CUMMINGS
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CONSULTANTS, INC.

DATA SUMMARY REPORT - RADIOLOGICAL TESTING
FORMER ZIRCALOY BURN AREA
WESTINGHOUSE ELECTRIC COMPANY
SPECIALTY METALS PLANT
BLAIRSVILLE, PENNSYLVANIA

PREPARED FOR:
WESTINGHOUSE ELECTRIC COMPANY
SPECIALTY METALS PLANT
BLAIRSVILLE, PENNSYLVANIA

PROJECT NO. 96205.50/02
JUNE 15, 1999

339 Haymaker Road • Parkway Building • Suite 201 • Monroeville, PA 15146
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RITER
CONSULTANTS, INC.

June 15,1999
Project No. 96205.50/02

Mr. Daniel Wesolowski
Manager - Environmental Health and Safety
Westinghouse Electric Company
Specialty Metals Plant
R.D. #4 Box 333
Westinghouse Road
Blairsville, PA 15717-8904

RE: TRANSMITTAL - DATA SUMMARY REPORT
RADIOLOGICAL TESTING - FORMER ZIRCALOY BURN AREA
WESTINGHOUSE ELECTRIC COMPANY - SPECIALTY METALS PLANT
BLAIRSVILLE, PENNSYLVANIA

Dear Mr. Wesolowski:

Enclosed please find nine copies of the above-referenced report. Cummings/Riter Consultants, Inc. appreciates the opportunity to be of service to Westinghouse.

Please call me at (412) 373-5240 if you have any questions.

Sincerely,
Cummings/Riter Consultants, Inc.

William A. Baughman, P.G.
Project Manager

WAB/DMW/wb
Enclosure

pc: Mr. Joseph Nardi - Westinghouse Electric Company (w/enclosure – five copies)

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1.0 INTRODUCTION

Cummings/Riter Consultants, Inc. (Cummings/Riter) is pleased to submit this report to Westinghouse Electric Company (Westinghouse) in reference to the soil sampling program conducted in November 1998 by Cummings/Riter at the Specialty Metals Plant located in Blairsville, Pennsylvania. Specifically, this report includes procedures for the collection and characterization of soil cores, handwritten copies of the soil sample description logs, chain-of-custody forms, a soil boring location map, and a fence diagram of the former Zircaloy Burn Area at the Specialty Metals Plant (Figure 1). A summary of the physical and radiological characteristics of the area based on the soil-coring program is also provided. In addition, soil sampling and radiological testing performed by Westinghouse at the former Zircaloy Burn Area is included as Appendix A.

1.1 SITE BACKGROUND

The Specialty Metals Plant was founded in 1955 as a research and development manufacturing facility for Westinghouse. Westinghouse began manufacturing zircaloy tubing in 1967. The Specialty Metals plant historically manufactured two lines of nuclear grade tubing, including stream generator tubing and fuel clad tubing. The plant currently manufactures only fuel-clad tubing. Manufacture of the tubing includes the use of a variety of lubricants, solvents, acid pickle solutions, and alkaline cleaners. Several spent solutions and/or materials used in the plant process are managed as hazardous wastes under the Resource Conservation and Recovery Act. These materials are treated and disposed of off site.

During the period from approximately 1955 to 1961, fuel manufacturing operations were conducted at the Specialty Metals plant using enriched uranium in both metal and oxide

forms. This involved both highly enriched uranium for the Navy fuel program (under subcontract with the Bettis Atomic Power Laboratory for U.S. Atomic Energy Commission work) and low enriched uranium for atomic power plants (under License SNM-37 from the U.S. Atomic Energy Commission).

1.2 SUMMARY OF PREVIOUS INVESTIGATIONS

A series of radiological investigations have been performed in the vicinity of the former Zircaloy Burn Area, and are summarized as follows:

- ***Phase I Site Investigation:*** Cummings/Riter performed a Phase I site investigation of soils, sediments, groundwater, and surface water at the site in October and November, 1994 (Cummings/Riter, 1995a). Included in this investigation were ten subsurface boring in the vicinity of the former Zircaloy Burn Area, with twelve soil samples from these borings analyzed for radiological parameters. In addition, 234 discrete surface soil samples were collected from a 25–foot grid established in the same area for initial screening using a gamma survey instrument. Seventeen of these surface soil samples were then submitted for analysis of specific radioisotopes. Radiochemistry results for selected surface and subsurface soil samples indicated the presence of total uranium of concentrations in excess of 30 picoCuries per gram (pCi/g). Such results are indicative of enriched uranium rather than natural uranium.

- ***Phase II Investigation:*** Cummings/Riter performed a Phase II investigation of soils and groundwater at the site in August through October, 1995 (Cummings/Riter, 1995b). As part of this investigation, 28 surface soil samples were collected from a 25-foot grid established immediately east of the Phase I sampling grid at the Former Zircaloy Burn Area. Samples were screened using a gamma survey instrument. A magnetometer survey was also performed at the area, as well as additional surface scanning using a gamma survey instrument in areas that had been identified as exhibiting radiological activity above background. After an initial surface remediation effort established that impacts were present at greater depths, a series of test trenches were excavated at the area to a depth of up to two meters. Upon completion of each trench, the exposed soils were scanned using a gamma survey instrument, and samples were collected from the trenches at five meter intervals for subsequent radiological analysis. The results of the various surveys performed as

part of the Phase II investigation (radiological, trenching, and magnetometer) indicated the presence of enriched uranium, with total localized uranium concentration exceeding 30 pCi/g in surface and subsurface materials at the Former Zircaloy Burn Area.

- ***Addendum – Phase II Investigation:*** Cummings/Riter performed an additional Phase II characterization of site soils and groundwater in April, September, and October, 1996 (Cummings/Riter, 1996). Included in the additional work was an assessment of a former lagoon reportedly adjacent to the existing sludge drying beds. As part of this work, electromagnetic geophysical surveys (EM-31 and EM-61) and trenching were performed in order to located and characterize the former lagoon, and two soil samples were collected from the trenches for radiological analysis. Small quantities of processed uranium were identified with some of the debris encountered in the former lagoon, but general levels of radioactivity were consistent with normal background.

2.0 FIELD SAMPLING ACTIVITIES

2.1 DRILLING AND SOIL CORING PROCEDURES

Pennsylvania Drilling Company of McKees Rocks, Pennsylvania was retained by Cummings/Riter to collect soil cores using a 4¼-inch inside diameter (I.D.) hollow stem auger equipped with a 3½-inch I.D. split core barrel sampler. Soil cores were collected from 48 boring locations (Figure 1). A majority of the borings were advanced to five feet below ground surface; however, borings located south of the underground gasoline transmission line were deeper due to thicker sequences of unconsolidated deposits at this location. The borings were advanced below the fill/indigenous soil interface (in borings which encountered fill), to the top of bedrock, or to a maximum depth of 15 feet.

The soil cores were extracted from the split-barrel sampler and placed in a wooden core box. Wooden core boxes were properly labeled with the boring number, sample date, sample interval, and percentage of recovery marked with indelible ink. The cores were logged by a Cummings/Riter geologist for distinguishing characteristics including color, grain size, soil type, moisture content, and the presence of waste materials. Soil boring logs are included as Appendix B.

The soil core borings were monitored for organic vapors using an HNu Systems photoionization detector (PID) with a 10.2 electron-volt (eV) lamp. Organic vapor monitoring did not indicate exceedances of background concentrations. Westinghouse health physics personnel continuously monitored the drilling activities and soil cores using a gamma survey meter (Ludlum Model 2221 meter with a 1X1 sodium iodide [NaI] detector) and a beta/gamma survey meter (Model 140 meter with a GM pancake probe).

Pin flags were used to mark each soil core location. Upon completion of each boring, an eight-inch I.D. polyvinyl chloride (PVC) casing was installed by Carlucci Construction to allow for further radiological testing by a Westinghouse health physicist. In some instances, there was some partial collapse of the core hole prior to installation of the casing. Chain-of-custody forms were used to document sample custody. Copies of the chain-of-custody forms are included as Appendix C. Core boxes were stored on site in a secure location.

The hollow-stem augers and split core barrels were steam cleaned on a plastic-lined temporary decontamination pad upon arrival at the site, between sampling locations, and at the conclusion of sampling. Water used for steam cleaning was obtained from a potable supply located in Blairsville, Pennsylvania. The water generated by the decontamination procedure was transferred to a polyethylene storage tank for characterization and disposal by Westinghouse. Swipe samples of the drill rig were collected by a Westinghouse health physics representative for radiological testing prior to demobilizing the drilling equipment.

A professional surveyor licensed in the Commonwealth of Pennsylvania located the horizontal position and vertical elevation of each soil core location. Vertical elevations were measured to the nearest 0.1 foot in feet above mean sea level. Table 1 summarizes the coordinates, elevations, and contacts between fill, indigenous soil, and bedrock for each sample location.

2.2 DOWNHOLE LOW-ENERGY GAMMA SURVEY

Following completion of the soil-coring program, a low energy gamma (L.E.G.) radiation survey was performed by Westinghouse representatives on each boring at 6-inch intervals, starting at the surface and ending at the bottom of each hole. A Ludlum Measurements Inc. Model 2221 "1 x 1" NaI detector was used. All distances were measured from the effective center of the sodium iodide (Nal crystal. The ground surface being "zero" and the highest distance being the bottom of each hole. All counts taken were accumulated for one minute in gross counts per minute. A one-minute background, three feet above each hole was also recorded. This survey data was collected over a three-day period. Each day, a response check of the instrument was performed. This source response is also listed for each hole. This data is presented in Table 2. "NA" denotes portions of the borings that collapsed and could not be surveyed using the downhole probe.

2.3 INITIAL CORE SAMPLING AND LABORATORY ANALYSIS

Based on the visual observations from the soil cores and the downhole L.E.G. survey data, 70 sample intervals most likely to exhibit the highest levels of radiological activity were identified for additional radiological analysis. Each sample interval was identified in the core storage box and the sample removed using a clean stainless steel trowel. The selected sample intervals were placed in new plastic sample containers, counted in the MS-2 counter

and delivered to Antech, Ltd., an independent testing laboratory located at the Westinghouse Waltz Mill facility in Madison, Pennsylvania for analysis of U-235 and other radiological isotopes via gamma spectroscopy. The summary of the MS-2 counting data and the U-235 results from Antech for these 70 samples and approximately 100 additional samples are presented in Table 3. A figure depicting the correlation of these data is provided as Figure 3. The chain-of-custody forms are included in Appendix C and the complete analytical reports are included in Appendix D.

2.4 RADIOLOGICAL COUNTING OF THE CORE SEGMENTS

The soil cores recovered from the coring program were segmented into 2 to 4 inch intervals and placed in clean plastic containers. The core segments from areas of known or suspected radiological activity above background based on previous downhole L.E.G. and gamma spectrometry results were then counted using an MS-2 counter with a "1 x 1" NaI detector in a lead pig to reduce the natural gamma background counts. Each container was counted for a one-minute interval. A background subtraction was made based on the ten minute count with an empty container in the lead pig.

The results for each core interval are presented in Table 4. Because in many instances several sample results were obtained for each twelve-inch depth interval, the maximum result within each twelve-inch interval was assumed to represent the entire interval (Table 5). The maximum data for each twelve-inch depth interval was then plotted and contoured as shown on Figures 4 through 9. The contours depicted were generated by computer software based on interpolation between existing data points, and may not necessarily represent actual conditions at the site.

3.0 SUMMARY OF FINDINGS

3.1 PHYSICAL CHARACTERIZATION

Non-indigenous fill and waste materials were encountered in 41 of the 48 borings advanced in this area to depths of up to 12 feet below existing ground surface. Waste material encountered consisted predominantly of zircaloy shavings, ash, and fragments of limestone, asphalt, and concrete. Slag and roof tar fragments were also observed at select locations during coring activities.

Based on a visual field classification, the non-indigenous fill consisted primarily of silt and fine-grained sand, with some sandstone fragments. Based on visual classification of the soil cores alone, compared to the unified soil classification system (USCS), the non-indigenous fill would be expected to be composed of particles primarily ranging in size from less than a No. 200 sieve (0.075 mm) up to a No. 40 sieve (0.425 mm). However, some sandstone fragments would be expected in the range of 4.75 mm (gravel-size) to greater than 300 mm (boulders). The percentage of these larger fragments increases with depth.

A black organic layer was observed in Borings SC-43 and SC-46. This thin organic layer is interpreted to represent the original ground surface prior to placement of non-indigenous fill, and may represent a "marker bed" associated with the contact between the fill material and indigenous soils.

Indigenous soils in the area consist of silt, fine-grained sand, and some sandstone fragments (with the quantity of sandstone fragments increasing with depth). In addition, clay was encountered in select locations at depth, particularly south of the underground gasoline line. The USCS particle distribution for indigenous soils would be expected to be similar to that listed above for non-indigenous fill. A three-dimensional fence diagram depicting the subsurface based on the 48 soil core borings is included as Figure 2.

3.2 RADIOLOGICAL CHARACTERIZATION

Downhole radiological data was collected from each of the cased soil core holes at six-inch intervals using a gamma survey meter with a NaI detector. The counts were integrated for a one-minute interval. The highest readings from this data were observed at location SC-35, at the

western edge of the area of interest, as indicated in Table 2. A comparison of this data and the analytical results of the selected samples indicate that the gross gamma counting for each core is subject to natural background variations, and is not necessarily indicative of impacts caused by human activities.

A review of the correlation chart between the gamma spectrometry data for U^{235} content and the MS-2 data (Figure 3) indicates that there is a significant uncertainty due to the variations in the natural background concentrations and isotopic distributions. This uncertainty limits the ability to establish U^{235} concentrations with any degree of confidence when the MS-2 results are low. In order to group the MS-2 results into reasonable categories, the following ranges were selected for plotting each 12-inch interval on Figures 4 through 9:

- ***0-0.2 net counts per minute per gram (cpm/gram):*** This range corresponds approximately to less than 1 pCi/g for U^{235} and is considered to be less than the acceptance criteria for total uranium contamination.

- ***0.2-0.5 cpm/gram:*** This range is considered to be suspect since the uncertainty in the U^{235} appears to be above 1 pCi/g but the variability is high.

- ***0.5-0.75 cpm/gram:*** This range has a higher probability of being contaminated.

- ***>0.75 cm/gram:*** This range is considered to be contaminated.

3.3 SOIL VOLUME ESTIMATES

From Figures 4 through 9, an estimate of the value of material with MS-2 data in specified ranges was determined. As shown in Table 6, approximately 18,100 cubic feet of soil exceeds 0.75 net counts per gram per minute. An additional 13,200 cubic feet ranges from 0.5 to 0.75 net counts per gram per minute, and approximately 131,200 cubic feet of soil ranges from 0.2 of 0.5 net counts per gram per minute. A majority of the radiologically impacted material is located within four feet of the existing ground surface, primarily along the western portion of the study area and north of the gasoline transmission pipeline. Since the contours on the figures were generated using computer software to interpolate between available data points, the areas and associated volumes presented in Table 6 are estimated, and may not be representative of actual conditions at the site.

REFERENCES

Cummings/Riter Consultants, Inc., 1995a, "Data Summary Report, Site Investigation, Westinghouse Electric Corporation, Specialty Metals Plant, Blairsville, Pennsylvania."

Cummings/Riter Consultants, Inc., 1995b, "Data Summary Report, Phase II Investigation, Westinghouse Electric Corporation, Specialty Metals Plant, Blairsville, Pennsylvania."

Cummings/Riter Consultants, Inc., 1996, "Addendum, Data Summary Report, Phase II Investigation, Westinghouse Electric Corporation, Specialty Metals Plant, Blairsville, Pennsylvania.

TABLES

TABLE 1
BORING SUMMARY
WESTINGHOUSE ELECTRIC COMPANY
FORMER ZIRCALOY BURN AREA
SPECIALTY METALS PLANT - BLAIRSVILLE, PENNSYLVANIA

Sample Point	Elevation (feet MSL)	Horizontal Position		Fill (feet bgs)	Indigenous Soil (feet bgs)	Probable Top of Bedrock (feet bgs)
		Northing	Easting			
SC-1	988.8	408882.59	1535328.49	none	0-5	5
SC-2	989.8	408806.85	1535333.68	none	0-3.7	3.7
SC-3a	989.1	408797.34	1535369.12	none	0-3.7	3.7
SC-3b	989.9	408790.35	1525370.89	0-3.0	3.0-4.7	4.7
SC-4	989.0	408775.90	1535388.96	0-2.8	2.8-5.0	5
SC-5	988.1	408751.73	1535388.09	0-2.5	2.5-3.5	3.5
SC-6	987.1	408734.37	1535390.36	0-1.7	1.7-5	5
SC-7	986.9	408773.81	1535430.00	none	0-5	5
SC-8	986.9	408807.13	1535434.76	0-1.7	1.7-5	5
SC-9	988.2	408766.25	1535397.79	0-3.3	3.3-4	4
SC-10	987.9	408800.20	1535399.20	none	0-3.0	3
SC-11	986.0	408791.56	1535475.82	0-3.4	3.4-10.0	10.0
SC-12	983.7	408712.35	1535484.04	0-2.1	2.1->5	>5
SC-13	979.7	408783.59	1535546.15	none	0-4	4
SC-14	980.9	408719.47	1535527.91	none	0-5	5
SC-15	991.2	408699.69	1535304.54	0-3.5	--	3.5
SC-16	991.6	408723.63	1535319.31	0-5	--	5
SC-17	990.5	408753.39	1535354.08	0-5	--	5
SC-18	990.2	408727.26	1535343.16	0-5	--	5
SC-19	989.8	408763.34	1535371.25	0-4.5	--	4.5
SC-20	988.5	408730.80	1535364.56	0-5	--	5
SC-21	991.9	408676.28	1535277.03	0-5	--	5
SC-22	992.7	408719.93	1535286.31	0-5	--	5
SC-23	992.0	408769.07	1535328.42	0-5	--	5
SC-24	992.9	408751.11	1535308.59	0-5	--	5
SC-25	993.0	408762.39	1535299.33	0-3	--	3
SC-26	993.2	408749.86	1535299.64	0-5	--	5
SC-27	991.0	408675.63	1535297.00	0-3.5	--	3.5
SC-28	994.1	408770.23	1535280.51	0-5.0	--	5
SC-29	993.6	408785.48	1535296.03	0-5	--	5
SC-30	993.7	408804.55	1535284.17	0-5	--	5
SC-31	992.8	408797.02	1535316.64	0-5	--	5
SC-32	992.5	408793.53	1535326.40	0-3.5	--	3.5
SC-33	990.8	408792.95	1535353.83	0-4.8	--	4.8
SC-34	993.8	408815.97	1535257.62	0->6.5	--	>6.5
SC-35	993.6	408748.63	1535248.16	0-10	--	10
SC-36	993.6	408780.75	1535239.99	0-8	--	8
SC-37	993.0	408841.11	1535273.48	0-5	--	>5
SC-38	994.3	408879.17	1535208.15	0-8	8-10	10
SC-39	993.5	408847.78	1535234.26	0-4	--	4
SC-40	993.8	408697.55	1535249.98	0-8	--	8
SC-41	994.0	408686.81	1535227.87	0-9.5	--	9.5
SC-42	994.2	408599.04	1535222.98	0-10	10-15	15
SC-43	994.7	408535.10	1535287.91	0-10	10-13	13
SC-44	992.6	408525.17	1535347.21	0-12	12-15	>15
SC-45	992.8	408571.31	1535355.66	0-10	10-15	>15
SC-46	992.9	408607.91	1535315.71	0-6	6-9.5	9.5
SC-47	992.6	408624.22	1535314.16	0-5	5-8	8

TABLE 2
DOWN HOLE GAMMA SURVEY RESULTS

Boring ID	Background[a]	Depth Below Ground Surface									
		0"	6"	12"	18"	24"	30"	36"	42"	48"	54"
SC-1	2081	2420	2916	3312	3668	3785	3671	3478	3504	NA	NA
SC-2	1775	2129	2371	2821	3084	3131	3326	NA	--[c]	--	--
SC-3a	1739	1754	NA[b]	NA	NA	NA	NA	NA	--	--	--
SC-3b	1903	1995	NA	NA	NA	NA	NA	NA	NA	NA	NA
SC-4	1944	2128	2478	3207	4111	4235	3400	3147	2943	NA	NA
SC-5	2014	2056	2410	2666	2917	2872	2820	2745	2585	--	--
SC-6	2085	2321	2283	2647	2953	3014	3290	3369	3437	3109	2772
SC-7	1909	1994	2047	2667	3387	3517	3406	3536	3618	3712	3810
SC-8	1689	1950	2206	2560	2899	3343	3576	3673	3499	3558	NA
SC-9	1833	2121	2670	3051	3240	3540	3463	3123	2748	2741	--
SC-10	1645	1746	1783	2183	2415	2312	NA	NA	--	--	--
SC-11	1797	2228	2486	2995	2997	3003	3176	3295	3425	3911	4159
SC-12	1871	1890	2121	2207	2493	2595	2855	2826	3368	3993	NA
SC-13	2122	2648	3051	3848	3949	4010	4030	4176	4165	NA	--
SC-14	2006	2297	2988	3562	3885	4136	4341	4308	4317	4143	NA
SC-15	1950	1942	2242	2620	2721	2733	2781	3071	2931	--	--
SC-16	2080	2437	2579	3578	3819	4197	4244	4436	4238	4322	4306
SC-17	1894	2209	2435	2757	2885	3188	3229	3356	3136	2741	2750
SC-18	1815	2271	2654	3053	3229	3349	3366	3328	3122	2977	3161
SC-19	1943	2067	2348	2534	2746	2728	2761	2773	2720	2536	2487
SC-20	2236	3885	5046	5080	4701	4472	4133	4250	3910	3905	4242
SC-21	2637	3424	3475	3281	3035	2751	2995	3242	3423	3350	3146
SC-22	2213	2391	2617	2972	3131	2940	2840	2874	2933	2840	2813
SC-23	2120	3060	3665	4366	3812	3315	3130	3137	2947	3045	2788
SC-24	3281	5340	4992	4243	3667	3335	3107	3140	3055	3133	3345
SC-25	4004	5930	5409	4047	3564	3315	3438	3337	--	--	--
SC-26	2636	3372	3380	3282	3249	3250	3311	3123	2986	2937	3235
SC-27	1939	2126	2456	2681	2910	3156	3144	2902	2960	--	--
SC-28	1956	2341	2647	2940	3016	2908	3021	3041	2973	3077	3089
SC-29	2198	2724	3090	3012	3080	3042	3195	3102	3116	2873	2864
SC-30	1967	1861	2095	2525	2713	2877	2861	2804	2787	2805	2827
SC-31	1888	2088	2278	2560	2691	2928	3093	3116	3083	2927	2873
SC-32	1894	2095	2335	2437	2623	2774	2845	3007	2985	--	--
SC-33	1935	1844	2028	2559	2841	2928	3361	3209	2833	2754	NA
SC-34	2276	2705	3056	3950	4132	3779	3460	3451	3295	3132	3216
SC-35	3898	7457	7778	7667	7782	7728	7765	6187	4823	4196	4394
SC-36	2278	2468	2790	2978	3042	2895	2757	2810	2742	2919	2492
SC-37	1530	2305	2501	2738	2913	3010	3015	2966	NA	NA	NA
SC-38	1877	2352	2886	3270	3736	3750	3625	3521	3509	3279	3083
SC-39	1863	2076	2360	2764	2603	2684	2585	2546	2414	2445	--
SC-40	2098	2644	3735	5402	5128	3679	3612	3454	3102	2989	2866
SC-41	2335	2701	3357	4601	4077	3707	3624	3230	2967	3135	NA
SC-42	2052	2699	2981	3495	3765	3809	3804	3729	3343	3433	3284
SC-43	2110	2728	3047	3346	3986	4098	4315	4187	3886	3852	3821
SC-44	2103	2506	2703	3225	3405	4005	4240	4336	4379	4321	4064
SC-45	2195	2612	3209	3799	4258	4242	4059	3947	4177	3908	3942
SC-46	2085	2615	3104	3610	3656	4013	4006	4167	4315	4289	NA
SC-47	2185	2346	2761	3158	3360	3741	3903	4124	3956	3986	NA

Notes:

a. Background measurement taken three feet above borehole.

b. "NA" indicates no measurement available due to borehole collapse prior to casing installation.

c. "'--" indicates no measurement - below bottom of boring.

TABLE 2
DOWN HOLE GAMMA SURVEY RESULTS

Boring ID	Background[a]	Depth Below Ground Surface							
		60"	66"	72"	78"	84"	90"	96"	102"
SC-1	2081	NA	--	--	--	--	--	--	--
SC-2	1775	--	--	--	--	--	--	--	--
SC-3a	1739	--	--	--	--	--	--	--	--
SC-3b	1903	--	--	--	--	--	--	--	--
SC-4	1944	NA	--	--	--	--	--	--	--
SC-5	2014	--	--	--	--	--	--	--	--
SC-6	2085	NA	--	--	--	--	--	--	--
SC-7	1909	3685	--	--	--	--	--	--	--
SC-8	1689	NA	--	--	--	--	--	--	--
SC-9	1833	--	--	--	--	--	--	--	--
SC-10	1645	--	--	--	--	--	--	--	--
SC-11	1797	4417	4260	4510	4495	4113	NA	NA	NA
SC-12	1871	NA	--	--	--	--	--	--	--
SC-13	2122	--	--	--	--	--	--	--	--
SC-14	2006	NA	--	--	--	--	--	--	--
SC-15	1950	--	--	--	--	--	--	--	--
SC-16	2080	NA	--	--	--	--	--	--	--
SC-17	1894	NA	--	--	--	--	--	--	--
SC-18	1815	NA	--	--	--	--	--	--	--
SC-19	1943	--	--	--	--	--	--	--	--
SC-20	2236	NA	--	--	--	--	--	--	--
SC-21	2637	NA	--	--	--	--	--	--	--
SC-22	2213	2825	--	--	--	--	--	--	--
SC-23	2120	NA	--	--	--	--	--	--	--
SC-24	3281	NA	--	--	--	--	--	--	--
SC-25	4004	--	--	--	--	--	--	--	--
SC-26	2636	NA	--	--	--	--	--	--	--
SC-27	1939	--	--	--	--	--	--	--	--
SC-28	1956	NA	--	--	--	--	--	--	--
SC-29	2198	NA	--	--	--	--	--	--	--
SC-30	1967	2811	--	--	--	--	--	--	--
SC-31	1888	2897	--	--	--	--	--	--	--
SC-32	1894	--	--	--	--	--	--	--	--
SC-33	1935	NA	--	--	--	--	--	--	--
SC-34	2276	NA	NA	NA	NA	--	--	--	--
SC-35	3898	NA	NA	NA	NA	NA	NA	NA	NA
SC-36	2278	2442	NA	NA	NA	NA	NA	NA	--
SC-37	1530	NA	--	--	--	--	--	--	--
SC-38	1877	2891	2844	NA	NA	NA	NA	NA	NA
SC-39	1863	--	--	--	--	--	--	--	--
SC-40	2098	2802	--	NA	NA	NA	NA	NA	--
SC-41	2335	NA	NA	NA	NA	NA	NA	NA	NA
SC-42	2052	3174	3089	2998	2963	2936	NA	NA	NA
SC-43	2110	3872	NA	NA	NA	NA	NA	NA	NA
SC-44	2103	4096	4268	4055	NA	NA	NA	NA	NA
SC-45	2195	4143	4252	5356	4676	4897	4924	4667	4671
SC-46	2085	NA	NA	NA	NA	NA	NA	NA	NA
SC-47	2185	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

a. Background measurement taken three feet above borehole.

b. "NA" indicates no measurement available due to borehole collapse prior to casing installation.

c. "'--" indicates no measurement - below bottom of boring.

