

The Effectiveness of Solid-State CZT vs. Low-Resolution NaI(Tl) Detector Types Upon the Active Measurement of Americium and Plutonium in Aqueous Waste Streams.

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As part of the ongoing operations within the TA-55 facility at the Los Alamos National Laboratory, a variety of non-classified aqueous waste streams are generated that require characterization of alpha activity before disposal. The result of this characterization determines the path which these waste streams are then directed.

The method currently in use requires that a small aliquot to be taken, dried on a glass planchet cover and counted within a set of proportional counters. The laboratory, in its efforts to reduce the radiological exposure to the analysts and minimize the amount of TRU and LLW waste streams generated as a result of the analytical procedures utilized, is examining other non-invasive methods in which to derive this quantitative information. One proposed method will examine both the efficiency and efficacy of a variety of detector configurations associated with these particular waste streams. The two detector types (CZT and NaI(Tl)) were chosen because they require no special external environment in which to run, are easily cleanable to remove any external contamination, are rugged and are relatively inexpensive.

The results of this work will examine a variety of factors (ie., relative and absolute efficiency vs. distance from detector to sample and FWHM) that will affect the decision as to which (if any) system will provide the most valuable information in which to support the various programmatic needs.