AAR CORP.

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630-227-2049

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August 7, 2013

VIA FEDERAL EXPRESS

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Re: Remedial Work Plan – Revision 1

Ladies and Gentlemen:

AAR is pleased to submit the enclosed Remedial Work Plan – Revision 1 for Regulatory Review in connection with AAR's Western Parcel Strategic Waste Excavation and Site Restoration for 12633 Inkster Road, Livonia, Michigan (the "Plan"). We believe the Plan is in line with our past discussions.

Please contact us with any questions or comments you may have as you review the Plan. We look forward to the NRC's sign off. Thank you.

Very truly yours,

AAR CORP.

By: _____
Donald J. Vilim
Assistant General Counsel

DJV:uc
Enclosure

cc: Theodore B. Smith, Mail Stop 8F5 (w/o encl.)

FSME20

FSME

REMEDIAL WORK PLAN
FOR REGULATORY REVIEW

AAR CORP.
WESTERN PARCEL

STRATEGIC WASTE EXCAVATION
SITE RESTORATION

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REMEDIAL WORK PLAN NO. 20130419

AAR WESTERN PARCEL STRATEGIC WASTE EXCAVATION AND SITE RESTORATION RWP FOR 12633 INKSTER ROAD, LIVONIA, MI SITE

Authored by: Randall L Farneth — Randy Farneth, Project Manager — 8-3-13 — Date

Reviewed by: _____ — Donald Vilim, AAR CORP. — _____ — Date

Reviewed by: _____ — Doug Hara, AAR CORP. — _____ — Date

Reviewed by: _____ — Barry Koh, Owner's Consultant — _____ — Date

Reviewed by: _____ — Chad Hollaway, Health Physicist — _____ — Date

Reviewed by: _____ — Steve Wilk, General Superintendent — _____ — Date

Approved by: _____ — Dell Reuss, Operations Manager — _____ — Date

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Authored by: _____ _____
Randy Farneth, Project Manager — Date

Reviewed by: _____ 8/7/2013
Donald Vilim, AAR CORP. — Date

Reviewed by: _____ 8/5/2013
Doug Hara, AAR CORP. — Date

Reviewed by: _____ _____
Barry Koh, Owner's Consultant — Date

Reviewed by: _____ _____
Chad Hollaway, Health Physicist — Date

Reviewed by: _____ _____
Steve Wilk, General Superintendent — Date

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Dell Reuss, Operations Manager — Date

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Reviewed by: Barry Koh _____ 8/30/13
Barry Koh, Owner's Consultant — Date

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Chad Hollaway, Health Physicist — Date

Reviewed by: _____ _____
Steve Wilk, General Superintendent — Date

Approved by: Dell Reuss 8-5-13
Dell Reuss, Operations Manager — Date

AAR Western Parcel Strategic Waste Excavation and Site Restoration RWP

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TABLES

AAR Western Parcel Strategic Waste Excavation, Soils Management and Site Restoration RWP

1.0 BACKGROUND STATEMENT

The 12633 Inkster Road, Livonia, MI property, which is the subject of this Remedial Work Plan (RWP), was formerly owned by Brooks and Perkins, Inc., who conducted licensed activities involving radioactive thorium materials under Atomic Energy Commission (AEC) source materials license No. STB-0362. Brooks and Perkins terminated their license on 17 May 1981.AAR Corporation subsequently purchased the assets of the former Brooks and Perkins, including the property located at 12633 Inkster Road.

Oak Ridge National Laboratory (ORNL), under contract with the United States Nuclear Regulatory Commission (USNRC), conducted a site investigation which discovered levels of thorium-contaminated surface and sub-surface soils that exceeded USNRC release criteria. Said discovery caused the property to be added to the Site Decommissioning Management Plan list in August 1994 NUREG 1444.

Since 1996, AAR CORP. has maintained a proactive approach in negotiations with the NRC regarding remediation of the site. In November 2002, AAR submitted to the USNRC a plan calling for the unrestricted release and use of the eastern portion of the property and for restricted use of the western portion to include a restrictive covenant. Subsequently, the property was legally divided into the Eastern Parcel and the Western Parcel, 12633 Inkster road, Livonia, MI.

In 2006 AAR CORP. enlisted Partners Environmental consulting to prepare and submit to the USNRC a Revised Dose Assessment and Work Plan. Said document was dated 7 August 2006. A Remedial Work Plan, authored by EnergySolutions, was submitted for review on 14 November 2006.

In a letter dated 27 October 2006 the NRC determined that the revised probabilistic dose analysis for the site demonstrated that, contingent upon implementation of the Remedial Work Plan of August 2006, the Eastern Parcel of the site would meet the dose criteria for unrestricted use, per the License Termination Rule (LTR) (10 CFR Part 20, Subpart E). The Western Parcel was deemed to meet the dose criteria for restricted release.

Site remediation activities began in November 2006. A total of six (6) $100m^2$ grids of soil in an open land area were excavated to a depth of one (1) meter, loaded out, transported and disposed. Two (2) of the $100m^2$ grids were within the Eastern Parcel and four (4) of the $100m^2$ grids were within the area designated as the Western Parcel. Excavation cavities were backfilled with clean imported soils. This remedial action was successfully carried out, as evidenced in the Final Site Remediation Report authored by Partners Environmental in April 2007.

In September 2010, the NRC and its consultant performed a radiological survey of the CSXT parcel that runs parallel and contiguous to the southern boundary of the AAR CORP. property. In June 2011 the NRC released its Technical Evaluation Report regarding the radiological status of the contiguous CSXT right-of-way. NRC staff concluded that the CSXT property meets the criteria for unrestricted use and that this parcel requires no additional soil remediation or cleanup.

It is anticipated that use of the site will remain consistent with its current use and that of the neighboring properties (commercial, light industrial, warehousing, trucking).

AAR Western Parcel Strategic Waste Excavation and Site Restoration RWP

2.0 PRIMARY AND SECONDARY PROJECT OBJECTIVES

2.1 PRIMARY OBJECTIVE

The primary objective for the AAR Western Parcel Strategic Waste Excavation and Site Restoration project is to obtain unrestricted release of the Western Parcel of the property located at 12633 Inkster Road, Livonia, MI.

2.2 SECONDARY OBJECTIVES

A. Strategic Waste Excavation

Excavation of soils will be limited to those 100m³ grids identified in Section 3.1.

B. Soils Management

1. When practicable, site soils will be excavated and direct loaded into Michigan Gravel Train tractor-trailers for transportation to the designated off-site disposal facility.

2. When necessary, site soils within any one grid (or series of grids) will be intentionally mixed in order to achieve the project-specific Waste Acceptance Criteria.

C. Site Restoration

Following excavation of any one 100m³ grid or series of contiguous 100m³ grids, the excavation will be backfilled using clean fill imported material. Excavations will be brought to existing surrounding grade and machine-compacted. Clean fill materials will be obtained from suppliers who will document, through appropriate analysis, that the material is clean and that it is free of hazardous materials or constituents.

3.0 REGULATORY GUIDELINES/RELEASE CRITERIA

3.1 REVISED PROBABALISTIC DOSE ANALYSIS/ BASIS FOR UNRESTRICTED RELEASE

The License Termination Rule (LTR), 10 CFR 20, Subpart E, states that a site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a TEDE to an average member of the critical group that does not exceed 25 mrem (0.25 mSv) per year, including that from groundwater sources of drinking water, and the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA). ...

In a letter dated, October 27, 2006, the NRC stated that that the radiological analysis submitted by AAR demonstrates that it fulfilled the dose requirement of the LTR for unrestricted release of the eastern parcel of the site, contingent on the completion of the remedial action. Remedial activities were completed in January, 2007 and a final report submitted to the NRC in April, 2007.

The radiological analysis previously submitted and approved by the NRC was used to evaluate what further soil removal from the western and eastern parcels would be required to reduce the radiation dose consistent with the LTR for unrestricted release of the entire site. The probabilistic dose assessment yielded a dose source ratio (DSR) for the resident farmer scenario of 2.4 mrem/year per pCi/g, assuming a 10,000 m2 "area of contaminated zone" and a 2 m "depth of contaminated zone." A 10,000 m2 contaminated zone was used because it is the value recommended by the NRC for the AAR dose assessment. Based on the calculated DSR, the average thorium concentration in the site soils must be ≤ 10 pCi/g to meet the limit established in LTR for unrestricted release.

Excavating the soil and replacing it with uncontaminated material from the 32 grids listed below, results in an average concentration, in the top one meter of soil within the western most 10,000 m2 area of the site (155W to 60W) of 6 pCi/g. The specific grids recommended for removal are as follows (see Figure 3a, Site Characterization Report, Phase II of B. Koh 1999 for grid locations): 36, 37, 74, 75, 76, 94, 98, 99, 101, 122, 123, 124, 125, 126, 156, 157, 158, 187, 188, 189, 216, 217, 247, 265, 266, 283, 284, 315, 368, 369, 370, 375.

Table 3.1, shows the grids to be removed and the resulting average thorium concentration after grid removal.

3.2 EXCAVATION DEPTH

No excavation is required below a depth of one meter provided the average thorium concentration in the 1-2 meter layer does not cause the resulting dose to exceed the LTR limit for unrestricted release. At the time of maximum dose for the 0 to 1 meter layer the Dose Source Ratios are as follows: DSR (0-1 m) = 2.4 mrem/year per pCi/g and DSR (1-2 m) = 0.13 mrem/year per pCi/g. Therefore, at this time, the average concentration in the 0 to 1 meter layer of 6 pCi/g would equate to a dose rate of 14.4 mrem/year, and the average concentration in the 1 to 2 meter layer would have to be at or below 82 pCi/g for the total dose rate not to exceed the 25 mrem/year criteria.

However, at the time of the maximum dose for the 1 to 2 meter layer which occurs several hundred years later, the Dose Source Ratios are as follows: DSR (0-1 m) = 1.2 mrem/year per pCi/g and DSR (1-2 m) = 0.65 mrem/year per pCi/g. Therefore, at the time in question, the average concentration in the 0 to 1 meter layer of 6 pCi/g would equate to a dose rate of 7.2 mrem/year, and the average concentration in the 1 to 2 meter layer would have to be at or below 27 pCi/g for the total dose rate not to exceed the 25 mrem/year criteria.

