



ASSURED BIO LABS

May 2014 Newsletter

May 2014 - Surface Sampling and The Chain of Custody



The Advantages of Bulk Sampling

by: Dylan Graves

During a property inspection, various combinations of samples are often collected in order to assess the presence of unwanted microbes. While spore traps are utilized for the evaluation of airborne molds and swab or tape samples for surface growth, bulk sampling often times is overlooked as an option. This is unfortunate as bulk sampling provides the flexibility of ease in sample collection, the diversity of analytical methods, the reliability if absolute quantification, and the ability to do downstream analysis.

Collection of a bulk sample consists of simply collecting a portion of the material on which the suspected microbe is growing. Such a sample may simply be collected by removing a section of any material that is in question. Bulk samples may be drywall, carpet, dust, fibers, water, etc. Their most attractive feature, however, may be their diversity. Bulk samples may be processed using microscopy or culture, by PCR or QPCR, and by Ft-IR or other chemistry methods. Knowing this, bulk sampling affords the lab the ability to select the best sub-sample for the desired analysis.

In situations where microbial quantifications and viability is being assessed, bulk sampling is often the only option. Viability cannot be reliably determined utilizing microscopy. It is also advantageous to culture directly from a bulk sample. This allows the analyst to identify growth which may be permeating a substance in addition to any surface growth. One practical application is when carpet or insulation are a concern. Bulk sampling would yield laboratory results that are a direct reflection of the microbial presence within the material sampled.

Last but not least, bulk samples are not consumed during their analysis. Any remaining sample and any resulting dilution of sample are retained by the laboratory for a period of three years. This affords the inspector (or client) the ability to reanalyze or to do downstream analysis. This often becomes useful when the "problem" is not identified by the analytical method chosen. A key example would be environmental issues related to chemical exposure and the hygienist tests initially for mold. Having sample, left over, means a new sample does not have to be collected.

During the project planning process, remember to think through the sampling options and how they couple with identifying an environmental complaint. Air, surface, and bulk are all tools in your tool belt. Each have their advantages and disadvantages, but by utilizing the appropriate combination techniques the root cause of the concern may be easily identified.



Assured Bio Labs will be closed for the upcoming holiday:

- Friday, July 4th, 2014

Meet the Assured Bio's latest addition.

Annie Furches
Lead Scientist- Industrial and Commercial Support



Annie earned a B.S. in Plant Biology and an M.S. in Evolutionary Biology from the University of Tennessee. She has contributed to research projects on the evolution of pollination biology, the model plant *Ceratopteris* (C-fern), fungal barcoding for the All Taxa Biodiversity Inventory, and systematics and population genetics in *Sarracenia*.



Figure 1:



Figure 2:



Figure 3:

The Ins and Outs of Surface Sampling

By: Marcus Reed

Surface sampling can be divided into two types of sampling, swab samples and tape lifts.

Swabs are the more versatile of the two, however tape lifts do serve as a valuable sampling tool. There are situations where a swab or tape lift prove to be a more suitable collection technique than the standard air sample. When planning an indoor air quality assessment, keep in mind the advantages and limitations of the various collection techniques.

The primary advantage to sampling with a tape lift is ease of use. More or less, any flat surface can be easily sampled without much risk of sample contamination. If you see an odd growth on a flat surface and wonder "What mold is this?", then a tape lift is the ideal sampling technique. Tape lifts often provide specificity to fungal identifications. In the lab an analyst often sees relatively undamaged structures of the mold in question, such as their conidiophores. This is advantageous as a genus may be identified in the sample instead of the generic, broad classifications associated with standard spore trap air sampling. Tape lifts are also very cheap, easy to use, and easy to transport. Prefabricated tape lifts are often provided at no charge by testing labs, however a roll of crystal clear tape will do the trick in a pinch.

Swabs serve the same function as tape lifts, but have a few added advantages. Swabs very simple to use. They are ideal for the identification of mold and bacteria collected from a suspect area, flat or not. In the laboratory, swabs are very diverse. They may be processed from microscopy, culture, or DNA methods. Such is not the case for tape lifts or traditional spore trap air cassettes.

This being said, black water contamination may be easily identified by swab using a Coliform Test. Simply swab the suspect area.

Legionella sp. presence may also be ascertained by swabbing bio films in water fountains or aerators. Many swab applications are qualitative, just as tape lift's, however samples for quantification may also be collected with ease. Simply measure out the area to be tested and the lab can report microorganism counts relative to the specific area sampled, i.e. cells per square inch.

Surface sampling is an easy, reliable field technique. Coupled with microscopy,

She has conducted fieldwork in fifteen states and in Western Australia. Her Master's thesis focused on phylogenetics and population genetics in *Penstemon*. In her spare time she collaborates on research projects with her husband, Dr. M. Steven Furches, at Lincoln Memorial University.

Is your Chain of Custody complete?

1. Has your business information been included?
2. Are the sample locations recorded?
3. Were the sample volumes calculated correctly?
4. Is the project name recorded?
5. Are collection times documented?
6. Has a laboratory service been indicated?
7. Did you sign the document?
8. Did you date the document?
9. Has the shipment tracking information been recorded?
10. Is the document legible?