TABLE 3
COMPARISON OF MS-2 AND
GAMMA SPECTROMETRY U-235 DATA

Sample ID	Description	MS-2 Net Counts/ Gram/Minute	U-235 Content (pCi/gm)
BV-SS-398	55 Gal. Drum TC pipe	0.91	12.80
BV-SS-400	Finishing Area 1st T/C pipe joint at S trough; Pre-Removal	0.23	0.56
BV-SS-401	Finishing Area 2nd T/C pipe joint at S trough; Pre-Removal	0.20	3.58
BV-SS-402	Finishing Area under floor drain; Pre-Removal	0.36	0.82
BV-SS-403	Drum B-1313; Finishing Area T/C pipe contents	0.45	7.13
BV-SS-404	Bag B-1312; Finishing Area T/C pipe trench dirt	0.26	1.96
BV-SS-405	Finishing Area T/C trench 0m N	0.36	4.68
BV-SS-406	Finishing Area T/C trench 1m N	0.19	0.33
BV-SS-407	Finishing Area T/C trench 2m N	0.18	0.81
BV-SS-408	Finishing Area T/C trench 3m N	0.20	0.79
BV-SS-409	Finishing Area T/C trench dirt put back into hole as fill	0.15	1.63
BV-SS-410	Cow Palace Inside sump	0.41	4.56
BV-SS-411	Cow Palace Inside sump	0.39	6.76
BV-SS-412	Cow Palace Inside sump	0.15	2.39
BV-SS-413	Cow Palace Inside sump	0.20	2.05
BV-SS-414	Cow Palace Inside sump	0.55	8.16
BV-SS-415	Cow Palace Inside sump	0.50	6.45
BV-SS-416	Cow Palace Inside sump	0.30	7.17
BV-SS-417	Cow Palace Inside sump	0.19	1.56
BV-SS-418	Cow Palace Inside sump	2.47	35.70
BV-SS-419	Cow Palace Inside sump	1.80	18.80
BV-SS-420	Cow Palace Outside sump	0.19	2.15
BV-SS-421	Cow Palace Outside sump	0.15	0.71
BV-SS-422	Cow Palace Outside sump	0.33	3.31
BV-SS-423	Cow Palace Outside sump	0.30	3.22
BV-SS-424	Cow Palace Outside sump	0.40	5.11
BV-SS-425	Cow Palace Outside sump	0.31	3.57
BV-SS-426	Cow Palace Outside sump	0.12	1.51
BV-SS-427	Cow Palace Outside sump	0.13	1.37
BV-SS-428	Cow Palace Outside sump	0.29	4.05
BV-SS-429	Cow Palace Outside sump	0.17	1.96
BV-SS-430	Cow Palace drainline trench side N meters: 1	0.14	0.50
BV-SS-431	Cow Palace drainline trench side N meters: 2	0.20	0.65
BV-SS-432	Cow Palace drainline trench side N meters: 3	0.13	0.99
BV-SS-433	Cow Palace drainline trench side N meters: 4	0.14	0.60
BV-SS-434	Cow Palace drainline trench side N meters: 5	0.16	1.39
BV-SS-435	Cow Palace drainline trench side N meters: 6	0.21	1.28
BV-SS-436	Cow Palace drainline trench side N meters: 7	0.17	2.22
BV-SS-437	Cow Palace drainline trench side N meters: 8	0.16	1.10
BV-SS-438	Cow Palace drainline trench side N meters: 9	0.57	5.34
BV-SS-439	Cow Palace drainline trench side N meters: 10	0.23	1.10
BV-SS-440	Cow Palace drainline trench side N meters: 0	0.15	0.73
BV-SS-441	Cow Palace drainline trench side N meters: 11	0.13	0.51
BV-SS-442	Cow Palace drainline trench side N meters: 12	0.17	0.95
BV-SS-443	Cow Palace drainline trench side N meters: 13	0.14	1.24

TABLE 3
COMPARISON OF MS-2 AND
GAMMA SPECTROMETRY U-235 DATA

Sample ID	Description	MS-2 Net Counts/ Gram/Minute	U-235 Content (pCi/gm)
BV-SS-444	Cow Palace drainline trench side N meters: 14	0.18	2.70
BV-SS-445	Cow Palace drainline trench side N meters: 15	0.21	2.35
BV-SS-446	Cow Palace drainline trench side N meters: 16	0.21	1.11
BV-SS-447	Cow Palace drainline trench side N meters: 17	0.24	1.61
BV-SS-448	Cow Palace drainline trench side N meters: 18	0.21	2.43
BV-SS-449	Cow Palace drainline trench side N meters: 19	0.17	1.47
BV-SS-450	Cow Palace drainline trench side N meters: 20	0.28	3.65
BV-SS-451	Cow Palace drainline trench side N meters: 21	0.10	0.08
BV-SS-452	Cow Palace drainline trench side N meters: 22	0.15	0.72
BV-SS-453	Cow Palace drainline trench bottom N meters: 0	0.08	1.47
BV-SS-454	Cow Palace drainline trench bottom N meters: 1	0.13	1.09
BV-SS-455	Cow Palace drainline trench bottom N meters: 2	0.15	1.41
BV-SS-456	Cow Palace drainline trench bottom N meters: 3	0.20	1.41
BV-SS-457	Cow Palace drainline trench bottom N meters: 4	0.18	1.81
BV-SS-458	Cow Palace drainline trench bottom N meters: 5	0.27	1.81
BV-SS-459	Cow Palace drainline trench bottom N meters: 6	0.23	2.29
BV-SS-460	Cow Palace drainline trench bottom N meters: 7	0.93	9.27
BV-SS-461	Cow Palace drainline trench bottom N meters: 8	0.61	7.42
BV-SS-462	Cow Palace drainline trench bottom N meters: 9	0.35	2.95
BV-SS-463	Cow Palace drainline trench bottom N meters: 10	0.68	8.24
BV-SS-464	Cow Palace drainline trench bottom N meters: 11	0.26	2.38
BV-SS-465	Cow Palace drainline trench bottom N meters: 12	0.13	1.02
BV-SS-466	Cow Palace drainline trench bottom N meters: 13	0.11	1.14
BV-SS-467	Cow Palace drainline trench bottom N meters: 14	0.74	3.43
BV-SS-468	Cow Palace drainline trench bottom N meters: 15	0.24	8.27
BV-SS-469	Cow Palace drainline trench bottom N meters: 16	0.12	2.40
BV-SS-470	Cow Palace drainline trench bottom N meters: 17	0.13	0.75
BV-SS-471	Cow Palace drainline trench bottom N meters: 18	0.13	0.97
BV-SS-472	Cow Palace drainline trench bottom N meters: 19	0.69	8.30
BV-SS-473	Cow Palace drainline trench bottom N meters: 20	0.70	6.86
BV-SS-474	Cow Palace drainline trench bottom N meters: 21	0.71	8.11
BV-SS-475	Cow Palace drainline trench bottom N meters: 22	0.22	1.70
BV-SS-477	Cow Palace lagoon material @ 8m NE	1.87	30.80
BV-SS-478	Cow Palace N-S lagoon trench ash-type material	1.26	18.30
BV-SS-479	Cow Palace lagoon trench meters NE: 0	0.13	0.50
BV-SS-480	Cow Palace lagoon trench meters NE: 2	0.18	1.63
BV-SS-481	Cow Palace lagoon trench meters NE: 4	0.19	0.57
BV-SS-482	Cow Palace lagoon trench meters NE: 6	0.22	1.75
BV-SS-483	Cow Palace lagoon trench meters NE: 8	0.43	1.91
BV-SS-484	Cow Palace lagoon trench meters NE: 10	0.32	2.84
BV-SS-485	Cow Palace lagoon trench meters NE: 12	0.37	4.39
BV-SS-486	Cow Palace lagoon trench meters NE: 14A	0.27	1.27
BV-SS-487	Cow Palace lagoon trench meters NE: 14B	0.23	0.90
BV-SS-488	Cow Palace lagoon trench meters NE: 16	0.16	1.32
BV-SS-489	Cow Palace lagoon trench meters NE: 18	0.39	3.47

TABLE 3
COMPARISON OF MS-2 AND
GAMMA SPECTROMETRY U-235 DATA

Sample ID	Description	MS-2 Net Counts/ Gram/Minute	U-235 Content (pCi/gm)
BV-SS-490	Cow Palace lagoon trench meters NE: 20	0.23	1.49
BV-SS-491	Cow Palace lagoon trench meters NE: 22	0.19	0.83
BV-SS-492	Cow Palace lagoon trench meters NE: 24	0.41	5.10
BV-SS-493	Cow Palace lagoon trench meters NE: 26	0.14	1.64
BV-SS-494	Cow Palace lagoon trench meters NE: 28	0.14	1.05
BV-SS-495	Cow Palace lagoon trench meters NE: 30	0.17	0.82
BV-SS-3000	Bag Number 3000	0.25	2.41
BV-SS-3002	Bag Number 3002	0.24	3.08
BV-SS-3006	Bag Number 3006	0.32	2.86
BV-SS-3007	Bag Number 3007	0.32	3.33
BV-SS-3010	Bag Number 3010	0.21	2.38
BV-SS-3013	Bag Number 3013	0.47	5.52
BV-SS-3019	Bag Number 3019	0.42	3.99
BV-SS-3022	Bag Number 3022	0.28	2.99
BV-SS-3025	Bag Number 3025	0.32	3.71
BV-SS-3031	Bag Number 3031	0.37	4.41
BV-SS-3032	Bag Number 3032	0.25	1.79
BV-SS-3037	Bag Number 3037	0.22	2.24
BV-SS-3042	Bag Number 3042	0.41	5.44
BV-SS-3047	Bag Number 3047	0.37	4.62
BV-SS-3052	Bag Number 3052	0.35	2.78
BV-SS-3096	Sample from Ash Layer	0.42	12.20
BV-SS-3097	Sample from Ash Layer	0.38	13.30
BV-SS-3098	Sample from Ash Layer	0.28	2.37
BV-SS-3099	Sample from Ash Layer	1.74	16.70
BV-SS-3100	Sample from Ash Layer	0.88	24.80
BV-SS-3101	Sample from Ash Layer	0.36	6.39
BV-SS-1126	Samples from Clean Dirt Pile -second set of samples	0.24	0.96
BV-SS-1127	Samples from Clean Dirt Pile -second set of samples	0.23	0.71
BV-SS-1128	Samples from Clean Dirt Pile -second set of samples	0.27	0.77
BV-SS-1129	Samples from Clean Dirt Pile -second set of samples	0.24	1.07
BV-SS-1130	Samples from Clean Dirt Pile -second set of samples	0.31	1.38
BV-SS-1131	Samples from Clean Dirt Pile -second set of samples	0.25	1.22
BV-SS-1132	Samples from Clean Dirt Pile -second set of samples	0.20	0.94
BV-SS-1133	Samples from Clean Dirt Pile -second set of samples	0.21	0.83
BV-SS-1134	Samples from Clean Dirt Pile -second set of samples	0.23	0.77
BV-SS-1135	Samples from Clean Dirt Pile -second set of samples	0.24	1.22
BV-SS-1136	Samples from Clean Dirt Pile -second set of samples	0.22	1.12
BV-SS-1137	Samples from Clean Dirt Pile -second set of samples	0.19	0.84
BV-SS-1138	Samples from Clean Dirt Pile -second set of samples	0.23	0.10
BV-SS-1139	Samples from Clean Dirt Pile -second set of samples	0.23	0.49
BV-SS-1140	Samples from Clean Dirt Pile -second set of samples	0.27	1.00
BV-SS-1141	Samples from Clean Dirt Pile -second set of samples	0.25	0.61
BV-SS-1142	Samples from Clean Dirt Pile -second set of samples	0.27	0.93
BV-SS-1143	Samples from Clean Dirt Pile -second set of samples	0.22	0.78

TABLE 3
COMPARISON OF MS-2 AND
GAMMA SPECTROMETRY U-235 DATA

Sample ID	Description	MS-2 Net Counts/ Gram/Minute	U-235 Content (pCi/gm)
BV-SS-1144	Samples from Clean Dirt Pile -second set of samples	0.22	0.93
BV-SS-1145	Samples from Clean Dirt Pile -second set of samples	0.27	1.09
BV-SS-1146	Samples from Clean Dirt Pile -second set of samples	0.26	0.88
BV-SS-1147	Samples from Clean Dirt Pile -second set of samples	0.23	0.74
BV-SS-1148	Samples from Clean Dirt Pile -second set of samples	0.21	0.57
BV-SS-1149	Samples from Clean Dirt Pile -second set of samples	0.25	0.84
BV-SS-1150	Samples from Clean Dirt Pile -second set of samples	0.24	0.52
BV-SS-1151	Samples from Clean Dirt Pile -second set of samples	0.25	1.00
BV-SS-1152	Samples from Clean Dirt Pile -second set of samples	0.25	0.88
BV-SS-1153	Samples from Clean Dirt Pile -second set of samples	0.22	0.70
BV-SS-1154	Samples from Clean Dirt Pile -second set of samples	0.26	0.85
BV-SS-1155	Samples from Clean Dirt Pile -second set of samples	0.32	1.16
BV-SS-1156	Samples from Clean Dirt Pile -second set of samples	0.25	0.61
BV-SS-1157	Samples from Clean Dirt Pile -second set of samples	0.25	0.77
BV-SS-1158	Samples from Clean Dirt Pile -second set of samples	0.24	0.53
BV-SS-1159	Samples from Clean Dirt Pile -second set of samples	0.22	0.59
BV-SS-1160	Samples from Clean Dirt Pile -second set of samples	0.24	0.89
BV-SS-1161	Samples from Clean Dirt Pile -second set of samples	0.32	1.39
BV-SS-1048	Samples from Core Bore Tests	0.37	2.96
BV-SS-1062	Samples from Core Bore Tests	0.52	1.52
BV-SS-1070	Samples from Core Bore Tests	0.32	0.88
BV-SS-1071	Samples from Core Bore Tests	1.17	12.50
BV-SS-1075	Samples from Core Bore Tests	0.41	1.47
BV-SS-1077	Samples from Core Bore Tests	1.47	16.10
BV-SS-1079	Samples from Core Bore Tests	0.95	8.09
BV-SS-1086	Samples from Core Bore Tests	0.12	1.74
BV-SS-1092	Samples from Core Bore Tests	0.30	2.03
BV-SS-1095	Samples from Core Bore Tests	0.78	3.78
BV-SS-1099	Samples from Core Bore Tests	0.31	1.00
BV-SS-1103	Samples from Core Bore Tests	0.75	5.54
BV-SS-1105	Samples from Core Bore Tests	0.41	1.76

TABLE 4
MS-2 DATA
FOR SOIL CORE SAMPLES

Core ID	Analysis Date	Depth (inches)	Sample Weight (Grams)	Background Count	Gross Count	Net Count	Net Count/ Gram/Min.
SC-01	1/14/99	23.5	575	143	234	91	0.16
SC-02	4/13/99	1.5	582	135	224	89	0.15
SC-02	4/13/99	4.5	588	135	212	77	0.13
SC-02	4/13/99	7.5	654	135	276	141	0.22
SC-02	4/13/99	10.5	654	135	216	81	0.12
SC-02	4/13/99	13.5	621	135	202	67	0.11
SC-02	4/13/99	16.5	712	135	210	75	0.11
SC-02	4/13/99	19.5	678	135	205	70	0.10
SC-02	4/13/99	21.0	777	135	211	76	0.10
SC-02	4/13/99	23.0	705	135	219	84	0.12
SC-02	4/13/99	26.5	711	135	258	123	0.17
SC-02	1/14/99	30.5	575	143	263	120	0.21
SC-02	4/13/99	33.5	664	135	231	96	0.14
SC-02	4/13/99	36.5	639	135	233	98	0.15
SC-02	4/13/99	39.5	707	135	248	113	0.16
SC-02	4/13/99	42.0	722	135	239	104	0.14
SC-02	4/13/99	44.0	696	135	217	82	0.12
SC-02	4/13/99	46.0	595	135	177	42	0.07
SC-3B	1/14/99	12.0	844	143	234	91	0.11
SC-04	4/14/99	1.0	597	145	232	87	0.15
SC-04	4/14/99	3.0	633	145	202	57	0.09
SC-04	4/14/99	6.0	649	145	235	90	0.14
SC-04	4/14/99	10.0	591	145	236	91	0.15
SC-04	1/14/99	13.5	572	143	352	209	0.37
SC-04	4/14/99	16.0	654	145	225	80	0.12
SC-04	4/14/99	18.0	655	145	261	116	0.18
SC-04	4/14/99	20.0	668	145	224	79	0.12
SC-04	4/14/99	22.0	720	145	193	50	0.07
SC-04	1/14/99	24.0	894	143	234	89	0.10
SC-04	4/14/99	26.0	716	145	203	58	0.08
SC-04	4/14/99	28.0	675	145	203	58	0.09
SC-04	4/14/99	30.0	592	145	189	44	0.07
SC-04	4/14/99	32.0	626	145	198	53	0.08
SC-04	4/14/99	bottom >33	389	145	203	58	0.15
SC-05	1/14/99	19.5	813	143	259	116	0.14
SC-06	1/14/99	37.0	831	143	247	104	0.13
SC-07	1/14/99	36.0	765	143	292	149	0.19
SC-08	1/14/99	12.0	845	143	253	110	0.13
SC-08	1/14/99	36.0	667	143	249	106	0.16
SC-09	1/14/99	24.0	718	143	302	159	0.22
SC-09	1/14/99	47.0	877	143	238	95	0.11
SC-10	1/14/99	35.0	763	143	224	81	0.11
SC-11	4/13/99	1.5	454	135	211	76	0.17
SC-11	4/13/99	4.5	656	135	201	66	0.10
SC-11	4/13/99	7.5	580	135	241	106	0.18
SC-11	4/13/99	10.5	605	135	226	91	0.15
SC-11	4/13/99	13.5	636	135	253	118	0.19
SC-11	4/13/99	16.0	663	135	275	140	0.21

TABLE 4
MS-2 DATA
FOR SOIL CORE SAMPLES

Core ID	Analysis Date	Depth (inches)	Sample Weight (Grams)	Background Count	Gross Count	Net Count	Net Count/ Gram/Min.
SC-11	4/13/99	18.5	671	135	221	86	0.13
SC-11	4/13/99	21.5	674	135	259	124	0.18
SC-11	4/13/99	24.0	682	135	226	91	0.13
SC-11	4/13/99	26.5	652	135	223	88	0.13
SC-11	4/13/99	29.0	682	135	212	77	0.11
SC-11	4/13/99	31.0	621	135	211	76	0.12
SC-11	4/13/99	33.0	665	135	237	102	0.15
SC-11	4/13/99	35.5	608	135	214	79	0.13
SC-11	4/13/99	39.0	526	135	186	51	0.10
SC-11	1/14/99	42.0	629	143	247	104	0.17
SC-11	4/13/99	44.5	580	135	263	128	0.22
SC-11	4/13/99	47.5	616	135	228	93	0.15
SC-11	4/13/99	49.5	617	135	267	132	0.21
SC-11	4/13/99	51.0	511	135	228	93	0.18
SC-11	4/13/99	53.0	614	135	269	134	0.22
SC-11	4/13/99	55.0	594	135	252	117	0.20
SC-11	4/13/99	57.0	614	135	239	104	0.17
SC-11	4/13/99	59.0	585	135	234	99	0.17
SC-11	4/13/99	61.0	576	135	253	118	0.20
SC-11	4/13/99	63.5	559	135	248	113	0.20
SC-11	4/13/99	66.0	573	135	261	126	0.22
SC-11	4/13/99	68.0	636	135	257	122	0.19
SC-11	4/13/99	70.0	641	135	255	120	0.19
SC-11	1/14/99	72.0	732	143	281	138	0.19
SC-11	4/13/99	74.0	566	135	228	93	0.16
SC-11	4/13/99	76.0	552	135	234	99	0.18
SC-11	4/13/99	78.0	595	135	255	120	0.20
SC-11	4/13/99	80.0	610	135	241	106	0.17
SC-11	4/13/99	82.0	720	135	228	93	0.13
SC-11	4/13/99	84.0	662	135	247	112	0.17
SC-11	4/13/99	86.0	629	135	255	120	0.19
SC-11	4/13/99	88.0	625	135	272	137	0.22
SC-11	4/13/99	90.0	624	135	236	101	0.16
SC-11	4/13/99	92.0	652	135	293	158	0.24
SC-11	4/13/99	94.0	604	135	247	112	0.19
SC-11	4/13/99	96.0	552	135	209	74	0.13
SC-14	1/14/99	42.0	757	143	317	174	0.23
SC-15	4/19/99	1.5	574	140	241	101	0.18
SC-15	4/19/99	4.5	627	140	231	91	0.15
SC-15	4/19/99	7.5	610	140	241	101	0.17
SC-15	4/19/99	10.5	537	140	225	85	0.16
SC-15	1/14/99	13.0	738	143	247	104	0.14
SC-15	4/19/99	15.0	628	140	201	61	0.10
SC-15	4/19/99	17.5	667	140	221	81	0.12
SC-15	4/19/99	20.0	703	140	285	145	0.21
SC-15	4/19/99	22.0	670	140	231	91	0.14
SC-15	4/19/99	25.0	661	140	259	119	0.18
SC-15	4/19/99	28.5	502	140	206	66	0.13

TABLE 4
MS-2 DATA
FOR SOIL CORE SAMPLES

Core ID	Analysis Date	Depth (inches)	Sample Weight (Grams)	Background Count	Gross Count	Net Count	Net Count/ Gram/Min.
SC-16	4/13/99	1.0	358	135	224	89	0.25
SC-16	4/13/99	2.5	480	135	208	73	0.15
SC-16	4/13/99	7.0	540	135	236	101	0.19
SC-16	4/13/99	10.0	565	135	229	94	0.17
SC-16	4/13/99	12.5	590	135	280	145	0.25
SC-16	4/13/99	15.5	566	135	299	164	0.29
SC-16	4/13/99	18.5	551	135	286	151	0.27
SC-16	4/13/99	21.5	569	135	249	114	0.20
SC-16	1/14/99	24.0	753	143	535	392	0.52
SC-16	4/13/99	26.0	597	135	260	125	0.21
SC-16	4/13/99	29.0	573	135	259	124	0.22
SC-16	4/13/99	32.5	582	135	249	114	0.20
SC-16	4/13/99	35.0	568	135	250	115	0.20
SC-16	1/14/99	37.0	606	143	270	127	0.21
SC-16	4/13/99	bottom >36	356	135	184	49	0.14
SC-17	4/15/99	1.0	592	147	216	69	0.12
SC-17	4/15/99	3.5	610	147	239	92	0.15
SC-17	4/15/99	6.5	639	147	221	74	0.12
SC-17	4/15/99	9.5	656	147	211	64	0.10
SC-17	4/15/99	13.0	624	147	235	88	0.14
SC-17	4/15/99	16.5	672	147	218	71	0.11
SC-17	4/15/99	19.0	661	147	229	82	0.12
SC-17	4/15/99	21.5	685	147	243	96	0.14
SC-17	4/15/99	24.0	617	147	212	65	0.11
SC-17	4/15/99	26.0	617	147	258	111	0.18
SC-17	4/15/99	28.0	661	147	245	98	0.15
SC-17	4/15/99	30.0	703	147	243	96	0.14
SC-17	4/15/99	32.0	786	147	199	52	0.07
SC-17	4/15/99	>33	366	147	179	32	0.09
SC-17	1/14/99	35.0	837	143	218	75	0.09
SC-18	4/14/99	1.0	413	145	184	39	0.09
SC-18	4/14/99	4.0	494	145	222	77	0.16
SC-18	4/14/99	7.5	503	145	229	84	0.17
SC-18	4/14/99	10.5	515	145	191	46	0.09
SC-18	4/14/99	14.0	551	145	260	115	0.21
SC-18	4/14/99	16.5	346	145	188	43	0.12
SC-18	4/14/99	18.0	768	143	254	111	0.14
SC-18	4/14/99	20.5	627	145	218	73	0.12
SC-18	4/14/99	23.0	657	145	215	70	0.11
SC-18	4/14/99	25.5	663	145	247	102	0.15
SC-18	4/14/99	28.5	576	145	216	71	0.12
SC-18	4/14/99	31.5	587	145	233	88	0.15
SC-18	4/14/99	34.5	654	145	255	110	0.17
SC-18	1/14/99	37.0	756	143	228	85	0.11
SC-19	4/20/99	1.5	500	145	221	76	0.15
SC-19	4/20/99	4.5	612	145	211	66	0.11
SC-19	4/20/99	8.0	601	145	213	68	0.11
SC-19	4/20/99	11.5	659	145	228	83	0.13

TABLE 4
MS-2 DATA
FOR SOIL CORE SAMPLES

Core ID	Analysis Date	Depth (inches)	Sample Weight (Grams)	Background Count	Gross Count	Net Count	Net Count/ Gram/Min.
SC-19	4/20/99	14.0	597	145	234	89	0.15
SC-19	4/20/99	16.5	680	145	235	90	0.13
SC-19	4/20/99	19.0	655	145	208	63	0.10
SC-19	4/20/99	22.0	726	145	266	121	0.17
SC-19	1/18/99	25.0	834	143	266	123	0.15
SC-19	4/20/99	27.5	714	145	261	116	0.16
SC-19	4/20/99	30.5	664	145	192	47	0.07
SC-19	4/20/99	33.0	698	145	225	80	0.11
SC-19	4/20/99	35.0	592	145	228	83	0.14
SC-19	1/18/99	37.0	754	143	240	97	0.13
SC-19	4/20/99	39.5	722	145	238	93	0.13
SC-19	4/20/99	42.0	670	145	219	74	0.11
SC-19	4/20/99	44.5	782	145	196	51	0.07
SC-19	4/20/99	47.0	597	145	198	53	0.09
SC-19	4/20/99	49.5	716	145	196	51	0.07
SC-20	4/13/99	1.5	351	135	602	467	1.33
SC-20	4/13/99	5.5	556	135	617	482	0.87
SC-20	1/14/99	9.0	720	143	575	432	0.60
SC-20	4/13/99	12.0	616	135	278	143	0.23
SC-20	4/13/99	15.5	583	135	320	185	0.32
SC-20	4/13/99	18.0	530	135	238	103	0.19
SC-20	4/13/99	21.0	558	135	250	115	0.21
SC-20	4/13/99	24.0	529	135	245	110	0.21
SC-20	4/13/99	26.0	546	135	254	119	0.22
SC-20	1/14/99	28.0	720	143	370	227	0.32
SC-20	4/13/99	30.0	543	135	241	106	0.20
SC-20	4/13/99	32.0	555	135	247	112	0.20
SC-20	4/13/99	34.0	578	135	203	68	0.12
SC-20	4/13/99	36.0	586	135	255	120	0.20
SC-21	1/18/99	2.0	347	147	426	279	0.80
SC-21	4/15/99	5.0	529	143	763	620	1.17
SC-21	4/15/99	7.0	490	147	295	148	0.30
SC-21	4/15/99	9.0	530	147	242	95	0.18
SC-21	4/15/99	11.0	592	147	238	91	0.15
SC-21	4/15/99	13.0	582	147	214	67	0.12
SC-21	4/15/99	15.0	580	147	240	93	0.16
SC-21	4/15/99	17.0	579	147	220	73	0.13
SC-21	4/15/99	19.5	588	147	222	75	0.13
SC-21	4/15/99	22.0	606	147	234	87	0.14
SC-21	4/15/99	24.5	674	147	232	85	0.13
SC-21	4/15/99	27.5	628	147	233	86	0.14
SC-21	4/15/99	30.0	628	147	235	88	0.14
SC-21	4/15/99	32.5	637	147	243	96	0.15
SC-21	4/15/99	35.0	503	147	211	64	0.13
SC-21	1/18/99	37.0	745	143	259	116	0.16
SC-21	4/15/99	39.0	547	147	259	112	0.20
SC-21	4/15/99	41.0	609	147	261	114	0.19
SC-21	4/15/99	43.0	736	147	267	120	0.16

TABLE 4
MS-2 DATA
FOR SOIL CORE SAMPLES

Core ID	Analysis Date	Depth (inches)	Sample Weight (Grams)	Background Count	Gross Count	Net Count	Net Count/ Gram/Min.
SC-21	4/15/99	45.0	627	147	290	143	0.23
SC-21	4/15/99	47.0	693	147	220	73	0.11
SC-21	4/15/99	49.0	593	147	233	86	0.15
SC-21	4/15/99	51.0	612	147	232	85	0.14
SC-22	4/15/99	1.5	555	147	223	76	0.14
SC-22	4/15/99	4.0	602	147	270	123	0.20
SC-22	4/15/99	6.5	541	147	289	142	0.26
SC-22	4/15/99	9.5	578	147	278	131	0.23
SC-22	4/15/99	12.5	586	147	214	67	0.11
SC-22	4/15/99	16.0	612	147	279	132	0.22
SC-22	4/15/99	20.0	597	147	214	67	0.11
SC-22	1/18/99	23.0	758	143	216	73	0.10
SC-22	4/15/99	25.5	603	147	232	85	0.14
SC-22	4/15/99	28.5	617	147	235	88	0.14
SC-22	4/15/99	31.5	689	147	194	47	0.07
SC-22	4/15/99	34.5	632	147	190	43	0.07
SC-22	4/15/99	37.0	688	147	236	89	0.13
SC-22	4/15/99	39.0	640	147	206	59	0.09
SC-22	4/15/99	41.0	672	147	219	72	0.11
SC-22	4/15/99	43.0	611	147	229	82	0.13
SC-22	1/18/99	45.0	728	143	236	93	0.13
SC-22	4/15/99	47.0	699	147	227	80	0.11
SC-22	4/15/99	>48	459	147	185	38	0.08
SC-23	4/12/99	1.5	492	138	262	124	0.25
SC-23	4/12/99	4.5	552	138	264	126	0.23
SC-23	4/12/99	7.5	540	138	266	128	0.24
SC-23	4/12/99	10.5	514	138	328	190	0.37
SC-23	4/12/99	14.0	576	138	424	286	0.50
SC-23	1/18/99	17.0	717	140	431	291	0.41
SC-23	4/12/99	19.0	637	138	250	112	0.18
SC-23	4/12/99	21.0	772	138	236	98	0.13
SC-23	4/12/99	23.0	705	138	220	82	0.12
SC-23	4/12/99	25.0	697	138	256	118	0.17
SC-23	4/12/99	27.0	620	138	240	102	0.16
SC-23	4/12/99	30.5	698	138	188	50	0.07
SC-23	4/12/99	35.0	638	138	224	86	0.13
SC-23	1/18/99	38.0	766	140	235	95	0.12
SC-23	4/12/99	40.0	636	138	203	65	0.10
SC-23	4/12/99	42.0	626	138	236	98	0.16
SC-23	4/12/99	44.0	680	138	213	75	0.11
SC-23	4/12/99	46.0	643	138	197	59	0.09
SC-23	4/12/99	48.0	633	138	227	89	0.14
SC-23	4/12/99	50.0	680	138	216	78	0.11
SC-23	4/12/99	52.0	647	138	211	73	0.11
SC-23	4/12/99	54.0	671	138	183	45	0.07
SC-24	4/12/99	2.0	614	138	476	338	0.55
SC-24	1/14/99	5.0	554	140	953	813	1.47
SC-24	4/12/99	7.5	572	138	428	290	0.51