3.3 REAL-TIME CONFIRMATORY SAMPLING

After excavating soil to a depth of one meter, the average concentration in the 1-2 meter level will be verified by removing and analyzing soil samples. Four samples will be removed from each 100 square meter grid as described in Site Characterization Report, Phase II, Former Brooks and Perkins, Site, Inc., Revision 0, August 1999, prepared by B.Koh and Associates. The concentration of the four grid samples will be added to the existing data for the 1-2 meter layer and a new layer average calculated. The existing data for the 1-2 meter layer is presented in the attached spreadsheet, Table 3.4.

If the average thorium concentration of an exposed grid in the 1-2 meter layer causes the average concentration in the entire 1-2 meter layer to exceed 20 pCi/g, AAR will remove the exposed grid to an appropriate depth and replace it with clean fill.

Table 3.1
Average Thorium Concentration in the Area of Contamination Zone After Removal

Data from Figure 3a of Site Characterization Report, Phase II, Former Brooks and Perkins, Site., Inc., Revision 0, August 1999, prepared by B.Koh and Associates and tabulated in Partners Environmental letter to Larry W. Camper, USNRC, dated August 7, 2006.

Parcel		Grid #	Average AAR and ORISE Th232/228 Th230 pCi/g	
E		31-32	2.1	
E		33-34	0.3	
W	Remove	35-36	0.0	Replace with Clean Soil
W	Remove	37-38	0.0	Replace with Clean Soil
E		69	10.5	
E		70	11.6	
E		71	0.0	
E		72 (ORISE 34 & 36)	13.6	
	W-Removed Previously	73	0.0	Replaced with Clean Soil
W	Remove	74	0.0	Replace with Clean Soil
W	Remove	75	0.0	Replace with Clean Soil
W	Remove	76	0.0	Replace with Clean Soil
E	Remove	94 (ORISE 17-20)	0.0	Replace with Clean Soil
E		95	22.6	
E		96	15.3	
E		97	32.9	
W	Remove	98	0.0	Replace with Clean Soil
W	Remove	99	0.0	Replace with Clean Soil
	W-Removed Previously	100	0.0	Replaced with Clean Soil
W	Remove	101	0.0	Replace with Clean Soil
E		119	36.0	
E		120	9.9	
E		121	29.5	
E	Remove	122	0.0	Replace with Clean Soil
W	Remove	123	0.0	Replace with Clean Soil
W	Remove	124	0.0	Replace with Clean Soil
W	Remove	125	0.0	Replace with Clean Soil
W	Remove	126	0.0	Replace with Clean Soil
E		152	6.9	
E		153	10.0	
E		154	1.9	
E		155	27.1	

Table 3.1
Average Thorium Concentration in the Area of Contamination Zone After Removal

W	Remove	156	0.0	Replace with Clean Soil
W	Remove	157	0.0	Replace with Clean Soil
W	Remove	158	0.0	Replace with Clean Soil
W		159	6.5	
E		183	9.5	
E		184	24.0	
E		185	21.9	
E		186	33.3	
W	Remove	187	0.0	Replace with Clean Soil
W	Remove	188	0.0	Replace with Clean Soil
W	Remove	189	0.0	Replace with Clean Soil
W		190	0.3	
E		213	0.4	
E		214	65.2	
E		215	11.6	
E	Remove	216	0.0	Replace with Clean Soil
W	Remove	217	0.0	Replace with Clean Soil
W		218	15.1	
	W-Removed Previously	219	0.0	Replaced with Clean Soil
W		220 (ORISE 39-40	8.3	
E		243	1.6	
E		244	2.2	
E		245	1.4	
E		246	17.6	
W	Remove	247	0.0	Replace with Clean Soil
W		248	0.5	
	W-Removed Previously	249	0.0	Replaced with Clean Soil
E		260	6.5	
E		261	1.0	
E		262	0.4	
E		263	15.6	
W		264	2.5	
W	Remove	265	0.0	Replace with Clean Soil
W	Remove	266	0.0	Replace with Clean Soil
E		278	0.8	
E		279	0.3	
E		280	0.0	
E		281	1.6	
W		282	0.0	
W	Remove	283	0.0	Replace with Clean Soil
W	Remove	284	0.0	Replace with Clean Soil
E		310	0.3	

Table 3.1
Average Thorium Concentration in the Area of Contamination Zone
After Removal

E		311	0.3	
E		312	0.4	
E		313	25.9	
W		314	16.5	
W	Remove	315	0.0	Replace with Clean Soil
W		316	26.9	
E		348-349	3.6	
E		350-351	2.8	
W		352-353	0.5	
W		354-355	0.0	
W		356	3.6	
W		357	2.7	
W		358	16.7	
W		359 (ORISE 36-37)	14.5	
W		360	0.6	
W		361	0.6	
W		362	1.3	
W		363	0.5	
W		364	0.5	
W		365	0.0	
W		366	15.3	
W		367	0.0	
W	Remove	368	0.0	Replace with Clean Soil
W	Remove	369	0.0	Replace with Clean Soil
W	Remove	370	0.0	Replace with Clean Soil
W		371-372	0.9	
W		374	3.2	
W	Remove	375	0.0	Replace with Clean Soil
			6.0	**AVERAGE**

Table 3.4

1 -2 Meter Layer

Data are taken from Figure 3a of Site Charaterization Report, Phase II, Former Brooks and Perkins, Site., Inc., Revision 0, August 1999, prepared by B.Koh and Associates				
		Th232/Th228	Total Thorium	
	Th232/Th228	bkg sub	(Th-230 added)	
Grid #	pCi/g	pCi/g	pCi/g	
35	1.47	0.17	0.34	
35	1.47	0.17	0.34	
36	4.56	3.26	6.52	
36	4.56	3.26	6.52	
37	11.2	9.9	19.8	
37	10.5	9.2	18.4	
38	4.72	3.42	6.84	
38	4.32	3.02	6.04	
159	1.08	-0.22	0	
159	1.08	-0.22	0	
159	1.08	-0.22	0	
159	1.08	-0.22	0	
190	0.88	-0.42	0	
190	0.88	-0.42	0	
190	0.88	-0.42	0	
190	0.88	-0.42	0	
218	6.5	5.2	10.4	
218	4.46	3.16	6.32	
218	2.52	1.22	2.44	
218	8.3	7	14	
220	0.86	-0.44	0	
220	1.2	-0.1	0	
220	1.14	-0.16	0	
220	1.17	-0.13	0	
248	1.23	-0.07	0	
248	1.07	-0.23	0	
248	6.82	5.52	11.04	
248	1.4	0.1	0.2	
264	1.3	0	0	
264	1.3	0	0	
264	1.3	0	0	
264	1.3	0	0	
282	1.04	-0.26	0	
282	1.04	-0.26	0	
282	1.04	-0.26	0	
282	1.04	-0.26	0	
219	19.6	18.3	36.6	
219	20	18.7	37.4	
219	4.22	2.92	5.84	
219	114	112.7	225.4	
249	31	29.7	59.4	

Table 3.4

1 -2 Meter Layer

249	13.7	12.4	24.8	
249	250	248.7	497.4	
249	33	31.7	63.4	
314	1.36	0.06	0.12	
314	1.36	0.06	0.12	
314	1.36	0.06	0.12	
314	1.36	0.06	0.12	
315	0.93	-0.37	0	
315	0.93	-0.37	0	
315	0.93	-0.37	0	
315	0.93	-0.37	0	
316	1.075	-0.225	0	
316	1.075	-0.225	0	
316	1.075	-0.225	0	
316	1.075	-0.225	0	
352	3.78	2.48	4.96	
352	3.78	2.48	4.96	
352	3.78	2.48	4.96	
352	3.78	2.48	4.96	
353	1.21	-0.09	0	
353	1.21	-0.09	0	
353	1.21	-0.09	0	
353	1.21	-0.09	0	
354	3.44	2.14	4.28	
354	3.44	2.14	4.28	
354	3.44	2.14	4.28	
354	3.44	2.14	4.28	
355	1.08	-0.22	0	
355	1.08	-0.22	0	
355	1.08	-0.22	0	
355	1.08	-0.22	0	
356	1.22	-0.08	0	
356	1.22	-0.08	0	
356	1.22	-0.08	0	
356	1.22	-0.08	0	
357	0.97	-0.33	0	
357	0.97	-0.33	0	
357	0.97	-0.33	0	
357	0.97	-0.33	0	
358	3.52	2.22	4.44	
358	3.52	2.22	4.44	
358	3.52	2.22	4.44	
358	3.52	2.22	4.44	
359	1.12	-0.18	0	
359	1.12	-0.18	0	
359	1.12	-0.18	0	
359	1.12	-0.18	0	

Table 3.4

1 -2 Meter Layer

360	1.58	0.28	0.56	
360	1.58	0.28	0.56	
360	1.58	0.28	0.56	
360	1.58	0.28	0.56	
361	1.58	0.28	0.56	
361	1.58	0.28	0.56	
361	1.58	0.28	0.56	
361	1.58	0.28	0.56	
362	1.93	0.63	1.26	
362	1.93	0.63	1.26	
362	1.93	0.63	1.26	
362	1.93	0.63	1.26	
363	1.55	0.25	0.5	
363	1.55	0.25	0.5	
363	1.55	0.25	0.5	
363	1.55	0.25	0.5	
364	1.55	0.25	0.5	
364	1.55	0.25	0.5	
364	1.55	0.25	0.5	
364	1.55	0.25	0.5	
365	0.92	-0.38	0	
365	0.92	-0.38	0	
365	0.92	-0.38	0	
365	0.92	-0.38	0	
366	8.06	6.76	13.52	
366	8.46	7.16	14.32	
366	11.1	9.8	19.6	
366	8.08	6.78	13.56	
367	0.48	-0.82	0	
367	0.48	-0.82	0	
367	0.48	-0.82	0	
367	0.48	-0.82	0	
369	13.1	11.8	23.6	
369	16.4	15.1	30.2	
369	10.8	9.5	19	
369	15.8	14.5	29	
371	2.22	0.92	1.84	
371	2.22	0.92	1.84	
372	0.84	-0.46	0	
372	0.84	-0.46	0	
373	2.78	1.48	2.96	
373	2.78	1.48	2.96	
374	3	1.7	3.4	
374	3	1.7	3.4	
375	31.6	30.3	60.6	
375	50.6	49.3	98.6	
31	0.94	-0.36	0	

