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OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

ENERGY/ENVIRONMENT SYSTEMS DIVISION

October 5, 1993

Mr. Tim Johnson
Decommissioning and Regulatory Issues Branch
U.S. Nuclear Regulatory Commission
Washington, DC 20555

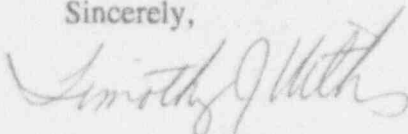
SUBJECT: CONFIRMATORY AND RADIOLOGICAL SURVEYS OF THE NUCLEAR LAKE SITE, PAWLING, NEW YORK [DOCKET NO 070-00903]

Dear Mr. Johnson:

The Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education performed radiological and confirmatory surveys at the Nuclear Lake site during the period September 20 through 28, 1993. The surveys included both structures and soil areas. The complete survey results will be provided in a draft report for NRC review in approximately 2 weeks. In the interim, ESSAP is providing the attached summary of survey findings.

Should you have any questions, please call Michele Landis at (615) 576-2908 or me at (615) 576-5073.

Sincerely,



Timothy J. Vitkus
Project Leader
Environmental Survey and
Site Assessment Program

cc: T. Mo, NRC, NMSS, 4H4
D. Tiktinsky, NRC/NMSS, 6E6
J. Austin, NRC/NMSS, 5E2
M. Nalluswami, NRC/NMSS, 5E2
J. Swift, NRC/NMSS, 6H3
J. Berger, ESSAP
M. Landis, ESSAP
PMDA, NRC, 6E6
File/225

9401190039 931005
PDR ADOCK 07000903
C PDR

PO BOX 117, OAK RIDGE, TENNESSEE 37831-0117

NH10

**PRELIMINARY RESULTS
CONFIRMATORY AND RADIOLOGICAL SURVEY
OF THE
NUCLEAR LAKE SITE
PAWLING, NEW YORK**

Affected Buildings

ESSAP identified residual beta contamination in each of the three affected site structures, which were the Plutonium Facility, the Waste Disposal Building, and the Multiple Failure Building. In addition, residual alpha contamination was identified in the Plutonium Facility. NES, the remedial action contractor for Chevron USA, Inc., was notified of these findings and subsequently performed additional remediation and surveys.

Affected Soil Areas

Surface scans of the outdoor affected soil areas did not identify any locations of elevated direct radiation. One sub-floor location in the northeast corner of the Waste Disposal Building was identified as having elevated direct gamma radiation. Soil samples collected from the outdoor areas and sub-floor locations are currently being analyzed.

Unaffected Buildings

The following unaffected structures; the Engineering Building, Critical Facility, Shield Mock-Up Building, the Lodge, and Remote Assembly Building, were also surveyed. Surface scans and direct measurements for alpha and beta activity were performed in each structure, with the exception of the Lodge where only beta measurements were performed as a result of the extensive debris and water on the floor. The results of the direct measurements are summarized in Tables 1 and 2. There were no locations of residual contamination identified by the surface scans and direct measurements satisfied the NRC's guidelines at the 95% confidence level. There was one measurement location in the Critical facility (37 dpm/100 cm²) and two locations in the Remote Assembly Building (32 and 54 dpm/100 cm²) which exceeded 25% of the alpha surface contamination guidelines. For the Critical Facility, four additional measurements were performed in the surrounding one square meter area. All measurements were less than or equal

to the detection sensitivity of the instrumentation which was 25 dpm/100 cm². In the Remote Assembly Building, one location (32 dpm/100 cm²) on the fireplace wall, was a result of the rock and mortar construction material; the second location (54 dpm/100 cm²) was measured on a rock outcropping located in the basement of the structure and was associated with background radioactivity.

There are two additional site features that are to be addressed by NES during structure demolition. The first is the shield blocks located near the Multiple Failure Building, which were not included in the radiological survey. The blocks were stacked in a manner that made most surfaces inaccessible. In addition, the sodium tent is no longer present. A concrete pad and adjacent debris pile was found and is believed to be the remnants of this facility. Gamma surface scans were performed in the vicinity of the debris and the concrete pad. No other measurements were performed. It is ESSAP's understanding that NES surveyed the debris during asbestos abatement activities and intends to perform scans and direct measurements of the concrete pad and the shield blocks during the demolition and removal actions.

