



# Department of Environmental Protection

Jeb Bush  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Colleen M. Castille  
Secretary

June 1, 2005

Steve Greason  
Sitelab Corporation  
4 Crane Neck Street  
West Newbury, Massachusetts 01985

Re: **siteLAB<sup>®</sup> Analytical Test Kit UVF-3100**

Dear Mr. Greason:

The Bureau of Petroleum Storage Systems hereby accepts the *siteLAB<sup>®</sup>* ultraviolet fluorescence UVF-3100 Analytical Test Kit as a field screening device for the measurement of petroleum hydrocarbon concentrations in soil and groundwater. The basis for this acceptance is the September 2001, United States Environmental Protection Agency, Innovative Technology Verification Report titled *Field Measurement Technologies for Total Petroleum Hydrocarbons in Soil*, publication number EPA/600/R-01/080, which is available in its entirety at Internet address [www.site-lab.com](http://www.site-lab.com). The Bureau, in accordance with its May 1998 *Guidelines for Assessment and Source Removal of Petroleum Contaminated Soil*, hereby recognizes the EPA verification test of the UVF-3100 as an alternative validation method. Enclosure 1 contains supplemental information that prospective users of the *siteLAB<sup>®</sup>* UVF-3100 may find helpful.

This acceptance applies only to the jurisdiction of this Bureau, which is the cleanup of petroleum pursuant to Chapter 62-770, Florida Administrative Code (F.A.C.). Other bureaus or other state agencies and local governments may choose to recognize this acceptance if their needs and requirements are similar, but this Bureau is not responsible for applications beyond its jurisdiction. We suggest that a copy of this letter be placed in the appendix of contamination assessment plans that propose the use of *siteLAB<sup>®</sup>*, and in Source Removal Reports for sites where *siteLAB<sup>®</sup>* was used during the excavation of petroleum-contaminated soil.

While the Bureau does not endorse specific or brand name remediation products or processes, it does recognize the need to determine their acceptability from an environmental standpoint with respect to applicable rules and regulations, and the interests of public health and safety. Vendors must then market the products and processes on their own merits regarding performance, cost and safety in comparison to competing alternatives in the marketplace. In no way, however, shall this regulatory acceptance letter be construed as certification of product performance. Additionally, the Department emphasizes a distinction between its regulatory "acceptance" and an approval. Products and processes are accepted but they are not approved.

The Bureau reserves the right to revoke its acceptance of a product or process if it has been falsely represented. Additionally, acceptance of any product or process does not imply it has been deemed applicable for all cleanup situations, or that it is preferred over other products in any

Mr. Steve Greason  
June 1, 2005  
Page 2

particular case. A site-specific evaluation of the applicability must be considered, and adequate details must be provided in a site-specific document. You may contact me at (850) 877-1133, extension 29.

Sincerely,

Rick Ruscito, P.E.  
Ecology and Environment, Inc.  
Bureau of Petroleum Storage Systems  
Petroleum Cleanup Section 6

Rebecca S. Lockenbach  
FDEP Section Leader  
Bureau of Petroleum Storage Systems  
Petroleum Cleanup Section 6

enc: (1) Supplemental Information

c: T. Conrardy - FDEP MS 4530/Tallahassee

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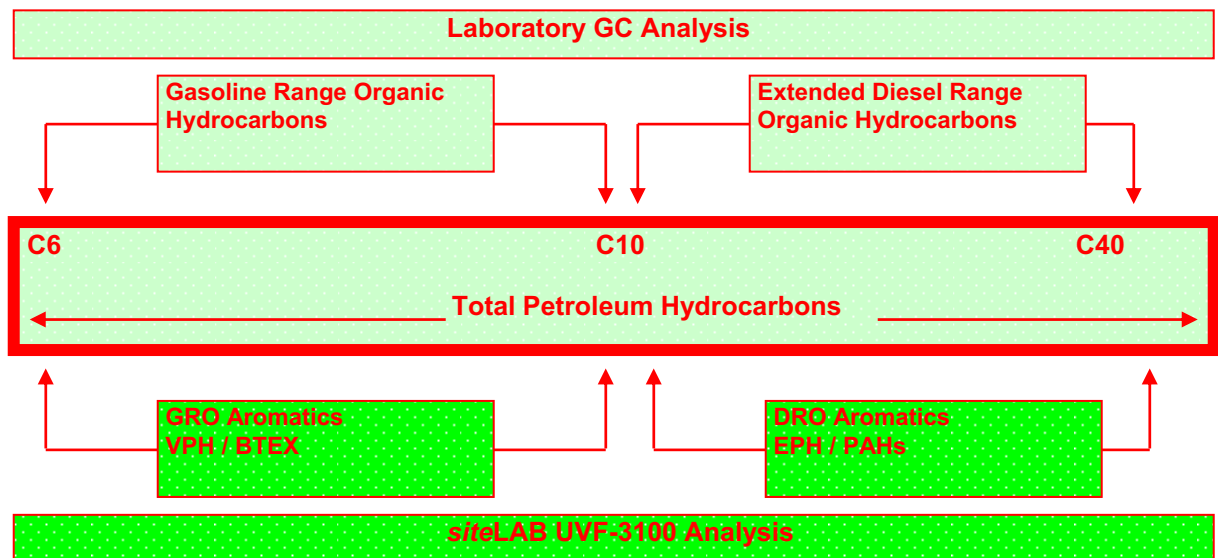
ENCLOSURE 1