Table 3.4

1 -2 Meter Layer

31	0.94	-0.36	0	
32	0.88	-0.42	0	
32	0.88	-0.42	0	
33	0.82	-0.48	0	
33	0.82	-0.48	0	
34	0.86	-0.44	0	
34	0.86	-0.44	0	
69	1.11	-0.19	0	
69	1.11	-0.19	0	
69	1.11	-0.19	0	
69	1.11	-0.19	0	
70	1.16	-0.14	0	
70	1.16	-0.14	0	
70	1.16	-0.14	0	
70	1.16	-0.14	0	
71	0.66	-0.64	0	
71	0.66	-0.64	0	
71	0.66	-0.64	0	
71	0.66	-0.64	0	
72	0.89	-0.41	0	
72	0.89	-0.41	0	
72	0.89	-0.41	0	
72	0.89	-0.41	0	
94	1.8	0.5	1	
94	1.8	0.5	1	
94	1.8	0.5	1	
94	1.8	0.5	1	
95	1.08	-0.22	0	
95	1.08	-0.22	0	
95	1.08	-0.22	0	
95	1.08	-0.22	0	
96	1.2	-0.1	0	
96	1.2	-0.1	0	
96	1.2	-0.1	0	
96	1.2	-0.1	0	
97	1.04	-0.26	0	
97	1.04	-0.26	0	
97	1.04	-0.26	0	
97	1.04	-0.26	0	
119	1.66	0.36	0.72	
119	1.66	0.36	0.72	
119	1.66	0.36	0.72	
119	1.66	0.36	0.72	
120	1.13	-0.17	0	
120	1.13	-0.17	0	
120	1.13	-0.17	0	
120	1.13	-0.17	0	

Table 3.4

1 -2 Meter Layer

121	1.13	-0.17	0	
121	1.13	-0.17	0	
121	1.13	-0.17	0	
152	0.99	-0.31	0	
152	0.99	-0.31	0	
152	0.99	-0.31	0	
152	0.99	-0.31	0	
153	0.99	-0.31	0	
153	0.99	-0.31	0	
153	0.99	-0.31	0	
153	0.99	-0.31	0	
154	1.05	-0.25	0	
154	1.05	-0.25	0	
154	1.05	-0.25	0	
154	1.05	-0.25	0	
155	0.89	-0.41	0	
155	0.89	-0.41	0	
155	0.89	-0.41	0	
155	0.89	-0.41	0	
183	0.8	-0.5	0	
183	0.8	-0.5	0	
183	0.8	-0.5	0	
183	0.8	-0.5	0	
184	1.17	-0.13	0	
184	1.17	-0.13	0	
184	1.17	-0.13	0	
184	1.17	-0.13	0	
185	1.16	-0.14	0	
185	1.16	-0.14	0	
185	1.16	-0.14	0	
185	1.16	-0.14	0	
186	1.42	0.12	0.24	
186	1.42	0.12	0.24	
186	1.42	0.12	0.24	
186	1.42	0.12	0.24	
213	0.76	-0.54	0	
213	0.76	-0.54	0	
213	0.76	-0.54	0	
213	0.76	-0.54	0	
214	7.96	6.66	13.32	
214	5.54	4.24	8.48	
214	0.86	-0.44	0	
214	2.16	0.86	1.72	
215	2.94	1.64	3.28	
215	5.4	4.1	8.2	
215	1.18	-0.12	0	
215	126	124.7	249.4	

Table 3.4

1 -2 Meter Layer

216	4.08	2.78	5.56	
216	1.02	-0.28	0	
216	30.6	29.3	58.6	
216	2.18	0.88	1.76	
243	0.83	-0.47	0	
243	0.83	-0.47	0	
243	0.83	-0.47	0	
243	0.83	-0.47	0	
244	1.07	-0.23	0	
244	1.07	-0.23	0	
244	1.07	-0.23	0	
244	1.07	-0.23	0	
245	0.83	-0.47	0	
245	0.83	-0.47	0	
245	0.83	-0.47	0	
245	0.83	-0.47	0	
246	1.4	0.1	0.2	
246	1.4	0.1	0.2	
246	1.4	0.1	0.2	
246	1.4	0.1	0.2	
260	0.94	-0.36	0	
260	0.94	-0.36	0	
260	0.94	-0.36	0	
260	0.94	-0.36	0	
261	1.16	-0.14	0	
261	1.16	-0.14	0	
261	1.16	-0.14	0	
261	1.16	-0.14	0	
262	0.81	-0.49	0	
262	0.81	-0.49	0	
262	0.81	-0.49	0	
262	0.81	-0.49	0	
263	0.99	-0.31	0	
263	0.99	-0.31	0	
263	0.99	-0.31	0	
263	0.99	-0.31	0	
278	0.89	-0.41	0	
278	0.89	-0.41	0	
278	0.89	-0.41	0	
278	0.89	-0.41	0	
279	1.07	-0.23	0	
279	1.07	-0.23	0	
279	1.07	-0.23	0	
279	1.07	-0.23	0	
280	1.12	-0.18	0	
280	1.12	-0.18	0	
280	1.12	-0.18	0	

Table 3.4

1 -2 Meter Layer

280	1.12	-0.18	0	
281	1.14	-0.16	0	
281	1.14	-0.16	0	
281	1.14	-0.16	0	
281	1.14	-0.16	0	
310	0.9	-0.4	0	
310	0.9	-0.4	0	
310	0.9	-0.4	0	
310	0.9	-0.4	0	
311	0.92	-0.38	0	
311	0.92	-0.38	0	
311	0.92	-0.38	0	
311	0.92	-0.38	0	
312	0.85	-0.45	0	
312	0.85	-0.45	0	
312	0.85	-0.45	0	
312	0.85	-0.45	0	
313	1.47	0.17	0.34	
313	1.47	0.17	0.34	
313	1.47	0.17	0.34	
313	1.47	0.17	0.34	
348	1.17	-0.13	0	
348	1.17	-0.13	0	
349	1.19	-0.11	0	
349	1.19	-0.11	0	
350	1.13	-0.17	0	
350	1.13	-0.17	0	
351	1.34	0.04	0.08	
351	1.34	0.04	0.08	
35	1.47	0.17	0.34	
35	1.47	0.17	0.34	
36	4.56	3.26	6.52	
36	4.56	3.26	6.52	
37	10.5	9.2	18.4	
37	11.2	9.9	19.8	
38	4.32	3.02	6.04	
38	4.72	3.42	6.84	
74	3.88	2.58	5.16	
74	3.88	2.58	5.16	
74	3.88	2.58	5.16	
74	3.88	2.58	5.16	
75	38	36.7	73.4	
75	10.2	8.9	17.8	
75	3.32	2.02	4.04	
75	2.92	1.62	3.24	
76	4.74	3.44	6.88	
76	4.74	3.44	6.88	

Table 3.4

1 -2 Meter Layer

76	2.86	1.56	3.12	
76	2.86	1.56	3.12	
370	21.4	20.1	40.2	
370	31.2	29.9	59.8	
370	22.8	21.5	43	
370	21.4	20.1	40.2	
98	1.52	0.22	0.44	
98	1.52	0.22	0.44	
98	1.52	0.22	0.44	
98	1.52	0.22	0.44	
99	0.96	-0.34	0	
99	0.96	-0.34	0	
99	3.7	2.4	4.8	
99	1.02	-0.28	0	
101	8.36	7.06	14.12	
101	1.09	-0.21	0	
101	1.56	0.26	0.52	
101	1.56	0.26	0.52	
122	1.52	0.22	0.44	
122	1.52	0.22	0.44	
122	1.52	0.22	0.44	
122	1.52	0.22	0.44	
123	1.52	0.22	0.44	
123	9.2	7.9	15.8	
123	1.8	0.5	1	
123	5.18	3.88	7.76	
124	1.57	0.27	0.54	
124	1.57	0.27	0.54	
124	1.57	0.27	0.54	
124	1.57	0.27	0.54	
125	3.22	1.92	3.84	
125	3.22	1.92	3.84	
125	3.22	1.92	3.84	
125	3.22	1.92	3.84	
126	6.2	4.9	9.8	
126	6.2	4.9	9.8	
126	3.12	1.82	3.64	
126	3.12	1.82	3.64	
368	37	35.7	71.4	
368	37	35.7	71.4	
368	37	35.7	71.4	
368	37	35.7	71.4	
156	9.94	8.64	17.28	
156	1.18	-0.12	0	
156	5	3.7	7.4	
156	1.02	-0.28	0	
157	1.44	0.14	0.28	

Table 3.4

1 -2 Meter Layer

157	1.44	0.14	0.28	
157	1.44	0.14	0.28	
157	1.44	0.14	0.28	
158	1.87	0.57	1.14	
158	1.87	0.57	1.14	
158	1.87	0.57	1.14	
158	1.87	0.57	1.14	
187	1.28	-0.02	0	
187	3.5	2.2	4.4	
187	0.92	-0.38	0	
187	4.38	3.08	6.16	
188	9.18	7.88	15.76	
188	3.26	1.96	3.92	
188	5.66	4.36	8.72	
188	21	19.7	39.4	
189	11.1	9.8	19.6	
189	24.8	23.5	47	
189	3.28	1.98	3.96	
189	3.28	1.98	3.96	
217	1.11	-0.19	0	
217	6.62	5.32	10.64	
217	22.6	21.3	42.6	
217	9.26	7.96	15.92	
247	1.64	0.34	0.68	
247	1.64	0.34	0.68	
247	1.64	0.34	0.68	
247	1.64	0.34	0.68	
265	0.97	-0.33	0	
265	0.97	-0.33	0	
265	0.97	-0.33	0	
265	0.97	-0.33	0	
266	36.2	34.9	69.8	
266	17.2	15.9	31.8	
266	21.8	20.5	41	
266	3.98	2.68	5.36	
283	0.95	-0.35	0	
283	0.95	-0.35	0	
283	0.95	-0.35	0	
283	0.95	-0.35	0	
284	1.04	-0.26	0	
284	1.04	-0.26	0	
284	1.04	-0.26	0	
284	1.04	-0.26	0	
369	0.88	-0.42	0	
369	0.88	-0.42	0	
369	0.88	-0.42	0	
369	0.88	-0.42	0	

Table 3.4

1 -2 Meter Layer

371	4.32	3.02	6.04	
371	4.32	3.02	6.04	
100	32.8	31.5	63	
100	10.2	8.9	17.8	
100	51	49.7	99.4	
100	15.8	14.5	29	
73	1.02	-0.28	0	
73	1.02	-0.28	0	
73	1.02	-0.28	0	
73	1.02	-0.28	0	
218	6.5	5.2	10.4	
218	4.46	3.16	6.32	
218	8.3	7	14	
218	2.52	1.22	2.44	
248	1.57	0.27	0.54	
248	1.57	0.27	0.54	
248	1.57	0.27	0.54	
248	1.57	0.27	0.54	
264	2.56	1.26	2.52	
264	2.56	1.26	2.52	
264	2.56	1.26	2.52	
264	2.56	1.26	2.52	
282	1.01	-0.29	0	
282	1.01	-0.29	0	
282	1.01	-0.29	0	
282	1.01	-0.29	0	
Averagre Total Thorium Concentration			7.4	

4.0 WESTERN PARCEL SITE FEATURES

Prior to removal of overburden, the Western Parcel will be surveyed to establish the perimeter boundaries of the previously-designated plat of 10m X 10m grids/quadrants that comprise the Western Parcel work-zone/zone of contamination.