TABLE 4
MS-2 DATA
FOR SOIL CORE SAMPLES

Core ID	Analysis Date	Depth (inches)	Sample Weight (Grams)	Background Count	Gross Count	Net Count	Net Count/ Gram/Min.
SC-24	4/12/99	11.0	587	138	323	185	0.32
SC-24	4/12/99	14.5	578	138	232	94	0.16
SC-24	4/12/99	17.0	593	138	258	120	0.20
SC-24	4/12/99	19.0	612	138	238	100	0.16
SC-24	4/12/99	22.0	773	138	274	136	0.18
SC-24	1/18/99	25.0	870	140	299	159	0.18
SC-24	4/12/99	27.0	742	138	219	81	0.11
SC-24	4/12/99	29.0	657	138	566	428	0.65
SC-24	4/12/99	31.0	646	138	195	57	0.09
SC-24	4/12/99	33	704	138	199	61	0.09
SC-24	4/12/99	35.0	727	138	243	105	0.14
SC-24	4/12/99	37.0	658	138	212	74	0.11
SC-24	4/12/99	39.0	709	138	213	75	0.11
SC-24	4/12/99	41.0	688	138	204	66	0.10
SC-24	4/12/99	43.0	751	138	198	60	0.08
SC-24	4/12/99	46.0	634	138	220	82	0.13
SC-24	4/12/99	48.5	215	138	140	2	0.01
SC-25	4/13/99	2.0	431	138	506	368	0.85
SC-25	1/18/99	5.0	774	140	875	735	0.95
SC-25	4/13/99	7.5	554	138	273	135	0.24
SC-25	4/13/99	10.5	689	138	307	169	0.25
SC-25	4/13/99	13.5	619	138	263	125	0.20
SC-25	4/13/99	17.0	579	138	262	124	0.21
SC-25	4/13/99	19.5	645	138	204	66	0.10
SC-25	4/13/99	23.0	716	138	228	90	0.13
SC-25	1/18/99	26.0	835	140	266	126	0.15
SC-25	4/13/99	28.0	696	138	212	74	0.11
SC-25	4/13/99	30.5	669	138	248	110	0.16
SC-25	4/13/99	33.0	612	138	217	79	0.13
SC-25	4/13/99	35.0	651	138	203	65	0.10
SC-26	4/13/99	1.5	401	138	437	299	0.75
SC-26	4/13/99	5.0	533	138	343	205	0.38
SC-26	4/13/99	8.5	561	138	319	181	0.32
SC-26	4/13/99	11.5	608	138	251	113	0.19
SC-26	4/13/99	14.5	563	138	219	81	0.14
SC-26	4/13/99	17.0	673	138	233	95	0.14
SC-26	4/13/99	19.5	612	138	222	84	0.14
SC-26	4/13/99	22.5	654	138	220	82	0.13
SC-26	4/13/99	25.5	648	138	234	96	0.15
SC-26	4/13/99	28.5	689	138	217	79	0.11
SC-26	4/13/99	31.0	705	138	264	126	0.18
SC-26	4/13/99	33.0	694	138	196	58	0.08
SC-26	4/13/99	35.0	733	138	224	86	0.12
SC-26	4/13/99	37.0	755	138	249	111	0.15
SC-26	4/13/99	39.0	723	138	197	59	0.08
SC-26	4/13/99	41.5	740	138	239	101	0.14
SC-26	4/13/99	45.0	759	138	230	92	0.12
SC-26	1/18/99	48.0	820	140	261	121	0.15

TABLE 4
MS-2 DATA
FOR SOIL CORE SAMPLES

Core ID	Analysis Date	Depth (inches)	Sample Weight (Grams)	Background Count	Gross Count	Net Count	Net Count/ Gram/Min.
SC-26	4/13/99	50.5	705	138	238	100	0.14
SC-26	4/13/99	53.0	657	138	220	82	0.12
SC-26	4/13/99	55.0	607	138	212	74	0.12
SC-27	4/13/99	1.5	293	135	221	86	0.29
SC-27	4/13/99	5.0	471	135	193	58	0.12
SC-27	4/13/99	8.0	484	135	200	65	0.13
SC-27	4/13/99	10.5	528	135	219	84	0.16
SC-27	4/13/99	13.0	516	135	203	68	0.13
SC-27	4/13/99	15.5	622	135	206	71	0.11
SC-27	4/13/99	18.5	615	135	218	83	0.13
SC-27	4/13/99	22.0	761	135	240	105	0.14
SC-27	4/13/99	25.0	689	135	229	94	0.14
SC-27	4/13/99	27.0	648	135	242	107	0.17
SC-27	4/13/99	30.0	648	135	269	134	0.21
SC-27	1/18/99	33.0	898	140	261	121	0.13
SC-27	4/13/99	35.0	656	135	238	103	0.16
SC-27	4/13/99	37.5	670	135	232	97	0.14
SC-27	4/13/99	40.5	826	135	193	58	0.07
SC-28	4/13/99	2.0	570	135	288	153	0.27
SC-28	4/13/99	5.5	622	135	507	372	0.60
SC-28	4/13/99	8.5	635	135	302	167	0.26
SC-28	4/13/99	11.0	694	135	305	170	0.24
SC-28	4/13/99	13.0	705	135	270	135	0.19
SC-28	4/13/99	15.5	690	135	263	128	0.19
SC-28	4/13/99	19.0	603	135	310	175	0.29
SC-28	4/13/99	22.5	590	135	227	92	0.16
SC-28	1/18/99	25.0	837	140	246	106	0.13
SC-28	4/13/99	27.0	637	135	274	139	0.22
SC-28	4/13/99	29.5	743	135	243	108	0.15
SC-28	4/13/99	33.0	680	135	223	88	0.13
SC-28	4/13/99	35.5	438	135	159	24	0.05
SC-28	1/18/99	37.0	898	140	257	117	0.13
SC-28	4/13/99	39.0	686	135	205	70	0.10
SC-28	4/13/99	41.5	666	135	223	88	0.13
SC-28	4/13/99	44.5	750	135	235	100	0.13
SC-28	4/13/99	47.5	668	135	234	99	0.15
SC-29	4/15/99	2.0	583	140	334	194	0.33
SC-29	4/15/99	6.0	607	140	361	221	0.36
SC-29	1/18/99	9.0	788	140	420	280	0.36
SC-29	4/15/99	11.5	614	140	240	100	0.16
SC-29	4/15/99	14.5	585	140	237	97	0.17
SC-29	4/15/99	17.5	701	140	214	74	0.11
SC-29	4/15/99	20.0	673	140	274	134	0.20
SC-29	4/15/99	23.0	710	140	216	76	0.11
SC-29	4/15/99	25.0	760	140	224	84	0.11
SC-29	4/15/99	27.0	666	140	284	144	0.22
SC-29	4/15/99	29.5	656	140	259	119	0.18
SC-29	4/15/99	32.0	637	140	210	70	0.11

TABLE 4
MS-2 DATA
FOR SOIL CORE SAMPLES

Core ID	Analysis Date	Depth (inches)	Sample Weight (Grams)	Background Count	Gross Count	Net Count	Net Count/ Gram/Min.
SC-29	4/15/99	34.5	696	140	233	93	0.13
SC-29	4/15/99	37.0	702	140	231	91	0.13
SC-29	4/15/99	39.0	698	140	267	127	0.18
SC-29	4/15/99	41.0	767	140	255	115	0.15
SC-29	4/15/99	43.0	761	140	251	111	0.15
SC-29	4/15/99	45.0	733	140	235	95	0.13
SC-29	4/15/99	47.0	714	140	201	61	0.09
SC-29	4/15/99	49.0	804	140	229	89	0.11
SC-29	4/15/99	51.0	697	140	212	72	0.10
SC-30	4/14/99	3.0	537	145	239	94	0.18
SC-30	4/14/99	7.0	930	140	247	107	0.12
SC-30	4/14/99	10.5	816	145	200	55	0.07
SC-30	4/14/99	14.5	660	145	352	207	0.31
SC-30	4/14/99	17.0	654	145	196	51	0.08
SC-30	4/14/99	19.5	676	145	250	105	0.16
SC-30	4/14/99	22.0	658	145	229	84	0.13
SC-30	4/14/99	24.5	764	145	264	119	0.16
SC-30	4/14/99	27.5	697	145	251	106	0.15
SC-30	4/14/99	30.0	716	145	230	85	0.12
SC-30	4/14/99	32.5	693	145	212	67	0.10
SC-30	4/14/99	35.5	706	145	248	103	0.15
SC-30	4/14/99	38.5	712	145	234	89	0.13
SC-30	4/14/99	41.0	693	145	232	87	0.13
SC-30	4/14/99	43.5	772	145	196	51	0.07
SC-30	4/14/99	46.0	713	145	246	101	0.14
SC-31	4/13/99	2.5	443	135	204	69	0.16
SC-31	4/13/99	6.5	603	135	274	134	0.22
SC-31	1/14/99	9.0	821	140	283	148	0.18
SC-31	4/13/99	11.0	653	135	211	76	0.12
SC-31	4/13/99	13.0	675	135	236	101	0.15
SC-31	4/13/99	15.0	657	135	198	53	0.08
SC-31	4/13/99	17.0	679	145	219	84	0.12
SC-31	4/13/99	19.5	689	135	195	60	0.09
SC-31	4/13/99	22.5	732	135	223	88	0.12
SC-31	4/13/99	26.0	674	135	195	60	0.09
SC-31	4/13/99	31.0	690	135	242	107	0.16
SC-31	1/14/99	35.0	838	140	259	119	0.14
SC-31	4/13/99	37.0	733	135	265	130	0.18
SC-31	4/13/99	39.5	743	135	220	85	0.11
SC-31	4/13/99	42.0	712	135	227	92	0.13
SC-31	4/13/99	45.0	782	135	234	99	0.13
SC-31	4/13/99	48.5	658	135	228	93	0.14
SC-31	4/13/99	51.0	707	135	231	96	0.14
SC-31	4/13/99	53.0	689	135	233	98	0.14
SC-31	4/13/99	55.0	739	135	244	109	0.15
SC-31	4/13/99	57.0	671	135	262	127	0.19
SC-32	4/20/99	1.0	429	145	206	61	0.14
SC-32	4/20/99	3.5	560	145	225	80	0.14

TABLE 4
MS-2 DATA
FOR SOIL CORE SAMPLES

Core ID	Analysis Date	Depth (inches)	Sample Weight (Grams)	Background Count	Gross Count	Net Count	Net Count/ Gram/Min.
SC-32	4/20/99	6.5	564	145	213	68	0.12
SC-32	4/20/99	9.5	564	145	194	49	0.09
SC-32	4/20/99	12.5	644	145	232	87	0.14
SC-32	4/20/99	15.5	604	145	296	151	0.25
SC-32	4/20/99	18.5	667	145	233	88	0.13
SC-32	4/20/99	21.5	816	145	235	90	0.11
SC-32	4/20/99	24.0	642	145	255	110	0.17
SC-32	4/20/99	26.5	718	145	205	60	0.08
SC-32	1/18/99	29.0	862	140	262	122	0.14
SC-32	4/20/99	31.5	697	145	201	56	0.08
SC-32	4/20/99	35.0	648	145	227	82	0.13
SC-32	4/20/99	37.5	699	145	236	91	0.13
SC-32	4/20/99	41.5	559	145	176	31	0.06
SC-33	4/6/99	2.5	436	140	250	110	0.25
SC-33	4/6/99	6.5	693	140	242	102	0.15
SC-33	4/6/99	9.0	525	140	228	88	0.17
SC-33	4/6/99	11.5	571	140	226	86	0.15
SC-33	4/6/99	14.0	540	140	223	83	0.15
SC-33	4/6/99	16.5	387	140	201	61	0.16
SC-33	1/18/99	19.0	836	140	287	147	0.18
SC-33	4/6/99	22.0	718	140	256	116	0.16
SC-33	4/6/99	25.0	504	140	361	221	0.44
SC-33	4/6/99	26.5	475	140	346	206	0.43
SC-33	4/6/99	28.5	535	140	242	102	0.19
SC-33	4/6/99	31.0	535	140	249	109	0.20
SC-33	4/6/99	33.5	634	140	217	77	0.12
SC-33	4/6/99	36.5	683	140	217	77	0.11
SC-33	4/6/99	39.0	729	140	240	100	0.14
SC-33	4/6/99	40.0	420	140	183	43	0.10
SC-33	1/18/99	41.0	841	140	209	69	0.08
SC-34	4/6/99	3.0	474	140	267	127	0.27
SC-34	4/6/99	8.0	532	140	360	220	0.41
SC-34	4/6/99	11.5	702	140	278	138	0.20
SC-34	4/6/99	15.0	564	140	334	194	0.34
SC-34	1/18/99	18.0	708	140	354	214	0.30
SC-34	4/6/99	20.5	609	140	315	175	0.29
SC-34	4/6/99	23.0	635	140	281	141	0.22
SC-34	4/6/99	25.0	569	140	254	114	0.20
SC-34	4/6/99	27.0	642	140	277	137	0.21
SC-34	4/6/99	29.0	698	140	302	162	0.23
SC-34	4/6/99	31.5	711	140	413	273	0.38
SC-34	4/6/99	34.5	705	140	305	165	0.23
SC-34	4/6/99	37.0	578	140	217	77	0.13
SC-34	4/6/99	39.5	610	140	199	59	0.10
SC-34	4/6/99	42.0	622	140	213	73	0.12
SC-34	4/6/99	44.5	643	140	242	102	0.16
SC-34	4/6/99	47.0	592	140	191	51	0.09
SC-34	1/18/99	49.0	799	140	245	105	0.13

TABLE 4
MS-2 DATA
FOR SOIL CORE SAMPLES

Core ID	Analysis Date	Depth (inches)	Sample Weight (Grams)	Background Count	Gross Count	Net Count	Net Count/ Gram/Min.
SC-34	4/6/99	51.0	689	140	220	80	0.12
SC-34	4/6/99	52.0	301	140	190	50	0.17
SC-35	4/7/99	2.0	318	142	1220	1078	3.39
SC-35	1/18/99	5.0	694	140	2064	1924	2.77
SC-35	4/7/99	7.5	571	142	1188	1046	1.83
SC-35	4/7/99	11.0	571	142	1354	1212	2.12
SC-35	4/7/99	14.5	629	142	1243	1101	1.75
SC-35	4/7/99	17.0	619	142	1426	1284	2.07
SC-35	4/7/99	19.0	589	142	802	660	1.12
SC-35	4/7/99	21.5	587	142	493	351	0.60
SC-35	4/7/99	24.0	618	142	382	240	0.39
SC-35	4/7/99	26.5	626	142	546	404	0.65
SC-35	4/7/99	29.0	415	142	466	324	0.78
SC-35	1/18/99	31.0	842	142	794	652	0.77
SC-35	4/7/99	33.5	646	142	838	693	1.07
SC-35	4/7/99	36.5	594	142	808	666	1.12
SC-35	4/7/99	39.0	632	142	789	647	1.02
SC-35	4/7/99	41.0	678	142	766	624	0.92
SC-35	4/7/99	43.5	722	142	693	551	0.76
SC-35	4/7/99	46.0	699	142	488	346	0.49
SC-35	4/7/99	48.5	719	142	357	215	0.30
SC-35	4/7/99	51.0	724	142	250	108	0.15
SC-35	4/7/99	53.0	717	142	233	91	0.13
SC-35	4/7/99	55.0	696	142	214	72	0.10
SC-35	4/7/99	57.0	630	142	284	142	0.23
SC-35	4/7/99	61.0	724	142	206	64	0.09
SC-35	4/7/99	62.5	622	142	258	116	0.19
SC-35	4/7/99	66.0	604	142	220	78	0.13
SC-35	4/7/99	69.5	597	142	271	129	0.22
SC-35	4/7/99	73.5	676	142	163	21	0.03
SC-35	4/7/99	77.0	664	142	188	46	0.07
SC-35	4/7/99	79.0	661	142	215	73	0.11
SC-35	4/7/99	81.0	726	142	224	82	0.11
SC-35	4/7/99	83.0	680	142	190	48	0.07
SC-35	4/7/99	83.5	774	142	255	113	0.15
SC-35	4/7/99	88.5	694	142	178	36	0.05
SC-35	4/7/99	90.5	685	142	219	77	0.11
SC-35	4/7/99	94.0	705	142	199	57	0.08
SC-35	4/7/99	97.0	710	142	197	55	0.08
SC-35	4/7/99	99.0	728	142	209	67	0.09
SC-35	4/7/99	101.0	666	142	213	71	0.11
SC-35	4/7/99	103.0	763	142	242	100	0.13
SC-35	4/7/99	105.0	790	142	225	83	0.11
SC-35	1/18/99	107.0	897	140	220	80	0.09
SC-36	4/7/99	2.0	651	142	349	207	0.32
SC-36	4/7/99	6.0	600	142	347	205	0.34
SC-36	4/7/99	10.0	588	142	251	109	0.19
SC-36	4/7/99	13.0	603	142	242	100	0.17

TABLE 4
MS-2 DATA
FOR SOIL CORE SAMPLES

Core ID	Analysis Date	Depth (inches)	Sample Weight (Grams)	Background Count	Gross Count	Net Count	Net Count/ Gram/Min.
SC-36	4/7/99	15.0	533	142	210	68	0.13
SC-36	1/18/99	17.0	830	140	324	184	0.22
SC-36	4/7/99	19.5	656	142	274	132	0.20
SC-36	4/7/99	22.5	607	142	263	121	0.20
SC-36	4/7/99	25.5	632	142	275	133	0.21
SC-36	4/7/99	28.0	630	142	216	74	0.12
SC-36	4/7/99	30.5	676	142	249	107	0.16
SC-36	4/7/99	32.5	664	142	204	62	0.09
SC-36	4/7/99	35.5	679	142	225	83	0.12
SC-36	4/7/99	38.0	677	142	219	77	0.11
SC-36	4/7/99	40.0	700	142	247	105	0.15
SC-36	4/7/99	42.0	719	142	212	70	0.10
SC-36	4/7/99	45.5	725	142	209	67	0.09
SC-36	4/7/99	59.0	419	142	178	36	0.09
SC-36	1/18/99	61.0	737	140	199	59	0.08
SC-36	4/7/99	64.5	600	142	221	79	0.13
SC-36	4/7/99	68.5	772	142	245	103	0.13
SC-36	4/7/99	71.0	651	142	201	59	0.09
SC-36	4/7/99	73.0	707	142	241	99	0.14
SC-36	4/7/99	75.5	829	142	230	88	0.11
SC-36	4/7/99	78.5	704	142	208	66	0.09
SC-36	4/7/99	81.0	718	142	217	75	0.10
SC-36	4/7/99	84.0	731	142	237	95	0.13
SC-36	4/7/99	87.0	722	142	226	84	0.12
SC-36	4/7/99	90.0	746	142	237	95	0.13
SC-36	4/7/99	94.0	753	142	273	131	0.17
SC-37	4/8/99	2.5	507	141	247	106	0.21
SC-37	4/8/99	6.0	669	141	280	139	0.21
SC-37	4/8/99	8.5	657	141	276	135	0.21
SC-37	4/8/99	11.0	744	141	239	98	0.13
SC-37	4/8/99	13.5	645	141	237	96	0.15
SC-37	4/8/99	16.5	346	141	166	25	0.07
SC-37	1/18/99	19.0	835	140	304	164	0.20
SC-37	4/8/99	21.5	644	141	218	77	0.12
SC-37	4/8/99	24.5	662	141	222	81	0.12
SC-37	4/8/99	27.5	702	141	249	108	0.15
SC-37	4/8/99	30.0	610	141	217	76	0.12
SC-37	4/8/99	32.5	718	141	241	100	0.14
SC-37	4/8/99	35.0	670	141	228	87	0.13
SC-37	4/8/99	37.0	678	141	200	59	0.09
SC-37	4/8/99	39.0	730	141	215	74	0.10
SC-37	4/8/99	41.5	647	141	293	152	0.23
SC-38	4/8/99	2.0	473	141	218	77	0.16
SC-38	4/8/99	5.5	515	141	244	103	0.20
SC-38	4/8/99	8.0	497	141	266	125	0.25
SC-38	4/8/99	11.0	533	141	265	124	0.23
SC-38	4/8/99	15.5	606	141	291	150	0.25
SC-38	1/18/99	19.0	748	140	369	229	0.31

TABLE 4
MS-2 DATA
FOR SOIL CORE SAMPLES

Core ID	Analysis Date	Depth (inches)	Sample Weight (Grams)	Background Count	Gross Count	Net Count	Net Count/ Gram/Min.
SC-38	4/8/99	21.0	625	141	293	152	0.24
SC-38	4/8/99	23.0	617	141	307	166	0.27
SC-38	4/8/99	25.0	635	141	466	325	0.51
SC-38	4/8/99	27.5	614	141	263	122	0.20
SC-38	4/8/99	30.5	621	141	241	100	0.16
SC-38	4/8/99	32.5	643	141	258	117	0.18
SC-38	4/8/99	35.0	632	141	255	114	0.18
SC-38	4/8/99	37.0	646	141	252	111	0.17
SC-38	4/8/99	39.0	676	141	244	103	0.15
SC-38	4/8/99	41.5	612	141	231	90	0.15
SC-38	4/8/99	44.5	687	141	169	28	0.04
SC-38	4/8/99	48.0	626	141	200	59	0.09
SC-38	4/8/99	52.0	726	141	237	96	0.13
SC-38	4/8/99	56.0	583	141	198	57	0.10
SC-38	4/8/99	59.0	583	141	188	47	0.08
SC-38	1/18/99	61.0	833	140	221	81	0.10
SC-38	4/8/99	64.0	633	141	196	55	0.09
SC-38	4/8/99	68.0	681	141	215	74	0.11
SC-38	4/8/99	72.0	804	141	177	36	0.04
SC-38	4/8/99	75.5	765	141	205	64	0.08
SC-38	4/8/99	78.5	751	141	242	101	0.13
SC-38	4/8/99	81.5	755	141	204	63	0.08
SC-38	4/8/99	84.5	740	141	244	103	0.14
SC-38	4/8/99	87.5	711	141	260	119	0.17
SC-38	4/8/99	90.5	773	141	244	103	0.13
SC-39	4/8/99	3.0	720	141	239	98	0.14
SC-39	1/18/99	7.0	665	140	244	104	0.16
SC-39	4/8/99	9.0	669	141	182	41	0.06
SC-39	4/8/99	11.0	668	141	220	79	0.12
SC-39	4/8/99	12.5	627	141	238	97	0.15
SC-39	4/8/99	15.0	639	141	228	87	0.14
SC-39	4/8/99	19.5	689	141	224	83	0.12
SC-39	1/18/99	23.0	812	140	214	74	0.09
SC-39	4/8/99	25.0	703	141	212	71	0.10
SC-39	4/8/99	27.5	645	141	221	80	0.12
SC-39	4/8/99	31.0	672	141	211	70	0.10
SC-39	4/8/99	34.5	694	141	214	73	0.11
SC-39	4/8/99	37.0	696	141	232	91	0.13
SC-39	4/8/99	39.5	709	141	154	13	0.02
SC-39	4/8/99	42.5	750	141	193	52	0.07
SC-39	4/8/99	45.5	745	141	225	84	0.11
SC-39	4/8/99	48.5	699	141	209	68	0.10
SC-39	4/8/99	50.5	443	141	170	29	0.07
SC-40	4/14/99	1.0	606	145	225	80	0.13
SC-40	4/14/99	3.5	535	145	222	77	0.14
SC-40	4/14/99	6.5	636	145	267	122	0.19
SC-40	4/14/99	9.0	584	145	492	347	0.59
SC-40	4/14/99	12.0	610	145	570	425	0.70

TABLE 4
MS-2 DATA
FOR SOIL CORE SAMPLES

Core ID	Analysis Date	Depth (inches)	Sample Weight (Grams)	Background Count	Gross Count	Net Count	Net Count/ Gram/Min.
SC-40	1/14/99	15.0	761	140	711	571	0.75
SC-40	4/14/99	17.0	538	145	323	178	0.33
SC-40	4/14/99	19.0	601	145	285	140	0.23
SC-40	4/14/99	21.0	644	145	296	151	0.23
SC-40	4/14/99	23.5	563	145	248	103	0.18
SC-40	4/14/99	26.5	627	145	239	94	0.15
SC-40	4/14/99	29.0	658	145	261	116	0.18
SC-40	4/14/99	31.0	679	145	228	83	0.12
SC-40	4/14/99	33.5	673	145	256	111	0.16
SC-40	4/14/99	35.5	365	145	191	46	0.13
SC-40	1/14/99	37.0	757	140	227	87	0.11
SC-40	4/14/99	39.0	666	145	217	72	0.11
SC-40	4/14/99	40.5	360	145	180	35	0.10
SC-40	4/14/99	61.0	599	145	234	89	0.15
SC-40	4/14/99	63.5	602	145	204	59	0.10
SC-40	4/14/99	66.0	582	145	191	46	0.08
SC-40	4/14/99	68.0	584	145	198	53	0.09
SC-40	4/14/99	70.0	698	145	258	113	0.16
SC-40	4/14/99	72.0	721	145	199	54	0.07
SC-40	4/14/99	74.0	700	145	225	80	0.11
SC-40	4/14/99	76.0	638	145	212	67	0.11
SC-40	4/14/99	78.0	648	145	231	86	0.13
SC-40	4/14/99	80.0	583	145	179	34	0.06
SC-40	4/14/99	82.5	585	145	172	27	0.05
SC-40	4/14/99	85.5	590	145	192	47	0.08
SC-40	4/14/99	88.5	670	145	215	70	0.10
SC-40	4/14/99	92.0	717	145	230	85	0.12
SC-40	4/14/99	95.5	710	145	218	73	0.10
SC-41	4/12/99	2.0	717	138	348	210	0.29
SC-41	4/12/99	6.0	632	138	227	89	0.14
SC-41	4/12/99	9.0	594	138	468	330	0.56
SC-41	4/12/99	11.5	551	138	873	735	1.33
SC-41	4/12/99	14.5	535	138	496	358	0.67
SC-41	1/14/99	17.0	775	140	460	320	0.41
SC-41	4/12/99	19.0	735	138	186	48	0.07
SC-41	4/12/99	21.0	676	138	208	70	0.10
SC-41	4/12/99	23.5	694	138	206	68	0.10
SC-41	4/12/99	26.5	721	138	218	80	0.11
SC-41	4/12/99	30.5	663	138	217	79	0.12
SC-41	4/12/99	32.5	698	138	218	80	0.11
SC-41	4/12/99	36.0	455	138	188	50	0.11
SC-41	1/14/99	39.0	737	140	269	129	0.18
SC-41	4/12/99	41.5	566	138	225	87	0.15
SC-41	4/12/99	45.0	615	138	220	82	0.13
SC-41	4/12/99	48.5	627	138	274	136	0.22
SC-41	4/12/99	51.5	623	138	241	103	0.17
SC-41	4/12/99	54.5	679	138	223	85	0.13
SC-41	4/12/99	57.0	725	138	219	81	0.11

