

Rapid Assessment of Coal Combustion Products Utilizing Microscopy Techniques

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Upcoming regulations will create the need for the rapid assessment, or “real time” presence or absence determination of Coal Combustion Products (CCPs) during excavation and removal activities. Many regulatory agencies historically have required analytical testing of metals to assess CCPs. Use of metals as surrogates for CCP can prove problematic due to interferences from native background metals that can confound the data interpretation. The techniques developed herein utilize a sequential tiered approach to identify CCPs during excavation activities in a time and cost effective manner. The project area for this study consisted of a 0.6 acre stormwater pond that was infilled with CCPs due to runoff from an adjacent CCP landfill. Samples were collected from grids, dried, and visually inspected with a 7x hand lens. Visual characteristics such as color, texture, lustrousness, and fracture were noted and compared to end member samples of native soils, site specific CCPs, and uncombusted materials. The second tier consisted of the field examination with a portable re polarized 40-600X petrographic microscope. Again the samples were compared to end member samples. If CCPs were noted the excavation continued, however, if no CCPs were identified during the second tier observation, then the sample was submitted to a laboratory for electron microscopy x-ray diffraction verification analysis. Results of the study indicate CCPs/uncombusted materials and native soils could be positively differentiated as confirmed by laboratory analysis allowing use for “real time” CCPs delineation.