4.1 ACCUMULATED SURFACE DEBRIS

The Western Parcel is encumbered with randomly placed accumulations of debris, including scrap tires, piles of broken concrete, scrap metal, cinder block, wooden structural members, concrete structural members, concrete foundations, and broken asphalt.

Accumulated surface debris falls outside the scope of this project specific to the disposition of thorium-contaminated waste. As such, accumulated surface debris will be consolidated into a twenty-five (25) cubic yard roll-off box and transported to a Construction and Demolition Debris (C&DD) landfill in close proximity to the Inkster Road property.

4.2 TREES AND SCRUB BRUSH

The Western Parcel is bordered by numerous immature deciduous trees and thickets of scrub brush, some of which are within the boundaries of the proposed soils excavation footprint. Equipment will be utilized to remove the trees and scrub brush, leaving the lower 18" and root balls of said vegetation in place.

The tree limbs and scrub brush exceeding 18" above grade fall outside the scope of this project specific to the disposition of thorium-contaminated waste. As such, they will remain piled on-site or will be size reduced
and sent to a yard waste recycler at a later date.

4.3 SURFACE VEGETATION

Heavy equipment will be utilized to surface grade the Western Parcel and to place vegetation outside and contiguous to its northern boundary. As such, surface vegetation will remain piled on-site or will be sent to a yard waste recycler at a later date.

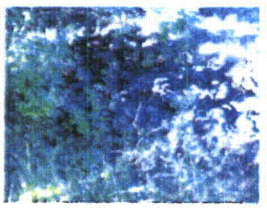
The resultant cleared open land area will be surveyed and pinned corresponding to the 10m X 10m grids/ quadrants established on the Western Parcel plat.


Site Photos 001

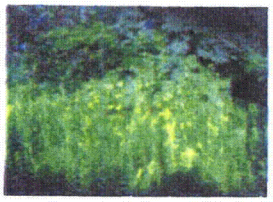

Site Photos 002


Site Photos 003

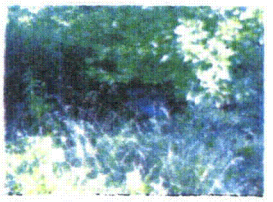

Site Photos 004


Site Photos 005


Site Photos 006


Site Photos 007


Site Photos 008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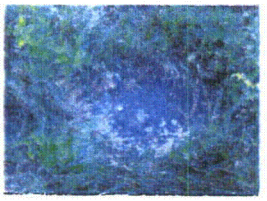
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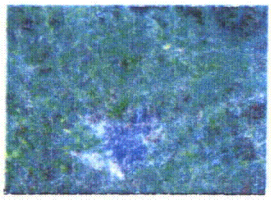
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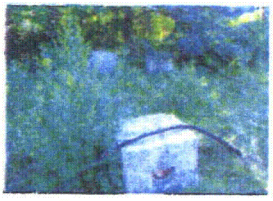
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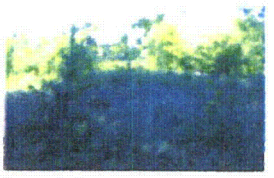
Site Photos 013

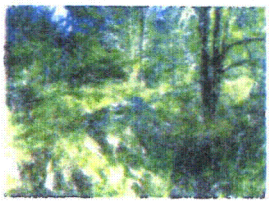

Site Photos 014


Site Photos 015


Site Photos 016


Site Photos 017


Site Photos 018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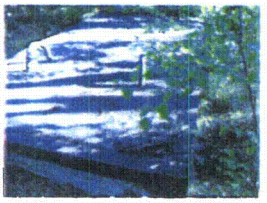
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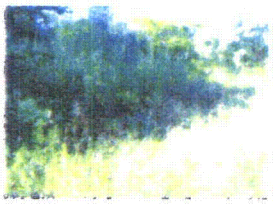
Site Photos 022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Site Photos 025


Site Photos 026

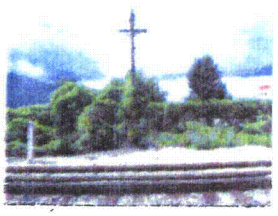

Site Photos 027


Site Photos 028


Site Photos 029


Site Photos 030


Site Photos 031


Site Photos 032

5.0 Environmental Overview

5.1 ENDANGERED SPECIES

A survey of endangered and/or protected species of plants and animals in Wayne County, MI resulted in the following:

SPECIES	STATUS	HABITAT
Indiana Bat	Endangered	Summer habitat includes small to medium river and stream corridors with well-developed riparian woods; woodlots within 1-3 miles of small to medium rivers and streams; and upland forests. Caves and mines as hibernacula
Eastern Massasauga	Candidate	Shallow wetlands and adjacent uplands
Northern Riffleshell	Endangered	Large streams and small rivers in firm sand or riffle areas; also occurs in Lake Erie
Rayed Bean Mussel	Endangered	Smaller headwater creeks, but sometimes found in large rivers
Eastern Prarie Orchid	Threatened	Mesic to wet prairies and meadows

Solutient referenced Section 7 of the USFWS Region III Endangered Species Act, followed by conversations with representatives of the United States Fish and Wildlife Service (USFWS) who confirmed the absence of endangered species of plants and animals on or in close proximity to the 12633 Inkster Road property or in that geography defined by USFWS as an "action area".

Additionally, said conversations confirmed the absence of the habitat that could support those species of endangered plants and animals indigenous to Wayne County, MI. Said inquiry took into account the future physical, chemical and biotic impacts to the environment of the actions to be undertaken by this project.

5.2 CONTIGUOUS PROPERTIES

To the North of the 12633 Inkster Road property are numerous light industrial and warehousing facilities whose normal working hours will correspond to the proposed work day for this project, and whose employees work indoors. Noise levels produced by operating equipment should have a negligible impact on these facilities and their employees. Should trucking operations create airborne particulate with the potential to carry onto contiguous properties to the North, steps will be taken to dampen the trucking route, thus eliminating airborne particulate. Airborne radiological particulate will be monitored

throughout the project's duration. A drainage ditch provides a natural barrier and a fenceline provides a constructed barrier on the northern boundary of the "action area".

To the East of the 12633 Inkster Road property is Inkster Road and light industrial and warehousing facilities whose normal working hours will correspond to the proposed work day for this project. We anticipate the same impacts as are associated with the properties to the North, with the addition of the possibility of material tracking from the haul truck tires onto the roadway. Care will be taken to monitor for and remove this material as necessary. The additional vehicle traffic created by this project will have a negligible impact on noise or congestion on Inkster Road. The physical plant provides a constructed barrier on the eastern boundary of the "action area".

To the South of the 12633 Inkster Road property is the CSX railway and a Wayne County Road Maintenance yard. Heavy equipment is utilized by county workers at this location. Thus, the additional noise created by our equipment operation should have negligible impact on this facility and its workers. With prevailing winds from the southwest, we do not anticipate the airborne migration of particulate on to these properties. A drainage ditch provides a natural barrier and the CSX railway provides a constructed barrier on the southern boundary of the "action area".

To the West of the 12633 Inkster Road property is a transportation company trailer staging lot with very little activity. A stand of trees will remain between the project work zone and the contiguous property; thus, coupled with prevailing winds from the southwest, we anticipate negligible impact on this facility and its employees. A change in elevation and tree line form a natural barrier and a fenceline provides a constructed barrier on the western boundary of the "action area".

5.3 OFF-SITE MIGRATION OF LIQUIDS, SOLIDS AND AIRBORNE PARTICULATE

Following clearing and grubbing, silt fence will be installed along the perimeter of the Western Parcel and along that portion of the Eastern Parcel used for stockpiling of imported fill materials and trucking routes associated therewith. Once the excavation zone along the driveway and contiguous to the electrical substation is firmly established, silt fence will be installed along the perimeter of the planned excavation.

HI-Q RAS pumps will be installed to the north and east of the "action area" to monitor for airborne particulate. In consultation with Solutient's Radiation Safety Officer, should elevated levels (defined as 25% of the Th232-DAC, Class Y, 1E-12 uCi/ml found in 10 CFR Part 20 Appendix B) be detected, Solutient will perform an investigation to determine the probable cause and document their findings. Should levels exceed 50% of the Th232-DAC, Solutient will institute appropriate engineering controls (ex: water misting)to reduce the particulate levels.

5.4 ACCUMULATED WATER IN EXCAVATIONS

Of major concern is the potential accumulation of entrained perched/groundwater and the possibility of weather events that would cause accumulation of rain water in open excavations. Thus, we are looking to obtain real-time analytical results that either confirm achievement of an average thorium concentration in the excavation cavity of <10pCi/g or that establish the need for and result in further vertical or horizontal soils removal, with backfill of the cavity as soon as practicable thereafter.

