

What are you sampling and why?

Volatile organic compounds (VOCs) are organic compounds which volatilize at lower temperatures e.g. limonene, ethanol and formaldehyde. Semi-volatile organic compounds (SVOCs) are organic compounds which tend to be solid or liquid at lower temperatures e.g. pesticides, polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs). SVOCs and VOCs are compounds commonly tested for and monitored by the analysis of environmental samples of soil, air and water. VOCs are most likely to be monitored in air whilst SVOCs can be found on outdoor surfaces.¹

VOCs and SVOCs are known to have a negative impact to human health and the environment which dependent on their concentration can be short to long term. There is significant concern for VOCs exposure indoors due to the adverse health effects.²

Many countries have guidelines in place for these compounds to advise on limits of exposure. A document released by the UK government advises that the indoor air quality guideline for formaldehyde is 100 µg.m³ in a 30 minute period due to potential health impacts including irritation to eyes, nose and throat with long term exposure potentially leading to carcinogenic effects.³

Analysis of samples

When taking environmental samples at site there are two options for the analysis location, at site or send to a lab. The benefit of a single well equipped lab site is that it can cover a huge area i.e. UK wide. By having your analytical instruments in one location it allows the systems to be validated in this one place and samples from a varying range of locations can be analyzed with one another for comparison. Validating your system is important to ensure your system is producing reliable and accurate results. See our technical note on [Method Validation](#) for more information.

Types of Sampling

Sample collection, preservation and storage are key steps to ensuring sample integrity remains intact and results from the analysis of the samples give an accurate and reliable overview of the area sampled. If sampling VOCs it is integral that you minimize the loss of these compounds. The sample matrix and target analytes will determine how the samples are collected, preserved and stored.

When collecting air samples there are two options: active sampling and passive sampling. Active sampling requires a pump to pull a known volume of air into a collection vessel. An

example of active sampling is Tedlar bags where a pump discharges a sample into a bag. Passive sampling does not require a pump. A popular choice for this type of sampling is a SUMMA cannister. A SUMMA cannister uses a valve to control the collection of the air sample into the cannister.

Collection of air samples can be taken as a “grab sample” which is typically over a short period of time (<5 minutes) or as an “integrated sample” which is taken over a longer period of time (0.5 to 24 hours).

The collection of water samples can be as simple as a bottle with a cap but depending on your target analytes this bottle may need to be glass or plastic or have a specific type of cap material.

When collecting samples for volatile organic analysis (VOA), it is important to use the correct type of container e.g. VOA vials. This type of container will help to minimize the loss of VOCs caused by opening sample containers and transferring samples from one container to another. Certified pre-cleaned VOA vials are commonly used as sample containers for VOCs and are commercially available as amber or clear vials.

Sampling soil can be done using a soil probe or a trowel but if you are analyzing VOCs then more precautions must be taken to minimize the loss of these compounds. One way to collect a soil sample for VOC analysis is a miniature corer or plunger which can be used to minimize the disturbance to the soil and collect an intact core sample which can immediately be sealed e.g. En-Core sampler.

EPA Methods

EPA SW-846 Hazardous Waste Test Methods provides guidance on sampling, recommended sampling equipment and methods linked for specific sample types i.e. EPA 8260 and EPA 8270. Methods such as EPA 5035A also give guidance depending on the concentration of your sample. See our technical note on EPA methods for organic extraction of SVOCs from solid matrices in the [SCION Instruments Knowledge Centre](#).

References

1. United States Environmental Protection Agency, <https://www.epa.gov/east-palestine-oh-train-derailment/what-are-svocs-and-vocs>, (accessed Feb 2026).
2. United States Environmental Protection Agency, https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality#Health_Effects, (accessed Feb 2026).
3. GOV.UK, <https://www.gov.uk/government/publications/air-quality-uk-guidelines-for-volatile-organic-compounds-in-indoor-spaces>, (accessed Feb 2026).