TABLE 4
MS-2 DATA
FOR SOIL CORE SAMPLES

Core ID	Analysis Date	Depth (inches)	Sample Weight (Grams)	Background Count	Gross Count	Net Count	Net Count/ Gram/Min.
SC-41	4/12/99	59.5	708	138	211	73	0.10
SC-41	4/12/99	62.0	609	138	191	53	0.09
SC-41	4/12/99	64.5	608	138	199	61	0.10
SC-41	4/12/99	67.0	723	138	221	83	0.11
SC-41	4/12/99	69.0	775	138	202	64	0.08
SC-41	4/12/99	71.0	726	138	210	72	0.10
SC-41	4/12/99	73.0	724	138	213	75	0.10
SC-41	4/12/99	75.0	703	138	212	74	0.11
SC-41	4/12/99	77.0	702	138	226	88	0.13
SC-41	4/12/99	79.0	605	138	223	85	0.14
SC-42	4/14/99	2.0	343	145	218	73	0.21
SC-42	4/14/99	5.5	539	145	230	85	0.16
SC-42	4/14/99	8.0	568	145	268	123	0.22
SC-42	4/14/99	10.0	629	145	246	101	0.16
SC-42	4/14/99	12.5	639	145	257	112	0.18
SC-42	4/14/99	16.0	619	145	270	125	0.20
SC-42	4/14/99	19.0	687	145	312	167	0.24
SC-42	4/14/99	21.5	634	145	250	105	0.17
SC-42	4/14/99	24.5	705	145	284	139	0.20
SC-42	1/18/99	27.0	737	140	288	148	0.20
SC-42	4/14/99	29.0	599	145	258	113	0.19
SC-42	4/14/99	31.5	544	145	234	89	0.16
SC-42	4/14/99	34.0	567	145	232	87	0.15
SC-42	4/14/99	36.0	597	145	245	100	0.17
SC-42	4/14/99	38.5	589	145	259	114	0.19
SC-42	4/14/99	41.0	630	145	262	117	0.19
SC-42	4/14/99	43.0	643	145	274	129	0.20
SC-42	4/14/99	45.0	627	145	241	96	0.15
SC-42	4/14/99	47.0	456	145	174	29	0.06
SC-42	4/14/99	49.0	518	145	221	76	0.15
SC-42	4/14/99	51.0	577	145	237	92	0.16
SC-42	4/14/99	53.0	517	145	203	58	0.11
SC-42	4/14/99	55.0	604	145	193	48	0.08
SC-42	4/14/99	57.0	642	145	233	88	0.14
SC-42	4/14/99	59.0	443	145	184	39	0.09
SC-42	4/14/99	61.0	591	147	226	79	0.13
SC-42	4/14/99	64.0	565	147	233	86	0.15
SC-42	4/14/99	67.5	557	147	208	61	0.11
SC-42	4/14/99	70.0	581	147	228	81	0.14
SC-42	4/14/99	72.5	564	147	207	60	0.11
SC-42	4/14/99	75.0	633	147	225	78	0.12
SC-42	4/14/99	77.0	589	147	218	71	0.12
SC-42	4/14/99	79.0	601	147	230	83	0.14
SC-42	4/14/99	81.5	599	147	242	95	0.16
SC-42	4/14/99	84.5	604	147	241	94	0.16
SC-42	4/14/99	87.5	610	147	230	83	0.14
SC-42	4/14/99	90.5	638	147	208	61	0.10
SC-42	4/14/99	93.0	812	147	184	37	0.05

TABLE 4
MS-2 DATA
FOR SOIL CORE SAMPLES

Core ID	Analysis Date	Depth (inches)	Sample Weight (Grams)	Background Count	Gross Count	Net Count	Net Count/ Gram/Min.
SC-42	4/14/99	95.5	650	147	224	77	0.12
SC-42	4/15/99	98.0	635	147	238	91	0.14
SC-42	4/15/99	100.0	630	147	223	76	0.12
SC-42	4/15/99	102.0	630	147	249	102	0.16
SC-42	4/15/99	104.0	588	147	218	71	0.12
SC-42	4/15/99	106.0	633	147	215	68	0.11
SC-42	4/15/99	107.5	628	147	202	55	0.09
SC-42	1/18/99	109.0	784	147	233	86	0.11
SC-42	4/15/99	>108	736	147	252	105	0.14
SC-43	4/19/99	13.0	544	140	264	124	0.23
SC-43	4/19/99	39.0	649	140	266	126	0.19
SC-43	4/19/99	69.0	568	140	247	107	0.19
SC-43	4/19/99	83.0	670	140	263	123	0.18
SC-43	4/19/99	99.0	579	140	223	83	0.14
SC-44	1/18/99	121.0	685	140	278	138	0.20
SC-44	1/18/99	155.0	791	140	242	102	0.13
SC-45	1/18/99	29.0	754	140	274	134	0.18
SC-45	1/18/99	73.0	664	140	273	133	0.20
SC-46	1/18/99	73.0	547	140	222	82	0.15
SC-46	1/18/99	99.0	789	140	230	90	0.11
SC-47	4/19/99	13.0	517	140	221	81	0.16
SC-47	4/19/99	25.0	603	140	239	99	0.16
SC-47	4/19/99	73.0	639	140	243	103	0.16
SC-47	1/18/99	28.0	697	140	257	117	0.17
SC-47	1/18/99	72.0	820	140	219	79	0.10

TABLE 5
FILTERED MS-2 SAMPLE DATA

Sample	NET COUNT/GM 0-12 inches	NET COUNT/GM 12-24 inches	NET COUNT/GM 24-36 inches	NET COUNT/GM 36-48 inches	NET COUNT/GM 48-60 inches	NET COUNT/GM >60 inches
SC-1		0.16				
SC-2	0.22	0.12	0.21	0.16		
SC-3A	0.18	0.16	0.10			
SC-3B	0.11	0.14	0.15			
SC-4	0.15	0.37	0.15			
SC-5		0.14				
SC-6				0.13		
SC-7				0.19		
SC-8		0.13		0.16		
SC-9		0.22		0.11		
SC-10			0.11			
SC-11	0.18	0.21	0.15	0.22	0.22	0.24
SC-14				0.23		
SC-15	0.18	0.21	0.18			
SC-16	0.25	0.29	0.52	0.21		
SC-17	0.15	0.14	0.18			
SC-18	0.17	0.21	0.17	0.11		
SC-19	0.15	0.17	0.16	0.13	0.07	
SC-20	1.33	0.32	0.32	0.20		
SC-21	1.17	0.16	0.15	0.23	0.15	
SC-22	0.26	0.22	0.14	0.13	0.08	
SC-23	0.37	0.50	0.17	0.16	0.14	
SC-24	1.47	0.20	0.65	0.13	0.01	
SC-25	0.95	0.21	0.16			
SC-26	0.75	0.14	0.18	0.15	0.15	
SC-27	0.29	0.14	0.21	0.14		
SC-28	0.60	0.29	0.22	0.15		
SC-29	0.36	0.20	0.22	0.18	0.11	
SC-30	0.18	0.31	0.16	0.14		
SC-31	0.22	0.15	0.16	0.18	0.19	
SC-32	0.14	0.25	0.17	0.13		
SC-33	0.25	0.18	0.44	0.14		
SC-34	0.41	0.34	0.38	0.16	0.17	
SC-35	3.39	2.07	1.07	1.12	0.30	0.22
SC-36	0.34	0.22	0.21	0.15	0.09	0.17
SC-37	0.21	0.20	0.15	0.23		
SC-38	0.25	0.31	0.51	0.17	0.13	0.17
SC-39	0.16	0.15	0.12	0.13	0.10	
SC-40	0.59	0.75	0.18	0.11		0.16
SC-41	1.33	0.67	0.12	0.18	0.22	0.14
SC-42	0.22	0.24	0.20	0.20	0.16	0.16
SC-43		0.23	0.27	0.19		0.19
SC-44						0.20
SC-45			0.18			0.20
SC-46						0.15
SC-47		0.16	0.17			0.16

1. Table presents the maximum sample result (in net counts per gram per minute) within each designated sample interval.

TABLE 6
QUANTITY OF POTENTIALLY IMPACTED SOILS

	Area of soils with MS-2 data in given range (ft^2) [a]		
Depth (in.)	0.2 to 0.5[b]	0.5 to 0.75	> 0.75
0-12	17,190	6,490	12,225
12-24	32,991	2,292	4,548
24-36	30,431	2,523	619
36-48	15,722	1,897	707
48-60	5,713	0	0
> 60	29,108	0	0
Total Volume (ft^3)	**131,155**	**13,202**	**18,099**
Total Volume (yd^3)	**4,858**	**489**	**670**

a. Areas for each depth interval are as provided by the contouring software.
b. MS-2 data ranges are given in net counts per minute per gram.

FIGURES

DRAWING NUMBER 93132E61

8" STEEL GASOLINE LINE (LOCATION APPROXIMATE)

4" STEEL WATER LINE (LOCATION APPROXIMATE)

MONITORED WASTE LINE TO EVAPORATOR (LOCATION APPROXIMATE) (PARTIALLY REMOVED IN 1995)

POND

SAND

FORMER GROUNDWATER SUPPLY WELL DW-5

EXCAVATION AREA FOR SUBSURFACE INVESTIGATION

FORMER BUILDING

FORMER ZIRCALOY BURN AREA

8" STEEL GAS LINE (LOCATION APPROXIMATE)

EXISTING SLUDGE FILTER BEDS

WESTINGHOUSE SURVEY GRID

INDUSTRIAL WASTE TREATMENT PLANT

TWP. RD. 966

8" STEEL GASOLINE LINE (LOCATION APPROXIMATE)

MW-16A
MW-18A
MW-2
MW-19A
PW-1
MW-24
MW-25

SC-1 SC-2 SC-3A SC-3B SC-4 SC-5 SC-6 SC-7 SC-8 SC-9 SC-10 SC-11 SC-12 SC-13 SC-14 SC-15 SC-16 SC-17 SC-18 SC-19 SC-20 SC-21 SC-22 SC-23 SC-24 SC-25 SC-26 SC-27 SC-28 SC-29 SC-30 SC-31 SC-32 SC-33 SC-34 SC-35 SC-36 SC-37 SC-38 SC-39 SC-40 SC-41 SC-42 SC-43 SC-44 SC-45 SC-46 SC-47

N 0 N 20 N 40 N 60 N 80 N 100 N 120 N 140

E 0 E 20 E 40 E 60 E 80 E 100 E 120 E 140 E 160

970 975 980 985 990 995 1000

LEGEND:

- PONDS/STREAMS
- 980 SURFACE CONTOURS (FEET ABOVE MEAN SEA LEVEL)
- SC-8 NOVEMBER 1998 BORING LOCATION
- MW-8A UNCONSOLIDATED DEPOSITS/WEATHERED BEDROCK MONITORING WELL
- MW-8B SALTSBURG SANDSTONE MONITORING WELL
- MW-22A BORING LOCATION
- PW-1 PUMPING WELL LOCATION

SCALE 0 10 20 METERS

PLOT SCALE: 1=1

REFERENCE:

WESTINGHOUSE ELECTRIC CORPORATION, SPECIALTY METALS DIVISION, BLAIRSVILLE, PENNSYLVANIA; FIGURE 6; TITLED: "SURFACE AND GROUND WATER QUALITY MONITORING LOCATIONS NEAR PLANT FACILITIES," PROJECT P6043.

CUMMINGS RITER CONSULTANTS, INC.
CORPORATE HEADQUARTERS
339 Haymaker Road
Parkway Building, Suite 201
Monroeville, PA 15146
(412) 373-5240
Fax: (412) 373-5242

REVISIONS

REV.	DESCRIPTION	DATE	APPROVED

DRAWN BY:	T.E. McKee	DATE: 5-3-99
CHECKED BY:	B.R. Mawer	DATE: 6-14-99
APPROVED BY:	A.A. Baughman	DATE: 6-14-99

FIGURE 1

LOCATION MAP

FORMER ZIRCALOY BURN AREA
SPECIALTY METALS PLANT
BLAIRSVILLE, PENNSYLVANIA

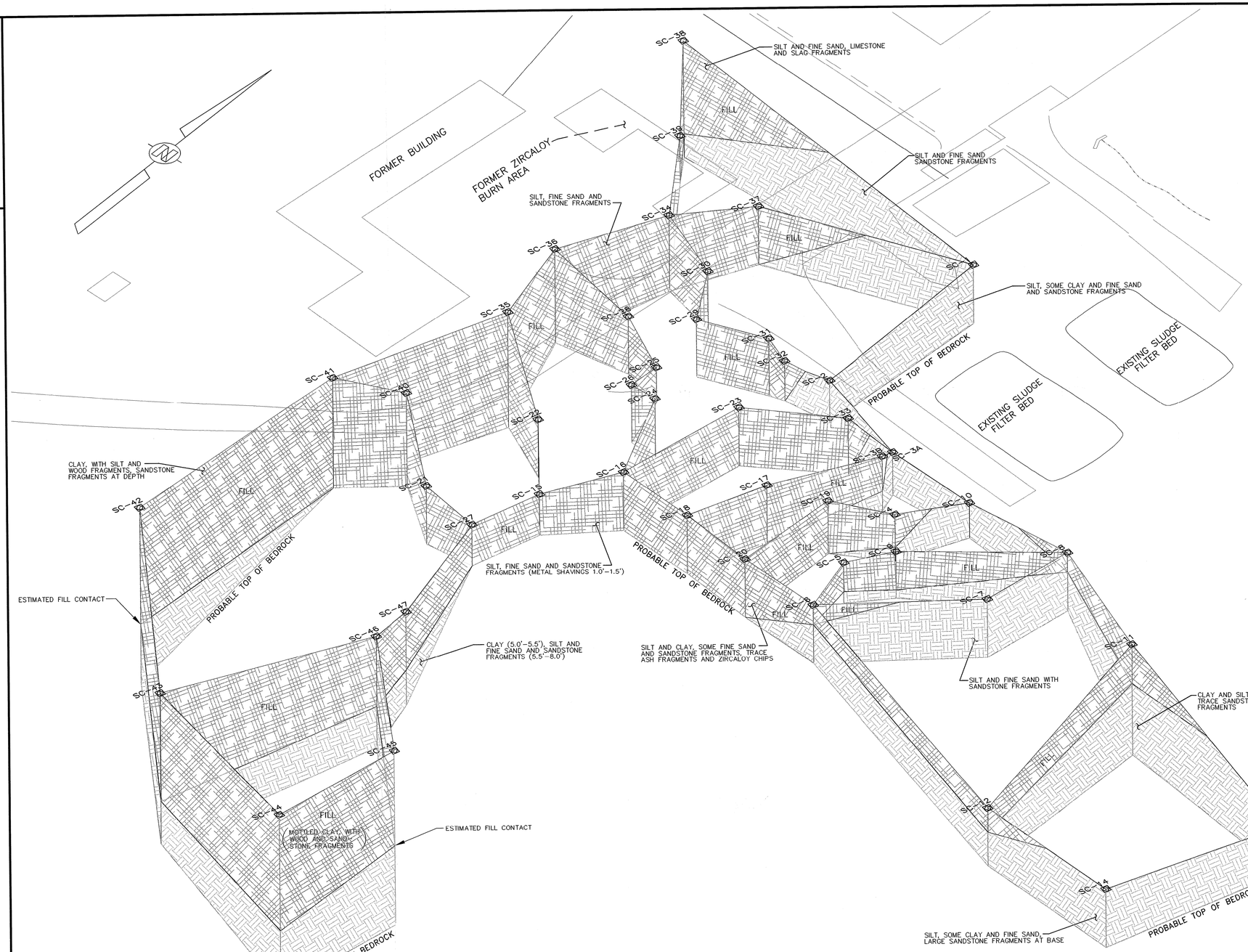
PREPARED FOR

WESTINGHOUSE ELECTRIC COMPANY
PITTSBURGH, PENNSYLVANIA

SIZE	DRAWING NUMBER	REV.
E	93132E61	

SCALE: 1" = 10m SHEET 1 OF 1

DRAWING NUMBER 93132E41



LEGEND:

FILL

UNCONSOLIDATED DEPOSIT

NOTE:

FILL IS DISTINGUISHED FROM SOIL BY THE PRESENCE OF WASTE AND/OR CONSTRUCTION DEBRIS. SOIL AS SHOWN, IS SOIL WITH NO OBVIOUS WASTE AND/OR CONSTRUCTION DEBRIS.

APPROXIMATE HORIZONTAL SCALE

25 0 25 50 FEET

APPROXIMATE VERTICAL SCALE

5 0 5 10 FEET

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED

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FIGURE 2

FENCE DIAGRAM
FORMER ZIRCALOY BURN AREA

SPECIALTY METALS PLANT
BLAIRSVILLE, PENNSYLVANIA

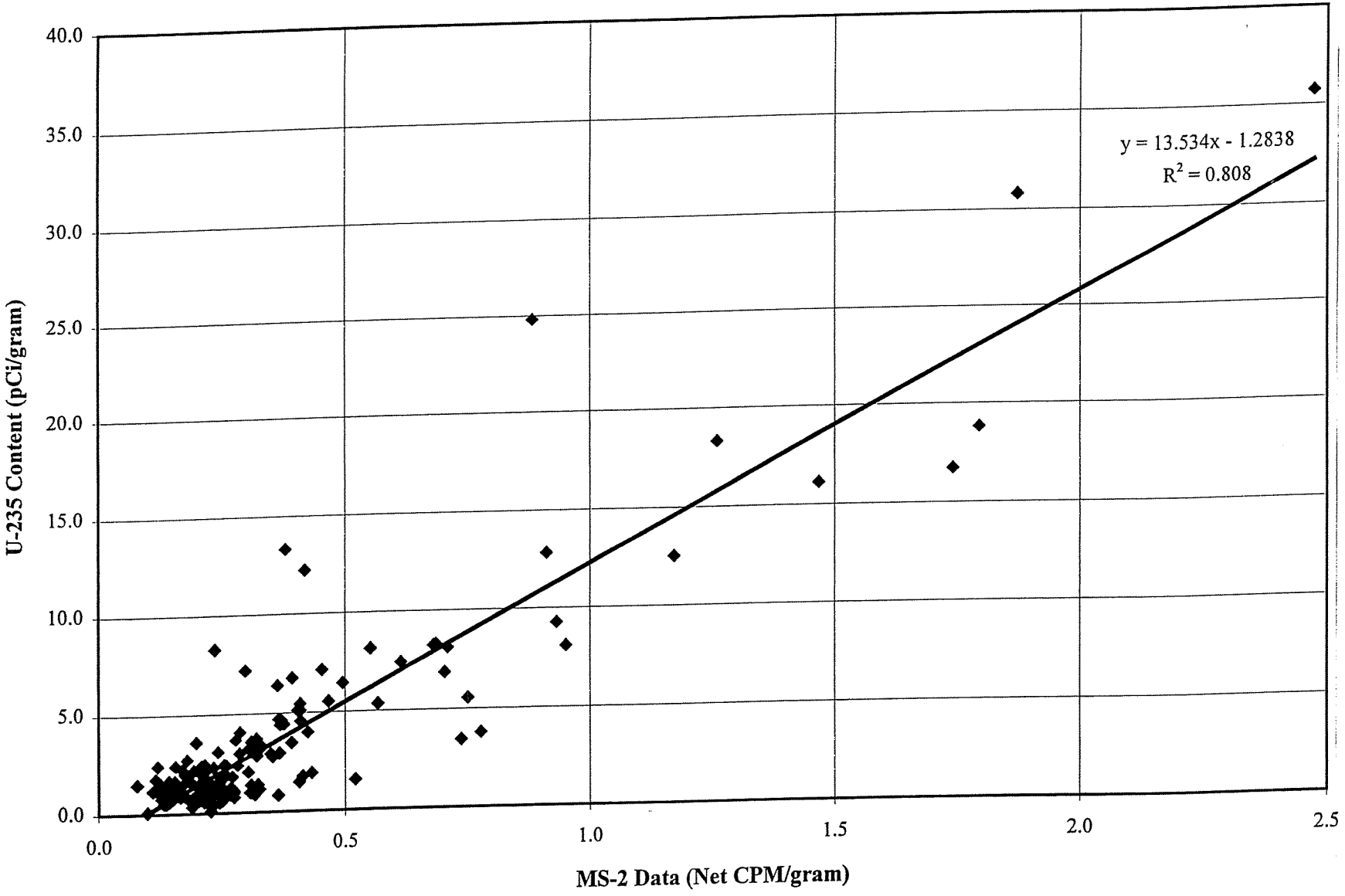
PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY
BLAIRSVILLE, PENNSYLVANIA

SIZE	SCALE:	REV.	DRAWING NUMBER
E	NONE		93132E41

DRAWN BY:	T.E. McKee	DATE: 12-16-98
CHECKED BY:	B.R. Maurer	DATE: 6-14-99
APPROVED BY:	W.A. Baughman	DATE: 6-14-99

PLOT SCALE: 1=1

FIGURE 3
GAMMA SPECTROMETRY U-235 DATA
vs. MS-2 DATA CORRELATION



brm\132\MS-2 Correlation.xls

DRAWING NUMBER 93132A26

Note: Contours were generated by the computer software based on interpolating the available data, and do not necessarily represent actual conditions.

DRAWN BY:	B. MAURER	DATE:	5/3/99
CHECKED BY:	B.R. Maurer	DATE:	6-11-99
APPROVED BY:	W. A. Baughman	DATE:	6-11-99

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER 93132A26

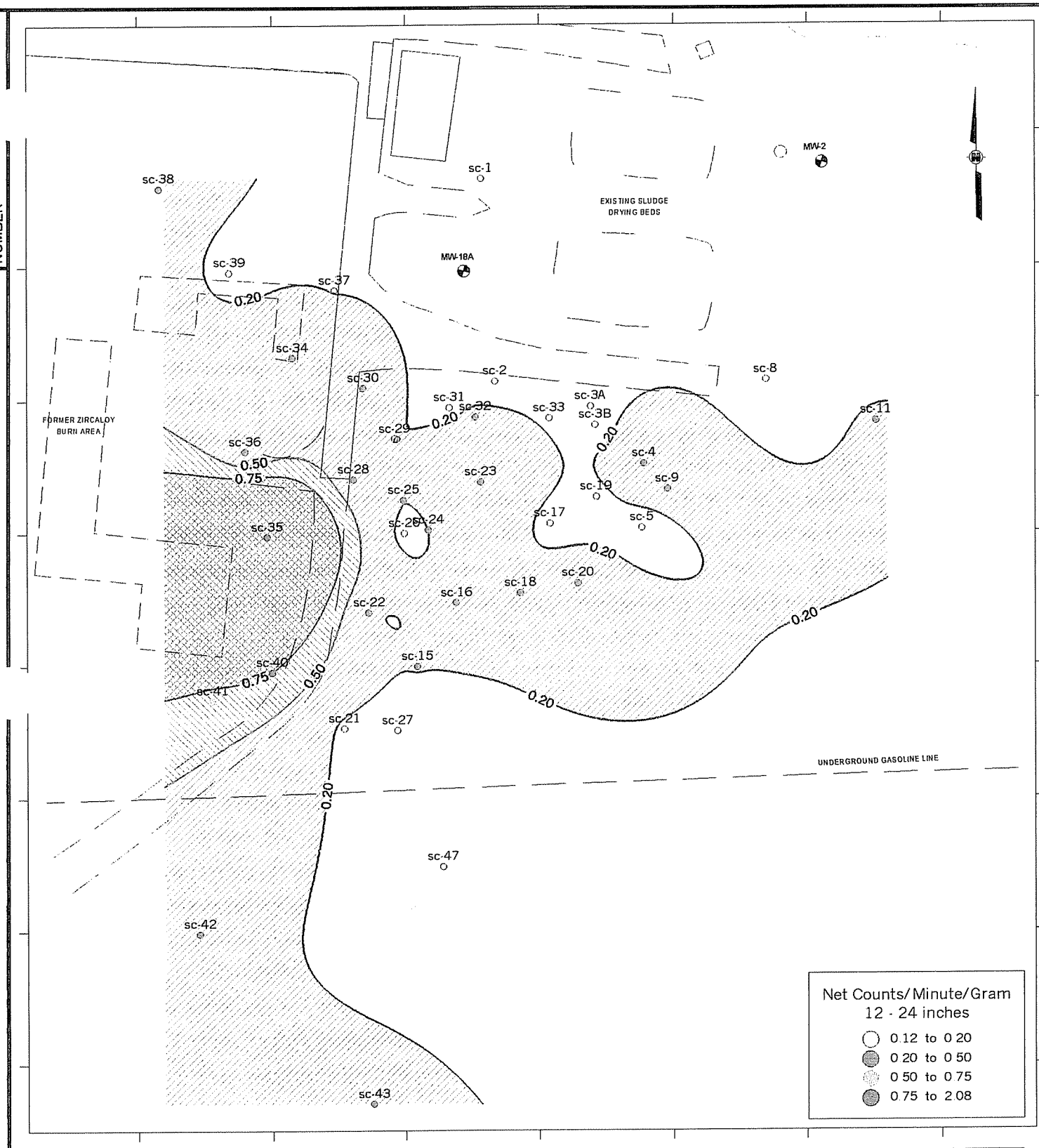
FIGURE 4

MS-2 DATA 0-12 INCHES

FORMER ZIRCALOY BURN AREA
WESTINGHOUSE ELECTRIC COMPANY
SPECIALTY METALS PLANT

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY
BLAIRSVILLE, PENNSYLVANIA

DRAWING NUMBER 93132A27



Note: Contours were generated by the computer software based on interpolating the available data, and do not necessarily represent actual conditions

DRAWN BY:	B. Maurer	DATE:	5/3/99
CHECKED BY:	BR Maurer	DATE:	6-11-99
APPROVED BY:	W. A. Baughman	DATE:	6-11-99

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER

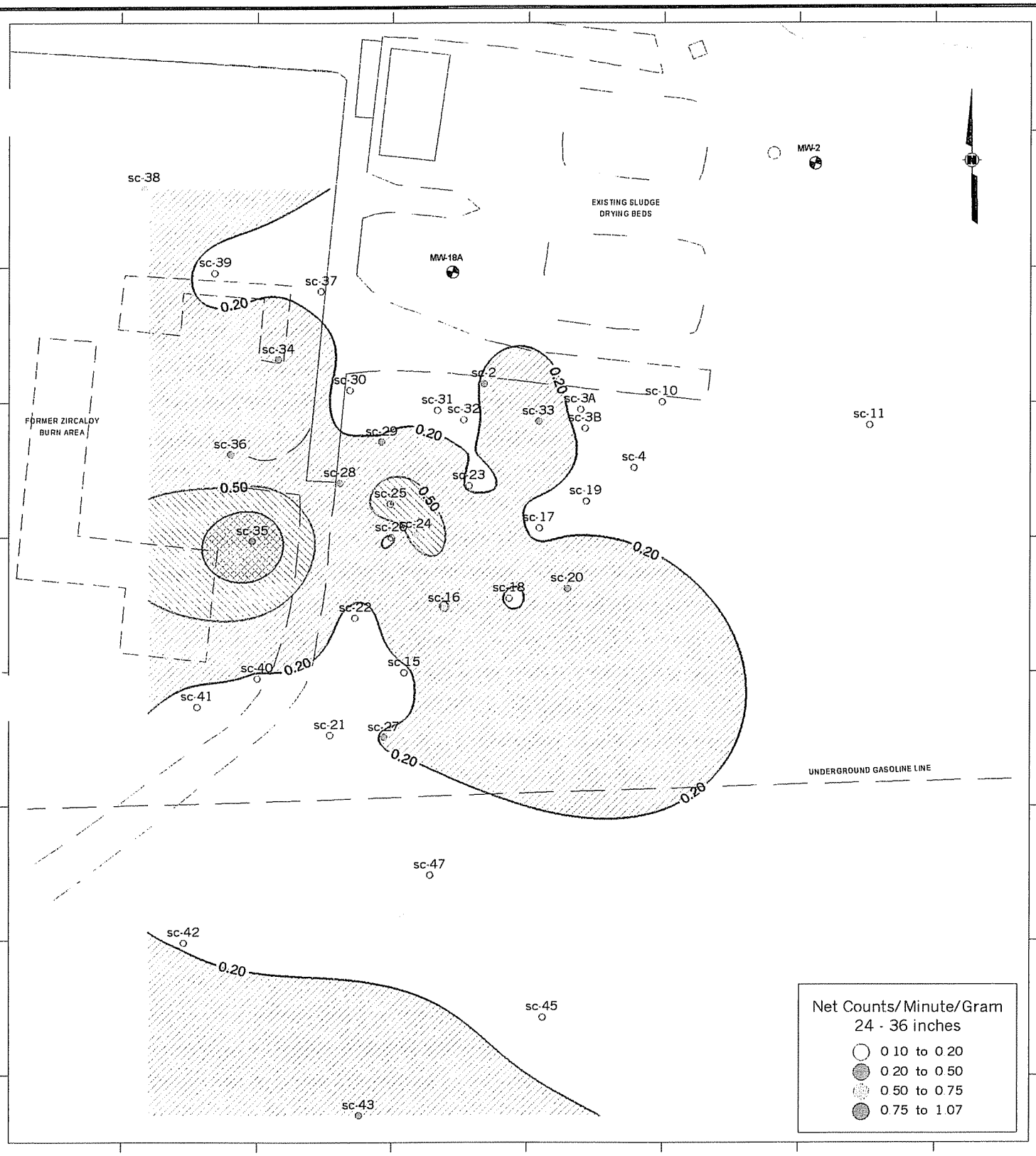
93132A27

FIGURE 5
MS-2 DATA 12-24 INCHES

FORMER ZIRCALOY BURN AREA
WESTINGHOUSE ELECTRIC COMPANY
SPECIALTY METALS PLANT

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY
BLAIRSVILLE, PENNSYLVANIA

DRAWING NUMBER 93123A28



Note: Contours were generated by the computer software based on interpolating the available data, and do not necessarily represent actual conditions