6.0 ALARA ANALYSIS FORMER BROOKS & PERKINS SITE

6.1 WESTERN PARCEL

The probabilistic dose assessment demonstrated that after remediation the radiological conditions of the Western and Eastern Parcels exceed the requirements for unrestricted release. Further dose reduction can only be achieved by removing additional contaminated soils and disposing of them at a licensed facility. NUREG 1757, Volume 2, Rev. 1, *Consolidated Decommissioning Guidance: Characterization, Survey and Determination of Radiological Criteria.* Section N.1.5, indicates that when soil removal is required, it is unlikely to be cost effective for unrestricted release and mathematical analyses are not necessary. Nevertheless, AAR undertook such an analysis and confirmed that proposed soil removal is already ALARA; demonstrating that no further remediation is necessary.

The remedial area (Grid 155W to Grid 60W) was chosen for the ALARA analysis. The average concentration of total thorium, after remediation is 6 pCi/g. The dose/source ratio at the peak mean dose is 2.4. This dose source ratio was used to calculate the thorium concentration ($DCGL_w$) that would equate to a dose of 25 mrem/year for unrestricted release. The resulting $DCGL_w$ is 10 pCi/g total thorium.

The following formula (N-8) from Appendix N, of Draft NUREG 1757, Volume 2, was used for the ALARA analysis:

$$\frac{Conc.}{DCGL_w} = \frac{Cost_T}{\$2000 \times P_D \times 0.025 \times F \times A} \times \frac{r+\lambda}{1-e^{-(r+\lambda)N}}$$

Conc.	=	concentration at which the benefit from removal equals the cost of removal
$DCGL_w$	=	derived concentration guideline equivalent to the average concentration of residual radioactivity that would give a dose of 25 mrem/year
$Cost_T$	=	total cost of removal (includes removal, transport, and burial only for this analysis)*
$2000	=	acceptable value for collective dose per NUREG/BR-0058, revision 2, November 1995.
P_D	=	population density, 0.0004/m^2 for land (generic value from Table N-2 of Appendix N)
0.025	=	annual dose to an average member of the critical group at the $DCGL_w$ in rems/year
F	=	fraction of residual radioactivity removed by the action
A	=	area being evaluated in m^2
λ	=	the radioactive decay constant for thorium
r	=	monetary discount rate, 0.03 for soil from Table N-2 of Appendix N

A $Cost_T$ of $140,000 was used in the calculation. It represents the cost for the removal ($35,000), transport and disposal ($105,000) of 500 m^3 of soil (i.e., remediation of the five 100 m^2 grids, to a depth of one meter, that AAR will remove in excess of the 27 grids required to achieve the $DCGL_w$. This soil removal results in an average thorium concentration of 6 pCi/g for remediation area which is a decrease of 4 pCi/g giving a value of F of 0..4. The area being evaluated, A, is 10.000 m^2. Because thorium has a very long half-life radioactive decay was ignored over the 1000 year assessment period (Lambda = 0 and N= 1000).

Using these values in the above equation, the concentration at which the benefit of further soil removal is equal to the cost is more than 50 times higher than the DCGLw, i.e., the ALARA analysis demonstrates that the costs of soil removal, already proposed by AAR far outweigh the benefits. Therefore, the residual levels are ALARA.

NRC guidance on ALARA, in NUREG-1757, Vol. 2, Section 6, and Appendix N, indicates that ALARA for decommissioning should include typical good practice efforts, such as removal of readily removable radioactivity in soils. Numerous reports by AAR, characterized the contamination as slag and incinerator ash mixed within a soil matrix. The slag, which is similar to crushed stone, and the ash are not readily removable from the soil. No large chunks of slag were identified in the site characterization nor encountered during the previous soils removal at the site. The characterization of the contaminant was confirmed by the NRC during various site visits and by the NRC's contractor, Oak Ridge Institute for Science and Education.

AAR Western Parcel Strategic Waste Excavation, Soils Management and Site Restoration RWP

7.0 ORGANIZATIONAL STRUCTURE

Site field services, site security and management of transportation and disposal services is the responsibility of Solutient Technologies, LLC, 6616 Promway Avenue, North Canton, OH 44720.

7.1 SITE FIELD SERVICES CONSIST OF THE FOLLOWING JOB TASKS:

1. Mobilization and Staging of Equipment, Materials and Supplies
2. Initial Survey to Establish Working Perimeter
3. Removal, Containerization Transportation and Disposal of Non-impacted Debris
4. Clearing and Grubbing
5. Installation of Erosion Control Materials as Deemed Necessary
6. Survey to Establish Incremental Grids/Quadrants
7. Construction of Haul Roads
8. On-site Stockpiling of Backfill Materials
9. Selective Excavation of Soils
10. Stockpiling of Soils Subject to Soils Mixing
11. Load-out of Soils
12. Real Time Analysis of Soil Samples
13. Radiological Survey of Outbound Haul Trucks and Equipment
14. Backfill, Rough Grade and Compaction of Backfill Material
15. Site Restoration as Deemed Necessary
16. Equipment Decontamination as Deemed Necessary
17. Release Survey of Equipment
18. Demobilization

7.2 SITE SECURITY SERVICES CONSISTS OF THE FOLLOWING JOB TASKS:

1. Controlled Access to 12633 Inkster Road Property
2. Use of Barrier Fence, Caution Tape and Cones to Establish Exclusion Zone, Transition Zone, Limits of Work Zone
3. Maintain Visitor Log

7.3 MANAGEMENT OF T&D SERVICES CONSISTS OF THE FOLLOWING JOB TASKS:

1. Ordering and Scheduling Roll-off Box(es) for Load-out, T&D of Site Debris
2. Ordering and Scheduling Backfill Material and Trucking of Same
3. Maintaining Backfill Materials Consumption and Trucking Documents and Records
4. Ordering and Scheduling LLRW Soil Trucking
5. Soils Sampling to Ensure Attainment of WAC
6. Scheduling Inbound Loads of LLRW Soil with Disposal Facility
7. Maintaining Transportation and Disposal Documents and Records
8. Surveying Outbound Vehicles and Equipment and Maintaining Survey Documents

AAR Western Parcel Strategic Waste Excavation and Site Restoration RWP

8.0 PERSONNEL ASSIGNMENTS AND AREAS OF RESPONSIBILITY/ACCOUNTABILITY

8.1 OWNER'S ENGINEER

1. Interface with regulatory authorities
2. Negotiate with EQ regarding Waste Acceptance Criteria (WAC)

8.2 RADIATION SAFETY OFFICER

1. Author site-specific radiation safety plan and health and safety plan, utilizing Solutient's Corporate Radiation Protection Written Procedures and Health and Safety Plan as the basis for same
2. Review and approve remedial work plan
3. Ensure that Solutient and subcontractor personnel have the training, qualifications and requisite licensing that corresponds to the anticipated Scope of Work and job tasks associated therewith
3. Respond to stop-work event and determine appropriate controls
4. Oversee implementation of appropriate controls and monitor effectiveness

8.3 PROJECT MANAGER

1. Design site logistics plan that ensures site security and maximizes the value of available resources
2. Schedule personnel, equipment, and receipt of materials and supplies
3. Coordinate field activities
4. Schedule sub-contracted waste transport vehicles
5. Schedule purchase and trucking of imported backfill materials
6. Schedule waste loads into disposal facility
7. Ensure attainment of project schedule and project goals
8. Maintain project logs, documents and records
9. Ensure amicable resolution to changes in the scope of work, if any

8.4 HEALTH PHYSICIST (NON-CERTIFIED)

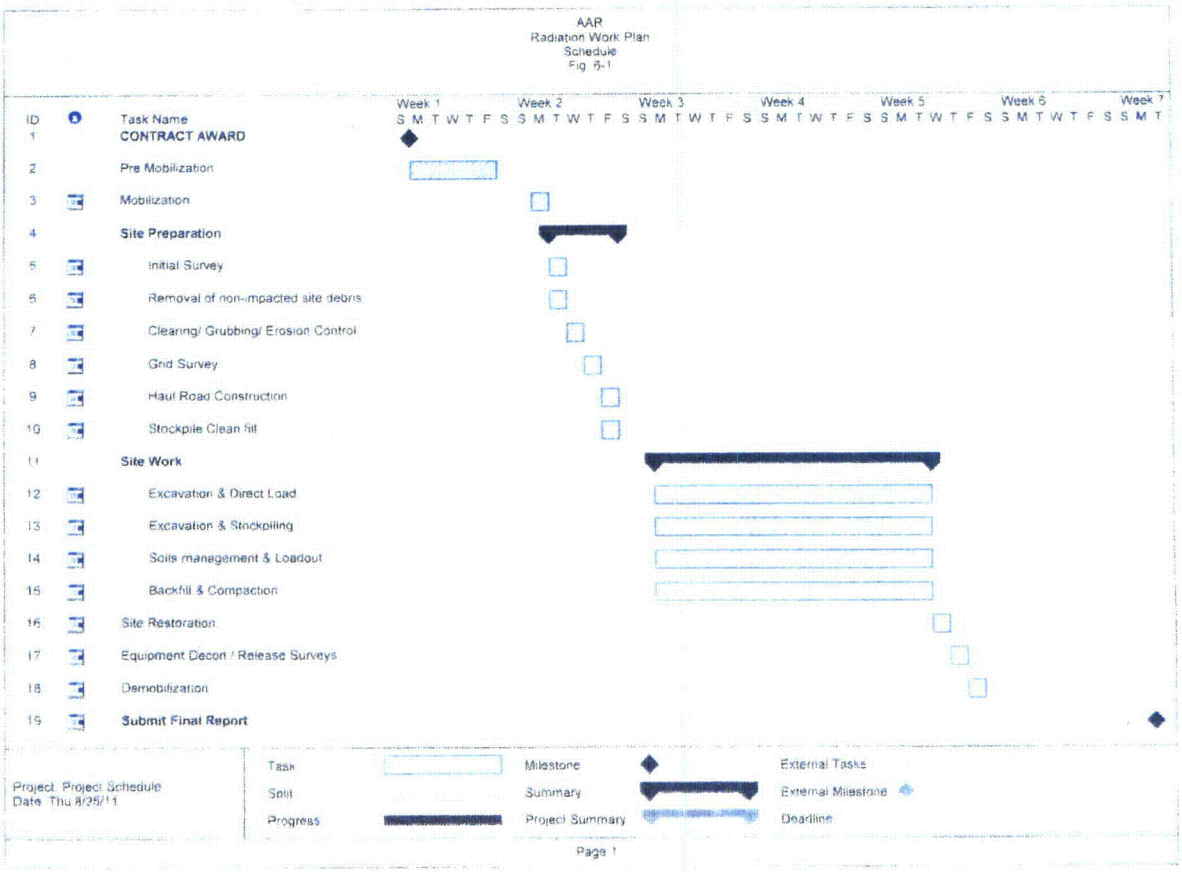
1. Conduct site-specific safety and radiation awareness training
2. Determine appropriate levels of Personal Protective Equipment (PPE)
3. Perform daily instrument background and source checks
4. Monitor release of airborne contaminants
5. Establish and monitor waste handling, sampling, analytical and equipment release procedures
6. Perform the duties of site safety officer

8.5 SITE SUPERVISOR

1. Supervise equipment operators
2. Supervise environmental technicians
3. Ensure proper utilization and maintenance of heavy equipment
4. Monitor on-site and off-site health and welfare of operators and technicians

AAR Western Parcel Strategic Waste Excavation and Site Restoration RWP

FIGURE 8-1
JOB TASKS AND
WORK PERFORMANCE SCHEDULE



Project schedule is based on ten-hour days during hours of daylight, Monday through Friday, excluding holidays. The schedule will remain flexible due to potential circumstances beyond the control of Solutient, including such factors as inclement weather, landfill hours of operation, delays due to regulatory issues, as examples.

