ADDENDUM TO

ACTION DESCRIPTION MEMORANDUM
NIAGARA FALLS STORAGE SITE

PROPOSED INTERIM REMEDIAL ACTIONS
FOR FY 1983-85 ACCELERATED PROGRAM

(1984 VICINITY PROPERTIES CLEANUP)

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Addendum to Proposed Interim Remedial Actions for FY 1983-85 Accelerated Program at the Niagara Falls Storage Site

SUMMARY OF PROPOSED ACTION AND RELATED ACTIVITIES

As part of its Formerly Utilized Sites Remedial Action Program (FUSRAP), the U.S. Department of Energy (DOE) proposes to carry out interim remedial actions on vicinity properties near DOE's Niagara Falls Storage Site (NFSS). These additional actions include:

- Excavation of approximately 3,000 m^3 (3,900 yd^3)* of radioactively contaminated materials (primarily soil) on 13 vicinity properties near NFSS--Properties A, C', H, H', L, M, N/N' South, Q, R, S, T, U, V, and X (Figure 1 and Table 1). About two-thirds of the total volume to be excavated will come from Property H'. The radioactively contaminated materials will be removed from the NFSS vicinity properties according to DOE's radiological guidelines for residual radionuclide concentrations in soil at FUSRAP sites (Attachment 1).

- Transport of these wastes to NFSS and placement in the existing diked containment area on the southwest part of the site.

- Backfilling of the excavated areas with approximately 3,000 m^3 (3,900 yd^3) of clean fill to restore the areas to their original grade.

These activities are part of ongoing interim remedial actions initiated in 1982 as part of DOE's ongoing maintenance and caretaker operations at NFSS. These interim actions are described in four Action Description Memorandums (ADMs) (U.S. Dep. Energy 1982a, 1982b, 1983a, 1983b) and consist of consolidation of all residues and wastes from NFSS and ditches (on NFSS and downstream of NFSS) within a newly constructed diked containment area in the southwest corner of NFSS. Now, DOE proposes to also clean up some vicinity properties and to place the contaminated materials within the diked containment area.

The remaining vicinity properties (Figure 1) have been radiologically surveyed but are not proposed for cleanup this year. There will be a separate future decision regarding remedial actions at these properties. Some of the properties may not need to be decontaminated.

Following removal of the radioactively contaminated materials, DOE will conduct a site-specific risk analysis and make a decision regarding release of the vicinity properties for future use relative to radioactive conditions.

Because a long-term management site is not now available, current plans call for interim storage at NFSS. Planning is under way for the long-term disposition of the NFSS residues and wastes (including wastes from the cleanup of vicinity properties). An Environmental Impact Statement (EIS) is being

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*This volume includes only those areas identified for definite excavation on preliminary drawings by Bechtel National (1984); areas identified for possible excavation (to be "identified in field by others") are not included. The total volume may change as detailed engineering and remedial actions progress.