Unaffected Soil Areas

Surface scans were performed and a minimum of 30 soil samples collected from within each of the four unaffected outdoor survey units. Surface scans identified one area of elevated direct gamma radiation south of the Lodge. Additional samples were collected from this location, as well as the surrounding 100 m² area. Soil samples are currently being analyzed.

TABLE 1
SUMMARY OF SURFACE ACTIVITY LEVELS
UNAFFECTED BUILDINGS
NUCLEAR LAKE SITE
PAWLING, NEW YORK

DRAFT

Location	Number of Measurement Locations	Total Activity Range (dpm/100 cm ²)		Removable Activity Range (dpm/100 cm ²)	
		Alpha	Beta	Alpha ^d	Beta ^e
Critical Facility					
Floor	26	0 to 37 ^a	660 to 1100 ^b	-1 to 4	-7 to 8
Lower Walls	8	-7 to 18 ^a	-290 to 510 ^b	-1 to 4	-3 to 8
Engineering Building					
Floor	23	-2 to 16 ^a	420-850 ^b	-1 to 4	-5 to 3
Lower Walls	7	0 to 23 ^a	-323 to 230 ^b	-1 to 6	-1 to 16
Remote Assembly Building					
Floor	21	-271 to 54 ^a	-270 to 610 ^b	-1 to 1	-7 to 6
Lower Walls	9	-623 to 32 ^a	-620 to 730 ^b	-1 to 4	-4 to 1
Shield Mock-Up Building					
Floor	27	0 to 39 ^a	420 to 820 ^b	-1 to 6	-7 to 14
Lower Walls	3	-2 to 2 ^a	-580 to -400 ^b	1 to 10	-4 to -3
Lodge					
Floor	22	NA	-580 to 600 ^c	-1 to 6	-7 to 8
Lower Walls	8	NA	-650 to -240 ^c	-1 to 1	-7 to 6

^aMinimum detectable activity equal 25 dpm/100 cm² for alpha instrumentation.

^bMinimum detectable activity equals 390 dpm/100 cm² for beta instrumentation.

^cMinimum detectable activity equals 990 dpm/100 cm² for beta instrumentation.

^dMinimum detectable activity equals 12 dpm/100 cm².

^eMinimum detectable activity equals 16 dpm/100 cm².

TABLE 2
 GUIDELINE COMPARISON OF SURFACE ACTIVITY LEVELS
 UNAFFECTED BUILDINGS
 NUCLEAR LAKE SITE
 PAWLING, NEW YORK

Building	Surface Area (m ²)	Averaged Total Activity (dpm/100 cm ²)								Guidelines/ Conditions Satisfied
		Alpha ^a				Beta ^b				
		Number of Meas.	Mean	Std. Deviation	μ_{α}	Number of Meas.	Mean	Std. Deviation	μ_{α}^c	
Critical Facility	510 m ²	34	14	8	16.0	34	660	290	750	Yes
Engineering Bldg.	410 m ²	30	6	6	7.9	30	500	280	590	Yes
Remote Assembly Bldg.	106 m ²	30	5	12	8.7	30	-26	300	67	Yes
Shield Mock-Up Bldg.	60 m ²	30	11	9	13.8	30	490	350	600	Yes
Lodge	66 m ²	0	NA	NA	NA	30	-160	340	-61	Yes

^aAlpha surface contamination guidelines:

100 dpm/100 cm², average in a 1 m² area

300 dpm/100 cm², maximum in a 100 cm² area

^bBeta-gamma surface contamination guidelines:

5,000 dpm/100 cm², average in a 1 m² area

15,000 dpm/100 cm², maximum in a 100 cm² area

^cCalculated value for statistically testing site data in accordance with Draft NUREG/CR-5849.