AAR Western Parcel Strategic Waste Excavation, Soils Management and Site Restoration RWP

9.0 SITE PREPARATION

The Western Parcel open land area at the 12633 Inkster Road property is encumbered by immature trees, scrub brush, surface vegetation and randomly-placed piles of cinder block, wood, asphalt, concrete, scrap metal and scrap tires, as examples. Site soils characteristically retain high moisture, with the southwest quadrant of the Western Parcel especially susceptible. We anticipate encountering perched water in this southwest quadrant during soils excavation activities. Surface soils in the remainder of the open land area are spongy and damp.

Site preparation activities, listed chronologically, will consist of the following:

9.1 Establishing work Zones

Installation of barrier fence and establishment of exclusion zone, transition zone, equipment staging area, site soils and backfill material stockpile areas.

9.2 Initial Survey

An initial survey will be performed from l00W to 155W and from 75S to 35N to establish the outer limits of the Western Parcel excavation zone. Perimeter limits will be surveyed, staked and labeled by a licensed land surveyor, Ambit Land Surveyors, Inc. ("Ambit"), Plymouth, MI (Milletics and Associates, Plymouth, MI, who performed these services preparatory to remedial activities conducted in November 2006 merged into Ambit).

9.3 Clearing and Grubbing

All items of non-impacted debris that are discovered during a walk-over of the Western Parcel will be removed and consolidated into 25 cuyd roll-off boxes and subsequently disposed of as C&DD at a local licensed landfill.

Immature trees, scrub brush and vegetative cover will be moved via bulldozer to the outer limits of the Western Parcel to allow for a detailed survey of the resultant open land area.

9.4 Detailed Survey

Ambit will re-establish the 10m X 10m incremental grids corresponding to the grid layout that has been used historically at the site during site characterization and delineation and during previously-conducted remedial activities. Corners will be pinned and labeled.

Solutient and Owner's Representative will perform a walkover to ensure the accuracy of the survey and the grid numbering when compared to existing site remediation documents.

9.5 Haul Road Construction

Imported 1&3 backfill material will be used to construct those access ways necessary to position haul trucks during direct load-out of excavated soil and to facilitate site truck tramming of excavated soils to the site soils stockpile areas. Haul road construction will be limited to those surface areas that are not subject to excavation and those surface areas that have been excavated and backfilled to grade following excavation. Non-impacted road construction materials will eventually be used as backfill material in subsequent excavations.

AAR Western Parcel Strategic Waste Excavation and Site Restoration RWP

10.0 WESTERN PARCEL GRID EXCAVATIONS

10.1 ENCOUNTERED MATERIALS

Based on data supplied by Owner's Engineer, a minimum of thirty-two (32) grids will be excavated to a depth of one (1) meter below existing grade. Based on narratives regarding previous remedial activities contiguous to the Western Parcel and upon having obtained a limited number of hand auger samples in the Western Parcel to a depth of 18", we anticipate encountering native soils, soils impacted with brick bats and residual concrete, incineration slag resembling crushed stone and granular incinerator ash that was deposited in this area by Brooks and Perkins historically.

Random piles of debris such as scrap tires, scrap metal, blocks of concrete, cinder block, crushed concrete, wooden structures, are considered to be outside the scope of the RWP and will be surveyed. Should the results of the survey indicate that these materials meet the acceptance criteria for Republic Services Subtitle D landfill disposal (not to exceed five times background as measured in Counts Per Second [CPS]), said materials will be loaded into roll-off box(es) and transported to Sauk Trail Hills Landfill, 5011 S. Lilley Road, Canton, MI 48188. Should these materials exceed the Subtitle D landfill acceptance criteria, they will be included in the waste destined for EQ, Michigan.

Trees, scrub brush, vegetative cover and root balls associated therewith are considered to be outside the scope of the RWP and will be consolidated on-site in an area(s) outside the perimeter of the open land area that is subject to remedial activities. Should survey results indicate that these materials meet the acceptance criteria for Republic Services Subtitle D landfill disposal (not to exceed five times background as measured in Counts Per Second [CPS]), said materials will be loaded into roll-off box(es) and transported to Sauk Trail Hills Landfill, 5011 S. Lilley Road, Canton, MI 48188. Should these materials exceed the Subtitle D landfill acceptance criteria, they will be included in the waste destined for EQ, Michigan.

10.2 ANTICIPATED VOLUMES

For purposes of this RWP, twenty-nine (29) of the grids are 10m x 10m x 1m, and three (3) of the grids are 10m x 5m x 1m, giving us an estimated 3050 cubic meters of material to be excavated within the Western Parcel. This equates to 4,030yd^3. We anticipate an average soils density of ~ 1.29T per yd^3. Thus, we anticipate a volume of ~ 5,200T of material originating from the Western Parcel. The cost for disposal will be based on a "per ton" rate, with weights and measures as determined at the intended disposal facility.

10.3 EQUIPMENT UTILIZATION

Solutient plans to utilize one (1) bulldozer with operator to perform clearing of immature trees and scrub brush and to clear the excavation zone of surface humus. In doing so, the excavation zone is more easily and accurately surveyed in order to re-establish the 100m^2 grids upon which the excavation plan is based.

One trackhoe excavator with operator will work at the direction of the Solutient Project Manager to, when practicable, either (a) excavate and direct-load those soils that, in place, meet the disposal facility WAC or (b) concurrently excavate and mix "low level with high level soils" that, when sampled, represent homogenous material meeting the disposal facility WAC. This material will be direct-loaded into Michigan Gravel Trucks, each having a capacity of thirty-seven (37) cubic yards of material, and transported to EQ's Belleville, MI facility for landfill disposal.

One trackhoe with operator and one off-road haul truck will work at the direction of the Solutient Project Manager to, when practicable, excavate and tram soils of low total Thorium concentration and those soils exceeding the WAC for on-site segregation and stockpiling. This procedure will result in soil stockpiles that, through soils mixing and real time sampling/ analysis, will cause the material to meet the landfill WAC. Mixed soils meeting the WAC will be loaded into Michigan Gravel Trucks for transportation to EQ's Belleville, MI facility for landfill disposal.

10.4 ON-SITE STAGING OF SEGREGATED MATERIALS

Soils from each of the stockpiles will be formulated and loaded into the Michigan Gravel Trucks. The loaded material will be sampled/analyzed on-site to ensure that the formulated load meets the disposal facility WAC.

Radiation technicians trained and competent in the use of Gamma Spectroscopy, in the use of scaler/ rate meters with sodium iodide counters, and in the use of 44-9 GM Detectors will support the process of soils excavation, soils segregation, surveying of trucks and equipment, and off-site transportation for disposal.

Appropriate site security, material handling and erosion control measures will be implemented to prevent unauthorized access to the site and to prevent the intentional or inadvertent spread or release of contamination outside the control area(s).

Traditional values as published in NRC Regulatory guide 1.86 will dictate the release limits for personnel and equipment.

TABLE 10-1
GRIDS IDENTIFIED FOR EXCAVATION
(Tentative)

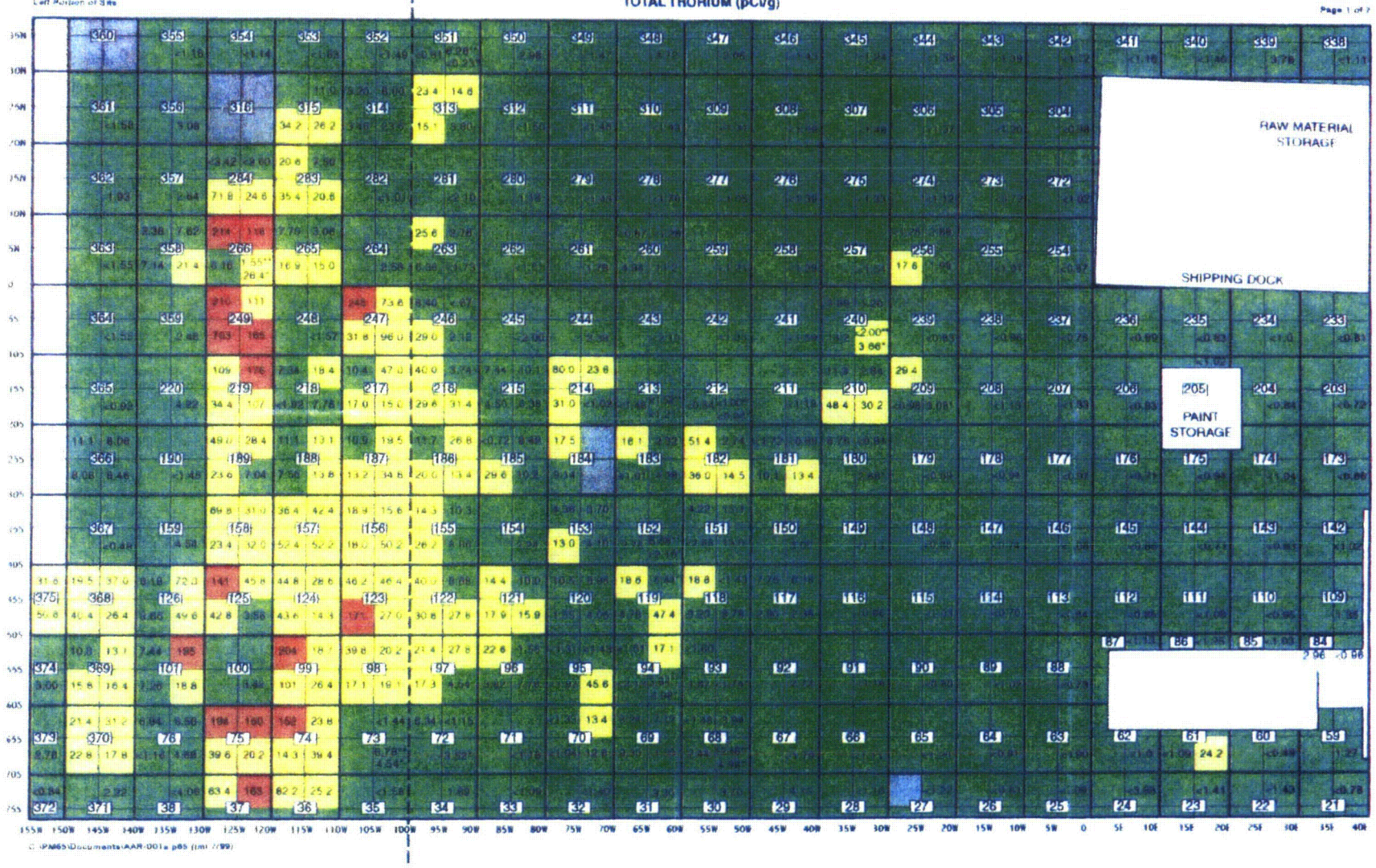
36	98	125	188	266	370
37	99	126	189	283	375
74	101	156	216	284	
75	122	157	217	315	
76	123	158	247	368	
94	124	187	265	369	

