



# Interstate Technology & Regulatory Council

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## Protocol for Use of Five Passive Samplers to Sample for a Variety of Contaminants in Groundwater (DSP-5)

### EXECUTIVE SUMMARY

This guidance contains protocols for five passive sampling technologies. “Passive sampling” is synonymous with “no-purge sampling.” The technologies included in this document include Snap Sampler™ and Hydrasleeve™ (grab-type well water samplers); regenerated-cellulose dialysis membrane sampler and rigid, porous polyethylene sampler (diffusion/equilibrium-type samplers), and GORE™ Module (a diffusion and sorption-type sampler). These three categories or types of passive samplers are described in detail in the precursor to this document, *Technology Overview of Passive Sampler Technologies* (DSP-4, ITRC 2006). That overview document and other supporting information are included on a CD in an envelope on the back cover of this document.

All groundwater samplers or sampling methodologies attempt to collect a sample that is formation-quality water of the groundwater adjacent to the well. Studies have shown that most wells receive groundwater flow through the screened interval of the well. This screened interval, considered in equilibrium with the adjacent groundwater (formation water), can be sampled with passive samplers with little or no well-water agitation, which can alter the contaminant concentrations in the sampled water.

Passive samplers, which remain submerged during a deployment period, collect from a discrete position within a well a sample of water in ambient equilibrium with adjacent groundwater.

Passive samplers

- are relatively easy to use;
- can be deployed in most wells;
- are practical for use where access is difficult or where discretion is desirable;
- can sample discrete intervals in a well;
- can be deployed in series to provide a vertical contaminant profile;
- have no depth limit;
- reduce field sampling variability, resulting in highly reproducible data;
- allow rapid field sample collection;
- decrease field labor and project management costs for long-term monitoring;
- eliminate purge-water production and thus all or most disposal cost.

Not all well water is thoroughly mixed within the screened interval. Passive samplers can be deployed at any location within the screened interval to evaluate the highest or lowest contaminant concentration in a stratified-flow screened interval. Deployed in a series within a

screened interval, passive samplers can provide a contaminant concentration profile of the screened interval.

According to 16 states responding to a questionnaire, there are no specific regulatory barriers to using passive samplers to collect groundwater samples. There is, however, guidance that specifically requires purge-type sampling, thereby requiring passive samplers to obtain an exception when used. However, most states require some sort of comparative study if passive samplers are intended to replace an existing sampling program.

Some state respondents were unaware of the operating mechanisms of passive sampler technologies and how the samplers collect a formation quality sample from a well. This misconception among regulators is a major reason why the ITRC Diffusion/Passive Sampler Team is publishing this protocol document—to provide a sound guidance on how to properly deploy and collect samples using passive devices.

During preparation of four previous ITRC documents on this subject, it is the consensus of the ITRC Diffusion/Passive Sampler Team that the samplers included in this protocol document have been validated through laboratory and field testing. When these samplers are deployed appropriately, the resulting data are reliable and accurate.