



**Approaches to Bridge the Gap Between Geology and Engineering:**

**Training to Maximize Engineering Sediment (“Soil”) Descriptions and Field Analysis**

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Environmental geology/hydrogeology and geotechnical engineering are multi-disciplinary sciences that rely on both geology and engineering. As in all multi-disciplinary studies, there is much power to be gained from allying the disciplines, yet at the same time there is the potential for pitfalls to develop because of the lack of communication between disciplines.

This short course addresses common pitfalls we've encountered in consulting work in environmental geology and geotechnical engineering, pitfalls that are in the most fundamental and important areas of the science: improper classification, incomplete soil logging, and flawed field investigation approach.

The environmental and geotechnical industry is hampered by improper or incomplete soil classification in field investigations. Often this arises because the sediment (“soil”) classification that is used, the Unified Soil Classification (ASTM D 2487 and D2488), is an engineering classification for which geologists often have little or no formal training. For this short course, we will present a “how to” in using the Unified Soil Classification, illustrating the nuances that can make the Unified Soil Classification meaningful for environmental and geotechnical investigations.

A major problematic area in the environmental and geotechnical industry is soil description which is almost always incomplete, lacking the key geological information for which correlation and successful evaluation are dependent. Typical soil descriptions in the industry tell one little more than the sediment classification as a silt, clay, sand or gravel with virtually no information about depositional environment or geologic unit. Incomplete description appears to stem from the fact that the soil classification is an engineering classification for which key information about the geology is not directly related. In the short course, we will discuss which components are necessary for complete soil descriptions so that needed engineering information is supplemented by critical geological information.

The short course concludes with a discussion and case study of a workable field investigation approach based not only on complete descriptions that take the mystery out of the subsurface, but on boring-by-boring analysis during the field program that reveals key questions about the complexity of the site that need to be answered if the field investigation is to be successfully completed. The case study also highlights how the Unified Soil Classification is often misused as a geological correlation tool.