Upon verified completion of excavation of any one grid or contiguous grids, backfilling of the excavation cavity will occur within a reasonable time frame so as to avoid the potential entrainment of snow/ water and the adverse impact such weather events might have on site activities.

As can be seen on Table 10.2, the average total thorium concentration of the soils to be excavated and disposed offsite is 77.08 pCi/gm not including background concentration. If the background is included the average concentration is 78.11 pCi/gm. The Code of Federal Regulations 10 CFR 40.13 defines 'unimportant quantities of source material' as being exempt from regulation if the source material is less than 0.05% by weight. For thorium, concentration of 116 pCi/gm is equivalent to 0,05% by weight. Accordingly, the excavated material can be properly classified as unimportant quantities of source material.

Figure 3a

AAR PROJECT SITE
0-1 METER INCREMENT SOIL SAMPLE RESULTS
TOTAL THORIUM (pCi/g)



1 M = 3.28'
10 M = 32.8'

1 m² = 10.8 ft²

Figure 3a

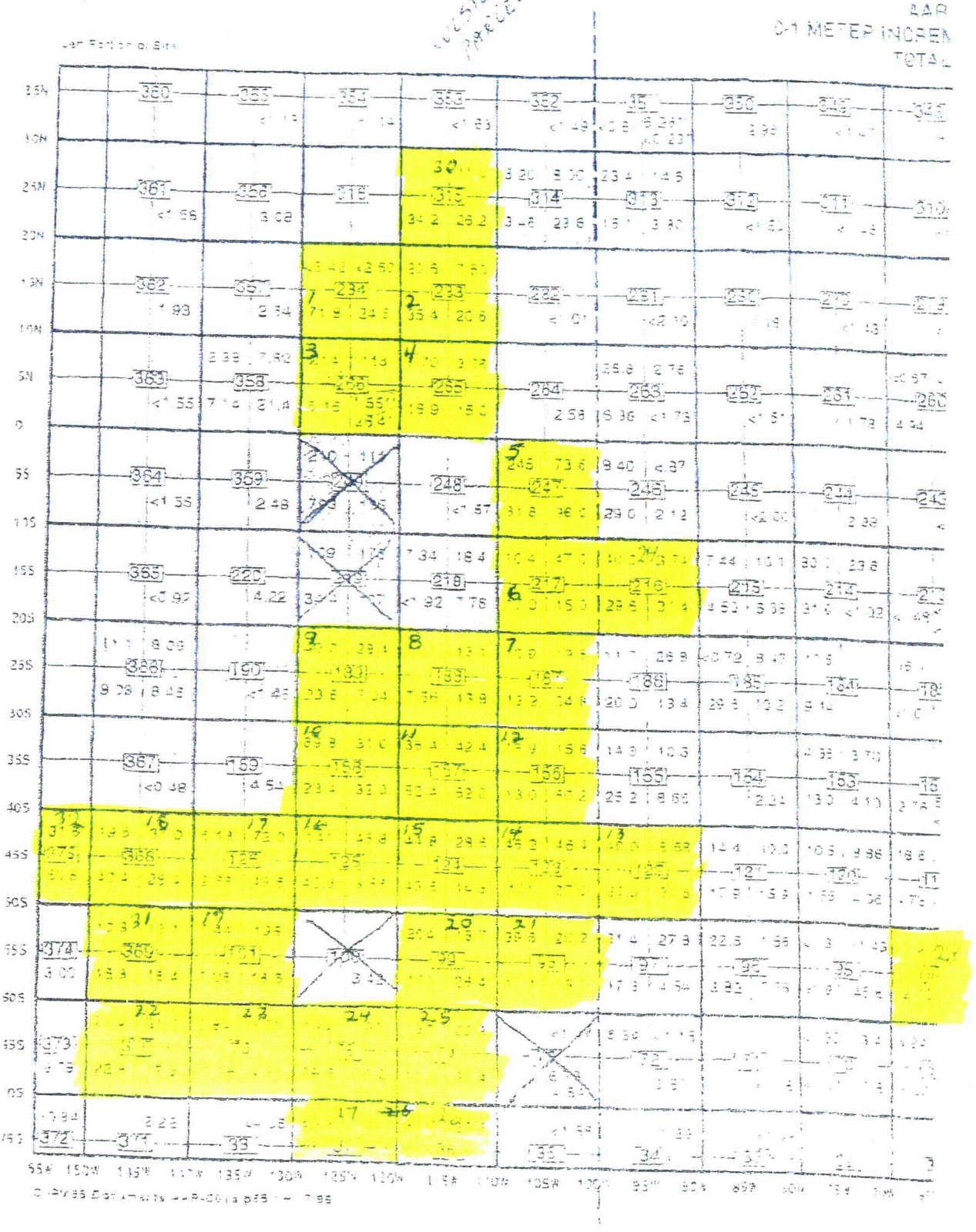


Table 10.2

Total Thorium Concentration of Excavated Material

Data Source	Grid #	Th232/Th228 pCi/g	Th232/Th228 bkg sub pCi/g	Total Thorium (Th-230 added) pCi/g	AAR Grid Avg. pCi/g	ORISE Grid Avg. pCi/g	Average AAR and ORISE pCi/g
AAR	36	25.2	23.9	47.8			
AAR	36	82.2	80.9	161.8	104.8		52.68
AAR	37	163	161.7	323.4			
AAR	37	63.4	62.1	124.2			
AAR	74	152	150.7	301.4			
AAR	74	23.8	22.5	45			
AAR	74	14.3	13	26			
AAR	74	39.4	38.1	76.2	112.15		
ORISE	74	30.86	30.26	74.7			
ORISE	74	23.05	22.45	58.89			
ORISE	74	8.31	7.71	21.85			
ORISE	74	61.4	60.8	127.24		70.67	91.41
AAR	75	160	158.7	317.4			
AAR	75	20.2	18.9	37.8			
AAR	75	194	192.7	385.4			
AAR	75	39.6	38.3	76.6	204.3		204.3
AAR	76	8.56	7.26	14.52			
AAR	76	4.68	3.38	6.76			
AAR	76	6.84	5.54	11.08			
AAR	76	1.16	-0.14	-0.28	8.02		8.02
AAR	94			-0.576			
AAR	94			1.64			
AAR	94			5.08			
AAR	94			31.6	9.436		
ORISE	94			317.7			
ORISE	94			198.8			
ORISE	94			111.64			
ORISE	94			85.3		178.36	93.898
AAR	98	20.2	18.9	37.8			
AAR	98	19.1	17.8	35.6			
AAR	98	39.8	38.5	77			
AAR	98	17.1	15.8	31.6	45.5		45.5
AAR	99	18.7	17.4	34.8			
AAR	99	26.4	25.1	50.2			
AAR	99	204	202.7	405.4			
AAR	99	101	99.7	199.4	172.45		
ORISE	99	95.4	94.8	202.24			
ORISE	99	95.7	95.1	302.54			
ORISE	99	9.82	9.22	23.06			
ORISE	99	263.4	262.8	563.24		272.77	222.61
AAR	101	195	193.7	387.4			
AAR	101	18.8	17.5	35			
AAR	101	7.44	6.14	12.28			

Table 10.2

Total Thorium Concentration of Excavated Material

AAR	101	7.26	5.96	11.92	111.65		111.65
AAR	122			77.4			
AAR	122			59			
AAR	122			53			
AAR	122			14.76			51.04
AAR	123	46.4	45.1	90.2			
AAR	123	27	25.7	51.4			
AAR	123	46.2	44.9	89.8			
AAR	123	171	169.7	339.4	142.7		142.7
AAR	124	28.6	27.3	54.6			
AAR	124	14.3	13	26			
AAR	124	44.8	43.5	87			
AAR	124	43.6	42.3	84.6	63.05		63.05
AAR	125	45.8	44.5	89			
AAR	125	3.56	2.26	4.52			
AAR	125	141	139.7	279.4			
AAR	125	42.8	41.5	83	113.98		113.98
AAR	126	72	70.7	141.4			
AAR	126	49.6	48.3	96.6			
AAR	126	6.18	4.88	9.76			
AAR	126	9.66	8.36	16.72	66.12		66.12
AAR	156	15.6	14.3	28.6			
AAR	156	50.2	48.9	97.8			
AAR	156	18.9	17.6	35.2			
AAR	156	18	16.7	33.4	48.75		48.75
AAR	157	42.4	41.1	82.2			
AAR	157	52.2	50.9	101.8			
AAR	157	36.4	35.1	70.2			
AAR	157	52.4	51.1	102.2	89.1		89.1
AAR	158	31	29.7	59.4			
AAR	158	32	30.7	61.4			
AAR	158	69.8	68.5	137			
AAR	158	23.4	22.1	44.2	75.5		75.5
AAR	187	19.5	18.2	36.4			
AAR	187	34.8	33.5	67			
AAR	187	10.9	9.6	19.2			
AAR	187	13.2	11.9	23.8	36.6		36.6
AAR	188	13.1	11.8	23.6			
AAR	188	13.8	12.5	25			
AAR	188	11.1	9.8	19.6			
AAR	188	7.56	6.26	12.52	20.18		20.18
AAR	189	28.4	27.1	54.2			
AAR	189	7.04	5.74	11.48			
AAR	189	49	47.7	95.4			
AAR	189	23.6	22.3	44.6	51.42		51.42
AAR	216			77.44			
AAR	216			56.6			