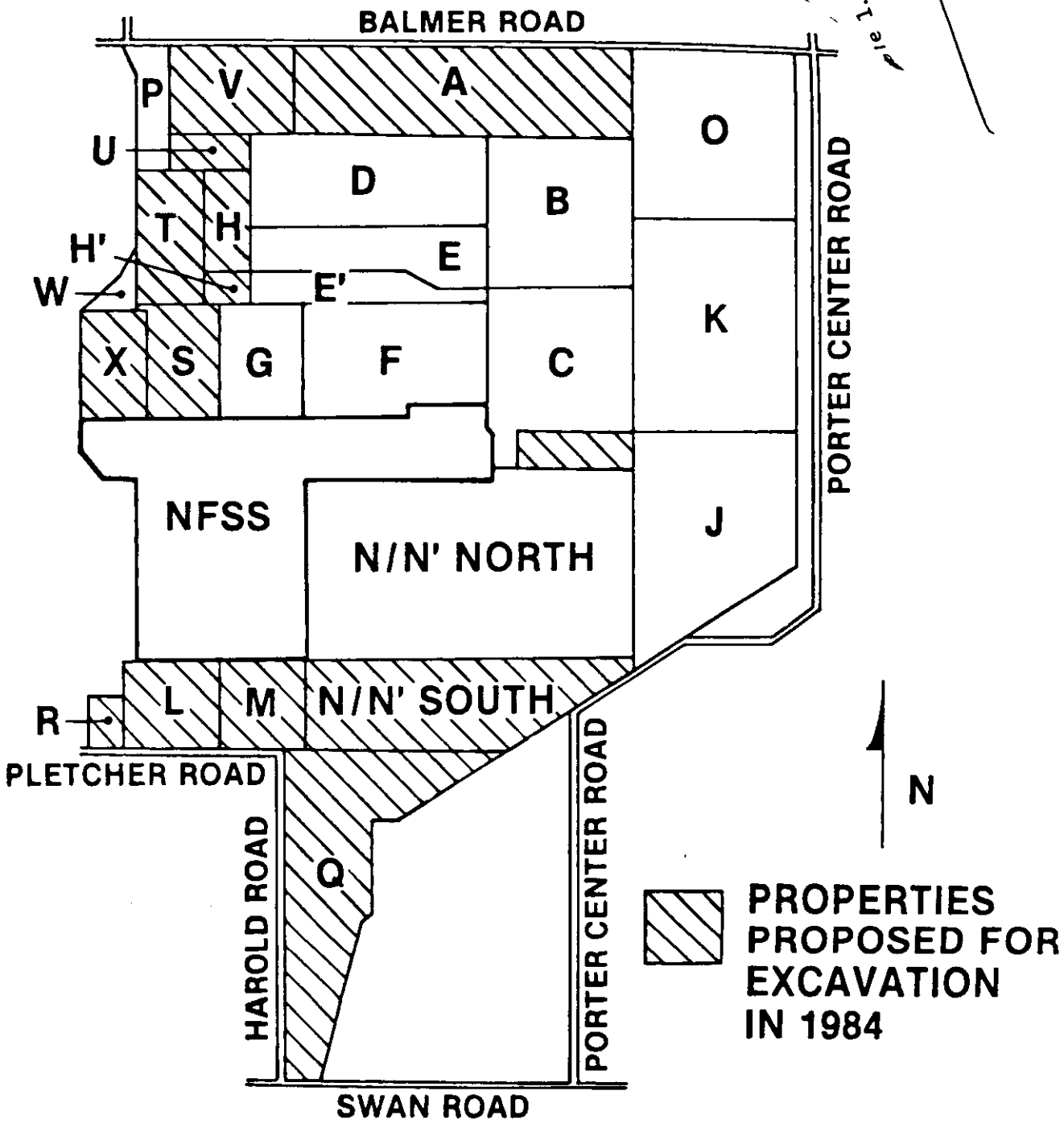

Figure 1. NFSS and Vicinity Properties. Source: Adapted from Bechtel National (1984--preliminary drawing no. 15-DD26-C-01).

Table 1. Summary of Proposed Cleanup of NFSS Vicinity Properties During 1984

Property	Owner	Area of Property (ha)	Estimated Volume to be Excavated†[1] (m^3)
A	SCA Chemical Services, Inc.	45.6	-
C'	Modern Landfill, Inc.	1.2	33
H	SCA Chemical Services, Inc.	6.3	<1
H'	SCA Chemical Services, Inc.	1.6	2,150
L	U.S. Department of Labor	11.8	117
M	U.S. Department of Labor	10.6	90
N/N' South	U.S. Department of Labor	31	328
Q	Town of Lewiston	36	98
R	Niagara Mohawk Power Co.	2.3	31
S	SCA Chemical Services, Inc.	9.2	1
T	SCA Chemical Services, Inc.	9.9	1
U	Somerset Group, Inc.	3.5	3
V	Somerset Group, Inc.	11	1
X	Town of Lewiston	8.8	159
TOTAL		178.9	3,013

†[1] Volume to be excavated is the sum of all volumes designated for excavation (Bechtel Natl. 1984--preliminary drawings nos. 15-DD26-15 through 15-DD26-19; Kuhaida 1984). A dash means that the property is only designated for possible excavation.

