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NSY PORTSMOUTH
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LETTER REGARDING RADIOLOGICAL SAMPLING OF GROUNDWATER AT NSY PORTSMOUTH ME
4/3/1997
MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ANGUS S. KING, JR.
GOVERNOR

EDWARD O. SULLIVAN
COMMISSIONER

April 3, 1997

Mr. Fred Evans
Department of the Navy
Northern Division
Naval Facilities Engineering Command
10 Industrial Highway, Mailstop 82
Lester, PA 19113-2090

RE: Radiological sampling of groundwater, Portsmouth Naval Shipyard, Kittery, ME

Dear Fred:

This letter is in response to Marty Raymond's request for information regarding State of Maine requirements for radiological sampling of groundwater. The State of Maine does not have specific requirements for sampling and analysis of radionuclides. We recommend the Navy use EPA's requirements for sampling and analysis. I'm sure Meghan Cassidy will provide those to you, however, for your information I have included material (Attachment 1) copied from the Remedial Investigation Report for OU1 at Loring Air Force Base[1]. This material discusses analytical methods used to characterize possible low level radioactivity at the Base.

I met with staff of the Radiation Control Program at the Maine Department of Human Services Division of Health Engineering to discuss specific radionuclides the Navy should sample for. They compiled a list based on radionuclides one would expect to find in a naval nuclear reactor and on radionuclides identified in Portsmouth Naval Shipyard's low level radioactive waste. I have included this list as Attachment 2.

Please feel free to contact me at (207) 287-8010 if you have any questions.

Sincerely,

Iver McLeod
Project Manager
Bureau of Remediation and Waste Management

[1] Final Operable Unit (OU 1) Remedial Investigation Report, Volume I - Text, August 1995, Installation Restoration Program, Loring Air Force Base, Maine

Serving Maine People & Protecting Their Environment

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PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, ME 04769
(207) 764-0477 FAX: (207) 764-1507

attachments

pc (w/ attachments):

Marty Raymond, PNS
Linda Klink, Brown and Root
Meghan Cassidy, USEPA

pc (w/out attachments):
Patty Marajh-Whittemore, USEPA
Mark Hyland, MEDEP
Denise Messier, MEDEP
Richard Heath, MEDEP
Harrison Bispham, MEDEP
John Nelson, NH Fish & Game
Ken Munney, US Fish & Wildlife Service
Jeff Clifford, RAB
Juanita Bell, RAB
Doug Bogen, RAB
Michele Dionne, RAB
Eilene Foley, RAB
Phil McCarthy, RAB
Jack McKenna, RAB
Guy Petty, RAB
Onil Roy, RAB
Peter Van der Mark, TAG Representative
Carolyn Lepage, TAG Advisor

Attachment 1

Wipe tests were performed on all sampling equipment prior to leaving the exclusion zone for gross alpha and beta-gamma contamination. The Ludlum 2929 was used to count the wipes. The results of the wipe tests did not exceed the guidelines for surface contamination for release of the equipment to an unrestricted area.

2.7.2.2 Off-Site Radiological Analyses. The off-site laboratory analytical methods used to characterize possible radioactivity at OU 1 were gross alpha and gross beta analyses; tritium analyses by liquid scintillation counting; gamma spectroscopy to scan for a variety of gamma-emitting radionuclides; and alpha spectroscopy with chemical separation to identify and quantify specific alpha-emitting isotopes of uranium, thorium, radium, plutonium, neptunium, and americium.

With the exception of gross alpha soil analysis, laboratory procedures were based on the following documents:

- U.S. Environmental Protection Agency, "Eastern Environmental Radiation Facility Radiochemistry Procedures Manual", USEPA 52-/5-84-006, EERF, Montgomery, Alabama.

- U.S. Environmental Protection Agency, "Radiochemical Analytical Procedures for Analysis of Environmental Samples", EMSL-LV-0539-17, USEPA Environmental Monitoring and Support Laboratory, Las Vegas, Nevada.

- Department of Energy, "EML Procedures Manual", Current Edition, Report HASL-300, U.S. Department of Energy, New York, New York).

- U.S. Environmental Protection Agency, "Prescribed Procedures for Measurement of Radioactivity in Drinking Water", EPA-600 4-80-032; USEPA Environmental Monitoring and Support Laboratory, Cincinnati, OH; August 1980.

- Department of Energy, "Methods for Evaluating Environmental and Waste Management Samples", DOE/EM-00897, current revision.

- RESL "Procedures Manual", Idaho Falls, ID, current revision.

- Los Alamos National Laboratory "Health and Environmental Chemistry Manual", LA-10300-M, Los Alamos, NM, current revision.

Background samples were analyzed for gross alpha and gross beta activity using USEPA Method 9310, Modified for Solids. During the 1992 program, soil samples were prepared and analyzed as a fine solid. Interim background estimates of gross alpha and gross beta activities were developed using this sample preparation method. Those background estimates were used to evaluate samples collected during the 1991 program. The gross alpha method was changed during the 1993 and 1994 field programs, and background soil samples were re-sampled and re-analyzed. During the 1993 and 1994 field programs, as part of the preparation, the soils were first digested in acid following a modification of USEPA Method 3050, and the resulting digestate was analyzed according to Method 9310. Minimum detectable activities (MDAs) for gross alpha and gross beta in soil samples from LAFB were determined by the laboratory following 40 CFR 136, Appendix B.

Gamma spectroscopy was conducted on soils using a modification of USEPA Method 901.1. Because the gamma photons are not affected by absorption in the soil sample over the short distance from source to detector within the instrument, the water method was modified for use with soil samples without an initial extraction

ATTACHMENT 2

The Navy should sample for the following radionuclides during radiological assessment of groundwater at Portsmouth Naval Shipyard:

Radionuclides based on what could be expected from naval nuclear reactor, according to Radiation Control Program, Maine Department of Human Services:

W-187 (tungsten)
Cr-51
Hf-181 (hafnium)
Fe-59
Fe-55
Ni-63
Nb-95 (niobium)
Nb-95m
Zr-95 (zirconium)
Ta-182 (tantalum)
Ta-182m
Mn-54
Co-58
Co-58m
Co-60
Co-60m
Cs-134 (cesium)
I-131

Radionuclides based on low level waste survey of Portsmouth Naval Shipyard, 1993 and 1994, as reported to Radiation Control Program, Maine Department of Human Services:

C-14
Co-58
Co-60
Fe-55
H-3 (tritium)
I-129
Mn-54
Ni-63
Tc-99 (technitium)