Sampling and Analytical Methods for Radionuclides in Environmental and Waste Samples

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Abstract

DOE Methods for Evaluating Environmental and Waste Management Samples (*DOE Methods*) is a growing method resource for sampling and radionuclide analysis. The methods complement those produced by the American Society for Testing and Materials (ASTM), U.S. Environmental Protection Agency (EPA), Environmental Measurements Laboratory (EML), and others. The sampling and analysis methods in *DOE Methods* cover a wide variety of analytes and matrices ranging from low-level waters to high-level soils and tank waste and represent current U.S. Department of Energy (DOE) practices at one or more sites. Field and laboratory screening techniques as well as isotope-specific separations and analyses are included. Examples include methods for the separation and analysis of ^{3}H, $^{59,63}Ni$, ^{79}Se, ^{99}Tc, ^{90}Sr, Th, U, ^{241}Am, and Pu by various counting techniques and/or inductively coupled plasma–mass spectrometry. Several sampling methods are addressed, including effluent monitoring of liquid samples. The methods are presented in a framework of the performance-based approach to data validation (as opposed to method validation) in conjunction with the use of the data-quality-objectives planning process. Other pertinent guidance is also represented in the document, reflecting current DOE sampling and analysis philosophy. Although *DOE Methods* is produced by the Pacific Northwest Laboratory, the document is sponsored by the DOE and has established ties with EML and EPA.

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