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Oak Ridge Associated Universities
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Manpower Education, Research and Training Division

July 17, 1987

Mr. Andrew Wallo
FUSRAP/Surplus Facilities Group
Division of Facility & Site
Decommissioning Projects
Office of Nuclear Energy
U.S. Department of Energy
Washington, DC 20545

Subject: INTERIM REPORT (PHASE II) - VERIFICATION SURVEY OF DOE PROPERTY - NIAGARA FALLS STORAGE SITE

Dear Mr. Wallo:

Enclosed is a copy of the phase II interim report for our survey of the DOE property at the Niagara Falls Storage Site. This data covers the portion of the property surveyed in May 1987; the remainder of the property will be completed in the summer of 1987. As evident from this report there are a number of areas of residual contamination, which we feel warrant further attention. It should be noted that U-238 was identified as a major contaminant at some locations and guideline levels have not yet been developed for U-238 at Niagara Falls Storage Site.

Questions concerning this information should be referred to me at FTS 626-3305.

Sincerely yours,

James D. Berger, Manager
Radiological Site Assessment Program

JDB:mec

Enclosure

cc: S. Ahrends, DOE/OR/TSD
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INTERIM REPORT ON VERIFICATION SURVEY OF DOE PROPERTY (PHASE II) NIAGARA FALLS STORAGE SITE LEWISTON, NEW YORK

Prepard by

R.J. HYSONG

INTRODUCTION

During the period of April 28 to May 7, 1987, the Radiological Site Assessment Program of Oak Ridge Associated Universities (ORAU) conducted surveys to verify the effectiveness of remedial actions at the Department of Energy (DOE) Niagara Falls Storage Site (Figure 1). Surveys were performed in the northeastern quadrant, north of 0 Street from the 3000E grid line to the boundary fence (4080E) and between Campbell Street and Castle Garden Road from 0 Street to the 1200S grid line.

The survey was performed in accordance with the October 26, 1986 survey plan, and measurements and sampling locations were referenced to the site grid system established by Bechtel National, Inc.

Activities consisted of walkover gamma scans to identify areas of elevated surface radiation, followed by exposure rate measurements and soil samples at 100 ft intervals and at selected locations identified by the walkover scans.

The interim report of findings is presented herein.

SURVEY FINDINGS

Walkover scans identified 29 areas of elevated direct contact gamma radiation. These locations, indicated on Figures 2 and 3, ranged in area from small isolated spots to about 18 m^2. In addition, a contaminated metal cable was identified by walkover scans at grid location 500N,3200E along the south edge of N Street. As can be noted from the figures, many of the elevated

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July 16, 1987

locations were along or in the drainage ditches, located east of Campbell Street, which empty into the South 16 Ditch. Most of the other elevated areas were along the edges of roads.

Radionuclide concentrations in samples from locations identified by gamma scans are presented in Table 1. Contaminants include Ra-226, U-238, and Cs-137; no areas of Th-232 contamination in excess of guidelines were noted. Most of the soil samples contained Ra-226 concentrations in excess of the 5 pCi/g and 15 pCi/g guideline level. No soil guidelines have yet been developed for this site for uranium; however, several of the samples contained concentrations of uranium which exceed guideline values used at other remedial action sites. Soil samples from grid locations 243S,1330E; 390S,1760E; and 550S,1280E appear to have Ra-226 and U-238 levels indicative of naturally occurring material and are not likely the result of Manhattan Engineer District/Atomic Energy Commission activities.

Based on the size of the areas of elevated contact radiation levels and/or the associated radionuclide concentrations, certain of the locations listed in Table 1 will satisfy soil guidelines when averaged over 100 m^2. These areas are at grid locations 500N,3060E; 640S,1740E, and 1050S,1360E. The other areas either exceed or may exceed DOE guidelines and, in ORAU's opinion, warrant further investigation or evaluation. A guideline level for U-238 will have to be developed before a thorough evaluation can be performed.