DRAWN BY:	B. Maurer	DATE:	5/3/99
CHECKED BY:	B.R. Maurer	DATE:	6-11-99
APPROVED BY:	W.A. Baughman	DATE:	6-11-99

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER 93132A28

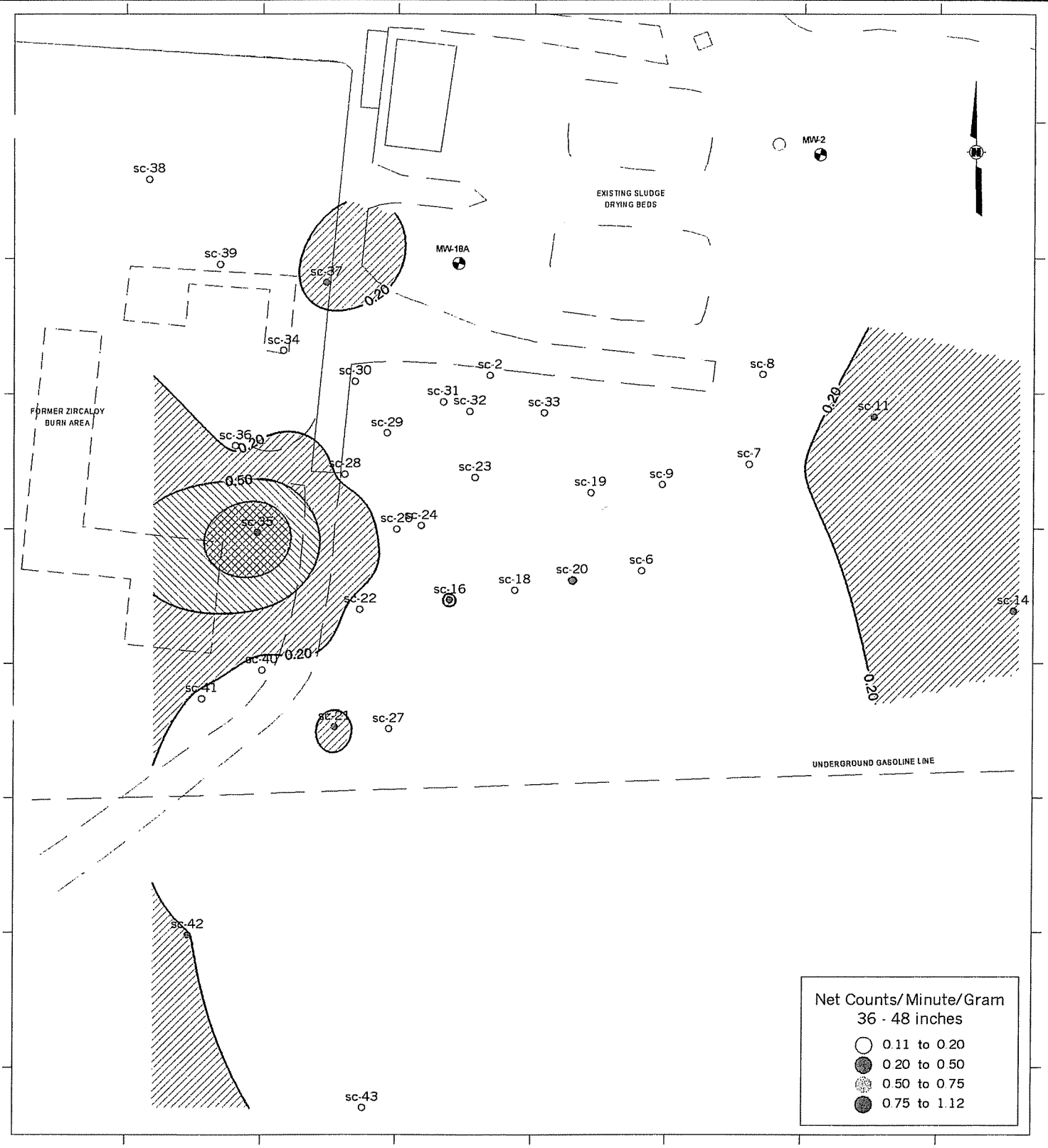
FIGURE NO. 6

MS-2 DATA 24-36 INCHES

FORMER ZIRCALOY BURN AREA
WESTINGHOUSE ELECTRIC COMPANY
SPECIALTY METALS PLANT

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY
BLAIRSVILLE, PENNSYLVANIA

DRAWING NUMBER 23A29



Note: Contours were generated by the computer software based on interpolating the available data, and do not necessarily represent actual conditions.

DRAWN BY:	B. Maurer	DATE:	5/3/99
CHECKED BY:	B.R. Maurer	DATE:	6-11-99
APPROVED BY:	W. A. Baughman	DATE:	6-11-99

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER

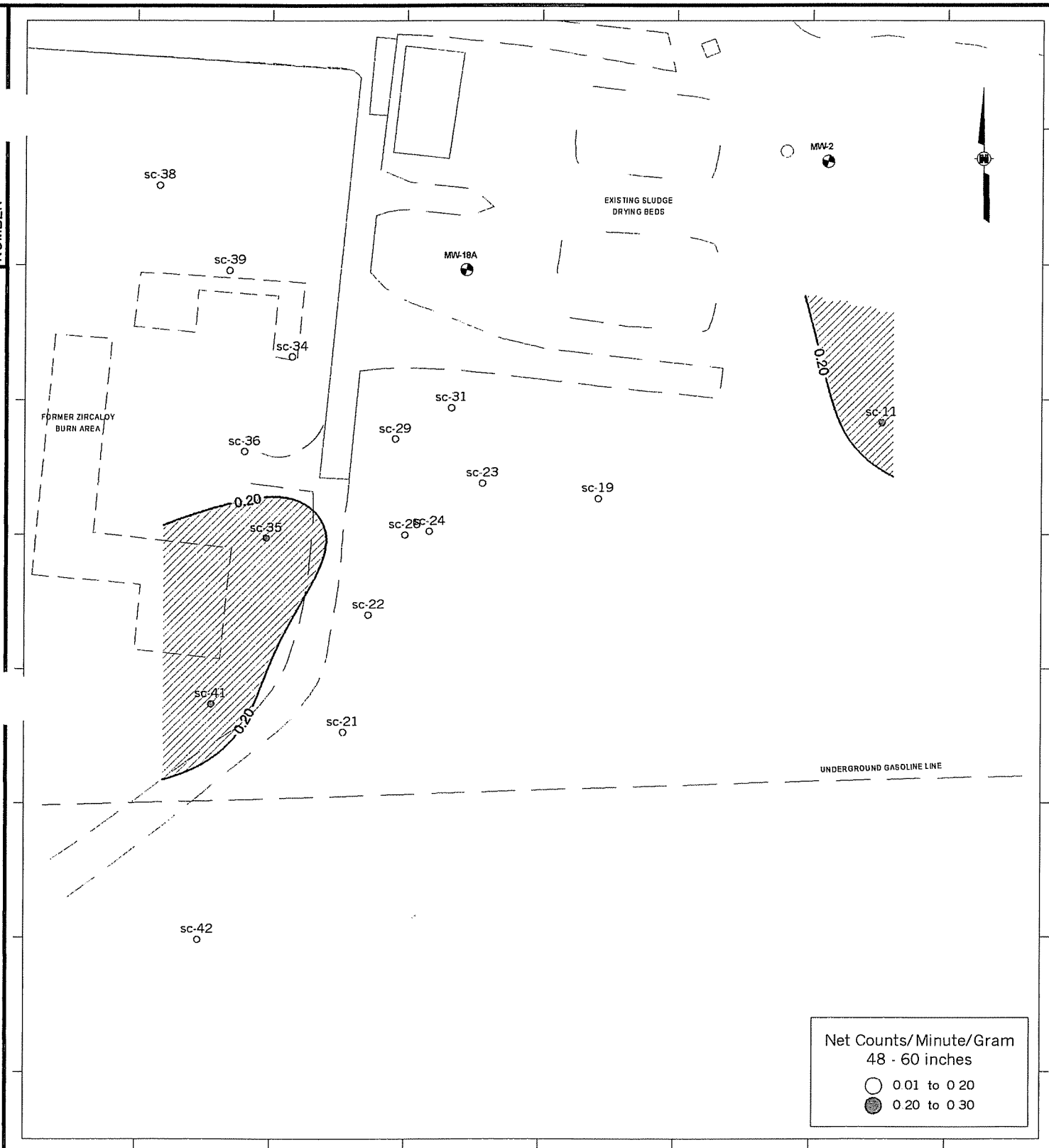
93132A29

FIGURE NO. 7
MS-2 DATA 36-48 INCHES

FORMER ZIRCALOY BURN AREA
WESTINGHOUSE ELECTRIC COMPANY
SPECIALTY METALS PLANT

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY
BLAIRSVILLE, PENNSYLVANIA

DRAWING NUMBER 93132A30



Note: Contours were generated by the computer software based on interpolating the available data, and do not necessarily represent actual conditions.

DRAWN BY:	B. Maurer	DATE:	5/3/99
CHECKED BY:	BR Maurer	DATE:	6-11-99
APPROVED BY:	W. A. Baughman	DATE:	6-11-99

CUMMINGS RITER CONSULTANTS, INC.

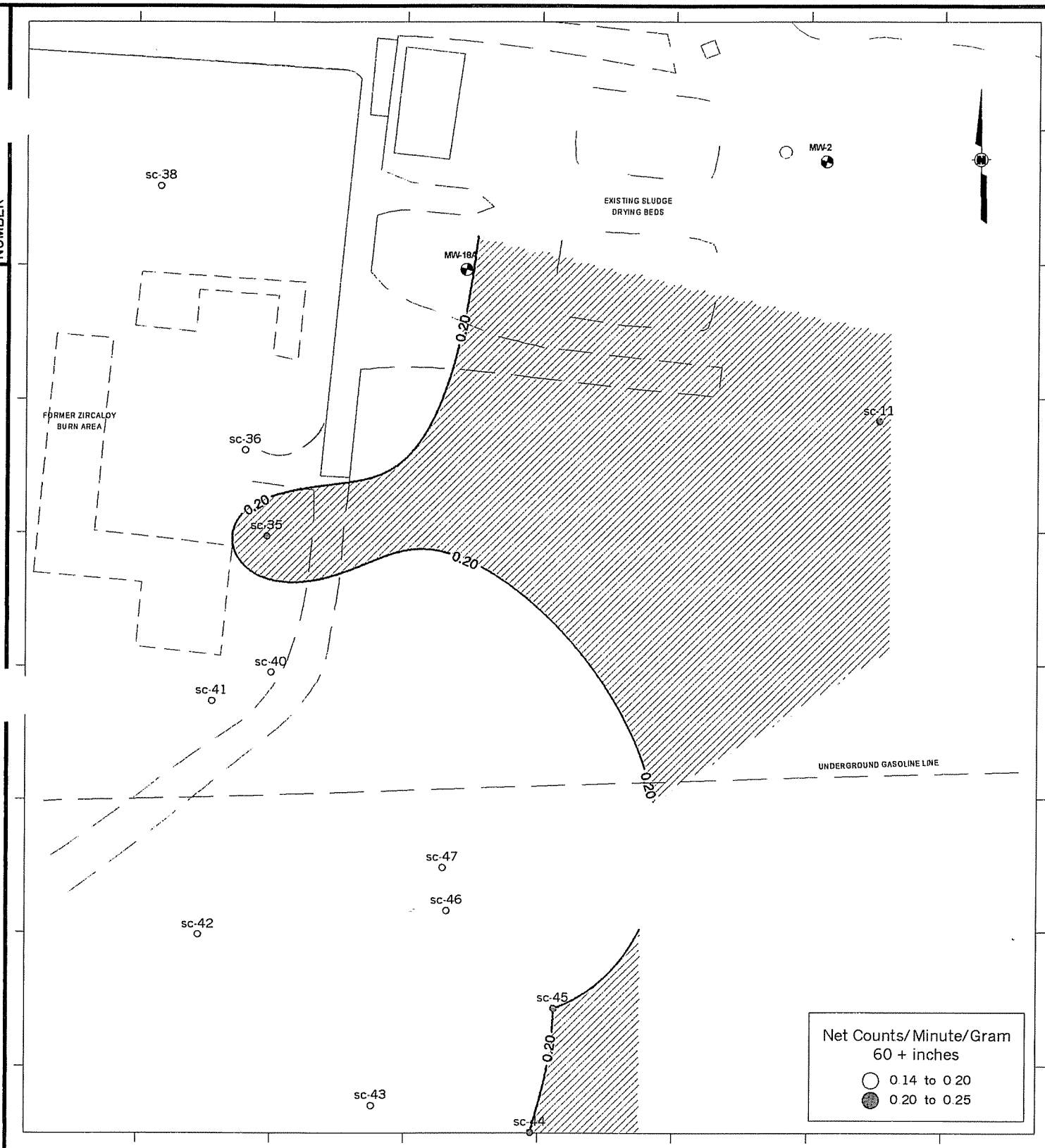
DRAWING NUMBER
93132A30

FIGURE NO. 8
MS-2 DATA 48-60 INCHES

FORMER ZIRCALOY BURN AREA
WESTINGHOUSE ELECTRIC COMPANY
SPECIALTY METALS PLANT

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY
BLAIRSVILLE, PENNSYLVANIA

DRAWING NUMBER 93132A31



Note: Contours were generated by the computer software based on interpolating the available data, and do not necessarily represent actual conditions

DRAWN BY:	B. Maurer	DATE:	5/3/99
CHECKED BY:	B.R. Maurer	DATE:	6-11-99
APPROVED BY:	W.A. Baughman	DATE:	6-11-99

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER
93132A31

FIGURE NO. 9
MS-2 DATA 60 + INCHES

FORMER ZIRCALOY BURN AREA
WESTINGHOUSE ELECTRIC COMPANY
SPECIALTY METALS PLANT

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY
BLAIRSVILLE, PENNSYLVANIA

APPENDIX A

SUMMARY OF WESTINGHOUSE INVESTIGATIONS
FORMER ZIRCALOY BURN AREA

Investigation and General Findings
"Former Zircaloy Burn Area"
or
"Cow Palace Area"
Blairsville SMP

Background

During the period from the mid 1950's to around the mid 1960's, Uranium fuel fabrication work was conducted at the Blairsville Specialty Metals Plant. This work consisted of both Navy Fuel designs utilizing highly enriched Uranium and commercial fuel designs using low enriched Uranium. Development work utilizing both Natural and Depleted Uranium was also conducted. In conjunction with the fuel fabrication work in the main building, a separate building was used for various waste treatment and packaging operations. These operations consisted of an evaporator for liquids, an Incinerator, and solid waste packaging and storage in preparation for shipment. This building was located south of the Main Building. The upper building structure was removed in the 1980's and the foundation structure was removed in the 1990's. The area encompassing the location of this former building is now referred to as either the "Former Zircaloy Burn (FZB) Area" or the "Cow Palace Area".

Extensive surface and subsurface investigations had previously been conducted in this area (References 1, 2 and 3). A few surface contamination areas were identified and remediated as a result of those investigations. Also exploratory trenches were dug to investigate the subsurface features. In general those investigations did not identify significant contamination. As a result, a decision was made to prepare a Risk Analysis that would include review of the available data, recommendations for additional sampling if required and an assessment of public risk that might accrue if no further remedial actions were taken. One previously identified item in the FZB area was a buried terra-cotta pipe line. (This item is noted on the Figure for the Area 4 Test Trenches in Appendix B of Reference 2.) A decision was made to relocate that terra-cotta line and remove it during the summer of 1998, coincident with the removal of a remaining underground line in the Finishing area of the Main Building. The relocation and removal of the terra-cotta line lead to the identification of additional contamination as described in this report.

A complicating factor in the previous characterization studies was the lack of knowledge that the FZB area had been covered over at some time in the past with a layer of fill soil. Some of the soil appears to have come from the several expansions of the on-site pond that is located to the southwest of the FZB area. There appears to be a minimum layer of approximately 2 feet of fill soil covering the original topography of the FZB area.

Initial Findings beneath Building Footprint

During the site characterization and investigation that occurred in the 1995-96 time frame, a buried pipe segment, of what has since been found to be a 70 foot section of terra-cotta piping, was located under the surface of the FZB area. The pipe is now believed to have been connected to the floor drain system of the former building structure. At the time of the pipe's discovery it was confirmed that the contents of the pipe was contaminated with materials characteristic of enriched Uranium. It was determined that the line would need to be removed in the future. No other information or evidence of other materials buried beneath the surface were evident at the time of the initial investigation. Furthermore, site history and knowledge of the former process and use of the drain line as well as the disposition of the former building structure was never fully detailed.

Remediation of the drain line began in early June, 1998 with the relocation of the pipe segment. At the time, the drain line was the only identified subsurface feature. However, prior to the excavation activity, drawings were identified that showed the presence of two sumps that had been connected to the drain line. The approximate locations of the sumps were identified and a search for the sumps was performed coincident with the removal of the terra cotta line. When the line was uncovered only about ½ of the line remained intact with the other ½ dispersed throughout the immediate area as evidenced by broken sections of terra cotta piping and pipe contents sludge). There were indications that material leakage had occurred from around the joints of the piping and as a result radiological contamination had leaked from the piping and leached into the soil. Excavation and removal of the affected soil was required. During this phase of the remediation large sections of concrete were uncovered. It became apparent that much of the building structure had been buried on site both within the footprint of the former building and the area immediately in front of the building (east side). Radiological contamination was found to be more wide spread than originally believed. During the initial site investigation in 1995, both shallow and deep samples were collected from the FZB area, without any indication of contamination. The shallow soil samples were collected from a depth of 0-6" and 6-12" and the deep soil samples collected down to bedrock. It was discovered in June, 1998 that the shallow soil that had been collected represented clean fill material placed on top of the original soil following the final excavation and burial of the former building structure. It was estimated that an 18-24" layer of clean fill was placed over the original surface.

The sumps were located and excavated. Upon access to the sump interiors it was noted that equipment and other related debris had been placed inside of the sumps prior to closure. Many of these materials were found to be radiologically contaminated as well as a significant volume of soils and concrete that were also contained in the sumps. All such equipment was removed and packaged accordingly for ultimate disposal as radiological waste.

Based on the observations during sump excavation radiological screening of debris, concrete and other assorted materials contained within the sump, it was determined that the footprint of the former building needed to be investigated in greater detail. During this investigation, the primary structure of the building, such as the floor and portions of the wall, was confirmed to have been buried in the area.

Remediation Actions in Building Area

Remediation of specific areas of the FZB area are described separately below. The locations of these features are provided on Figure A-1

Drain Pipe Excavation

The entire length of the remaining terra-cotta pipeline was exposed for excavation. Approximately half of the line was found in place. The other half (the shallow end) had apparently been dispersed during the removal of the building foundation since fragments of the terra-cotta pipe material were found throughout the area as the excavation proceeded. The portion of the line that remained in place was severely fractured and was essentially plugged with contaminated sediment. There was also indication of soil contamination beneath the pipeline. Since a red dye had been used in the ceramic magnet manufacturing process housed in the building during its later use, the red coloring of the soil also provided a visual indication of leakage from the pipe. The terra-cotta pipeline and all surrounding contaminated material was removed based on visual indications and radiological field measurements. Soil samples were taken along the length of the pipeline for analysis by gamma spectrometry. Additional soil was removed until the samples indicated that the remaining surface area would meet the release criteria for Uranium contamination.

Removal of Sumps

Two buried sumps were located at the northern end of the terra-cotta pipe line. The terra-cotta pipeline apparently ended in the one sump. The other sump had a line leading to it but the feed and use of this sump is not clear. Both sumps had been demolished to a level below grade and then back-filled with debris. Some of the sump contents included contaminated fragments of process equipment. The sumps were emptied of their contents and the remaining concrete sumps were removed from the ground. The contamination in the vicinity of the sumps was removed based on both visual indications and radiological field measurements. Soil samples were taken in the sump excavations for analysis by gamma spectrometry. Additional soil was removed until the samples indicated that the sump excavation surface would meet the release criteria for Uranium contamination.

Identification of Leach Field System

During the remediation of the pipeline and sumps, a piece of heavy equipment broke through into a buried concrete pit covered with a concrete lid. Subsequent excavation of the area identified the initial pit, a concrete distribution box, and a system of three parallel pipelines. These components were identified as a leach field system that was not identified on the available Westinghouse, Specialty Metal Plant, drawings. The piping system consisted of short lengths of terra-cotta pipes that were laid end-to-end in a gravel bed layer. There was no connection between the pipe ends so leakage would occur at each location where the pipes were butted together. There was no odor associated with the system and no sludge in the concrete pit, both of which indicate that the system had not been used for sanitary waste disposal. Samples taken along the three pipelines did not indicate the presence of radiological contamination. Based on the sampling information the location of the ends of the pipelines and the concrete pit were documented and the area was backfilled using the excavated soil. This action was taken to provide additional area in which to maneuver equipment and stockpile soil.

Separation of Building Rubble

Along with the excavations discussed above for the terra-cotta pipelines and the sumps, the entire area beneath and in front (Eastern side) of the former building was excavated to reclaim various building rubble. It appears that the plant floor and subsurface foundation were disposed of in an excavation in front of the former building. In order to assess the condition of the building rubble, all such material was segregated in a separate pile. Smaller items which were found to be contaminated were immediately packaged for disposal. The resulting pile of building rubble was then surveyed for radiological contamination and the small fraction of pieces that exceeded the release criteria for surface contamination were set aside for eventual disposal in a licensed burial facility. The large fraction of rubble that met the free release criteria was transported to a permitted landfill for disposal as industrial waste.

Formation and Evaluation of "Clean" Soil Pile

After separation of the building rubble, the remaining material excavated from under and around the former building consisted of about 43,000 cubic feet of soil. In order to evaluate the radiological condition of this soil in a meaningful manner, it was spread out into a layer about 4 feet thick.

An initial evaluation of the "spread out" pile was made by conducting a gamma survey of the pile on an established grid pattern. This data was compiled and entered into a computer graphics program (Surfer) to plot the data in both 3-D and contour plots to help visualize the information.

The data and the computer generated plots are included in Attachment A. The conclusion from that evaluation was that the soil pile appeared to be relatively uniform in radiation level.

Soil samples from the pile were then collected on a predetermined pattern. The evaluation (sampling, analysis and conclusions) of this "clean" soil pile is found in Attachment B to this report.

Identification of Ash Layer

Initial Findings

During excavation to remove building debris and rubble in the vicinity of the footprint of the former building, a well defined layer of dark ash-like material was observed. Also observed within this "ash" layer were materials similar to zirconium turnings and chips. Upon further observation many of the zirconium pieces appeared to be heat affected, as if they were residual material as a result of an incomplete burning process. A radiological field survey of the ash layer indicated the likely presence of radiological contamination . The layer was found at a depth of ~2-2.5 feet below the surface and was approximately 6" thick. The layer was first located along the Southeast end of the former building footprint excavation and bordering the roadway leading to the pond. Investigation indicated that the layer was present, parallel to the roadway and it appeared to continue east below the surface of the existing access road. Discovery of this ash layer indicated a need for further investigation, including radiological surveys and collection of samples for gamma spectrometry analysis to identify the extent and nature of the radiological contamination.

Trench Investigations

Further investigation of the extent of the ash layer entailed excavation of shallow, narrow trenches. The depth of these trenches was limited such that once the potentially contaminated layer of ash was identified, either visually or via field survey instrumentation, no further vertical investigation was conducted. This series of trenches provided evidence of the ash layer under the roadway as well as on the eastern side of the road leading toward a former lagoon. The ash layer in this area varied from ½ to 1" thickness to a layer of ~8-12" in depth. In general, whenever ash material was encountered it also contained the zirconium turnings/chips. The locations of the excavated trenches dug for this portion of the investigation are indicated in Figure A-1.

During the trenching operation along the east side of the roadway, field instrumentation indicated what appeared to be an area of elevated radiological contamination. Further investigation identified what appeared

to be a fuel pellet of a size consistent with commercial product. This was uncovered approximately 6"-12" below the surface. The soil in the immediate area also indicated elevated radiological levels above background. The pellet as well as soil samples from the vicinity of its discovery were taken to the Antech Laboratory, in Madison, PA for gamma spectrometry analysis.

Identification of Contaminants

Gamma spectrometry analysis of ash material, soil and the pellet indicated the presence of a variety of Uranium enrichments. Ash and soil samples showed contamination due to depleted, low and moderately enriched Uranium. The pellet discovered to the east of the road was depleted Uranium.

Decision to Conduct Core Boring Investigations

Based on analytical and field survey data, and visual observations from the shallow trenching investigations, the ash layer is not uniformly dispersed throughout the area, rather it appears to be distributed in a spotty, haphazard manner. Additional subsurface investigations were needed to delineate the vertical and horizontal extent of contamination. At this time Cummings/Riter Consultants Inc. was retained to provide assistance in the development of the protocol and methodologies for a detailed evaluation of the area.

Identification of Former Lagoon

Previous Investigations/Findings

A former lagoon had been previously identified and evaluated in Section 5.4 of Reference 3. During that investigation three trenches were excavated in the area of the approximate location of the lagoon, as based on review of historical aerial photographs. Two samples were taken of soil material associated with some metal debris found during the trenching. The isotopic composition of these samples is consistent with the processed Uranium that would have been used in the fuel fabrication work. The amount of contaminated material was very small and unlikely to be representative of the average concentration in the soil. Based on these results it did not appear that further investigation was warranted.

Identification of Line Leading to Lagoon

During the excavation of the area under the footprint of the former building, a black PVC line was uncovered that led from the building towards the area of the former lagoon. This line was investigated by excavating a trench along its length until the line terminated at the

apparent southwest corner of the former lagoon. Based on this physical information, a portion the former lagoon was found to be located further north than had been originally thought.

Exploratory Excavations in Lagoon Area

To further evaluate the lagoon area, excavation was initiated at the southwest corner where the PVC line terminated. More detailed review of the historical aerial photograph indicated that this corner was indeed where the water effluent entered the lagoon. The initial excavation did not indicate the presence of radiological contamination but did indicate that the lagoon had been filled in with rubble. When some of the concrete slabs were overturned for removal, several isolated pockets of radioactivity well above background were identified. These locations were gray in color and included some zirconium metal turnings and chips. A sample of this material was collected and sent to the laboratory for gamma spectrometry analysis.

Identification of Contaminants

The analytical results indicated that the soil was contaminated with Uranium and that the isotopic composition was highly enriched Uranium consistent with material that would have been used in the fabrication of Navy fuel designs.

Other Areas

Tree Line along Parking Lot

Two parallel rows of pine trees that border the paved parking lot are located directly north of the former. Since several of the trees were located such that they would interfere with additional trench investigations, these trees were removed. Tree ring counting of the trunks indicated that the trees were about 25 years old which would mean that they were planted around 1973. Zircaloy turnings and chips were found under the root ball of the overturned tree stumps indicating that such materials had been scattered in this area prior to the planting of the trees. Gamma surveys conducted beneath the tree stumps did not indicate readings above expected background levels. As part of the erosion control measures associated with the excavation activities, a shallow trench was excavated around the entire excavation for the installation of a cloth mesh erosion control fence. In the area adjacent to the parking lot, the soil overturned during the shallow trenching indicated radiation levels above normal background levels. This indicates the probable presence of Uranium contamination in this area that has not been fully characterized.

Areas not Investigated

The excavated area around the former building focused primarily on the area beneath and east of the original building footprint. The area west of the building has not been thoroughly investigated because of the presence of soil piles in the area when the soil coring program was conducted. At this time essentially no investigation has been conducted of the original ground surface beneath the soil piles.

Conclusions

Based on the extent and nature of the contamination identified in the above described activities, it was decided to conduct a more extensive subsurface investigation of the area in order to quantify the extent of the contamination in terms of both area and depth. Cummings/Riter was retained to assist the investigation and prepare a report documenting the findings. Based on the coring, test trenching and other excavation activities, the following conclusions/information have been noted:

- Radiological contamination is not uniformly distributed throughout the FZB area, rather the materials are found at varying depths and areal extents.
- There are multiple sources of contamination with regard to the origin of the contamination including: processed natural Uranium; depleted Uranium; low enriched Uranium materials consistent with commercial fuel; and high enriched Uranium consistent with Navy fuel. Attachments C and D include the log and analysis of all samples collected during the investigation/remediation and submitted for gamma spectrometry.
- In the FZB area there are other sub-areas which will require additional characterization (surface and subsurface): beneath the current lay down area for the "Clean Soil Pile": beneath the lay down area for the contaminated soil pile; the area to the north along the tree line adjacent to the parking lot; and possibly further investigation of the subsurface areas beneath the former leach bed.