Sources: Berger et al. (1983a-1983b, 1984a-1984e); Kuhaida 1984; Rocco et al. (1983a-1983c); Boerner et al. 1984a-1984d; and Bechtel National (1984--preliminary drawings nos. 15-DD26-15 through 15-DD26-19).

prepared as part of the decision-making process regarding long-term man of the wastes and residues (U.S. Dep. Energy 1983c). The preferred alter for long-term management has not yet been identified.

HISTORY AND ENVIRONMENTAL SETTING

The history and environmental setting of NFSS and vicinity properties have been described in previous ADMs (U.S. Dep. Energy 1982a, 1982b, 1983a, 1983b).

RADIOLOGICAL CONTAMINATION AND NEED FOR PROPOSED ACTION

DOE proposes to carry out remedial action in 1984 at several NFSS vicinity properties--namely, A, C', H, H', L, M, N/N' South, Q, R, S, T, U, V, and X (Figure 1). Contaminated soils will be excavated from the areas having radiological contamination in the soil that exceeds the guidelines set forth in Attachment 1. Of particular relevance are the guidelines for radium-226: 5 pCi/g above background averaged over 100 m^2 for the first 15-cm-thick layer of soil and 15 pCi/g above background averaged over 100 m^2 for any 15-cm-thick layer below the first (up to 1.5-m deep).

The locations and spatial dimensions of proposed excavation areas are given on a series of preliminary engineering drawings by Bechtel National (1984). The results of radiological surveys of the properties are given in reports of Berger et al. (1983a-1983b, 1984a-1984e), Boerner et al. (1984a-1984d), and Rocco et al. 1983a-1983c). These surveys included surface radiation scans as well as analyses of surface and borehole soil and water samples for radium-226, uranium-235, uranium-238, cesium-137, and thorium-232. The sampling locations were chosen based on the results of a walkover survey of accessible areas of the properties and by grid points laid over maps of each property. Ground-penetrating radar surveys were also carried out on some of the properties to check for the presence of buried metal objects and other anomalies (e.g., possible chemical wastes). A summary of the volumes of materials to be excavated is given in Table 1; a summary of the survey results is given in Table 2.

A comparison between the proposed excavations and the survey results indicates that there are locations of elevated radioactivity that will not be excavated. These are areas where:

(1) The contamination is the result of nongovernment activities (e.g., some locations on Properties H, S, T, U, V, and X). Apparently, pseudowallastonite--a slag by-product from chemical processing of phosphate ores in the Niagara Falls area--was widely used for fill materials for roads and other construction projects (Boerner et al. 1984c). This material comes from naturally radioactive ores. The ratio of uranium-238:radium-226 in this material is close to 1, whereas DOE presumes that the ratio in contaminated materials resulting from government activities is much less than 1 because the uranium-238 was extracted. During the remedial action, small areas contaminated with slag as a result of government activities will be excavated. However, in general, areas of nongovernment contamination will not be excavated (Hardison 1984a; Rudolph 1984b). For some properties (H, S, T, and U), there is a possibility that some of the

Table 2. Characteristics of Borehole Samples Taken at the NFSS Vicinity Properties Proposed for Remedial Action in 1984

Property	Surface Soil Samples†[1]				Borehole Sample with Highest Radium-226 Concentration			Surface Sample Locations Not Designated for Excavation†[2]		
	Number of Samples	Range of Activity (pCi/g)†[3]			Depth (m)	Concentration pCi/g)†[3]		Number of Samples	Range of Activity (pCi/g)†[3]	
		Ra-226	U-238	Th-232		Ra-226	U-238		Ra-226	U-238
A	16	4.2->6,700	<1.7->120	<0.36->91	0.15	16	15	8	27->4,500	<13->122
C'	29	1.7->23,000	3.5-15,000	<0.56-45	0.6	7.7	<1.1	4	1,300->2,600	<11->18
H	17	0.92-870	0.44-71	0.41-65	0.5	21	15	16	0.92-180	0.44-50
H'	21	2.1-1,800	<6.5-1,500	<0.25-3.5	0.5	18	23	0	-	-
L	19	6.3-40	<7.3-46	<0.46-1.1	1.0	1.9	<6	3	6-23	<11-<18
M	24	2.9->1,400	6.2-23	<0.34-1.6	1.0	1.6	<5.3	0	-	-
N/N' South	19	4.0->430	6.1->130	-	0.3	12	1.2	0	-	-
Q	22	<0.15-1,000	0.50-37	-	0.3	5	<7	11	4.7-7.8	<3-18
R	10†[4]	5.7-30	<0.50-5	-	0.5	1.3	<1.1	2	6.5-25	4.2-5
S	9	4.3-170	2.6-130	-	0.5	3.4	2.4	8	4.3-168	2.6-130
T	35	0.91-570	<0.81-270	<0.31-1200	0.3	36	<2.7	35	0.91-570	<0.81-270
U	25	0.26-890	0.50-250	<0.22-933	0.15	22	2.1	16-20†[5]	0.76-890	<0.7-290
V	10	25-4,300	25-95	<0.36-95	0.3	12	1.7	8	25-50	25-72
X	12	7.6-350	1.1-30	<0.3-1.7	0.3	13	2.8	3	7.5-10	4.6-9.5