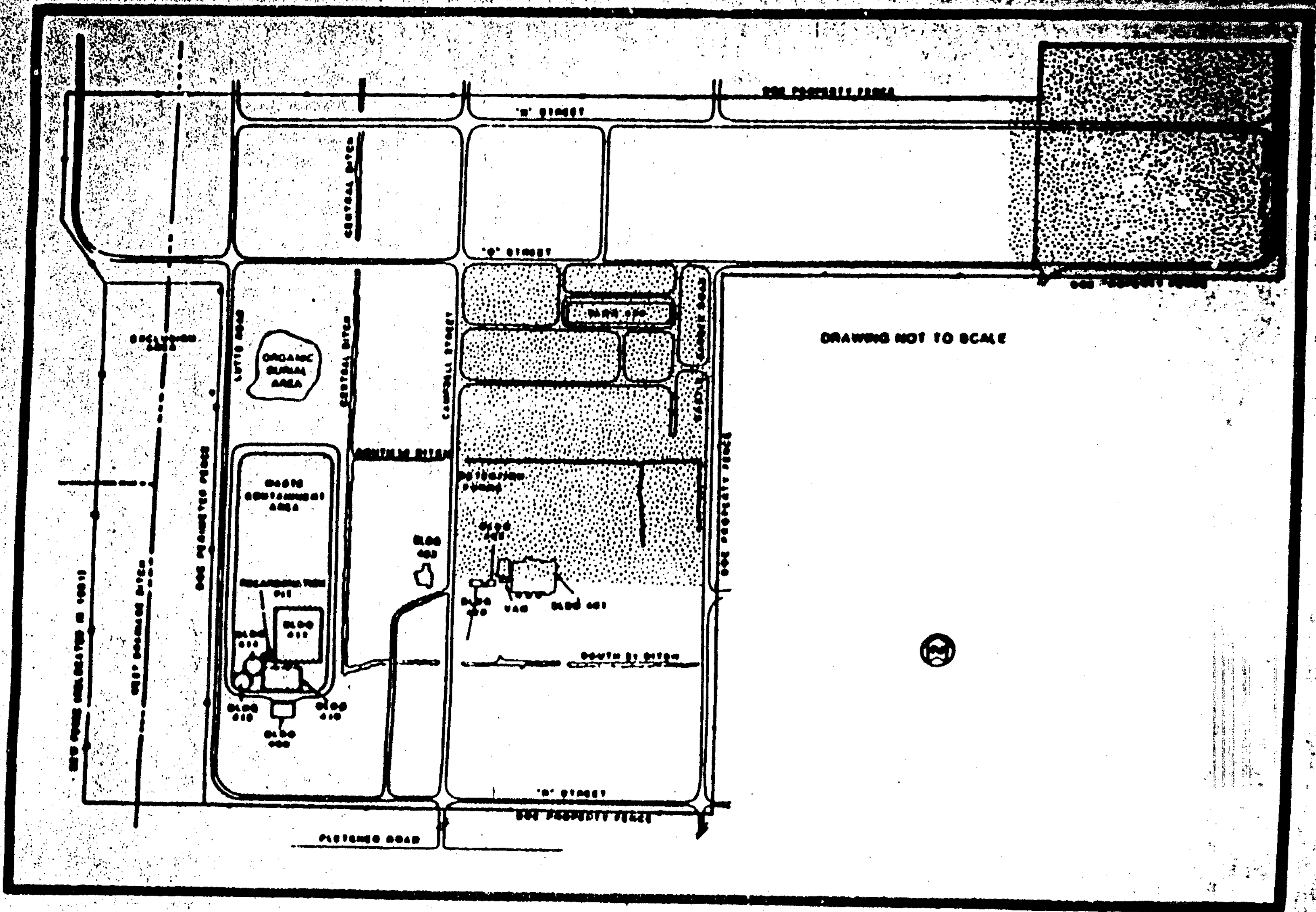

FIGURE 1: Plot Plan of the Niagara Falls Storage Site Indicating Areas Surveyed During Phase II

