

## METHOD 5035 FIELD SAMPLING FOR VOLATILE COMPOUNDS

*On February 27, 2002, Mr. Dale Givens, Secretary of the Louisiana Department of Environmental Quality (LDEQ), issued a memorandum stating the new requirement for sampling of Volatile Organic Compounds (VOCs). Effective July 1, 2002 all solid media samples collected for VOC analysis will be required to be collected using U.S. EPA Method 5035. This method must be applied for soil, sediment, solid waste and other waste materials.*

### Effective Date of the Requirement

July 1, 2002.

### Historical Data

This method will not have an impact on historical data. Any data collected at a site prior to July 1, 2002 in accordance with methods approved at that time will be considered acceptable data by the LDEQ.

### Exemptions

Effective July 1, 2002, all solid samples collected for VOCs must be in accordance with Method 5035 unless the samples are being collected at a site that was given a No Further Action-At This Time (NFA-ATT) status under the Risk Evaluation/Corrective Action Program (RECAP) prior to July 1, 2002 and confirmation samples are being collected to determine if existing concentrations continue to meet the original closure standards. Even then, the LDEQ reserves the right to require sampling Method 5035 if deemed necessary to protect human health and the environment.

In cases in which work plans were approved prior to July 1, 2002 with no provisions for Method 5035 Sampling techniques, and

sampling is to occur after July 1, 2002, the LDEQ team leader should be contacted to clarify the method acceptable by the LDEQ.

### Reasoning Behind Sampling Requirement Change

On June 13, 1997, the U.S. EPA adopted Method 5035 for sampling of VOCs. Implementation of the method had not previously occurred in the state due to logistical, technological and economic burdens which the LDEQ now believes do not exist. Therefore, the LDEQ has adopted the change in sampling method due to studies showing that sampling by previously accepted methods resulted in significant losses of selected VOCs in solids. In many instances, the impact was as much as an order of magnitude.

### Project Impacts

Impacts to projects initiated after July 1, 2002 will be realized in the time and costs involved with changes in field sampling techniques. A limited number of options are available to properly collect samples using Method 5035. No one option is better, as each have pros and cons with regards to costs, holding times and field preparation time. Below are three popular techniques used to collect VOC samples using Method 5035. Other sampling kits and techniques are available.

The least expensive method with regard to sampling equipment is to weigh each sample in the field. Samples must be weighed in the field to 5 grams  $\pm$  0.5 grams. The weighed soil samples are then collected in pre-weighed 40-milliliter (mL) vials. The vials are labeled with the pre-fill weight, including the vial, a magnetic stirring bar and preservative. Costs associated with this method will entail additional field

personnel, costs for the 40-mL vials and time to set-up and pre-weigh the vials with the preservative and magnetic stirring bars.

A second option uses the Terra Core™ sampler. The Terra Core™ sampler is a one-time use tool which collects approximately 5 grams of soil. The soil collected from the Terra Core™ sampler is then transferred into pre-weighed 40-mL vials with appropriate preservatives. Cost associated with the Terra Core™ sampler involve relatively minimal costs (approximately \$3 per sampler) plus the set-up time to pre-weigh the 40-mL vials with the magnetic stirring bar and preservatives. Additional field personnel will not likely be needed as the Terra Core™ sampler collects the appropriate amount of soil to be placed in each of the vials.

The third option is use of the Encore® sampling device. The Encore® sampler is pushed into the soil to be sampled, labeled and shipped to the analytical laboratory for testing. Three Encore® samples per interval are required to be collected. The Encore® samplers cost as much as \$10 per sampler (\$30 per sample collected). Holding times are only 48-hours for samples collected using the Encore® sampling device.

With each of these three sampling techniques, two options are available to collect the

samples. The first option is to sample the entire length of the boring, then select the samples based upon the sampling protocol (i.e. field screening). In this case, many sets of prepared samples will not be used and must be properly disposed. The remaining option is to drill a boring for logging and field screening purposes, then drill a boring adjacent to the first boring, collecting samples from the desired interval(s) based on field screening results from the first boring.

### **Analytical Laboratories**

Most of the analytical laboratories have indicated that analytical costs are not expected to increase as a result of this ruling. Method 5035 is a field sampling method and will not have substantial impacts on the way in which analytical laboratories analyze the samples. Analyses require a closed system autosampler with heated purge and magnetic stirring.

Holding times for samples collected with the Encore® sampling equipment is 48-hours. This will create the need for overnight shipment to and immediate attention by the analytical laboratory. However, use of the Terra Core™ sampler and field weighing method have 14-day holding times.

- *Sampling Method 5035 will be required for ALL soil, sediment, solid waste and other waste materials beginning July 1, 2002.*
- *As with all sampling events, the Pros and Cons of each collection technique must be evaluated to determine the appropriate way to collect VOC samples for that particular event.*
- *The table below briefly lists three sampling techniques which incorporate the Sampling Method 5035 along with Pros and Cons of each technique.*

## Summary of Sampling Method 5035 Options

COLLECTION METHOD	DESCRIPTION	PROS	CONS
Field Measurement	<p>Measure 5 grams <math>\pm</math> 0.5 grams in the field.</p> <p>Samples collected in 40-mL vials pre-weighed with magnetic stirring strip and appropriate preservatives.</p>	<p>Inexpensive field supplies.</p> <p>14-day holding time for samples</p>	<p>Requires one additional field person to properly collect samples.</p> <p>Requires use of accurate scale in a relatively closed environment, free from wind and weather effects.</p>
Terra Core™ Sampler	<p>Use sampling tool designed to collect approximately 5 grams of soil</p> <p>Samples collected in 40-mL vials pre-weighed with magnetic stirring strip and appropriate preservatives.</p>	<p>Relatively inexpensive field supplies</p> <p>14-day holding time for samples.</p>	<p>In high pH samples, sample can effervesce from reaction with the preservative resulting in inability to utilize this technique. Would have to use Encore® sampler or vials with reagent water rather than preservative, which affects holding time.</p>
Encore® Sampler	<p>Use sampling tool designed to collect the appropriate amount of soil.</p> <p>Three samplers required by laboratories per interval in which a sample is collected.</p>	<p>Very easy to collect samples.</p> <p>Very little additional field time and no additional field personnel required.</p>	<p>48-hour holding time.</p> <p>Costs – For each interval collected, three samplers have to be used at approximately \$10 per sampler (\$30 per sample collected).</p>

Additional information is available on the World Wide Web at the following locations:

<http://www.epa.gov/epaoswer/hazwaste/test/sw846.htm>

<http://www.deq.state.la.us/laboratory/index.htm>

<http://www.epa.gov/swertio1/products/regs/sw846mem.htm>

<http://www.ennovativetech.com/>

<http://hq.environmental.usace.army.mil/tools/lessons/list/II47/II47.html>

For further questions concerning this rule and other air quality management issues, please contact Mike Purdom or Melanie Hanks using the following contact information.



**P.O. Box 84380**  
**Baton Rouge, Louisiana 70884-4380**  
**Phone: (225) 766-7400**  
**Fax: (225) 766-7440**

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