Table 10.2

Total Thorium Concentration of Excavated Material

AAR	216			60.2			
AAR	216			4.88	49.78		49.78
AAR	217	47	45.7	91.4			
AAR	217	15	13.7	27.4			
AAR	217	10.4	9.1	18.2			
AAR	217	17	15.7	31.4	42.1		42.1
AAR	247	245	243.7	487.4			
AAR	247	73.6	72.3	144.6			
AAR	247	31.8	30.5	61			
AAR	247	96	94.7	189.4	220.6		220.6
AAR	265	3.06	1.76	3.52			
AAR	265	15	13.7	27.4			
AAR	265	7.7	6.4	12.8			
AAR	265	16.9	15.6	31.2	31.2		18.73
AAR	266	118	116.7	233.4			
AAR	266	1.55	0.25	0.5			
AAR	266	214	212.7	425.4			
AAR	266	6.16	4.86	9.72	167.255		
ORISE	266	38.4	37.8	129.24			
ORISE	266	15.87	15.27	30.11		79.675	123.465
AAR	283	7.5	6.2	12.4			
AAR	283	20.6	19.3	38.6			
AAR	283	20.6	19.3	38.6			
AAR	283	35.4	34.1	68.2	39.45		39.45
AAR	284	2.6	1.3	2.6			
AAR	284	24.6	23.3	46.6			
AAR	284	3.42	2.12	4.24			
AAR	284	71.8	70.5	141	48.61		48.61
AAR	315	11	9.7	19.4			
AAR	315	26.2	24.9	49.8			
AAR	315	34.2	32.9	65.8			
AAR	315	34.2	32.9	65.8	50.2		50.2
AAR	368	37	35.7	71.4			
AAR	368	26.4	25.1	50.2			
AAR	368	19.5	18.2	36.4			
AAR	368	40.4	39.1	78.2	59.05		59.05
AAR	369	13.1	11.8	23.6			
AAR	369	16.4	15.1	30.2			
AAR	369	10.8	9.5	19			
AAR	369	15.8	14.5	29	25.45		25.45
AAR	370	31.2	29.9	59.8			
AAR	370	17.8	16.5	33			
AAR	370	21.4	20.1	40.2			
AAR	370	22.8	21.5	43	44		44
AAR	375	31.6	30.3	60.6			
AAR	375	50.6	49.3	98.6	79.60		79.60

Table 10.2

Total Thorium Concentration of Excavated Material

		47.91019608					77.08203

AAR Western Parcel Strategic Waste Excavation, Soils Management and Site Restoration RWP

11.0 DOCUMENTATION/RECORDKEEPING

11.1 SOLUTIENT RADIOACTIVE MATERIALS LICENSE

A copy of Solutient's Radioactive Materials License, License Procedures and generic Radiation Work Plan will be retained on site for review by others.

11.2 SITE-SPECIFIC HEALTH AND SAFETY PLAN

The Health and Safety Plan for this Remedial Action is based on Solutient's Corporate Health and Safety Plan Document and Solutient's Standard Operating Procedures Manual, incorporating site-specific issues, such as radiological and non-radiological hazards, working in close proximity to heavy equipment, appropriate levels of personal protective equipment, applicable federal and state OSHA regulations and emergency contacts and procedures.

11.3 SITE-SPECIFIC RADIATION WORK PLAN

The Radiation Work Plan for this Remedial Action will address general area radiation levels, anticipated radiological exposures, dosimetry requirements, personal protective equipment/respiratory protection, ALARA guidelines, air monitoring requirements and response to discovered anomalies.

11.4 INSTRUMENT CALIBRATION AND SOURCE CHECKS

Solutient will maintain a record of daily source checks and calibration and will record background checks prior to and following daily site activities.

11.5 INCOMING EQUIPMENT RADIOLOGICAL SURVEYS

All pieces of working equipment will be surveyed prior to entering the control zone and a record maintained thereof.

11.6 INCOMING TRANSPORTATION VEIDCLE VISUAL INSPECTION

All incoming trucks that will be transporting waste to EQ for disposal will be visually inspected prior to moving them into position for load-out of soils. Trucks will be checked for internal and external cleanliness, tightness of tailgate, installation of liner (if required).

11.7 OUTBOUND VEIDCLE RELEASE SURVEY

All vehicles that, during the course of on-site activities, entered the control area will be surveyed prior to exiting the transition zone outbound.

11.8 LOADED SOILS/HOMOGENOUS MIXED SOILS ANALYTICAL

Records will be maintained of the survey results of a homogeneous sample of each outbound load of soil based on whether the material was direct-loaded or resulted from soils management techniques.

11.9 WASTE MANIFEST DOCUMENTS

Waste manifest documents will be pre-printed by the disposal facility and delivered to the Project Manager prior to project inception. Each manifest will have a unique manifest/materials tracking number. Owner will provide Solutient's Project Manager written authorization to sign as Generator/Offeror.

11.10 IMPORTED MATERIALS AND SUPPLIES BILLS OF LADING

Solutient will retain copies of bills of lading/weigh tickets for all incoming materials and supplies as a cross check against supplier invoicing.

11.11 TRUCK TICKETS

Solutient will retain copies of truck utilization tickets as a cross check against transporter invoicing.

11.12 DAILY/WEEKLY PROGRESS REPORTS

Owner's Representative will be provided with daily job task performance/completion reports and will receive weekly reports indicating to what extent project goals and time lines are being met.

11.13 PHOTO JOURNAL

Solutient will maintain a photo journal that will depict the site (1) prior to inception of site activities, (2) at completion of site preparation, (3) during excavation and load-out, (4) during soils management activities, (5) during the process of homogeneous soils sampling and analysis, (6) prior to and during placement of stockpiled backfill material and site soils, (7) during backfill, grading and compaction.

11.14 PROJECT FINAL REPORT

Solutient will provide AAR CORP. with a comprehensive narrative final report inclusive of a project chronology and all of the documents/records identified herein.

AAR Western Parcel Strategic Waste Excavation, Soils Management and Site Restoration RWP

12. QUALITY ASSURANCE/QUALITY CONTROL

12.1 RADIOLOGICAL INSTRUMENT CALIBRATION

Instrumentation utilized during the 12633 Inkster Road, Livonia, MI site remediation and restoration project will be maintained and calibrated to manufacturer's specifications to ensure the accuracy, precision and sensitivity dictated by the Remedial Work Plan (RWP). Calibration sheets, maintenance records and daily background/source check sheets will be retained on-site for review and inspection by those utilizing task-specific instrumentation and for administrative and regulatory personnel who wish to confirm that instrumentation calibration is current.

12.2 INSTRUMENTATION BACKGROUND AND SOURCE CHECKS

Daily logs will be maintained that identify instrument/probe:

- Manufacturer
- Model
- Serial Number
- Calibration Due Date
- Check Source
- Background Readings
- Source Check Readings

12.3 RESPONSIBILITY & ACCOUNTABILITY

The site Health Physicist is responsible for instrument security, calibration, maintenance and daily checks, and for maintaining and retaining documentation associated therewith.

12.4 INSTRUMENT UTILIZATION

Solutient intends to employ the following instrumentation during site activities:

INSTRUMENT
Ludlum Model2241-2
Ludlum Model 2224
Ludlum Model 2221
Ludlum Model 19
Cambera Gamma Spec

DETECTOR
Ludlum Model44-9 (15cm2)
Ludlum Model43-89 (100cm2)
Ludlum 44-10 (2 X 2)
Germanium

UTILIZATION
Frisk Personnel In/Out
Equipment Release Survey
Walk-over Activity Level Survey
Haul Truck External Dose Rates
Isotopes/Soil Mixing Activities

13.0 REFERENCES

Notification Letter to Mr. Howard A. Pulsifer, AAR General Counsel, 19 August 1994, USNRC

Revised Probabilistic Dose Assessment, June 2005, Partners Environmental

NRC Approval Letter to Mr. Howard A. Pulsifer, AAR General Counsel, 27 October 2006, USNRC

Radiological Risk Assessment for the AAR Site in Livonia, MI, December 2006, Rev. 1, USNRC

Final Site Remediation Report Former Brooks & Perkins Site, 11 April 2007, Energy Solutions

Final Site Remediation report Former Brooks & Perkins Site, 11 April 2007, Partners Environmental

Technical Evaluation Report Radiological Status: Acceptability of CSX Transportation Property for Unrestricted Use, Docket 040-00235, June 2011, USNRC

USNRC Guide NUREG-1757, Volume 1, Revision 2, Section 15.13

USNRC Guide NUREG-1757, Volume 2, Appendix N, Section 1.5

USNRC 10 CFR 20.1402 Radiological Criteria for Unrestricted Use

USNRC 10 CFR 20.2002 Method for Obtaining Approval of Proposed Disposal Procedures

USNRC 10 CFR 20.2008 Disposal of Certain Byproduct Material

USNRC: SECY-10-0043 Blending of Low-Level Radioactive Waste, 7 April 2010

USNRC: SECY-04-0035 Results of the License Termination Rule Analysis of the Use of Intentional Mixing of Contaminated Soil

WM'07 Conference, February 25-March 1, 2007, Tucson, AZ, "Methodology & Execution of Blending"

Letter to Mr. Thomas E. Magette, Energy Solutions, Blending of Low-Level Radioactive Waste, 27 August 2009, USNRC

Solutient Technologies, LLC Corporate Health and Safety Plan

Solutient Technologies, LLC Standard Operating Procedures Guidance Document