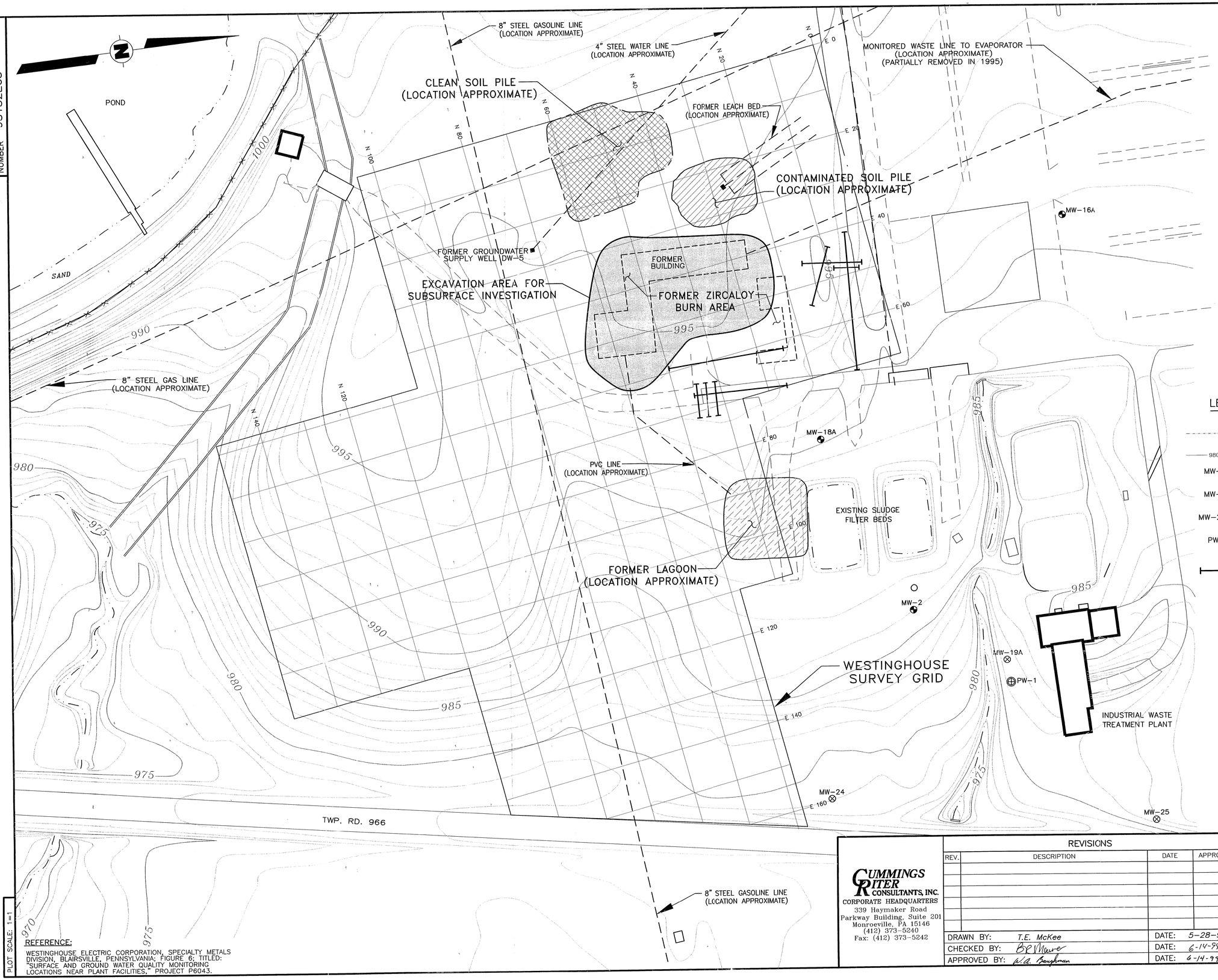
References

1. Data Summary Report, Site Investigation, Westinghouse Electric Corporation, Specialty Metals Plant, Blairsville, Pennsylvania; May 1995; prepared by Cummings Riter Consultants, Inc.
2. Data Summary Report, Phase II Investigation, Westinghouse Electric Corporation, Specialty Metals Plant, Blairsville, Pennsylvania (Three Volumes Report); December 15, 1995; prepared by Cummings Riter Consultants, Inc.
3. Addendum, Data Summary Report, Phase II Investigation, Westinghouse Electric Corporation, Specialty Metals Plant, Blairsville, Pennsylvania; December 30,1996; prepared by Cummings Riter Consultants, Inc.

FIGURE A-1

LOCATION MAP OF FORMER ZIRC BURN AREA LANDMARKS FROM WESTINGHOUSE SITE INVESTIGATION

DRAWING NUMBER 93132E63



LEGEND:

- PONDS/STREAMS
- 980 SURFACE CONTOURS (FEET ABOVE MEAN SEA LEVEL)
- MW-8A UNCONSOLIDATED DEPOSITS/WEATHERED BEDROCK MONITORING WELL
- MW-8B SALTSBURG SANDSTONE MONITORING WELL
- MW-22A BORING LOCATION
- PW-1 PUMPING WELL LOCATION
- APPROXIMATE TEST TRENCH LOCATION

SCALE
0 10 20 METERS

PLOT SCALE: 1=1

REFERENCE:
WESTINGHOUSE ELECTRIC CORPORATION, SPECIALTY METALS DIVISION, BLAIRSVILLE, PENNSYLVANIA; FIGURE 6; TITLED: "SURFACE AND GROUND WATER QUALITY MONITORING LOCATIONS NEAR PLANT FACILITIES," PROJECT P6043.

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REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED

DRAWN BY: T.E. McKee	DATE: 5-28-99	
CHECKED BY: B.P. Mercer	DATE: 6-14-99	
APPROVED BY: R.A. Baughman	DATE: 6-14-99	

FIGURE A-1

LOCATION MAP

FORMER ZIRCALOY BURN AREA
SPECIALTY METALS PLANT
BLAIRSVILLE, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY
PITTSBURGH, PENNSYLVANIA

SIZE	DRAWING NUMBER	REV.
E	93132E63	

SCALE: 1" = 10m SHEET 1 OF 1

ATTACHMENTS

A-1. Gamma Scan Data for the "Clean" Soil Pile

A-2. Radiological Evaluation of the "Clean" Soil Pile at Blairsville

A-3. Sample Log

A-4. Analytical Laboratory Data Sheets

ATTACHMENT A-1

GAMMA SCAN DATA FOR THE CLEAN SOIL PILE

This attachment provides the results for a gamma scan conducted of the "clean" soil pile prior to obtaining soil samples for analysis. The gamma scan was conducted by walking over the soil pile and making 6 second integrated counts at specific grid points. These measurements are recorded in the table. The detector used was a 1X1 NaI gamma detector.

The comments in the table indicate where analytical samples were taken. The measurement results were entered into the Surfer program which was used to provide graphical presentations of the data in the form of a 2D contour plot and two 3D plots (two different orientations).

Date 9-23-98

LEG Survey of S.M.P.
Cow Palace Dirt Pile

J. Gemza Jim Gemza

Inst# Ludlum 2221 S/N 99136

J. Shoemaker John Shoemaker

X	Y	Counts	CPM	BKG.	Net CPM	Comments	Sample
30	4	200	2000	2042	-42		
30	6	196	1960	2042	-82		
30	8	242	2420	2042	378		
30	10	226	2260	2042	218		
30	12	208	2080	2042	38		
30	14	228	2280	2042	238		
30	16	194	1940	2042	-102		
30	18	193	1930	2042	-112		
30	20	221	2210	2042	168		
32	0	213	2130	2042	88		
32	2	225	2250	2042	208		
32	4	211	2110	2042	68		
32	6	213	2130	2042	88		
32	8	226	2260	2042	218		
32	10	199	1990	2042	-52		
32	12	205	2050	2042	8		
32	14	208	2080	2042	38		
32	16	224	2240	2042	198		
32	18	211	2110	2042	68		
32	20	171	1710	2042	-332		
34	4	200	2000	2042	-42		
34	6	213	2130	2042	88		
34	8	191	1910	2042	-132		
34	10	188	1880	2042	-162		
34	12	191	1910	2042	-132		
34	14	229	2290	2042	248		
34	16	222	2220	2042	178		
34	18	229	2290	2042	248		
34	20	199	1990	2042	-52		
36	4	196	1960	2042	-82		
36	6	210	2100	2042	58		
36	8	202	2020	2042	-22		
36	10	186	1860	2042	-182		
36	12	212	2120	2042	78		
36	14	222	2220	2042	178		
36	16	192	1920	2042	-122		
36	18	216	2160	2042	118		
36	20	185	1850	2042	-192		
36	22	217	2170	2042	128		
36	24	200	2000	2042	-42		
38	2	236	2360	2042	318		
38	4	224	2240	2042	198		
38	6	220	2200	2042	158		
38	8	196	1960	2042	-82		
38	10	222	2220	2042	178		
38	12	193	1930	2042	-112		
38	14	199	1990	2042	-52		
38	16	218	2180	2042	138		
38	18	216	2160	2042	118		

Date 9-23-98

LEG Survey of S.M.P.
Cow Palace Dirt Pile

J. Gemza

Inst# Ludlum 2221 S/N 99136

J. Shoemaker

38	20	209	2090	2042	48		
38	22	211	2110	2042	68		
38	24	226	2260	2042	218		
39	6						BV-SS-3090
39	16						BV-SS-3093
40	2	238	2380	2042	338		
40	4	219	2190	2042	148		
40	6	255	2550	2042	508		
40	8	202	2020	2042	-22		
40	10	204	2040	2042	-2		
40	12	199	1990	2042	-52		
40	14	182	1820	2042	-222		
40	16	215	2150	2042	108		
40	18	214	2140	2042	98		
40	20	241	2410	2042	368		
40	22	201	2010	2042	-32		
40	24	220	2200	2042	158		
40	26	180	1800	2042	-242		
41	14						BV-SS-3091
42	0	240	2400	2042	358		
42	2	208	2080	2042	38		
42	4	205	2050	2042	8		
42	6	197	1970	2042	-72		
42	8	208	2080	2042	38		
42	10	233	2330	2042	288		
42	12	203	2030	2042	-12		
42	14	201	2010	2042	-32		
42	16	180	1800	2042	-242		
42	18	199	1990	2042	-52		
42	20	265	2650	2042	608		
42	22	216	2160	2042	118		
42	24	246	2460	2042	418		
42	26	213	2130	2042	88		
43	6						BV-SS-3089
44	0	228	2280	2042	238		
44	2	186	1860	2042	-182		
44	4	204	2040	2042	-2		
44	6	217	2170	2042	128		
44	8	212	2120	2042	78		
44	10	197	1970	2042	-72		
44	12	223	2230	2042	188		
44	14	202	2020	2042	-22		
44	16	212	2120	2042	78		BV-SS-3092
44	18	223	2230	2042	188		
44	20	227	2270	2042	228		
44	22	217	2170	2042	128		
44	24	256	2560	2042	518		
44	26	183	1830	2042	-212		
46	-12	191	1910	2042	-132		
46	-10	188	1880	2042	-162		

Date 9-23-98

LEG Survey of S.M.P.
Cow Palace Dirt Pile

J. Gemza

'nst# Lvd/lvm 2221 S/N 99136

J. Shoemaker

46	-8	186	1860	2042	-182		
46	-6	227	2270	2042	228		
46	-4	201	2010	2042	-32		
46	-2	217	2170	2042	128		
46	0	195	1950	2042	-92		
46	2	220	2200	2042	158		
46	4	204	2040	2042	-2		
46	6	201	2010	2042	-32		
46	8	237	2370	2042	328		
46	10	209	2090	2042	48		
46	12	204	2040	2042	-2		
46	14	228	2280	2042	238		
46	16	219	2190	2042	148		
46	18	217	2170	2042	128		
46	20	214	2140	2042	98		
46	22	225	2250	2042	208		
46	24	212	2120	2042	78		
46	26	202	2020	2042	-22		
48	-12	212	2120	2042	78		
48	-10	227	2270	2042	228		
48	-8	192	1920	2042	-122		BV-SS-3055
48	-6	223	2230	2042	188		
48	-4	180	1800	2042	-242		
48	-2	189	1890	2042	-152		BV-SS-3058
48	0	214	2140	2042	98		
48	2	217	2170	2042	128		BV-SS-3062
48	4	209	2090	2042	48		BV-SS-3065
48	6	246	2460	2042	418		BV-SS-3069
48	8	204	2040	2042	-2		BV-SS-3072
48	10	233	2330	2042	288		
48	11						BV-SS-3076
48	12	210	2100	2042	58		
48	14	212	2120	2042	78		BV-SS-3079
48	16	221	2210	2042	168		BV-SS-3083
48	18	205	2050	2042	8		BV-SS-3086
48	20	194	1940	2042	-102		
48	22	219	2190	2042	148		
48	24	231	2310	2042	268		
48	26	249	2490	2042	448		
50	-12	186	1860	2042	-182		
50	-10	216	2160	2042	118		
50	-8	204	2040	2042	-2		
50	-6	209	2090	2042	48		
50	-4	205	2050	2042	8		
50	-2	206	2060	2042	18		
50	0	199	1990	2042	-52		
50	2	193	1930	2042	-112		
50	4	215	2150	2042	108		
50	6	215	2150	2042	108		
50	8	225	2250	2042	208		

Date 9-23-98

LEG Survey of S.M.P.
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J. Gemza Jim Gemza

Inst# Ludlum 2221 S/N 99136

J. Shoemaker John Shoemaker

50	10	204	2040	2042	-2		
50	12	224	2240	2042	198		
50	14	231	2310	2042	268		
50	16	201	2010	2042	-32		
50	18	224	2240	2042	198		
50	20	232	2320	2042	278		
50	22	227	2270	2042	228		
50	24	237	2370	2042	328		
50	26	227	2270	2042	228		
52	-12	202	2020	2042	-22		
52	-10	199	1990	2042	-52		
52	-8	204	2040	2042	-2		
52	-6	221	2210	2042	168		
52	-4	203	2030	2042	-12		
52	-2	213	2130	2042	88		
52	0	191	1910	2042	-132		
52	2	217	2170	2042	128		
52	4	223	2230	2042	188		
52	6	196	1960	2042	-82		
52	8	209	2090	2042	48		
52	10	220	2200	2042	158		
52	12	204	2040	2042	-2		
52	14	209	2090	2042	48		
52	16	224	2240	2042	198		
52	18	221	2210	2042	168		
52	20	218	2180	2042	138		
52	22	220	2200	2042	158		
52	24	208	2080	2042	38		
52	26	210	2100	2042	58		
53	-5						BV-SS-3056
53	3						BV-SS-3063
53	7						BV-SS-3070
53	13						BV-SS-3077
53	17						Bv-SS-3084
54	-14	218	2180	2042	138		
54	-12	193	1930	2042	-112		
54	-10	221	2210	2042	168		
54	-8	209	2090	2042	48		
54	-6	198	1980	2042	-62		
54	-4	223	2230	2042	188		
54	-2	303	3030	2042	988		
54	0	225	2250	2042	208		
54	2	181	1810	2042	-232		
54	4	186	1860	2042	-182		
54	6	234	2340	2042	298		
54	8	196	1960	2042	-82		
54	10	209	2090	2042	48		
54	12	191	1910	2042	-132		
54	14	218	2180	2042	138		
54	16	238	2380	2042	338		

Date 9-23-98

LEG Survey of S.M.P.
Cow Palace Dirt Pile

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54	18	235	2350	2042	308		
54	20	200	2000	2042	-42		
54	22	200	2000	2042	-42		
54	24	218	2180	2042	138		
54	26	216	2160	2042	118		
56	-14	243	2430	2042	388		
56	-12	214	2140	2042	98		
56	-10	220	2200	2042	158		
56	-8	213	2130	2042	88		
56	-6	216	2160	2042	118		
56	-4	203	2030	2042	-12		
56	-2	230	2300	2042	258		
56	0	194	1940	2042	-102		
56	2	201	2010	2042	-32		
56	4	213	2130	2042	88		
56	6	210	2100	2042	58		
56	8	207	2070	2042	28		
56	10	225	2250	2042	208		
56	12	189	1890	2042	-152		
56	14	212	2120	2042	78		
56	16	192	1920	2042	-122		
56	18	215	2150	2042	108		
56	20	199	1990	2042	-52		
56	22	205	2050	2042	8		
56	24	218	2180	2042	138		
56	26	217	2170	2042	128		
58	-14	235	2350	2042	308		
58	-12	217	2170	2042	128		
58	-10	210	2100	2042	58		
58	-8	215	2150	2042	108		
58	-6	216	2160	2042	118		
58	-4	209	2090	2042	48		
58	-2	217	2170	2042	128		
58	0	207	2070	2042	28		
58	2	203	2030	2042	-12		
58	4	196	1960	2042	-82		
58	6	214	2140	2042	98		
58	8	234	2340	2042	298		
58	10	218	2180	2042	138		
58	12	213	2130	2042	88		
58	14	204	2040	2042	-2		
58	16	194	1940	2042	-102		
58	18	209	2090	2042	48		
58	20	200	2000	2042	-42		
58	22	196	1960	2042	-82		
58	24	209	2090	2042	48		
58	26	244	2440	2042	398		
58	28	196	1960	2042	-82		
60	-14	200	2000	2042	-42		
60	-12	206	2060	2042	18		

Date 9-23-98

Inst# Ludlum 2221 S/N 99136

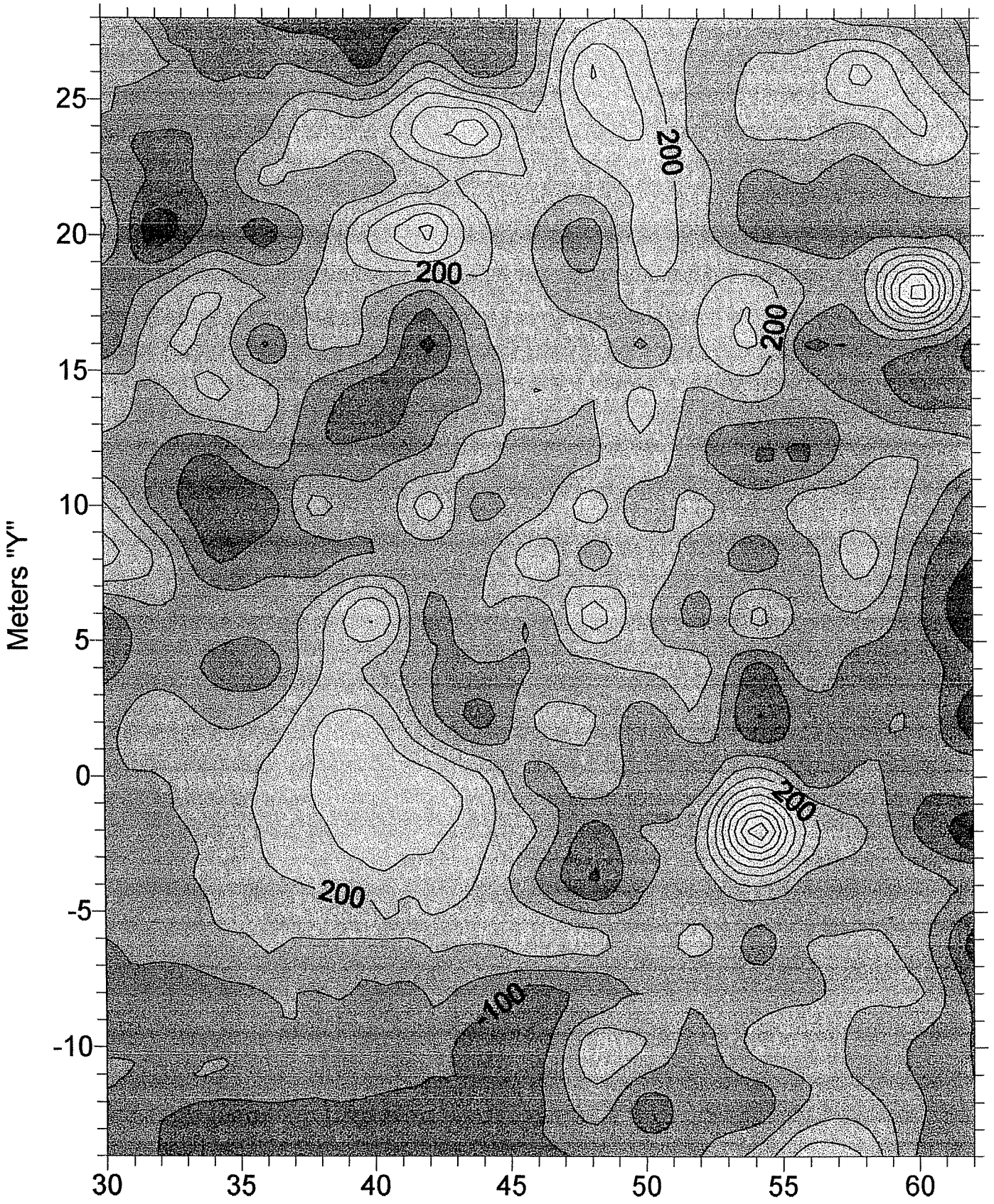
LEG Survey of S.M.P.
Cow Palace Dirt Pile

J. Gemza

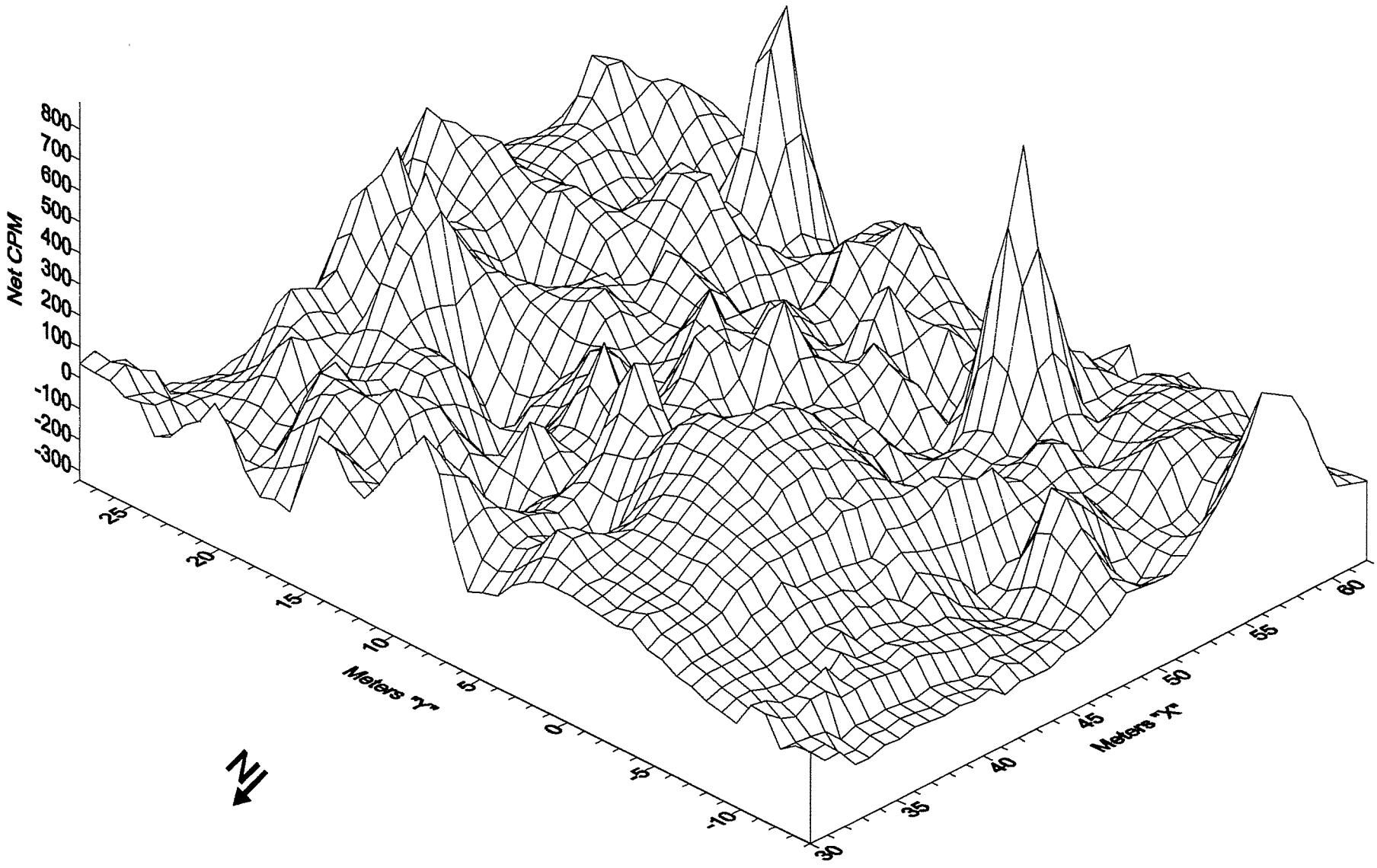
J. Shoemaker

60	-10	200	2000	2042	-42		
60	-8	218	2180	2042	138		BV-SS-3054
60	-6	208	2080	2042	38		
60	-4	212	2120	2042	78		
60	-2	190	1900	2042	-142		BV-SS-3057
60	0	197	1970	2042	-72		
60	2	205	2050	2042	8		BV-SS-3061
60	4	203	2030	2042	-12		BV-SS-3064
60	6	195	1950	2042	-92		BV-SS-3068
60	8	197	1970	2042	-72		BV-SS-3071
60	10	212	2120	2042	78		
60	12	215	2150	2042	108		BV-SS-3075
60	14	188	1880	2042	-162		BV-SS-3078
60	16	194	1940	2042	-102		BV-SS-3082
60	18	289	2890	2042	848		BV-SS-3085
60	20	195	1950	2042	-92		
60	22	209	2090	2042	48		
60	24	229	2290	2042	248		
60	26	215	2150	2042	108		
62	-6	176	1760	2042	-282		
62	-4	208	2080	2042	38		
62	-2	171	1710	2042	-332		
62	0	208	2080	2042	38		
62	2	172	1720	2042	-322		
62	4	188	1880	2042	-162		
62	6	173	1730	2042	-312		
62	8	184	1840	2042	-202		
62	10	187	1870	2042	-172		
62	12	209	2090	2042	48		
62	14	191	1910	2042	-132		
62	16	181	1810	2042	-232		
62	18	203	2030	2042	-12		
62	20	198	1980	2042	-62		
62	22	208	2080	2042	38		
62	24	214	2140	2042	98		
62	26	194	1940	2042	-102		

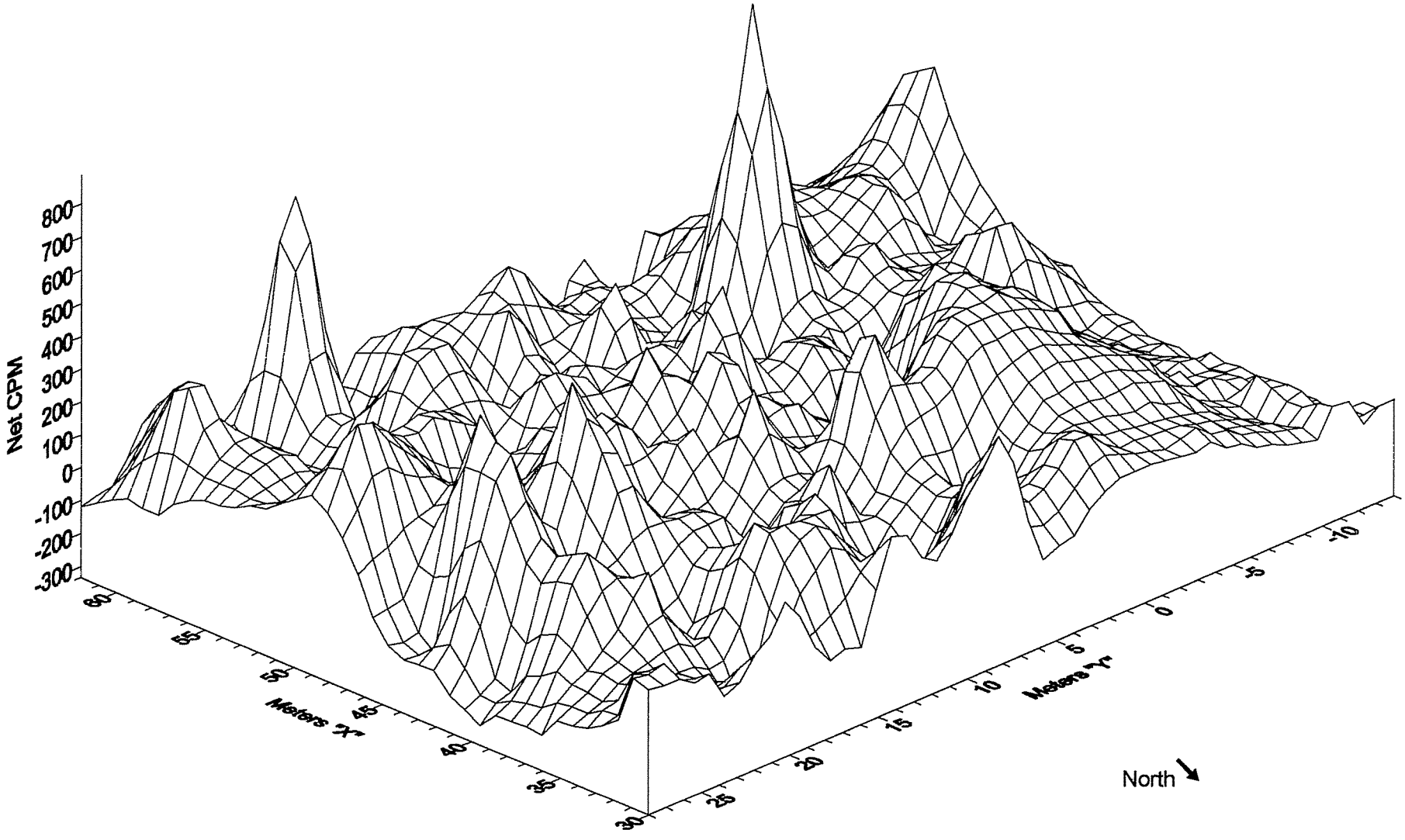
LEG Survey - Cow Palace Dirt Pile
9/23/98



LEG Survey - Cow Palace Dirt Pile
9/23/98



LEG Survey - Cow Palace Dirt Pile
9/23/98



ATTACHMENT A-2

RADIOLOGICAL EVALUATION OF THE "CLEAN" SOIL PILE AT BLAIRSVILLE

Radiological Evaluation of the "Clean" Soil Pile at Blairsville

Westinghouse Electric Company LLC
Specialty Metals Plant
Blairsville, PA

May 28, 1999

-DRAFT-

Prepared By:

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A. Joseph Nardi
Supervisory Engineer

Radiological Evaluation of the "Clean" Soil Pile at Blairsville

A. Background Information

During the summer of 1998, the soil beneath the original footprint of the Waste Processing building on the Westinghouse Blairsville Site was excavated as part of the remediation of the "Cow Palace Area" of the site (also referred to as the "Former Zircaloy Burn Area"). This former building was originally constructed and used for the processing and packaging of radioactive waste materials during the period from the mid 1950's to sometime in the mid 1960's. During June 1998, an initial excavation was made to relocate and excavate a pipe line that had been originally identified during an earlier site investigation.