†[1] Samples listed are those taken from locations identified by the walkover scan of the site.

†[2] Not designated for excavation means none of the locations are marked on Bechtel's drawings for either definite or possible excavation.

†[3] All concentrations are given to two significant figures.

†[4] Includes six samples from 20-m grid intervals.

†[5] Four locations designated on Bechtel drawings as contaminated sites to be "identified in the field by others" (i.e., designated for possible excavation).

Sources: Berger et al. (1983a-1983b, 1984a-1984e); Kuhaida (1984); Rocco et al. (1983a-1983c); Boerner et al. (1984a-1984d); and Bechtel National (1984--preliminary drawings nos. 15-DD26-15 through 15-DD26-19).

areas that will not be excavated have average radium-226 concentrations in excess of the DOE guidelines that are being applied to contaminated areas resulting from government activities.

(2) The contamination is an isolated spot which, when averaged over 100 m^2, gives an average radium-226 surface concentration of <5 pCi/g above background (e.g., some locations on Properties H, L, Q, R, T, and U).

(3) The removal of samples for analysis of radionuclide concentrations resulted in a significant reduction in the radioactive contamination at that location (e.g., some locations on Property A).

(4) Surface radiation scans revealed elevated radiation readings, but soil samples were not taken (e.g., Properties A, H, M, T, U, and V). The reasons for not taking samples were not always reported, but in some cases the reason apparently was because the area was covered by old building foundations, roads, or other structures.

(5) Samples have been taken and the contamination may be greater than the guidelines, but the areas are not designated on the preliminary drawings as areas to be excavated (Properties C', H, T, and U). For Property C', an area of numerous spot excavations might be combined into one excavation area.

The average radium-226 concentration in the soils to be excavated probably ranges from about 5 pCi/g (the lower limit for excavation) to 100 pCi/g (based on the data in Table 2, relatively few samples have concentrations above 100 pCi/g). Assuming that the material to be excavated has an average density of 1200 kg/m^3, about 0.018 to 0.36 Ci of radium-226 will be excavated.

In general, there does not appear to be significant chemical contamination at these properties. However, there is possible chemical contamination at properties M, Q, and H'.

Property A

The walkover scan of Property A identified several areas of elevated radiation levels (Berger et al. 1984c). Eight of the areas are identified for possible excavation (i.e., identified on the drawings [Bechtel Natl. 1984] as to be "identified in the field by others"). No contaminated areas are scheduled for definite excavation on Property A. Of the remaining areas, several are contaminated as a result of nongovernment activities (i.e., the uranium:radium ratios are approximately 1). Contamination in the other remaining areas was reduced below guidelines by the sampling (Berger et al. 1984c; Berger 1984).

Property C'

Property C' has 29 locations of radium-226 and uranium-238 surface contamination as identified from a walkover scan (Berger et al. 1984d). Concentrations are high, ranging up to more than 23,000 pCi/g radium-226 and 15,000 pCi/g uranium-238 (Table 2). The areas designated for excavation consist of a group of eight closely spaced but isolated spots and a group of broader rectangular areas.

areas with high concentrations of radium-226 that appear to have from governmental activities (Table 2) are not scheduled for ion. Berger (1984) reported that sampling reduced the direct radiation to background values.

