

## **Field Screening Petroleum Hydrocarbons using Ultraviolet Fluorescence Technology**

### **LSP Course #: 1203**

### **4.0 Technical (non-DEP) Credits**

#### **COURSE DESCRIPTION:**

Delineating the extent of petroleum contamination during site assessment and remediation activities at disposal sites in Massachusetts can be significantly improved using new field screening tools to test soil, sediment, water or NAPL on-site. Ultraviolet fluorescence (UVF) is portable tool which can accurately measure a wide variety of petroleum hydrocarbons, including TPH, GRO, DRO, VPH, EPH and PAHs required by federal and state regulatory agencies. Fluorescence has proven to be a very fast, easy and affordable field screening method that correlates well to traditional off-site laboratory techniques. This seminar will provide the participant with state-of-the-art knowledge of fluorescence testing which is becoming an everyday tool for the LSP to gather accurate and reliable data in a timely, cost-effective fashion.

The 4 hour “technical” continuing education course will provide the participant with:

- **Technology Description:** The science behind ultraviolet fluorescence, it's current uses and UVF's forensic fingerprinting capabilities to identify the age or type of petroleum.
- **Technical Considerations:** Regulatory acceptance, types of compounds detected and not detected, cost, speed and performance characteristics.
- **Applications:** Case studies and discussion will be provided for environmental site assessments, remedial actions, UST investigations, Brownfield sites and Triad projects. Case studies and discussion will also be provided detailing the test method's performance in the U.S. EPA's Superfund Innovative Technology Evaluation Program.
- **Hands on Training – Sample Preparation & Analysis:** Participants will break up into groups and learn how (1) to extract samples, (2) analyze samples, (3) calibrate instrument and (4) report test results for soil, water and oil (LNAPL forensics).
- **Data interpretation, Quality Controls and Method Limitations:** How test results compare to confirmatory lab GC analysis and how to apply results to state action levels. Determining detection limits, quality controls to consider, troubleshooting problems and sample homogeneity issues.

This seminar will provide the LSP with the information needed to evaluate fluorescence test methods and to be familiar with limitations of use.

**COURSE SCHEDULE:**

- 8:00 AM Introduction
- Presentation of how technology works, applications, performance studies and limitations of use.
  - Short Q & A session afterward.
- 8:45 AM UVF Test Demonstration
- Instructor will demonstrate how soil and water samples are prepared and analyzed using the equipment, including calibration and quality controls to perform.
- 9:15 AM Prepare and Analyze Soil Samples
- Break into groups of 4
  - Each group will extract their sample two times.
  - Groups will then test their samples on the UVF analyzers.
  - Use handout provided to record your data.
- 10:00 AM Break
- 10:15 AM LNAPL Forensic Fingerprinting Applications
- Presentation on using UVF to fingerprint non aqueous phase liquids.
  - Instructor will demonstrate how oil samples are prepared and analyzed using the equipment.
- 10:45 AM Prepare and Analyze Oil Samples
- Each group will test a different NAPL sample using UVF analyzers.
  - Use handout provided to record your data.
  - Short discussion to follow summarizing test results and how to interpret the data.
- 11:15 AM Site Assessment Applications from an LSP Perspective
- Summary and discussion of test results.
  - How UVF data is used for MCP sites.
- 12:00 PM Adjourn

## **INSTRUCTOR BIOGRAPHIES:**

### **Steve Greason:**

Steve Greason is an environmental scientist and founder of Sitelab Corporation, located in West Newbury, Massachusetts. Since 1998, the company provides mobile laboratory services and test kit products worldwide utilizing ultraviolet fluorescence technology. Mr. Greason serves as the sales and technical support manager and has trained a variety of different types of customers, including LSPs in Massachusetts, environmental consulting firms, the U.S. Dept. of Energy, utility companies, refineries, contractors for the U.S. Air Force and Army Corp. of Engineers and high school and college classrooms.

Prior to Sitelab, Mr. Greason operated Urban Contamination, Inc., a small mobile laboratory and consulting service in the Boston area from 1995 to 1998, where he developed Sitelab's fluorescence methodology. Before then, from 1990 to 1995, Mr. Greason worked in the environmental lab industry where he gained experienced from operating analytical equipment to project management.

### **Stephen S. Boynton:**

Mr. Boynton is a Massachusetts Licensed Site Professional with 35+ years of professional experience in environmental and geotechnical engineering consulting. Mr. Boynton began using Surfer in the late 1980s to create graphical output from groundwater and contaminant transport modeling software. He has used the program continuously since then to create groundwater contour and flow direction maps, contaminant distribution maps, and subsurface cross-section maps.

In 2011 Mr. Boynton served as a software beta-tester for Golden Software Inc.'s Voxler 3D imaging software (releases). In 2015 Mr. Boynton was again a beta-tester for Voxler 4. In the fall of 2018 Mr. Boynton joined Golden Software's Surfer Beta Testing group. Mr. Boynton has joined Golden Software to present two webinars on use of Voxler for creating 3D LNAPL distribution models. These webinars are available on the Golden Software website for viewing.

Mr. Boynton is a recognized expert in the management of Light Non-Aqueous Phase Liquid (LNAPL) sites. He has spearheaded efforts in Massachusetts to revise LNAPL regulations and practice standards. These changes were implemented by the Massachusetts Department of Environmental Protection in 2015 and 2016. In 2006 Mr. Boynton founded Subsurface Environmental Solutions, LLC (SES). SES specializes in providing rapid LNAPL site characterization and developing cost-effective LNAPL site management approaches.