

## **Mold Evaluation – Useful Sampling on a Real-World Budget**

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Recent publications and presentations offered at AIHCE, IAQA and other expositions have offered the conclusion that little to no useful information can be garnered from limited air and/or surface sampling during IAQ evaluations, and have recommended against such sampling unless a significant and severe quantity of samples are collected. Such sampling is not realistic in the real world outside of academia where budgets usually do not allow for collection of numerous samples.

Evaluation of thousands of bioaerosol samples have presented strong evidence that if collected properly and reviewed properly, the data has meaning and can be extremely useful in generating a picture of the condition of mold within a building. Limited sampling for mold utilizing the ACGIH methodology of following a carefully generated sampling hypothesis yields useful results that can be extremely helpful in forming and, more importantly, supporting conclusions rendered in one's evaluation. Experience acquired under deposition and through work performed for attorneys and Fortune 100 Companies has shown that an absence of supporting laboratory data can badly harm the credibility of one's evaluation. Such data is necessary and can be an important tool in building evaluation, if properly collected in conjunction with other evaluation tools.

Remember that sampling is a tool, to be used in conjunction with the other tools available in the proper performance of a mold investigation. Other tools at the surveyor's disposal that should nearly always be used include: thorough visual evaluation, a review of the building history, a moisture survey and measurement of relative humidity. A host of other evaluation tools are also available, and can be used on a case-by-case basis. Sampling alone should not be performed, as it cannot be based upon a hypothesis and can yield misleading results.

As stated by ACGIH - the goal of sampling as part of a survey should be to confirm or negate a hypothesis. The hypothesis of limited sampling as part of a mold evaluation is centered around the following statement: **“if the other findings of my survey were correct, then the results of my collected samples should be....”** Results should not surprise, and when they do the surveyor must find a reasonable explanation as to why. If a moisture survey found no leaks, a visual inspection found no growth and a history review found no past water intrusion problems; then sample data is not likely to indicate an issue. If it does, then further investigation is needed.

In general, and as part of a proper and thorough evaluation using the other appropriate mold evaluation tools, collection of 2-5 indoor samples, plus 1-2 outdoor/control samples is usually adequate to confirm or negate hypotheses. Wherever possible, at least two separate types of samples should be collected indoors (e.g. spore trap and culturable bulk dust). Each building is of course, different, so sampling protocols must be individually

tailored to the job at hand. In some buildings, just two IA and one OA samples may be sufficient to yield adequate data. It is nearly always preferable to obtain a control sample from an indoor non-complaint area, as opposed to outside.

Surface samples (swab and tape lift) can be useful in confirming the presence of mold on a surface suspected of contamination. It can also be useful in verifying the source of identified IAQ degradation. Example: if air samples show dominance of Chaetomium, and a tape lift sample documents that uniform surface growth is Asp/Pen, then another area of contamination may exist and further evaluation may be necessary.

Data is generally not suitable to interpretation by the analyzing laboratory or others unfamiliar with the findings of site conditions, since site conditions are the basis for generation of the surveyor's hypothesis. It is not advisable to allow someone who doesn't know the hypothesis to render judgment regarding its affirmation.

In collecting and interpreting sample results, the data must be reviewed in its entirety. For spore trap samples: total spore counts, dominance, and rank order must all be reviewed. An identified dominant/indicator genus may tell more about where mold is likely to be found (e.g. for Chaetomium – look behind vinyl covebase or wall coverings) . The limitations of sampling must also always be kept in mind. A single structure or two of anything in the IA that isn't in the OA may not be significant. Furthermore, slight elevations or differences between samples should not be over-analyzed.

It should also be kept in mind that elevated airborne spore levels within a building do not necessarily indicate a building-related IAQ problem. Things such as spoiled foods in sinks or garbage cans, stagnant water in flower vases, and laundry left in washing machines can result in enormous spore counts unrelated to building defects.

Different types of buildings may have innate conditions that can affect the outcome of sample results. Commercial buildings generally have filtered, mechanical outdoor air ventilation, whereas most residential buildings do not. Long-term vacancies, tightness, mechanical filtration and building usage can all affect IEQ and should be taken into account in all instances.

Collection of sample data (even in small quantities) as part of a thorough and complete evaluation is a necessary and useful tool in the painting of an accurate picture of the mold profile of a building. The absence of such data can lead to misjudgment of site conditions and can greatly harm your defensible position in court.