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PROJECT-SPECIFIC TYPE A VERIFICATION FOR THE HIGH FLUX BEAM REACTOR UNDERGROUND UTILITIES REMOVAL PHASE 3 TRENCH 1, BROOKHAVEN NATIONAL LABORATORY UPTON, NEW YORK

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ORISE

Oak Ridge Institute for Science and Education

December 15, 2010

Ms. Lisa Santoro
U.S. Department of Energy
Brookhaven Site Office
53 Bell Avenue, Bldg. 464
Upton, NY 11973

SUBJECT: DOE CONTRACT NO. DE-AC05-06OR23100
PROJECT-SPECIFIC TYPE A VERIFICATION FOR THE HIGH FLUX BEAM REACTOR UNDERGROUND UTILITIES REMOVAL PHASE 3 TRENCH 1, BROOKHAVEN NATIONAL LABORATORY
UPTON, NEW YORK
DCN: 5098-SR-05-0

Dear Ms. Santoro,

The Oak Ridge Institute for Science and Education (ORISE) has reviewed the project documentation and data for the High Flux Beam Reactor (HFBR) Underground Utilities removal Phase 3; Trench 1 at Brookhaven National Laboratory (BNL) in Upton, New York. The Brookhaven Survey Group (BSG) has completed removal and performed Final Status Survey (FSS) of the 42-inch duct and 14-inch line in Trench 1 from Building 801 to the Stack. Sample results have been submitted as required to demonstrate that the cleanup goal of ≤15 mrem/yr above background to a resident in 50 years has been met. Four rounds of sampling, from pre-excavation to FSS, were performed as specified in the Field Sampling Plan (FSP) (BNL 2010a).

It is the policy of the U.S. Department of Energy (DOE) to perform independent verifications of decontamination and decommissioning activities conducted at DOE facilities. ORISE has been designated as the organization responsible for this task for the HFBR Underground Utilities. ORISE, together with DOE, determined that a Type A verification of Trench 1 was appropriate based on recent verification results from Trenches 2, 3, 4, and 5, and the minimal potential for residual radioactivity in the area.

The removal of underground utilities has been performed in three stages to decommission the HFBR facility and support structures. Phase 3 of this project included the removal of at least 200 feet of 36-inch to 42-inch duct from the west side to the south side of Building 801, and the 14-inch diameter Acid Waste Line that spanned from 801 to the Stack within Trench 1. Based on the pre-excavation sample results of the soil overburden, the potential for contamination of the soil surrounding the pipe is minimal (BNL 2010a).

ORISE reviewed the gamma spectroscopy results for 14 FSS soil samples, four core samples, and one duplicate sample collected from Trench 1. Sample results for the radionuclides of concern were below the established cleanup goals. However, in sample PH-3 TR-1 FSS 012, the spectra identified Americium-241 (Am-241) at a concentration of 1.42 pCi/g (BNL 2010b). Although this concentration is low, Am-241 has typically not been specified as a project contaminant. The ORISE

Laboratory Manager reviewed spectra provided by the laboratory that performed the analysis for BSG and determined that the analyzing laboratory sufficiently met industry standard.

ORISE reviewed the BNL FSP and identified comments for consideration (ORISE 2010). BNL prepared a revised FSP that resolved each ORISE comment adequately (BNL 2010a). ORISE referred to the revised HFBR Underground Utilities FSP FSS data to conduct the Type A verification and determine whether the intent of the cleanup goals for the FSS have been met. ORISE determined that the FSP and data summary provided sufficient information to support a Type A analytical evaluation. The FSP provided sufficient information related to the selection of field instrumentation with sensitivity to meet the scan Minimum Detectable Concentrations (MDCs). Additionally, ORISE determined that the FSP appropriately addressed scan coverage, measurements, and analytical requirements for soil and duct samples collected for the contaminants of concern, cesium-137, strontium-90, and radium-226.

Removal of the duct and line required the excavation of the overburden to depths of at least eight feet and greater. BSG scanned and sampled the trench in accordance with the FSP. The surface gamma walk-over scans covered 100% of the accessible excavated area (BNL 2010c). Soil samples were shown to be collected at systematic increments, every four feet, where the duct and line where previously oriented in the trench. Concentrations for the primary contaminants of concern were analyzed on-site and determined to be well below cleanup goals. Notably, sample concentrations were at or below sample background (BNL 2010b).

It is therefore the opinion of ORISE that BNL has provided sufficient evidence to satisfy the cleanup goals specified in the FSP for this project (BNL 2010a). Please contact me via my information listed below or Phyllis Weaver at 865.576.5321 should you have any questions or need additional information.

Sincerely,

Evan M. Harpenau
Health Physicist/Assistant Project Manager
Survey Projects

EMH:jc

Enclosure

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