

WAND and HERCULES: High-Sensitivity Waste Assay Systems for Verification of Low-Density Clean Waste at LANL

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The Waste Assay for Nonradioactive Disposal (WAND) and the High Efficiency Radiation Counter for Low Emission Sensitivity (HERCULES) Systems are currently being used at the Los Alamos National Laboratory (LANL) to verify the absence of DOE-added radioactivity in low-density wastes. These complimentary systems are used in conjunction to perform verification measurements that confirm the absence of a large variety of radionuclides in low-density waste (i.e., paper and plastics) generated at many of LANL's R & D facilities. The two systems are believed to possess the greatest sensitivity of available waste assay systems to detect the low-energy x-rays and gamma-rays associated with isotopes of plutonium, americium, and uranium (generally, < 3.0 pCi/g). Other radionuclides which emit medium-to-high energy gamma-rays and/or beta particles are readily detected as well.

These screening measurements allow more than one-half of all such wastes generated in radiologically controlled areas at LANL to be disposed in non-regulated public landfills. Both systems utilize well-shielded 5-in diameter Phoswich scintillation detectors (WAND has six, HERCULES has three) which are a virtual "sandwich" of a thin NaI front crystal with a thicker CsI back crystal. Phoswich detectors are intrinsically efficient over a very broad range of energies (10 - 1800 keV) while the associated electronic components assist with reducing background radiation rates in the critically important low-energy x-ray and gamma-ray detection regions.

Biographical Sketch of Steven C Myers

Steven C. Myers is currently employed as a certified health physicist with Benchmark Environmental Corporation. Mr. Myers has a M.S. in Health Physics from Texas A&M University, a M.Ed. from SUNY at Buffalo, and a B.S. in Psychology from SUNY College at Buffalo. He has extensive experience in the area of LLW and TRU waste characterization using a variety of gamma spectroscopy measurement systems.