The depth of excavation might also have to be increased, depending on ditions found when excavating. For example, 7.7 pCi radium-226/g has been entified at one borehole site at a depth of 0.6 m. Because concentrations radium-226 increase with decreasing depth, there is a possibility that above-criteria concentrations of radium-226 exist at depths below 0.6 m.

Surface soil analyses at Property C' also identified many spots of elevated radium-226 concentrations along the railroad tracks (Berger et al. 1984d). The uranium:radium ratios for these samples suggest that the contamination is a result of nongovernment activities.

The eastern part of Property C' is a swamp and is designated as a wetlands area by the state of New York. It appears that most of the areas to be excavated lie in the wetlands area (Berger et al. 1984d).

Property H

At Property H, 17 of the areas identified by a walkover scan as having elevated levels of radioactivity were sampled (Boerner et al. 1984c--Table 5). Thirteen of these samples were pieces of rock that had uranium:radium ratios indicative of nongovernment activities. These areas will not be excavated (Rudolph 1984b). Only one of the areas contaminated by government activities requires excavation because the contamination in the other areas was reduced to background by sampling (Berger 1984).

Of the areas that were identified as being contaminated but were not sampled, it is presumed that most of these areas have contamination resulting from nongovernment activities because this is the case for most of the areas that were sampled. One of these areas appears to have contamination of government origin and is the area scheduled for excavation (Berger 1984).

Property H'

About two-thirds of the total volume of material to be excavated during 1984 will come from Property H' (Table 1). There is a large area of surface contamination that may have originated from incineration operations which are suspected to have occurred on the site before 1954. The area to be excavated includes all 21 locations with elevated radioactivity identified in the walkover scan (Berger et al. 1983a). Three locations that have elevated radioactivity at a depth of 0.5 m will be excavated to a depth of 0.6 m. The rest of the area will be excavated to a depth of 0.3 m. A ground-penetrating radar survey of the site identified some electrically active areas at a depth of 0.6 to 1.7 m at the locations to be excavated. It is suggested (Berger et al. 1983a) that these anomalies might indicate the presence of buried radioactive residues. However, other sampling indicates that radioactive contamination is limited to the top 0.5 m of soil (Berger et al. 1983a; Berger 1984). Consequently, the type of buried materials causing the activity is unknown. During June and July 1982, the area to be excavated was at least partially covered by standing water.

Property L

On Property L, there is contamination along Campbell Street on the ea edge of the property. This area of contamination is scheduled to be excava to a depth of 0.3 m. Three isolated areas of contamination in the eastern part along Pletcher Road will not be excavated, because averaging the contamination at each area over 100 m^2 gives an average above background radium-226 concentration of <5 pCi/g (Rudoplh 1984a). Several borehole samples showed radium-226 concentrations increasing with depth down to 1 m, although all subsurface radium-226 concentrations were less than 2 pCi/g (Rocco et al. 1983a). Ground-penetrating radar surveys identified anomalies at a depth of 1 to 1.5 m in the northern part of the site. These anomalies are indicative of materials such as organic solvents or petroleum materials, but there is no known radiological contamination in this portion of the property (Rocco et al. 1983a).

Property M

Three rectangular areas along Campbell Street on the western edge of Property M were identified in a walkover scan, and subsequent sampling confirmed contamination above guideline levels (Rocco et al. 1983b). These areas are scheduled to be excavated to a depth of 0.15 m (0.5 ft). Some other areas identified by a walkover scan and sampled (borehole sampling) showed slight radium-226 contamination (<2.23 pCi/g) at a depth of 0.5 m. Three locations of elevated radioactivity identified in the walkover scan were not sampled because they were on a paved surface. These areas are not scheduled to be excavated.

A ground-penetrating radar survey showed anomalies in the northern part of the site at a depth of 1 to 1.5 m. These anomalies are indicative of materials such as petroleum products or organic solvents (Rocco et al. 1983b). The areas of such anomalies are close to the northernmost area of proposed excavation.

