

# Best Practices for NAPL Mobility Core Collection in Sediment: A Systematic Approach to Maximize Sample Integrity

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**Background/Objectives.** The presence of principal threat wastes has received increased consideration in recent years with regard to evaluating the need for, and feasibility of, intrusive remedial action to address NAPL-affected sediment. A key element in determining if NAPL-affected sediment warrants a principal threat waste designation is NAPL mobility. Several techniques have been developed to quantitatively evaluate NAPL mobility with the goal of informing principal threat waste decisions. Common to most of these techniques is the need to collect an undisturbed sediment core. The quality of the core subjected to NAPL mobility testing is important to the integrity of the mobility testing. Collection of a relatively undisturbed core in the sediment environment is inherently challenging. Extensive experience in sediment characterization has evolved into the development of a systematic approach to NAPL mobility core collection which will provide justification for collection methodology, leading to high-quality NAPL mobility test results.

**Approach/Activities.** The primary challenge in NAPL mobility core collection is balancing the often-competing goals of minimizing sample disturbance while maximizing sample recovery. To verify that the proper balance between sample disturbance and core recovery is obtained at each site, a systematic approach for completing NAPL mobility core collection has been developed and will be presented. The framework commences with advancing thin-walled samplers (e.g., Shelby Tubes), which are the standard for collecting undisturbed cores. However, it can be impractical to obtain sufficient recovery using thin-walled samplers, particularly in soft, surficial sediment. Once use of thin-walled samplers have been attempted, the framework recommends following a tiered approach of alternative techniques to collect NAPL mobility cores, sequenced from lesser to greater potential for disturbance. The framework outlines methods and techniques suitable to each of the primary sediment sampling methods (sonic, hollow stem, direct push, and vibrocore). The framework also offers guidance on secondary challenges in NAPL core collection, such as identifying comparable sample intervals between co-located sediment cores with varying recovery percentages.

**Results/Lessons Learned.** The accuracy of NAPL mobility testing is highly dependent on the quality of the sediment core subjected to testing. The presentation will emphasize how following this core collection framework will provide important benefits. Collection of high-quality NAPL mobility cores in accordance with this framework will provide assurance that the collected core represents, to the extent practical, the actual subsurface conditions, thereby increasing the validity of subsequent NAPL mobility tests. Generating data that most closely mirrors the in situ conditions will facilitate the selection of the most appropriate remedy and a robust remedy design.