After relocating the pipe it was found that two buried sumps were associated with the original floor drain system. Excavation in the area also found that the original concrete floors were also buried in the area. During the excavation of these features, a pile of soil was put aside. An effort was made to sort through that soil and remove non-soil components such as the concrete floor pieces. The sorted soil was then spread out in a mound about 4 feet thick in order to grid it out for radiological surveying and sampling. The total volume of soil in the pile is estimated to be about 43,000 cubic feet. A sampling program was then undertaken with the results indicating that the Uranium concentration in the soil was definitely above normal background levels of Uranium. This report compares the measured concentrations of Uranium against the applicable acceptance criteria or Concentration Guideline for Uranium.

The Concentration Guideline for contaminated soils is 30 picoCuries of total Uranium per gram of soil. This is based on the values provided to the NRC in the original Health and Safety Plan that was provided to the NRC in 1993. The normal analytical approach that is used for soil analysis is Gamma Spectrometry. This technique measure specific isotopes including Uranium-235 but is not capable of measuring other Uranium isotopes (Uranium-234 and Uranium-238) and therefore does not directly measure the total Uranium content of the soil. The accepted method is to measure the U-235 concentration and multiply it by a factor to correct to the total Uranium concentration. The appropriate multiplier to use depends on a number of considerations. The actual value is not a constant but is dependent on the enrichment process along with the level of enrichment that the Uranium has undergone. The following information provides a basis for the recommended value used in this evaluation.

B. Determination of the U-total/U-235 Activity Ratio

B.1 Value Used in Previous Work

In all previous work at the Blairsville site, the evaluation of analytical data has been based on the use of a value of 30 for the ratio of total Uranium activity (picoCi/gram) to Uranium-235 activity (picoCi/gram). This has been based on the

knowledge that a ratio of 30 is considered to be conservative and has been accepted by the USNRC inspectors as such.

B.2 Dependence of Ratio on Enrichment

The specific activity of Uranium depends on the enrichment level since each isotope has a unique specific activity and the ratio of the isotopes changes as the Uranium is further enriched. A generally accepted equation to predict the specific activity of enriched Uranium is given by:

SA = (0.4+0.38*E+0.0034*(E^2))*10^-6
where:
SA = Specific Activity in Ci/gram
E = Enrichment in w/o U-235 expressed in % (i.e. E=2 for 2% U-235)

Using this equation provides the curve for Specific Activity shown on Figure 1. Given this information and the specific activity for the U-235 isotope, it is possible to directly calculate the ratio of U-tot/U-235 activity. The second curve on Figure 1 provides the activity ratio as a function of enrichment. This curve shows that the activity ratio ranges from the value of 50 for natural Uranium to a minimum of about 20 for low enriched Uranium and then increasing to about 30 for high enriched Uranium. The true ratio for natural Uranium is about 50 given the normal isotopic distribution of Uranium in nature. Although some samples of natural, depleted and high enriched Uranium have been found in the Cow Palace area, the bulk of the activity is present as low enriched Uranium.

The above equation is given in footnote 3 to 10CFR20 [paragraph 20.1001-20.2401], Appendix B. Some experience indicates that this equation may underpredict the specific activity by up to 40% at enrichments between 1% to 20% U-235 which covers the range of expected enrichments in this situation. However, the equation is only being used to establish the expected range of activity ratios and the not the absolute specific activity. The use of a multiplier that is slightly conservative will account for the uncertainty in the actual isotopic distribution.

The following provides an approximation of the expected values for the distribution of the three Uranium isotopes for three different enrichment levels.

Isotope	Natural Uranium	Low Enriched Uranium	High Enriched Uranium
Uranium Mass Distribution			
U-234	0.01%	0.03%	1%
U-235	0.71%	5%	90%
U-238	99%	95%	10%
Uranium Activity Distribution			
U-234	49%	82%	97%
U-235	2%	5%	3%
U-238	49%	13%	0.05%

B.3 Measured Value

In order to measure the actual activity ratio of the Uranium present in the Cow Palace area it is necessary to perform alpha spectrometry measurements on samples. While this technique is capable of measuring the concentration of each of the Uranium isotopes it is more expensive, takes a longer time to complete the analysis, and uses a small sample mass. This last consideration means that the results are more subject to micro-inhomogeneity issues within the sample and therefore the result for the total uranium concentration is less certain.

Table 1 provides the results of the alpha spectrometry measurements for various samples taken at Blairsville. This set of samples includes materials from both the Cow Palace area and materials recovered from the sumps in the Gauge Lab and Finishing area. In all cases the results support the curve presented in Figure 1 which indicates that a assumed specific activity ratio of 30 is conservative. The analytical data sheets are contained in Appendix A.

B.4 Recommendation on Use of Ratio

Based on the measured results, a more realistic value for the activity ratio of U-total to U-235 would be 25. This value still has some conservatism in it since the average for the measured values is 19.

C. Sampling Plan

In order to obtain a set of representative samples for the soil pile, the soil was spread out over an area to a depth of approximately 4 feet. This pile was divided into six sections of nearly equal size based on the shape of the pile and convenience for establishing a grid. Five samples were initially taken from each of the six sections for a total of 30 independent samples. A portion of each of the five samples from a section was also combined into two additional composite samples. One of these two composite samples was held on site and the other composite sample was submitted to the analytical laboratory. After an initial statistical analysis indicated that there was an insufficient number of samples to decide that the Concentration Guideline criteria had been met

within the 95% confidence level, an additional 36 samples were collected. The sample locations and the division of the pile are shown in Figure 2.

All samples were taken using a back-hoe to dig a hole through the depth of the pile. Small aliquots were taken from each shovel-full of soil and combined into a container. The contents of the container was then mixed thoroughly by hand and the sample was taken from the contents of the container. The composite samples were taken from the five containers that represented a section. In order to obtain a representative sample for alpha spectrometry analysis, an additional composite was made at the analytical laboratory by forming a composite from the six field generated composite. This composite was also analyzed by gamma spectrometry.

D. Analytical Results

The analytical measurements for U-235 are shown in Table 2 for the 66 individual samples and seven composites. The analytical laboratory report sheets are included in Appendix A. For purposes of the statistical evaluation only the 66 independent samples were included. The composite samples were not used in the statistical evaluation. However a direct comparison of the values for the U-235 in pCi/g between the average of the five samples and the composite sample indicate good agreement. This confirms that the mixing of the samples was adequate.

Figure 3 presents the frequency distribution for the 66 individual samples given in Table 2 against the U-235 result (pCi/g) for the gamma spectrometry measurements. From this graph it appears that the distribution can be represented by a normal distribution.

E. Statistical Evaluation

There are two approaches that are accepted by the NRC for the statistical evaluation of results to determine if the data supports the conclusion that the criteria for release for unrestricted use is met. Report NUREG/CR-5849, "Manual for Conducting Radiological Surveys in Support of License Termination" (published June 1992), is based on a statistical approach that assumes a normal distribution for the data. This report is still in draft form and is not officially accepted for general use by the NRC, however it has been accepted and authorized for use in specific cases. All of the building survey data was collected in compliance with the approach presented in this manual.

A second document titled "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)" (NUREG-1575), December 1997, is also available for use. This document has not been officially accepted by the NRC for general use but is the basis of all the guidance that is being currently issued by the NRC for license termination documentation. The statistical approach used in this document is based on non-parametric statistics. This approach is considered to be more powerfull and is applicable where the distribution of the data is not consistent with a normal distribution.

For purposes of this statistical evaluation it was decided to evaluate the data by both approaches as described below.

E1. NUREG/CR-5849 Evaluation

Table 3 provides the statistical evaluation of the data using the statistical approach given in NUREG/BR-5849. In this approach there are two considerations: 1) Is the measured data less than the concentration guideline at the 95% confidence level, and 2) Have enough samples been taken to demonstrate that the measured data satisfies the guideline value at the desired level of confidence. Using the measurement data for the 66 samples, both tests are satisfied. Another requirement of NUREG/CR-5849 is that the maximum measured value be less than 3 times the concentration guideline value. This requirement is also met.

E2. MARSSIM Evaluation

Table 4 provides the statistical evaluation of the data using the statistical approach given in MARSSIM. There are two approaches used in MARSSIM depending on whether the radionuclide is present in the environment. Although Uranium is present in the environment at a level of about 1 pCi/g, using the statistical approach that accounts provides credit for that presence requires that an adequate number of background samples be taken and justified to permit the subtraction of background. Rather than do that in this case, the statistical approach utilized assumes that all Uranium measured is due to operational contamination. This is conservative and is not a significant factor when the normal background is much lower than the concentration guideline value.

The same two considerations discussed above in Section E1 apply also to this statistical evaluation. Using the measurement data for the 66 samples, both tests are satisfied. One point should be noted. The highest vale of N given in Table I.3 in MARSSIM is 50 whereas the value of N is 65 for the data set. Therefore it was necessary to perform a linear interpolation of the table to obtain the Critical Value of 43 used in Table 4. Another point to note is that according to the MARRSIM Sign Test procedure, all adjusted values that are equal to zero are discarded. That accounts for using a value of N=65 when there are 66 samples.

E3. Summary of Statistical Evaluation

The statistical evaluation by both methods demonstrates that the measured data supports the conclusion that the uranium concentration of the "clean" soil pile meets the concentration guideline value of 30 pCi/g for total Uranium. Therefore the soil in this pile does not have to be disposed of as radioactive waste. This evaluation was performed using the activity ratio of 25 to calculate the total Uranium concentration from the measured U-235 concentration value. As noted in Section B.1 above, a value of 30 for the activity ratio has typically been used in the past. As noted in Table 1, the alpha spectrometry measurements indicate that even a activity ratio of 25 is conservative since the average is 19 for the measurements.

If the value of 30 had been used, the measured data would still have passed both of the MARSSIM tests. It would also have passed the first test in the NUREG/CR-5849 approach but would fail on the number of samples required. That statistical test indicates that an additional 40 samples would be required to meet the desired confidence level.

F. Conclusion

The measured U-235 concentrations and the statistical evaluation of the data supports the conclusion that the Uranium concentrations in the soil pile are less than the Concentration Guideline of 30 pCi/g at a confidence level of 95% or greater. Thus this pile of soil does not have to be disposed of as radioactive waste.

Table 1
Uranium Isotopic Information
Based on Alpha Spectrometry Measurements

	Lab ID	Sample Description	Concentration (picoCi/gram) U-234	U-235	U-238	U-total	Activity Ratio U-tot/U-235	Uranium Enrichment % U-235
1	9809-0254w (A1)	Bag Shipment Composite	160.00	8.21	9.35	177.56	21.63	12%
2	9809-0255w (A1)	"Clean Dirt" Pile Composite	21.80	1.10	3.14	26.04	23.67	5%
3	9809-0256w (A1)	Sample from under road	113.00	8.08	15.80	136.88	16.94	7%
4	99-03196-03	Composite from Sumps in Building	3079.00	253.20	323.30	3655.50	14.44	11%
5	99-03196-04	Composite from Sumps in Building	3352.00	174.90	371.40	3898.30	22.29	7%
6	99-03196-05	Composite from Sumps in Building	3538.00	249.00	459.20	4246.20	17.05	8%
7	99-03196-06	Composite from Sumps in Building	1544.00	104.50	221.00	1869.50	17.89	7%
						Average	19.13	8%

Table 2
Uranium-235 Results
Based on Gamma Spectrometry Measurements

See Note 1	Sample #	Sample Location Information			U-235 pCi/g	Uncertainty pCi/g	Notes
		Section	Sample Point	Coordinates (x,y)			
1	3054	1	1	60,-8	0.53	0.36	
2	3055	1	2	48,-8	1.45	0.38	
3	3056	1	3	53,-5	1.44	0.37	
4	3057	1	4	60,-2	0.87	0.37	Average for Samples #3054-3058 (pCi/g)
5	3058	1	5	48,-2	1.27	0.46	1.11
	3060	1	Composite of 1-5		2.76	0.60	Composite Sample of #3054-3058
6	3061	2	1	60,2	0.72	0.34	
7	3062	2	2	48,2	1.15	0.46	
8	3063	2	3	53,3	0.69	0.30	
9	3064	2	4	60,4	0.55	0.28	Average for Samples #3061-3065 (pCi/g)
10	3065	2	5	48,4	1.17	0.38	0.86
	3067	2	Composite of 1-5		0.94	0.37	Composite Sample of #3061-3065
11	3068	3	1	60,6	0.68	0.30	
12	3069	3	2	48,6	0.76	0.36	
13	3070	3	3	53,7	1.04	0.31	
14	3071	3	4	60,8	0.59	0.31	Average for Samples #3068-3072 (pCi/g)
15	3072	3	5	48,8	1.20	0.40	0.85
	3074	3	Composite of 1-5		0.95	0.33	Composite Sample of #3068-3072
16	3075	4	1	60,12	0.92	0.36	
17	3076	4	2	48,11	0.82	0.35	
18	3077	4	3	53,13	0.77	0.28	
19	3078	4	4	60,14	0.76	0.27	Average for Samples #3075-3079 (pCi/g)
20	3079	4	5	48,14	1.23	0.36	0.90
	3081	4	Composite of 1-5		1.24	0.40	Composite Sample of #3075-3079
21	3082	5	1	60,16	0.89	0.34	
22	3083	5	2	48,16	0.68	0.34	
23	3084	5	3	53,17	0.82	0.33	
24	3085	5	4	60,18	0.58	0.30	Average for Samples #3082-3086 (pCi/g)
25	3086	5	5	48,18	0.98	0.39	0.79
	3088	5	Composite of 1-5		0.91	0.33	Composite Sample of #3082-3086

Table 2 (Continued)
Uranium-235 Results
Based on Gamma Spectrometry Measurements

See Note 1	Sample #	Sample Location Information			U-235 pCi/g	Uncertainty pCi/g	Notes
		Section	Sample Point	Coordinates (x,y)			
26	3089	6	1	43,6	2.00	0.47	
27	3090	6	2	39,6	0.70	0.33	
28	3091	6	3	41,14	0.60	0.34	
29	3092	6	4	44,16	1.11	0.38	Average for Samples #3089-3093 (pCi/g)
30	3093	6	5	39,16	2.12	0.53	1.30
	3094	6	Composite of 1-5		1.02	0.29	Composite Sample of #3089-3093
	9809-0255w	1 to 6	Composite		0.75	0.08	Composite of above Composite Sample
31	1126	1	6		0.96	0.15	
32	1127	1	7		0.71	0.12	
33	1128	1	8		0.77	0.11	
34	1129	1	9		1.07	0.16	
35	1130	1	10		1.38	0.19	
36	1131	1	11		1.22	0.16	
37	1132	2	6		0.94	0.15	
38	1133	2	7		0.83	0.13	
39	1134	2	8		0.77	0.13	
40	1135	2	9		1.22	0.17	
41	1136	2	10		1.12	0.2	
42	1137	2	11		0.843	0.1	
43	1138	3	6		0.10	0.15	
44	1139	3	7		0.49	0.11	
45	1140	3	8		1.00	0.14	
46	1141	3	9		0.61	0.12	
47	1142	3	10		0.93	0.15	
48	1143	3	11		0.78	0.13	
49	1144	4	6		0.93	0.15	
50	1145	4	7		1.09	0.14	
51	1146	4	8		0.88	0.13	
52	1147	4	9		0.74	0.14	
53	1148	4	10		0.57	0.11	

Table 2 (Continued)
Uranium-235 Results
Based on Gamma Spectrometry Measurements

See Note 1	Sample #	Sample Location Information			U-235 pCi/g	Uncertainty pCi/g	Notes
		Section	Sample Point	Coordinates (x,y)			
54	1149	4	11		0.84	0.13	
55	1150	5	6		0.52	0.10	
56	1151	5	7		1.00	0.16	
57	1152	5	8		0.88	0.14	
58	1153	5	9		0.70	0.12	
59	1154	5	10		0.85	0.14	
60	1155	5	11		1.16	0.15	
61	1156	6	6		0.61	0.11	
62	1157	6	7		0.77	0.12	
63	1158	6	8		0.53		
64	1159	6	9		0.59	0.10	
65	1160	6	10		0.89	0.14	
66	1161	6	11		1.39	0.19	

Note:
Only the 66 samples noted in this table were treated as independent samples and used for the statistical analysis. The results for the analysis of the composite samples and the mathmatical average for the corresponding set of samples are presented in the notes column for comparison purposes.

Table 3
Statistical Evaluation of Data
Using NUREG/CR-5849 Approach

	Sample #	U-235 pCi/g	Total U* pCi/g	Comments
1	3054	0.53	13.2	
2	3055	1.45	36.3	Note:
3	3056	1.44	36.0	* - The total Uranium value is obtained by
4	3057	0.87	21.9	multiplying the measured value of the
5	3058	1.27	31.8	U-235 concentration by 25.
6	3061	0.72	18.0	
7	3062	1.15	28.8	
8	3063	0.69	17.3	
9	3064	0.55	13.7	
10	3065	1.17	29.3	
11	3068	0.68	16.9	
12	3069	0.76	19.0	
13	3070	1.04	26.0	
14	3071	0.59	14.9	
15	3072	1.20	30.0	
16	3075	0.92	23.1	
17	3076	0.82	20.5	
18	3077	0.77	19.3	
19	3078	0.76	19.0	
20	3079	1.23	30.8	
21	3082	0.89	22.2	
22	3083	0.68	16.9	
23	3084	0.82	20.6	
24	3085	0.58	14.6	
25	3086	0.98	24.5	
26	3089	2.00	50.0	
27	3090	0.70	17.4	
28	3091	0.60	14.9	
29	3092	1.11	27.8	
30	3093	2.12	53.0	
31	1126	0.96	24.1	
32	1127	0.71	17.8	
33	1128	0.77	19.3	
34	1129	1.07	26.8	
35	1130	1.38	34.5	
36	1131	1.22	30.5	
37	1132	0.94	23.5	
38	1133	0.83	20.7	
39	1134	0.77	19.2	
40	1135	1.22	30.5	
41	1136	1.12	28.0	
42	1137	0.843	21.1	
43	1138	0.10	2.6	
44	1139	0.49	12.3	
45	1140	1.00	25.0	
46	1141	0.61	15.2	
47	1142	0.93	23.2	
48	1143	0.78	19.4	

Table 3 (Continued)
Statistical Evaluation of Data
Using NUREG/CR-5849 Approach

	Sample #	U-235 pCi/g	Total U* pCi/g	Comments
49	1144	0.93	23.1	
50	1145	1.09	27.3	
51	1146	0.88	21.9	
52	1147	0.74	18.6	
53	1148	0.57	14.2	
54	1149	0.84	21.1	
55	1150	0.52	13.1	
56	1151	1.00	24.9	
57	1152	0.88	22.0	
58	1153	0.70	17.6	
59	1154	0.85	21.2	
60	1155	1.16	29.0	
61	1156	0.61	15.2	
62	1157	0.77	19.2	
63	1158	0.53	13.3	
64	1159	0.59	14.8	
65	1160	0.89	22.2	
66	1161	1.39	34.8	
	Concentration Guideline Value		30	pCi/g
	# of Samples		66	
	Average		22.63	pCi/g
	Std. Dev		8.32	pCi/g
	Degrees of Freedom		65	
	t(95%) Factor		1.670	From Table B-1 of NUREG/CR-5849
	Comparison Value		24.4	pCi/g, Equation 8-13 in NUREG/CR-5849
Is Comparison Value < Concentration Guideline?			Yes	
Factor for Estimating # of Samples Required			0.886	See definition, Table B-2 of NUREG/CR-5849
Number of Samples Required			12	From Table B-2 of NUREG/CR-5849
Were an adequate number of samples taken?			Yes	

Table 4
Statistical Evaluation of Data
Using MARSSIM Approach

	Sample #	U-235 pCi/g	Total U* pCi/g	Sign Test** Adj. Value	Sign***	Comments
1	3054	0.53	13.2	16.8	1	
2	3055	1.45	36.3	-6.3	0	Note:
3	3056	1.44	36.0	-6.0	0	* - The total Uranium value is obtained by
4	3057	0.87	21.9	8.2	1	multiplying the measured value of the
5	3058	1.27	31.8	-1.8	0	U-235 concentration by 25.
6	3061	0.72	18.0	12.1	1	
7	3062	1.15	28.8	1.3	1	** - The Adjusted Value is calculated by
8	3063	0.69	17.3	12.8	1	subtracting the Total U concentration from
9	3064	0.55	13.7	16.3	1	the Concentration Guideline Value of 30 pCi/g.
10	3065	1.17	29.3	0.8	1	
11	3068	0.68	16.9	13.1	1	*** - When the Adjusted Value is positive
12	3069	0.76	19.0	11.1	1	the Sign is given a value of 1, otherwise
13	3070	1.04	26.0	4.0	1	it is given a value of 0.
14	3071	0.59	14.9	15.2	1	
15	3072	1.20	30.0	0.0		---This data point is not used in the statistical
16	3075	0.92	23.1	6.9	1	evaluation in accordance with the MARSSIM
17	3076	0.82	20.5	9.5	1	procedure.
18	3077	0.77	19.3	10.7	1	
19	3078	0.76	19.0	11.0	1	
20	3079	1.23	30.8	-0.8	0	
21	3082	0.89	22.2	7.9	1	
22	3083	0.68	16.9	13.1	1	
23	3084	0.82	20.6	9.5	1	
24	3085	0.58	14.6	15.5	1	
25	3086	0.98	24.5	5.5	1	
26	3089	2.00	50.0	-20.0	0	
27	3090	0.70	17.4	12.6	1	
28	3091	0.60	14.9	15.1	1	
29	3092	1.11	27.8	2.3	1	
30	3093	2.12	53.0	-23.0	0	
31	1126	0.96	24.1	5.9	1	
32	1127	0.71	17.8	12.2	1	
33	1128	0.77	19.3	10.8	1	
34	1129	1.07	26.8	3.3	1	
35	1130	1.38	34.5	-4.5	0	
36	1131	1.22	30.5	-0.5	0	
37	1132	0.94	23.5	6.5	1	
38	1133	0.83	20.7	9.3	1	
39	1134	0.77	19.2	10.8	1	
40	1135	1.22	30.5	-0.5	0	
41	1136	1.12	28.0	2.0	1	
42	1137	0.843	21.1	8.9	1	
43	1138	0.10	2.6	27.4	1	
44	1139	0.49	12.3	17.7	1	
45	1140	1.00	25.0	5.0	1	
46	1141	0.61	15.2	14.8	1	
47	1142	0.93	23.2	6.8	1	
48	1143	0.78	19.4	10.6	1	

Table 4 (Continued)
Statistical Evaluation of Data
Using MARSSIM Approach

	Sample #	U-235 pCi/g	Total U* pCi/g	Sign Test** Adj. Value	Sign***	Comments
49	1144	0.93	23.1	6.9	1	
50	1145	1.09	27.3	2.8	1	
51	1146	0.88	21.9	8.1	1	
52	1147	0.74	18.6	11.4	1	
53	1148	0.57	14.2	15.8	1	
54	1149	0.84	21.1	8.9	1	
55	1150	0.52	13.1	16.9	1	
56	1151	1.00	24.9	5.1	1	
57	1152	0.88	22.0	8.0	1	
58	1153	0.70	17.6	12.4	1	
59	1154	0.85	21.2	8.8	1	
60	1155	1.16	29.0	1.0	1	
61	1156	0.61	15.2	14.9	1	
62	1157	0.77	19.2	10.8	1	
63	1158	0.53	13.3	16.8	1	
64	1159	0.59	14.8	15.3	1	
65	1160	0.89	22.2	7.8	1	
66	1161	1.39	34.8	-4.8	0	
		Average	22.6			
		Std. Dev.	8.32	S+ value	55	Sum of the Sign Values
				N value	65	See Table I.3 in MARRSIM
				Critical Value for the Sign Test Statistic S+	43	and Page 8-12 of MARSSIM and Figure 4
				Is Critical Value < S+ value?	Yes	Passes Sign test at alpha = 0.005
				Delta	15	
				Delta/Sigma	1.8	See Table I.2 in MARSSIM
				Value of N required for alpha =0.01 and beta =0.01	32	and Page 8-12 of MARSSIM
				Is the number of samples taken > Value of N required	Yes	Adequate number of samples are available