Property N/N' South

According to the radiological survey (Berger et al. 1983b), there are two areas of surface contamination on Property N/N' South: the incinerator area and the track area. The incinerator area has already been excavated during 1983 interim remedial actions (Gaspar 1984; Hardison 1984b),* and the contaminated soils were placed within the contaminated area at NFSS. Only the track area and two closely associated hot spots are proposed to be excavated to a depth of 0.3 m.

Property Q

Several widely scattered areas of contaminated materials on Property Q are proposed for excavation. Of the 22 surface samples taken from locations identified by the walkover scan (Rocco et al. 1983c), 11 lie in areas to be excavated. All the remaining samples had radium-226 and uranium-238 concentrations below 7.8 pCi/g and 18 pCi/g, respectively, and 7 of these samples had

*A post-action radiological survey report is not yet available.

26 concentrations <5 pCi/g (Table 2). No significant subsurface nation was found. At one location, there was a radium-226 concentration Ci/g at a depth of 0.3 m (1 ft) (Table 2). At most locations, contact ure rates were not reduced by soil sampling. This indicates that the aminated material either extends deeper than 0.15 m below the surface or diffuse (Rocco et al. 1983c).

A ground-penetrating radar survey indicated the possible presence of buried organic liquids in one of the areas to be excavated (the largest rectangular area so designated on the preliminary drawing) (Bechtel Natl. 1984).

Property R

Contamination on Property R is mostly confined to a long narrow strip on the southern border along Pletcher Road (Berger et al. 1984a). This strip is proposed for excavation. Two isolated spots with radium-226 and uranium-238 contamination <25 pCi/g and 5 pCi/g, respectively, will not be excavated because the radium-226 contamination averaged over 100 m^2 is less than 5 pCi/g (Rudolph 1984a). Sampling at these isolated spots had no significant effect on the radiation level, indicating that the contamination at these points is diffuse. Soil samples from three boreholes indicated no significant subsurface contamination (Berger et al. 1984a).

Property S

The radiological survey of Property S (Berger et al. 1984b) identified two isolated spots of contamination along Campbell Street and an area of contamination around a concrete pad along M Street. Only one of the isolated spots is proposed for excavation. The radium-226 concentrations around the concrete pad may be in excess of the applicable guideline even when averaged over 100 m^2. However, the remaining isolated contaminated spot (radium-226 concentration = 170 pCi/g) and the area around the pad are not to be excavated because the radioactivity is contained in the pseudowallastonite slag and is not the result of government activities (Berger et al. 1984b; Rudolph 1984a).

Property T

Property T has 35 locations of radium-226 and uranium-238 surface contamination as identified from a walkover scan (Boerner et al. 1984b). Concentrations in samples from these locations are as high as 570 pCi/g radium-226 and 1200 pCi/g thorium-232. Samples from 14 of these locations give radium:uranium ratios indicative of previous government activities. The remaining 21 locations yielded samples with ratios indicative of a natural origin. Most of the locations contaminated by government activities are near the west drainage ditch; however, there are other isolated government-contaminated areas that are not close to either the west ditch or the central drainage ditch. Both of these ditches join on the property (Boerner et al. 1984b).

The central drainage ditch has been excavated in previous remedial actions. At present, only a small area at the confluence of the west and central drainage ditches is scheduled for excavation (Kuhaida 1984). However, all of the above-noted 14 areas of contamination are located elsewhere on the property. Pending confirmatory surveys, the concentrations averaged over 100 m^2 may be less than 5 pCi/g in these areas and, therefore, these other areas will not be excavated.

Subsurface borehole samples showed the presence of elevated radi concentrations up to 0.6 m depth in an area of sediment piled along the drainage ditch. The total volume of sediments piled along the ditch, whic result from previous dredging activities and are a source of radium-226 contamination, is estimated to be 216 m^3 (Boerner et al. 1984b).

Four ponds are located on the property. Surface water samples from the ponds had gross alpha and beta concentrations that are close to background values (Boerner et al. 1984b).