SUPPLEMENTAL INFORMATION

1. **Principle of operation.** The *siteLAB*® UVF-3100 Analytical Test Kit for the field screening of soil and groundwater operates on the principle of ultraviolet fluorescence. Petroleum contaminant molecules in a sample to be analyzed are excited to a higher energy state when exposed to an ultraviolet light source. When they return to a lower energy state they emit their own characteristic wavelength of ultraviolet. The amount of fluorescence emitted at a particular wavelength is proportional to the number of molecules that fluoresce at that wavelength. It can be measured and used to calculate the concentration of the petroleum contaminant of interest at that wavelength, in units of milligrams per kilogram.
2. **Soil sample solvent extraction.** Soil samples cannot be placed directly into the *siteLAB*® fluorometer for analysis, because the device must make its measurements on a liquid. Therefore, the first step in a *siteLAB*® field analysis is to transfer the petroleum contaminants from the soil to a liquid. This is accomplished by solvent extraction, in which 10 milliliters (ml) of methanol is added to a 5- to 10-gram soil sample and shaken. The mixture is allowed to settle before a syringe is used to draw off the liquid for analysis.
3. **Groundwater samples.** The UVF-3100 is also capable of analyzing a groundwater sample. Although there is no need to first separate the contaminants from soil particles, as in paragraph 2 above, the sample is still mixed with methanol before it is placed in the fluorometer. Ten (10) ml of methanol is added to a 10-ml groundwater sample and shaken. A syringe is then used to draw off a portion for analysis.
4. **Sample processing time.** Field measurements with the *siteLAB*® UVF-3100 are quick: approximately 5 to 10 minutes per sample.
5. **Range.** On the low end of the concentration scale, there is no single minimum detection limit (MDL) value for the UVF-3100. The reason is that different calibration standards are available for the different types of contaminants to be analyzed, and each has its own MDL. For soil contaminants, the MDLs range from 0.03 parts per million (ppm) to 6.9 ppm, and for water samples they range from <0.05 ppm to 0.1 ppm. On the high end of the scale, there is no upper limit, since highly concentrated samples can be diluted as necessary for measurement, and then "mathematically reconstituted" back to the original strength when the results are reported.
6. **Calibration kits.** A number of calibration standards are available for the *siteLAB*® UVF-3100. Those currently available are listed below.
  - o EPH C11-C22 Aromatics (extractable petroleum hydrocarbons)
  - o PAHs (polynuclear aromatic hydrocarbons)
  - o VPH & BTEX Aromatics (volatile petroleum hydrocarbons)
  - o TPH #2 Fuel Oil (total petroleum hydrocarbons)
  - o TPH #4 Fuel Oil
  - o TPH #6 Fuel Oil
  - o TPH Diesel Fuel

- o TPH 50% Weathered Diesel
- o TPH Gasoline
- o TPH 50% Weathered Gasoline
- o TPH Motor Oil

7. **Total Petroleum Hydrocarbons.** The siteLAB® UVF-3100 fluorescent method reports TPH in the same way as a laboratory using a gas chromatograph would report TPH: as the sum of the gasoline range organics (GRO) and the diesel range organics (DRO). An illustration by Sitelab Corporation that visually makes this point is reproduced below.



Note: Sitelab Corporation indicates, while aliphatic hydrocarbons found in petroleum are detected by a laboratory gas chromatograph but not by fluorescence, that there is still a good correlation between the siteLAB® UVF-3100 fluorescent method and the laboratory.

8. **Correlation with laboratory methods.** Eight (8) linear regressions are presented in the EPA verification report for the siteLAB® UVF-3100 (5 are for different test sites, and 3 are for different sample types). For six (6) of the 8 regressions, the squares of the correlation coefficient ( $R^2$ ) were in the range of 0.91 to 0.99, which indicated a good correlation; the other two were 0.50 and 0.47.

The Bureau of Petroleum Storage Systems, having reviewed the EPA's verification report, believes that the siteLAB® UVF-3100 correlates reasonably well with laboratory data. The advice offered by the Bureau to users of the siteLAB® UVF-3100 is to continue the common practice of performing both a field measurement and a laboratory analysis on several samples in order to make a site-specific correlation between the siteLAB® UVF-3100 and the laboratory.

9. **Interferents.** The data in the EPA verification report suggest that siteLAB® UVF-3100, for the measurement of weathered gasoline or weathered diesel, as total petroleum hydrocarbons (TPH), is relatively

insensitive to interferents (i.e. substances that cause false positives). When chlorinated solvents and turpentine were present, they did not have a noticeable increase on TPH readings by the siteLAB® UVF-3100, but they did have a noticeable increase on laboratory measurements made for comparison purposes. The siteLAB® UVF-3100 was also relatively insensitive to the presence of methyl-tert-butyl ether (MTBE) and Stoddard Solvent, even though these were intended to be measured as TPH, while the laboratory comparison detected them as TPH. And lastly, neither the siteLAB® UVF-3100 nor the laboratory method were affected by the presence of humic acid, which would be present in soils as naturally occurring organic matter. In passing this information along to users of the siteLAB® UVF-3100, the Bureau hopes to put them in a better position to better understand and utilize the data they obtain from the device.

10. **Moisture.** The data in the EPA verification report suggest that siteLAB® UVF-3100 has a minor sensitivity to soil moisture during TPH measurement for weathered gasoline. The TPH readings for weathered gasoline in soil at 16% moisture were 15% higher than the TPH readings for that same weathered gasoline in soil at 9% soil moisture content. As in paragraph 9, the Bureau passes this information along to users so that they may better understand and utilize the data they obtain from the device. Overall, it was the EPA's opinion that the UVF-3100 was a reliable field measurement device for TPH in soil.
11. **Options.** The siteLAB® UVF-3100 can operate on 110-volt a.c. or 12-volt d.c., and it can be rented or purchased.