

After grouping surfacing material(s) into homogeneous areas, the following number of samples must be collected from each per area 763.86:

- A minimum of three bulk samples shall be collected from each homogeneous area that is 1,000 ft² or less.
- At least five bulk samples shall be collected from each homogeneous area that is greater than 1,000 ft² but less than or equal to 5,000 ft².
- At least seven bulk samples shall be collected from each homogeneous area that is greater than 5,000 ft².

THERMAL SYSTEM INSULATION

The concept of homogeneous sampling areas is applied to thermal system insulation as well, the major difference being that insulation on thermal systems is likely to be much more varied than surfacing material. A typical building may contain multiple insulated pipe runs from any combination of the following categories:

- Hot water supply, return and or recirculation
- Cold water supply
- Domestic hot and cold water
- Steam supply and/or return
- Roof or system drains

Each of these systems may have been installed at different times and insulated with different materials (cardboard-type wrap, white chalky pipe wrap, cementitious “mud” at fittings, canvas-wrap, rope, airocell, fiberglass, etc.). Therefore, it is important to first identify the building system in question and then to determine what type of thermal insulation it contains. Although fiberglass, foam glass rubber and Styrofoam are not suspect materials, they may cover up ACM. Therefore, it is important when sampling TSI to sample all the way down to the substrate using a coring type of sampler.

For TSI, the number of sample and sample location will depend on building circumstances. Per the AHERA rule:

- Collect at least three samples from each homogeneous area of TSI.
- For long pipe runs or risers, collect more samples.

Exceptions to the three sample rule are:

- Small sections (> 6 linear or square feet) of patched thermal system insulation (one sample)
- Areas where cement or plaster is used on fittings such as tees, elbows, or valves (as determined by AHERA Inspector)

MISCELLANEOUS MATERIALS

Miscellaneous materials at School District 91 includes floor tile, which is currently the most frequently sampled material. When floor tile is sampled, it is imperative that a sufficient quantity of mastic be collected along with the tile to determine if the mastic contains asbestos. It's also important to review the history of the building to identify any additions to the original building that were added at a later date.

These should be different homogeneous areas. According to AHERA regulations, samples of miscellaneous material are collected:

- “In a manner sufficient to determine whether material is ACM or not ACM” as determined by an accredited inspector.

SAMPLE IDENTIFICATION NUMBERS

Each sample is assigned a unique identification number at the time of collection. This sample number (often referred to as the field sample ID) is noted in the District 91 Environmental Sample Log Book, along with a description of where the sample was collected, the date, and the initials of the person collecting the samples. Most samples are also identified on a sampling diagram or floor plan. The sample ID is written on the sample label when it is sent to the laboratory. The laboratory will assign the sample a unique lab sample ID, and report the results by both numbers. District 91 used the following numbering sequence for environmental samples (including asbestos): AAA-BBBB-CCC-DD where,

A is the unique sample number,

B is the year the sample was collected,

C is the building number, and

D is the type of sample (air, water, soil, asbestos).

For instance, a sample of tile and mastic collected at Skyline High School may be numbered 153-2010-301-02. Samples are sent to an off-site laboratory under full chain-of-custody (lab specific form), generally either by U.S. Postal Service or Federal Express.

SAMPLE ANALYSIS

AHERA requires that laboratories that perform asbestos analysis be accredited. The National Institute of Standards and Technology (NIST) has developed an accreditation program for laboratories, known as the National Voluntary Laboratory Accreditation Program (NVLAP). Laboratories performing analyses under AHERA must maintain appropriate NVLAP certification. School District 91 used only laboratories meeting the accreditation requirements of § 763.87(a) for analysis of asbestos samples. Copies of laboratory accreditation certificates are kept in the ES&H Specialist's office. Bulk samples are analyzed for asbestos content by Polarized Light Microscopy (PLM) per Appendix E to Subpart E of §763.87. Transmission Electron Microscopy (TEM) may also be used when the sample contains extremely fine fibers.

Point Counting – The EPA's NESHAP regulations require that if asbestos is detected but with a result of less than 10% using standard PLM, a analytical technique called point counting be performed unless:

- The owner or operator of the building assumes the amount to be greater than 1% and treats the material as ACBM.
- A minimum of three slide mounts were prepared and examined to derive a no detected asbestos result.

ANALYTICAL RESULTS/RECORDKEEPING

The laboratory will analyze the sample and provide a detailed sample analysis report within 30 days of analysis that includes, at a minimum, the following information:

- Client sample identification number (field ID)
- Laboratory sample identification number
- Analytical technique used
- Laboratory quality to be collected from the area show asbestos in amounts of 1 percent or less.

The analytical results are entered into an electronic database (spreadsheet), and the building's Management Plan updated to includes the results. The hard copy of the analytical report received from the laboratory is filed in a binder by date. This binder is kept in the office of the Environmental Safety and Health Specialist. Copies of the sampling diagrams or floor plans showing the sample locations are also placed in this binder and in the Management Plan.

- control procedures
- Physical description of the sample, as received

- Type(s) and estimated percentage of non-asbestos fibers
- Type(s) and estimated percentage of asbestos
- Type(s) (if known) and percentage of other components
- Date of analysis
- Analysts name and signature

When analytical results are received from the laboratory, they are evaluated by the ES&H Specialist and the area determined to be ACBM using the following criteria:

- A homogeneous area is determined to contain ACBM based if the results of at least one sample collected from that area shows that asbestos is present in an amount greater than 1 percent.
- A homogeneous area is considered not to contain ACBM only if the results of all samples required indicate no asbestos present or asbestos present at less than 1%.

AIR SAMPLING

Air Sampling is often performed by the abatement contractor during a response action to ensure the integrity of the containments has not been compromised. After the Response Action is completed another set of samples are collected. Samples collected at the completion of Response Actions are called clearance samples, and are used to confirm that asbestos levels in the area are below exposure limits and that the area is safe to reoccupy.

Clearance samples are collected by a third party independent contractor hired by the District to avoid any conflict of interest with the abatement personnel. These samples are collected and analyzed per §763.90. Results from air samples collected during and after abatement activities are kept with other Response Action documentation in an abatement project manual that is specific to the particular abatement activity. Section 10 contains a more detailed discussion of AHERA Response Actions and list of the Response Actions conducted in the building since the inception of AHERA. Abatement project manuals from past abatements are located in the Environmental Safety and Health Specialist's office, or in an archived location.