Property U

Surface soil samples were not taken at several locations of elevated radiation levels identified in the walkover scan of Property U (Boerner et al. 1984a). Some of these locations are included in proposed excavation areas and some are not. Most of the locations of elevated radiation levels that were sampled are not designated to be excavated (Table 2) because either the contamination is presumed to result from nongovernment activities or the radium-226 concentration when averaged over 100 m^2 is presumed to be <5 pCi/g (Rudolph 1984a; Berger 1984). Most of the remaining sites are designated for possible excavation (surface contamination to be "identified in the field by others"). Borehole sampling identified 22 pCi/g radium-226 at a depth of 0.15 m at one location (Boerner et al. 1984a).

Property V

Most locations of elevated radiation levels identified by the walkover scan of Property V were not sampled (Boerner et al. 1984d) and are not proposed for excavation. Presumably, the contamination at these nonsampled areas results from nongovernment activities (Berger 1984). Only two of the sampled surface locations are scheduled to be excavated (Table 2). Samples from the other eight locations were all small rocks used for construction fill or paving and had uranium:radium ratios indicative of nongovernment activities (Boerner et al. 1984d). At one location to be excavated, a borehole sample had a concentration of 12 pCi/g radium-226 at a depth of 0.3 m (Boerner et al. 1984d).

Property V has two documented areas of standing water (Boerner et al. 1984d). These areas are not close to the two locations to be excavated; however, they are close to other sampled sites.

Property X

A radiological survey of Property X identified several areas and spots of surface soil contamination (Berger et al. 1984e). Only three of the locations will not be excavated (Table 2) because the contamination at these spots is probably due to nongovernment activities. Subsurface soil analyses of borehole samples from one location identified 18 pCi/g radium-226 at 0.15 m and 13 pCi/g at 0.3 m. Sampling indicated that the radium-226 concentrations below a depth of 0.15 m are less than the 15 pCi/g guideline (Berger et al. 19834e).

VES TO THE PROPOSED ACTION

AKE NO ACTION. Although there are currently no federal restrictions on use of the vicinity properties proposed for cleanup in 1984, the state of New York has imposed restrictions because the state did not consider the properties to be sufficiently decontaminated during past cleanup activities. Because the contamination exceeds current guidelines and Congress has allocated funds to the FUSRAP program for cleanup of properties such as those near NFSS, DOE feels it is prudent to proceed with such actions.

2. DELAY ACTION. Delaying action would allow more time to: (a) further characterize the areas that were identified by the walkover scans as having elevated radiation levels but were not sampled, (b) survey the parts of the properties that were "inaccessible" during previous surveys, (c) further characterize the areas having subsurface anomolies on the radar scans to determine whether or not hazardous chemicals are present, and (d) determine responsible authorities and coordinate any necessary cleanup of the areas that are contaminated with slag from the processing of phosphate ores. DOE feels it is prudent to proceed with the proposed actions for the reasons discussed under Alternative 1.

3. CLEAN UP CONTAMINATION FROM NONGOVERNMENT ACTIVITIES AT THE SAME TIME. There are several impediments to implementation of this alternative because the responsible parties, governmental jurisdiction, and other institutional issues have not been resolved. DOE has no authority, or funds, to clean up contamination resulting from nongovernment activities in the NFSS area. The appropriate state of New York office will be advised that such contamination will not be removed by DOE.

4. MOVE THE RADIOACTIVELY CONTAMINATED WASTES DIRECTLY TO OTHER SITE(S) FOR LONG-TERM MANAGEMENT. This alternative offers the advantage of having to move the wastes only once if NFSS is not eventually designated for long-term (rather than "interim") management. However, a permanent site for long-term management has not yet been identified, and funds are currently budgeted for excavation and interim storage.

5. REMOVE THE CONTAMINATED WASTES TO NFSS FOR LONG-TERM MANAGEMENT. This alternative is being considered and is included in the alternatives to be analyzed in the forthcoming Environmental Impact Statement.

POTENTIAL ISSUES AND ANALYSIS

The following discussion supplements the analysis provided in previous ADMs regarding interim actions at NFSS.