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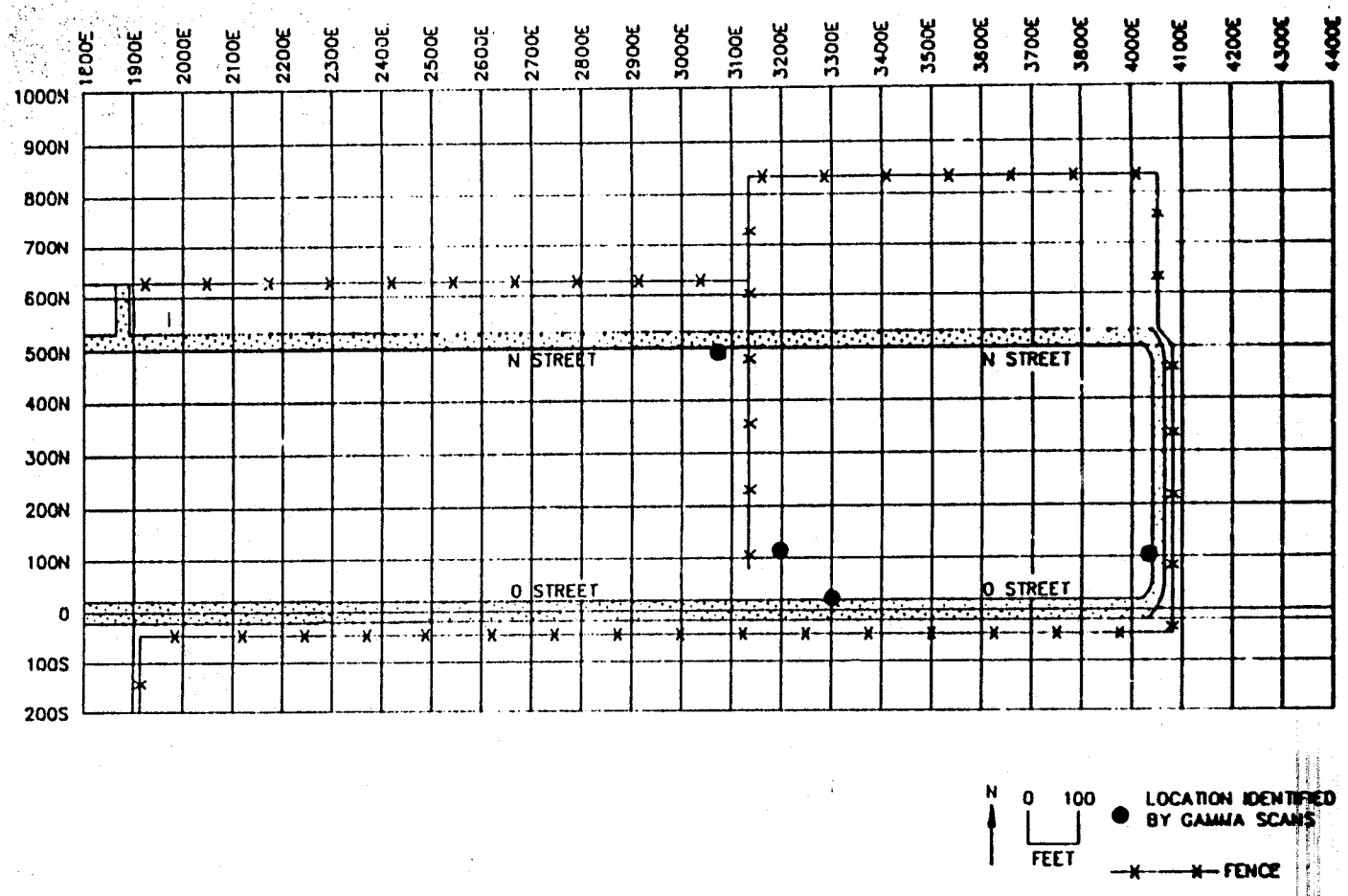

FIGURE 2: Eastern Portion of Surveyed Area Indicating Locations Identified by Gamma Scans