It is a best practice to confirm all of these point to ensure your project is litigation proof.



identifications can be made very quickly. Having a specific identification provides the site assessor insight to source determination and structural integrity concerns. For the occupant, the ability to identify any organisms growing in an area of concern provides the peace of mind provided by knowing what they are being exposed to. In essence the knowledge, coupled with a site assessor's feedback and plan of action produces the metaphorical "light at the end of the tunnel" which is a healthy indoor environment.



Get to Know the Chain of Custody

S P X A C V I N T E C I E P Y T G S
 E H A Z O D G M M A N L K P N O N Z
 P O Z H N V T A R S D F E S J K U L
 S N W J D A I E P E R U T A N G I S
 C E U T I L C E M P V N A D Q Q Y G
 W F T Q T A C S R P B O D N L C T W
 H G I B I T H Y D M E M L I T A B G
 Z K B L O K R B M L G R T U H I E Y
 W S C R N Z H O Z V O O A O N K A T
 R J S E S F C P F X L M F T I E P I
 A D D R E S S V E I V R B L U O P D
 H A E Q U F B Z Y L G W C T J R U I
 X V U T J Q G B S D K B X I T J E M
 C N Z H O V K J Q X M I E A A H C U
 D E S C R I P T I O N I E Y D I Z H

The Chain of Custody

by: Lyn Pope

Samples submitted for laboratory analysis should always be accompanied by a document called the Chain of Custody. While the Chain of Custody (COC) appears to be a simple order form, it is actually so much more. It serves as field documentation, a means of sample tracking, a request for laboratory processing, an accounting document, and a legal shield. How can all this be said about one piece of paper? Let's explore further.

As a field document the Chain of Custody:

- Identifies the Property Investigated
- Lists the Site Assessor or Project Manager
- Records Serial Numbers for Samples and their Collection Locations
- Documents Environmental Conditions
- Documents Internal and External Temperatures and/or Relative Humidity
- Documents Sample Types and Collection Volumes
- Relays Data Pertinent to Sample Processing

When tracking a sample, the COC is often useful. It contains project identification numbers and a record of the parties that have handled associated samples. Retaining a copy of the Chain of Custody provides the Site Assessor the ability to record shipping information. This may easily be done by affixing a copy of the way bill (or the peel and stick portion of a billable stamp) to it. This often proves helpful when samples do not arrive at the lab in a timely manner.

The Chain of Custody allows the lab to report data collected from the sample back to the client in an accurate manner. This is possible when the COC is completed in its entirety. Information crucial to the lab includes identification of the method by which each sample should be processed, documentation of sample volumes (or size), the sample serial number (when applicable), and the sample matrix. It is often advantageous to complete the comments section when sample collection deviates from the standard collection procedure. These key things allow a lab technician to relate identifications and their calculated quantifications to a specific site location, thus providing the client data which may be easily understood. (Ex.: 900 Aspergillus spores were found per square inch on the Master Bedroom End Table.)

As an office document, the COC is considered a request for work and acts as a service contract with the laboratory. Detailed project information is included on the document which is used for project management and accounting purposes. The



ADDRESS	COMMENTS	CONDITIONS
DATE	DESCRIPTION	EMAIL
ERMI	HUMIDITY	INSPECTOR
MOLDSKAN	PHONE	SIGNATURE
TEMPERATURE	TYPE	VOLUME



Chain of Custody identifies the laboratory customer, their billing information, and contact information. A complete COC reflects all samples associated with a project and the time in which laboratory personnel must complete the project. Utilizing the COC, the project manager has the ability to track each samples location in the lab and monitor daily progress. Once all samples from a project have been reported, accounting will invoice it. The Chain of Custody is used to account for all work associated with a project, its turn around, expedition, and associated freight charges

Finally, the Chain of Custody is a legal shield. When contracted to collect environmental samples finding the source of the problem and outlining the road to recovery become top priority. It is easy to overlook the legal aspects of a project. Many calls that indoor air quality professionals receive are due to water loss, so an insurance claim will be filed. These result in litigation, from time to time. Calls are received from renters who feel that involving the legal system is the only solution to improving their air quality. There are also times when a site assessor's or restoration company's plan to reduce a properties microbial burden are called into question. In each of these scenarios, a complete Chain of Custody acts as the best defense from opposing counsel. This is due to the documents ability to record, in completion, the empirical data that laboratory findings (or environmental evidence) provide. With a complete COC, any reviewer can identify the who, what, where, when, and how of a project. As the professional, you are not put in a situation to recall a project from several years earlier. The work becomes completely traceable.

While the completing the Chain of Custody may seem tedious, it is really the most important piece of an environmental site assessment which calls for sample collection. The document bridges the gap between field work and laboratory work by clarifying the conditions under which each sample was collected. This, in turn, provides reliable, repeatable results.

The image shows a Chain of Custody form from ASSUREdbio. The form is divided into several sections, with callouts highlighting key areas:

- Project Information:** Located at the top right, it includes fields for Project Name, Project Number, Project Date, and Project Location.
- Your Information:** Located on the left side, it includes fields for Recorder Name, Address, Phone, and Email.
- Sample Information:** This is the central table of the form, which has columns for Sample ID, Location, and various testing parameters (e.g., Microbial, Mold, VOCs, etc.). Each cell in the table contains a small box for data entry.
- Sign and Date:** Located at the bottom of the form, it includes fields for Recorder Name, Date, Recorder Name, and Date.

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