Radiological Impact

The radiological impact from the proposed excavation of contaminated soils from the vicinity properties and their transport and placement for interim storage at NFSS will be an incremental impact above that resulting from the previously analyzed interim remedial actions to be carried out in 1984 (U.S. Dep. Energy 1983b). In particular, during 1984 the K-65 residues will be moved from the Building 434 tower to Building 411; these residues contain 775 Ci of radium-226. In contrast, the vicinity properties remedial

actions will involve the movement of wastes containing only 0.018 to [illegible] of radium-226 (see previous discussion). The radioactive releases and r[illegible]ing doses associated with the vicinity properties actions will be a negli[illegible] fraction of those previously estimated for the residue transfer. The impac[illegible] associated with the residue transfer is negligible in comparison with doses received from natural background radiation, and the incremental impact from the vicinity properties actions will be insignificant.

The previously mentioned radiological issue of whether the decontamination guidelines will be considered sufficient is also an issue for the proposed vicinity properties actions. However, the guidelines to be used are based on recent detailed studies (U.S. Dep. Energy 1983d; Gilbert et al. 1983), and DOE believes that these guidelines are conservatively low for considering potential adverse health effects that might occur in the future from any residual contamination. All remedial actions will be conducted in a manner to minimize radiation doses to the general public and to workers in accordance with DOE's as-low-as-reasonably-achievable (ALARA) philosophy.

Release of the vicinity properties by DOE for unrestricted (or other restricted) use is not part of the proposed action. Such release will be subject to a separate DOE decision in the future. However, a decision by the state of New York relative to unrestricted use will be influenced by the fact that, at the completion of the remedial actions, there will be many areas contaminated as a result of nongovernment activities, and some of these areas have radium-226 concentrations in excess of the guidelines. DOE has no authority to take any action with respect to the nongovernment contamination.

Other areas that will not be excavated during the 1984 actions have elevated radium-226 concentrations and radium:uranium ratios indicative of previous government activities. For some of these areas, soil concentrations--when averaged over 100 m^2--may be less than the guidelines. However, whether or not this is in fact true cannot be ascertained from the information at hand. There were several other areas identified in the walkover scans as areas of elevated radiation levels that were not sampled. Most of these areas are not scheduled to be excavated because field examination of the material in these areas indicated probable nongovernment origin for the contamination (Berger 1984). Furthermore, there are a few limited areas that were simply not surveyed because they were "inaccessible." It is therefore not known if these areas are contaminated.

If, during the proposed remedial action, radiological support surveys indicate that other contaminated areas need to be excavated, the excavation activities will be modified to include these other areas. After excavation is complete, separate surveys will be conducted to ascertain the then-existing radiological condition of the site to support the future DOE decision regarding release of the site for other use.

Presence of Chemicals

A potential issue for Properties H', M, and Q is the presence (as indicated by ground-penetrating radar surveys) of electrically active materials such as organic solvents or petroleum products buried close to or in the areas to be excavated. For Properties H' and M, the burial depths indicated by the radar surveys are 0.6-1.7 m and 1.0-1.5 m, respectively; for Property Q, no

re reported (Rocco et al. 1983b, 1983c; Berger et al. 1983a). If drums or containers are encountered during excavation, they will be d for the presence of hazardous chemicals and appropriate measures will taken to ensure that such chemicals are properly disposed and are not eased offsite.

Excavation in Wetlands

Another potential issue arises from the presence of standing water and swampy areas on some of the properties. The eastern part of Property C' is a wet swampy area that has been designated by the state of New York as a wetlands area (Berger et al. 1984d). This area is proposed for excavation. Properties H, H', and V also have areas of standing water but are not officially classified as wetlands. The areas of standing water on Properties H and V do not appear to coincide with the areas scheduled to be excavated. On Property H', the area of standing water may partly overlie the area to be excavated.

Information regarding potential wetlands on the properties proposed for excavation in 1984 is limited. Anecdotal information is provided in the radiological survey reports, but this is limited to observations during the brief period of time that the property was surveyed. A wetlands survey based on seasonal aerial photos and vegetation characterization could more clearly delineate the presence and condition of wetlands on the properties. It is expected that many areas on the properties have seasonally saturated soils (hence the original need for the drainage ditches).

Planned activities in the wetland areas may require prerequisite technical evaluation pursuant to Executive Order 11990/10 CFR 1022, "Compliance with Floodplain/Wetlands Environment Review Requirements." It is possible that evaluation and resolution of state issues may delay excavation in the wetland areas until the summer of 1985.

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