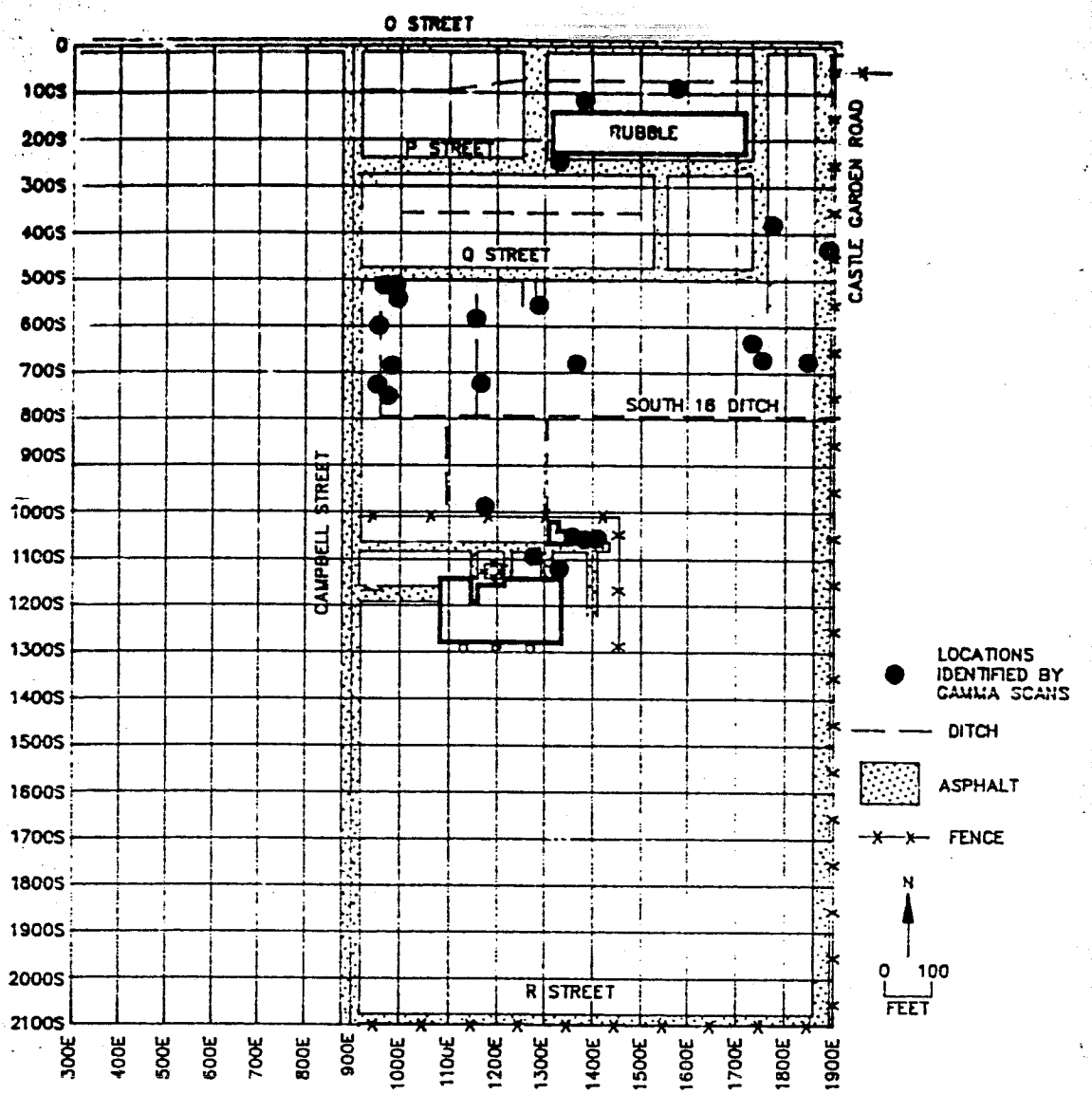

FIGURE 3: Surveyed Area Indicating Locations Identified By Gamma Scans

TABLE 1

ELEVATED AREAS OF DIRECT RADIATION
IDENTIFIED BY SURFACE SCANS

Grid[a] Location	Surface Area of Elevated Radiation (m^2)	Sample Depths (cm)	Radionuclide Concentrations (pCi/g) Ra-226	U-238	Th-232	Cs-137
500N,3060E	<1	Surface	59.0 ± 1.6	<5.4[b]	<0.94	2.05 ± 0.29
103N,3200E	1.5	Surface	1300 ± 14	<3.7	<5.0	<1.3
		15-30	102 ± 6	<1.8	<2.5	<0.61
		30-45	1170 ± 7	<3.6	<4.0	<1.2
100N,4040E	3	Surface	226 ± 3	<5.7	1.8 ± 2.0	<0.30
		15-30	219 ± 5	<6.6	<1.9	<0.47
		30-45	86.8 ± 1.9	<3.9	<0.69	0.61 ± 0.22
14N,3300E	<1	Surface	80.3 ± 1.9	<3.9	<0.76	0.54 ± 0.23
		15-30	193 ± 2	<8.6	<1.4	<0.40
		30-45	223 ± 3	<4.8	<1.1	<0.28
90S,1580	<1	Surface	6.38 ± 0.50	246 ± 5	1.40 ± 0.51	0.89 ± 0.20
		15-30	1.38 ± 0.21	23.8 ± 2.4	1.06 ± 0.34	<0.06
103S,1398E	1	Surface	103 ± 2	<3.9	<0.75	<0.20
		15-30	11.1 ± 0.6	4.6 ± 2.7	0.87 ± 0.65	0.08 ± 0.07
243S,1330E	3	Surface	6.32 ± 0.53	5.4 ± 1.6	1.01 ± 0.60	<0.07
		15-30	2.55 ± 0.30	2.68 ± 0.74	0.97 ± 0.35	<0.04

TABLE 1 (Continued)

ELEVATED AREAS OF DIRECT RADIATION
IDENTIFIED BY SURFACE SCANS

Grid Location	Surface Area of Elevated Radiation (m^2)	Sample Depths (cm)	Radionuclide Concentrations (pCi/g) Ra-226	U-238	Th-232	Cs-137
390S,1760E	<1	Surface	89.5 ± 2.1	97.2 ± 5.1	<0.85	0.43 ± 0.25
		15-30	4.46 ± 0.42	7.1 ± 1.4	1.06 ± 0.52	<0.06
450S,1890E	8	Surface	7.1 ± 1.3	520 ± 11	3.4 ± 1.2	828 ± 4
		15-30	0.95 ± 0.36	30.9 ± 3.8	1.26 ± 0.35	29.01 ± 0.76
505S,960E	1.5	n/a	c	c	c	c
505S,980E	4	Surface	112 ± 2	210 ± 64	<1.3	<0.37
		15-30	8.12 ± 0.54	18.4 ± 1.4	1.24 ± 0.52	<0.07
510S,990E	1.5	n/a	c	c	c	c
550S,1280E	8	Surface	23.79 ± 0.92	19.0 ± 2.6	<0.43	0.56 ± 0.13
		15-30	4.30 ± 0.37	8.9 ± 1.1	1.19 ± 0.47	<0.05
570S,1150E	18	Surface	<3.08	39,200 ± 100	<3.9	<1.7
600S,940E	1	Surface	40.4 ± 1.4	206 ± 6	<0.64	3.66 ± 0.45

TABLE 1 (Continued)

ELEVATED AREAS OF DIRECT RADIATION
IDENTIFIED BY SURFACE SCANS

Grid Location	Surface Area of Elevated Radiation (m^2)	Sample Depths (cm)	Radionuclide Concentrations (pCi/g)			
			Ra-226	U-238	Th-232	Cs-137
640S,1740E	2	Surface	30.18 ± 0.93	<2.2	<0.44	<0.10
		15-30	4.04 ± 0.39	1.28 ± 1.03	1.13 ± 0.41	<0.05
670S,970E	1	n/a	c	c	c	c
670S,1750E	4	Surface	61.6 ± 1.6	<1.4	<0.77	1.10 ± 0.44
		15-30	2.24 ± 0.33	3.67 ± 0.83	1.51 ± 0.66	<0.05
670S,1860E	10	Surface	240 ± 3	<5.0	<1.1	<0.34
		15-30	183 ± 3	<5.4	<1.1	<0.26
		30-45	41.8 ± 1.3	5.3 ± 2.7	1.31 ± 0.99	<0.13
680S,1370E	1.5	n/a	c	c	c	c
705S,1175E	2	Surface	31.10 ± 1.0	20.6 ± 2.9	<0.44	0.36 ± 0.12
		15-30	2.42 ± 0.30	4.49 ± 0.81	1.06 ± 0.42	0.12 ± 0.11
720S,940E	5	Surface	7.85 ± 0.55	16.4 ± 2.0	<0.38	1.17 ± 0.21
740S,970E	5	n/a	c	c	c	c

TABLE 1 (Continued)

ELEVATED AREAS OF DIRECT RADIATION
IDENTIFIED BY SURFACE SCANS

Grid Location	Surface Area of Elevated Radiation (m^2)	Sample Depths (cm)	Radionuclide Concentrations (pCi/g) Ra-226	U-238	Th-232	Cs-137
990S,1180E	6	Surface	42.4 ± 1.4	<3.0	<0.64	2.73 ± 0.39
1050S,1360E	<1	Surface	3.63 ± 0.47	<1.5	<0.25	0.31 ± 0.09
1065S,1380E	1.5	Surface	187 ± 2	6.7 ± 9.9	1.30 ± 1.40	0.50 ± 0.25
1065S,1405E	3	n/a	c	c	c	c
1090S,1275E	2.5	Surface	150 ± 2	<4.0	<0.92	0.47 ± 0.24
1105S,1310E	4.5	Surface	300 ± 4	<8.4	<1.6	2.11 ± 0.46

[a]Refer to Figures 2 and 3.
[b]Uncertainties are 2σ based only on counting statistics.
[c]No sample obtained.