Figure 1
Uranium Specific Activity and Activity Ratio vs. %Uranium-235

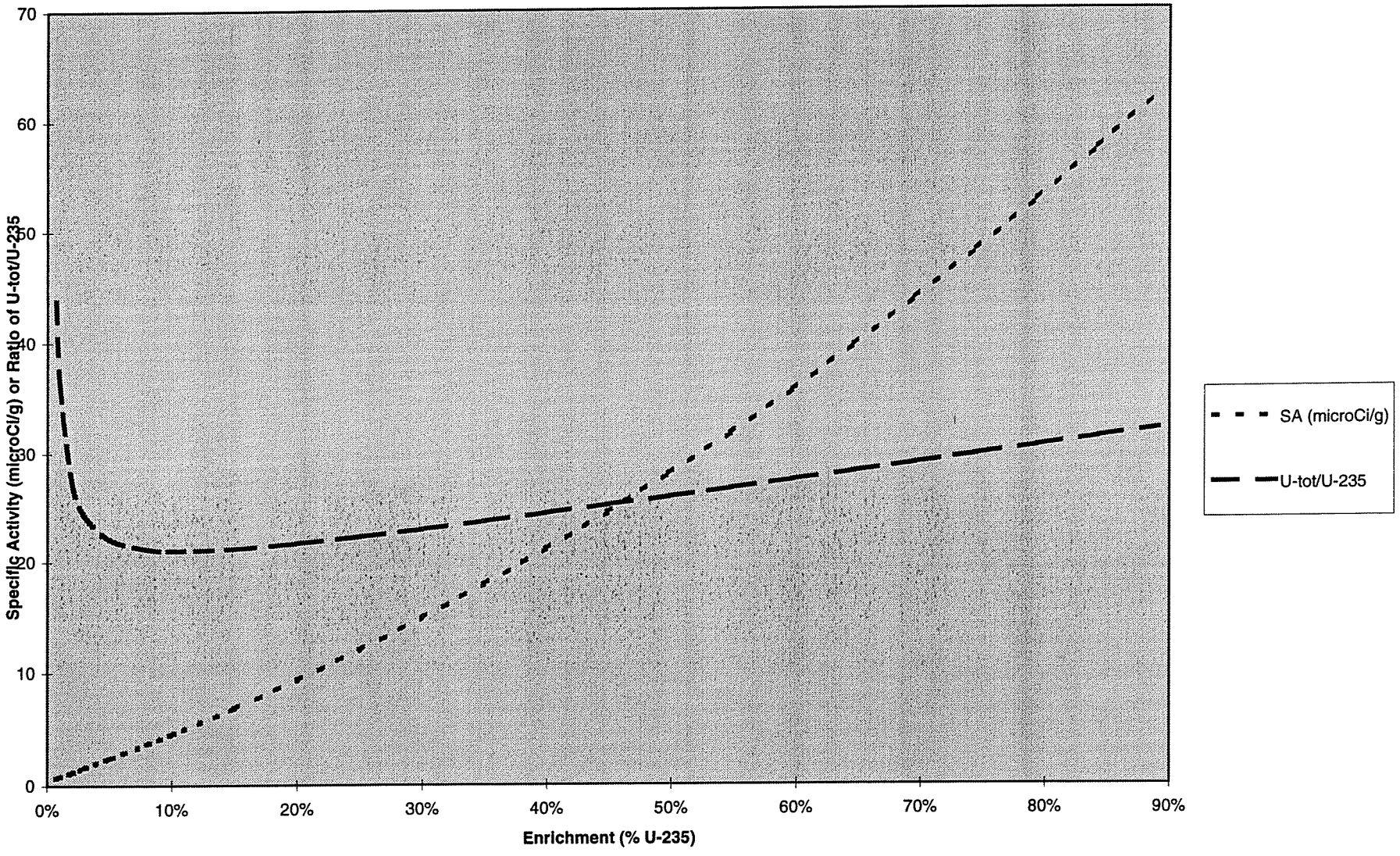
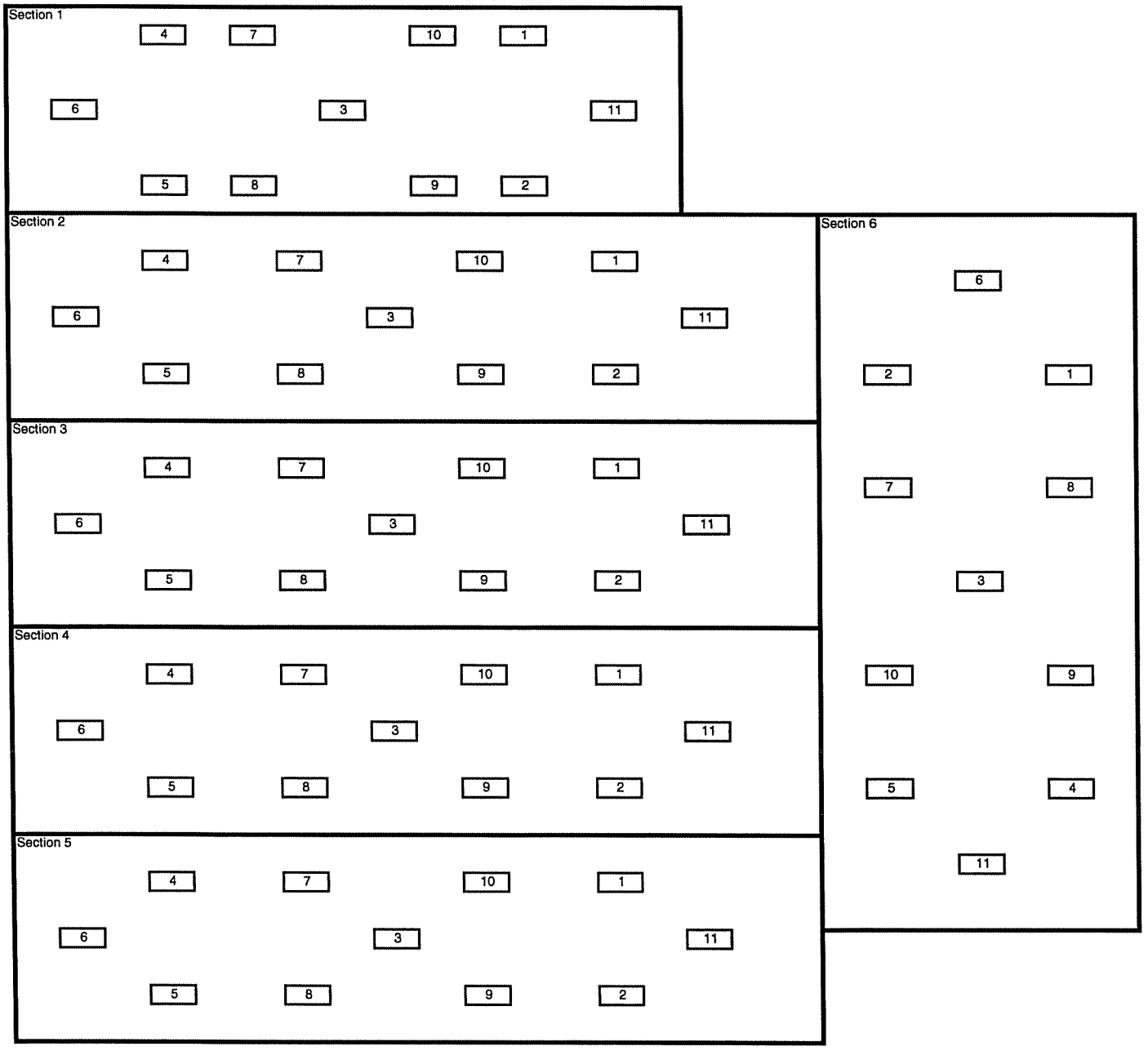


FIGURE 2
Sampling Pattern for Soil Pile



Notes:

1. This figure is not to scale
2. Samples 1 to 5 were taken in the first set.
3. Samples 6 to 11 were taken in the second set.

Figure 3
Distribution Frequency for U-235 Measurements

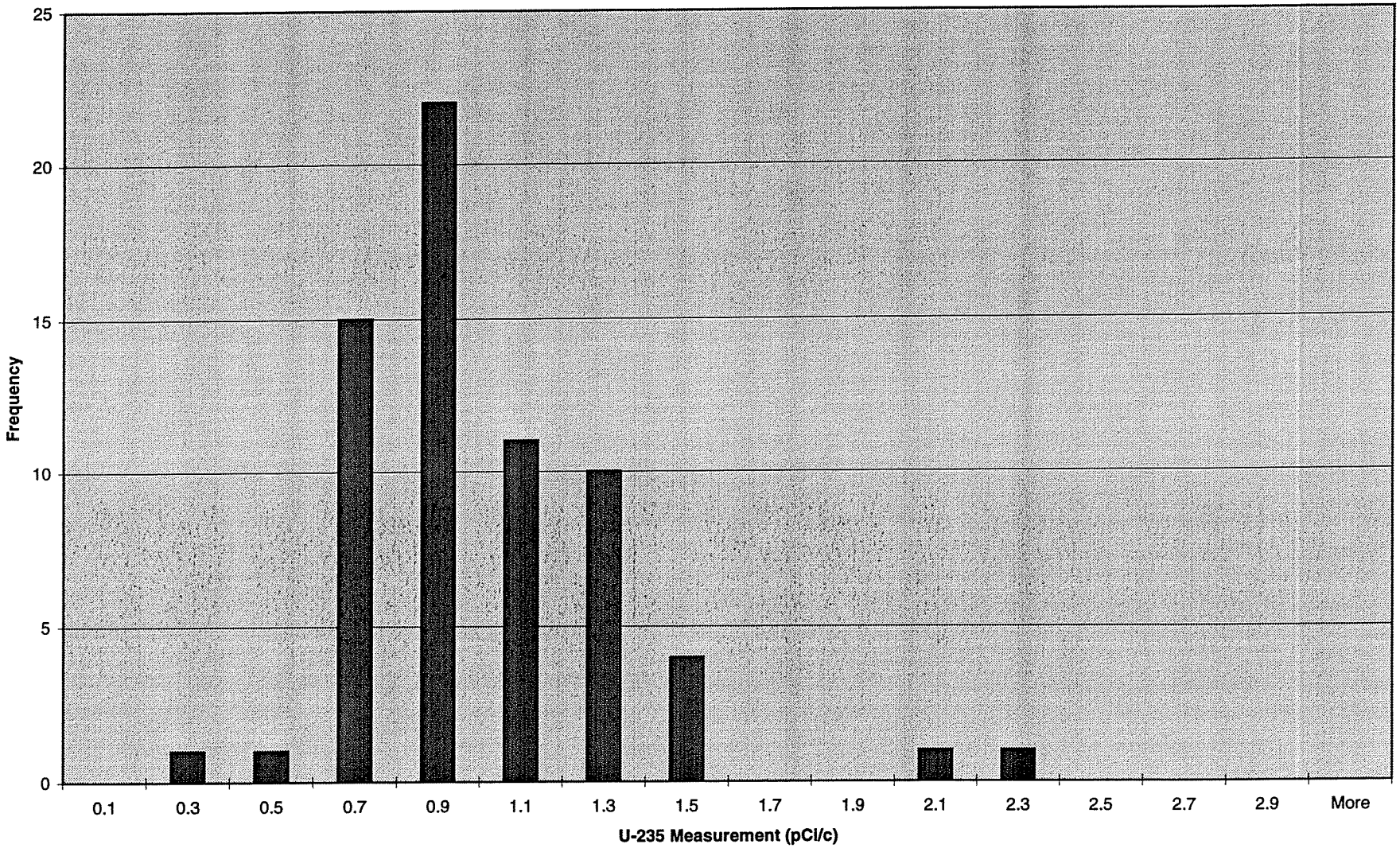
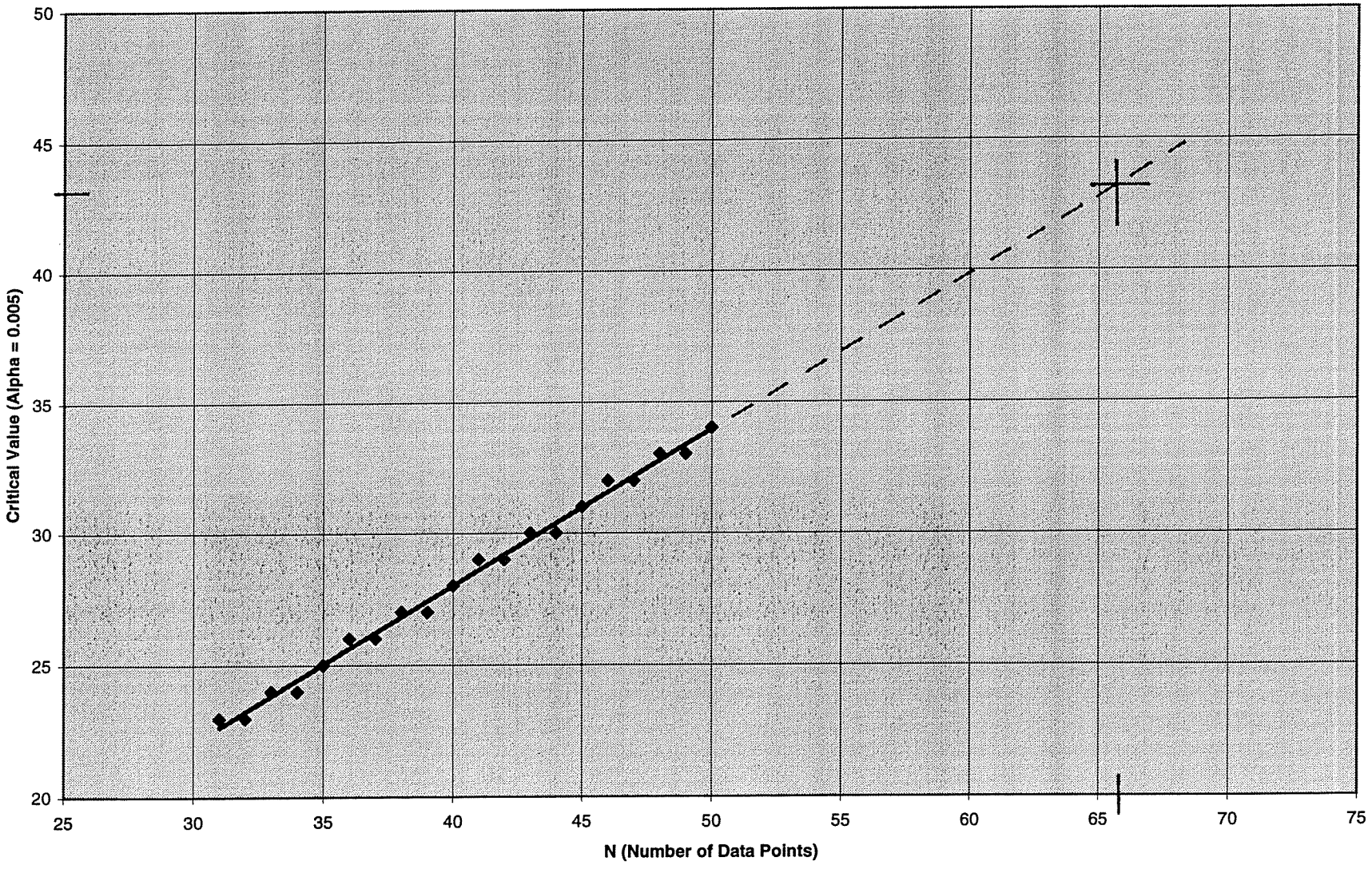


FIGURE 4
Critical Value for Sign Test Statistic S+



ATTACHMENT A-2A

ANALYTICAL REPORTS

Antech Ltd.

One Triangle Lane • Export, Pennsylvania 15632 • Phone: (724) 733-1161 • Fax: (724) 327-7793

September 23, 1998

Mr. Joe Nardi
Westinghouse Electric Company
Energy Center West, Bay 508 B
P. O. Box 355
Pittsburgh, PA 15230

Soil Characterization; Purchase Order No. 122284-SA286
Blairsville Soil Samples; WALTZ MILL; Energy Center
Antech Ltd. Project No. 98-0348W

Dear Mr. Nardi:

Enclosed are analytical results for samples submitted by Westinghouse Electric Company. Samples were received and logged in for analysis on September 1, 1998.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

W. Thomas Frenchek
for.
Shannon W. Thompson
Lead Analyst/Project Manager

SWT:ejg

Enclosures

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 98-0348W
CLIENT: Purchase Order Number: 122284-SA286

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
9809-0001W	BVSS3054	9809-0002W	BVSS3055
9809-0003W	BVSS3056	9809-0004W	BVSS3057
9809-0005W	BVSS3058	9809-0006W	BVSS3060
9809-0007W	BVSS3061	9809-0008W	BVSS3062
9809-0009W	BVSS3063	9809-0010W	BVSS3064
9809-0011W	BVSS3065	9809-0012W	BVSS3067
9809-0013W	BVSS3068	9809-0014W	BVSS3069
9809-0015W	BVSS3070	9809-0016W	BVSS3071
9809-0017W	BVSS3072	9809-0018W	BVSS3074
9809-0019W	BVSS3075	9809-0020W	BVSS3076
9809-0021W	BVSS3077	9809-0022W	BVSS3078
9809-0023W	BVSS3079	9809-0024W	BVSS3081
9809-0025W	BVSS3082	9809-0026W	BVSS3083
9809-0027W	BVSS3084	9809-0028W	BVSS3085
9809-0029W	BVSS3086	9809-0030W	BVSS3088
9809-0031W	BVSS3089	9809-0032W	BVSS3090
9809-0033W	BVSS3091	9809-0034W	BVSS3092
9809-0035W	BVSS3093	9809-0036W	BVSS3094
9809-0037W	BVSS3096	9809-0038W	BVSS3097
9809-0039W	BVSS3098	9809-0040W	BVSS3099
9809-0041W	BVSS3100	9809-0042W	BVSS3101
9809-0043W	BVSS3102	9809-0044W	BVSS3103
9809-0045W	BVSS3104	9809-0046W	BVSS3105
9809-0047W	BVSS3106	9809-0048W	BVSS3107
9809-0049W	BVSS3108		

C: SHIPPING/RECEIVING COMMENTS:

FINAL REPORT: 9/23/98

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
None

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format.

Table 1
General Data Table
Westinghouse Electric Company
Antech Ltd. Project No. 98-0348W
Soil Characterization; Blairsville Soil Samples
Charge Order No. 122284-SA286; WALTZ MILL

Parameter	Sample Identification 9809-0001W BVSS3054 (9/1/98)	9809-0002W BVSS3055 (9/1/98)	9809-0003W BVSS3056 (9/1/98)	9809-0004W BVSS3057 (9/1/98)	9809-0005W BVSS3058 (9/1/98)
K-40(1)	6.94E0 ± 1.0E0	8.19E0 ± 1.2E0	8.23E0 ± 1.1E0	8.57E0 ± 1.1E0	7.32E0 ± 1.8E0
Cs-137	9.17E-2 ± 5.2E-2	1.43E-1 ± 4.8E-2	9.92E-2 ± 4.5E-2	1.04E-1 ± 4.7E-2	<9.3E-2
Tl-208	2.77E-1 ± 6.3E-2	2.93E-1 ± 6.1E-2	2.26E-1 ± 5.4E-2	2.33E-1 ± 5.2E-2	3.57E-1 ± 1.1E-1
Bi-212	6.49E-1 ± 4.0E-1	1.00E0 ± 6.5E-1	8.55E-1 ± 6.3E-1	1.22E0 ± 4.6E-1	<1.4E0
Pb-212	7.58E-1 ± 8.5E-2	7.78E-1 ± 9.1E-2	8.90E-1 ± 9.7E-2	7.58E-1 ± 8.3E-2	3.62E-1 ± 2.9E-1
Bi-214	6.82E-1 ± 1.4E-1	7.55E-1 ± 1.3E-1	7.10E-1 ± 1.2E-1	7.90E-1 ± 1.3E-1	6.37E-1 ± 1.6E-1
Pb-214	8.26E-1 ± 1.3E-1	8.60E-1 ± 1.3E-1	8.47E-1 ± 1.3E-1	7.62E-1 ± 1.2E-1	6.40E-1 ± 2.6E-1
Ra-226	6.93E-1 ± 1.4E-1	7.67E-1 ± 1.4E-1	7.21E-1 ± 1.3E-1	8.01E-1 ± 1.4E-1	6.47E-1 ± 1.6E-1
Ac-228	5.93E-1 ± 2.4E-1	8.66E-1 ± 3.3E-1	1.05E0 ± 3.5E-1	8.79E-1 ± 3.9E-1	1.01E0 ± 5.0E-1
Th-232	7.87E-1 ± 1.8E-1	8.34E-1 ± 1.7E-1	6.42E-1 ± 1.5E-1	6.62E-1 ± 1.5E-1	1.01E0 ± 3.2E-1
Th-234	<1.3E0	4.38E0 ± 2.3E0	2.93E0 ± 1.8E0	2.64E0 ± 1.7E0	<1.8E0
U-235	5.28E-1 ± 3.6E-1	1.45E0 ± 3.8E-1	1.44E0 ± 3.7E-1	8.74E-1 ± 3.7E-1	1.27E0 ± 4.6E-1
U-238	<4.0E0	<4.3E0	<4.0E0	5.76E0 ± 3.5E0	<9.3E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0006W BVSS3060 (9/1/98)	9809-0007W BVSS3061 (9/1/98)	9809-0008W BVSS3062 (9/1/98)	9809-0009W BVSS3063 (9/1/98)	9809-0010W BVSS3064 (9/1/98)
K-40(1)	8.95E0 ± 1.2E0	7.09E0 ± 1.0E0	8.40E0 ± 2.1E0	8.68E0 ± 1.2E0	7.23E0 ± 1.1E0
Cs-137	NA ± <7.5E-2	9.38E-2 ± 4.4E-2	9.84E-2 ± 7.9E-2	7.75E-2 ± 4.5E-2	7.67E-2 ± 6.2E-2
Tl-208	2.83E-1 ± 6.3E-2	2.59E-1 ± 5.2E-2	3.36E-1 ± 9.1E-2	2.84E-1 ± 5.6E-2	2.51E-1 ± 6.9E-2
Bi-212	1.11E0 ± 6.8E-1	7.80E-1 ± 5.5E-1	1.80E0 ± 8.0E-1	7.10E-1 ± 4.7E-1	1.44E0 ± 5.1E-1
Pb-212	7.73E-1 ± 9.0E-2	6.96E-1 ± 8.7E-2	4.80E-1 ± 2.9E-1	7.83E-1 ± 9.0E-2	6.84E-1 ± 8.8E-2
Bi-214	6.48E-1 ± 1.4E-1	5.61E-1 ± 1.1E-1	5.15E-1 ± 1.6E-1	6.24E-1 ± 1.2E-1	7.31E-1 ± 1.4E-1
Pb-214	6.94E-1 ± 1.2E-1	7.76E-1 ± 1.1E-1	5.51E-1 ± 2.2E-1	7.31E-1 ± 1.5E-1	8.24E-1 ± 1.3E-1
Ra-226	6.58E-1 ± 1.4E-1	5.70E-1 ± 1.2E-1	5.23E-1 ± 1.7E-1	6.34E-1 ± 1.3E-1	7.42E-1 ± 1.5E-1
Ac-228	9.70E-1 ± 3.9E-1	9.16E-1 ± 3.1E-1	8.54E-1 ± 4.8E-1	9.34E-1 ± 3.0E-1	9.34E-1 ± 3.3E-1
Th-232	8.04E-1 ± 1.8E-1	7.35E-1 ± 1.5E-1	9.54E-1 ± 2.6E-1	8.08E-1 ± 1.6E-1	7.14E-1 ± 2.0E-1
Th-234	2.86E0 ± 2.1E0	<1.2E0	<1.9E0	2.24E0 ± 1.6E0	1.52E0 ± 1.3E0
U-235	2.76E0 ± 6.0E-1	7.18E-1 ± 3.4E-1	1.15E0 ± 4.6E-1	6.90E-1 ± 3.0E-1	5.47E-1 ± 2.8E-1
U-238	<5.6E0	<4.4E0	<9.4E0	4.90E0 ± 3.3E0	3.94E0 ± 4.6E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0011W BVSS3065 (9/1/98)	9809-0012W BVSS3067 (9/1/98)	9809-0013W BVSS3068 (9/1/98)	9809-0014W BVSS3069 (9/1/98)	9809-0015W BVSS3070 (9/1/98)
K-40(1)	8.46E0 ± 1.2E0	7.62E0 ± 1.0E0	7.63E0 ± 1.1E0	6.29E0 ± 1.7E0	6.69E0 ± 9.8E-1
Cs-137	8.39E-2 ± 4.9E-2	1.01E-1 ± 4.9E-2	1.04E-1 ± 4.5E-2	1.26E-1 ± 6.9E-2	1.59E-1 ± 4.9E-2
Tl-208	2.70E-1 ± 5.5E-2	2.05E-1 ± 7.0E-2	2.81E-1 ± 6.3E-2	2.98E-1 ± 9.9E-2	2.87E-1 ± 5.8E-2
Bi-212	9.69E-1 ± 4.7E-1	1.09E0 ± 6.3E-1	1.03E0 ± 6.5E-1	<1.3E0	1.32E0 ± 6.0E-1
Pb-212	6.53E-1 ± 9.5E-2	6.79E-1 ± 8.2E-2	7.44E-1 ± 8.6E-2	4.45E-1 ± 3.0E-1	6.85E-1 ± 8.0E-2
Bi-214	7.29E-1 ± 1.5E-1	5.42E-1 ± 1.1E-1	6.94E-1 ± 1.4E-1	7.77E-1 ± 1.6E-1	6.78E-1 ± 1.5E-1
Pb-214	7.44E-1 ± 1.3E-1	6.47E-1 ± 1.2E-1	7.64E-1 ± 1.4E-1	5.77E-1 ± 2.4E-1	7.56E-1 ± 1.2E-1
Ra-226	7.40E-1 ± 1.6E-1	5.50E-1 ± 1.1E-1	7.05E-1 ± 1.5E-1	7.89E-1 ± 1.7E-1	6.88E-1 ± 1.6E-1
Ac-228	8.14E-1 ± 3.3E-1	8.38E-1 ± 3.2E-1	6.15E-1 ± 2.4E-1	1.03E0 ± 4.8E-1	9.06E-1 ± 3.0E-1
Th-232	7.68E-1 ± 1.6E-1	5.83E-1 ± 2.0E-1	7.99E-1 ± 1.8E-1	8.46E-1 ± 2.8E-1	8.16E-1 ± 1.7E-1
Th-234	3.52E0 ± 1.8E0	2.25E0 ± 1.8E0	<1.1E0	<1.6E0	1.86E0 ± 1.7E0
U-235	1.17E0 ± 3.8E-1	9.38E-1 ± 3.7E-1	6.77E-1 ± 3.0E-1	7.58E-1 ± 3.6E-1	1.04E0 ± 3.1E-1
U-238	7.68E0 ± 3.5E0	<4.6E0	<4.1E0	<9.2E0	4.07E0 ± 3.7E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0016W BVSS3071 (9/1/98)	9809-0017W BVSS3072 (9/1/98)	9809-0018W BVSS3074 (9/1/98)	9809-0019W BVSS3075 (9/1/98)	9809-0020W BVSS3076 (9/1/98)
K-40(1)	7.35E0 ± 1.1E0	7.63E0 ± 1.0E0	6.88E0 ± 1.0E0	6.97E0 ± 1.0E0	7.82E0 ± 1.1E0
Cs-137	1.70E-1 ± 6.8E-2	1.47E-1 ± 5.7E-2	7.69E-2 ± 4.5E-2	1.04E-1 ± 4.6E-2	<5.2E-2
Tl-208	2.32E-1 ± 5.9E-2	2.62E-1 ± 6.1E-2	2.89E-1 ± 5.9E-2	2.71E-1 ± 5.2E-2	2.79E-1 ± 5.9E-2
Bi-212	1.19E0 ± 4.2E-1	1.42E0 ± 5.4E-1	1.41E0 ± 4.9E-1	8.93E-1 ± 5.5E-1	7.05E-1 ± 6.3E-1
Pb-212	6.58E-1 ± 8.4E-2	7.65E-1 ± 8.7E-2	7.56E-1 ± 8.9E-2	7.50E-1 ± 8.6E-2	7.82E-1 ± 8.9E-2
Bi-214	6.88E-1 ± 1.4E-1	6.82E-1 ± 1.3E-1	6.35E-1 ± 1.2E-1	6.58E-1 ± 1.1E-1	6.87E-1 ± 1.4E-1
Pb-214	8.08E-1 ± 1.4E-1	9.62E-1 ± 1.4E-1	7.44E-1 ± 1.2E-1	7.26E-1 ± 1.2E-1	7.88E-1 ± 1.3E-1
Ra-226	6.99E-1 ± 1.4E-1	6.93E-1 ± 1.4E-1	6.45E-1 ± 1.3E-1	6.68E-1 ± 1.2E-1	6.98E-1 ± 1.5E-1
Ac-228	7.73E-1 ± 3.2E-1	1.10E0 ± 3.0E-1	1.04E0 ± 3.6E-1	8.40E-1 ± 3.2E-1	8.59E-1 ± 2.8E-1
Th-232	6.58E-1 ± 1.7E-1	7.46E-1 ± 1.7E-1	8.22E-1 ± 1.7E-1	7.69E-1 ± 1.5E-1	7.92E-1 ± 1.7E-1
Th-234	1.88E0 ± 1.7E0	2.64E0 ± 1.8E0	2.68E0 ± 1.8E0	2.78E0 ± 1.4E0	3.17E0 ± 2.1E0
U-235	5.94E-1 ± 3.1E-1	1.20E0 ± 4.0E-1	9.49E-1 ± 3.3E-1	9.24E-1 ± 3.6E-1	8.19E-1 ± 3.5E-1
U-238	7.60E0 ± 6.1E0	5.52E0 ± 5.5E0	1.26E1 ± 6.0E0	<4.9E0	6.91E0 ± 4.3E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0021W BVSS3077 (9/1/98)	9809-0022W BVSS3078 (9/1/98)	9809-0023W BVSS3079 (9/1/98)	9809-0024W BVSS3081 (9/1/98)	9809-0025W BVSS3082 (9/1/98)
K-40(1)	7.97E0 ± 1.1E0	7.79E0 ± 1.0E0	6.99E0 ± 1.0E0	7.32E0 ± 1.2E0	7.34E0 ± 1.1E0
Cs-137	1.05E-1 ± 6.4E-2	1.00E-1 ± 5.0E-2	6.73E-2 ± 4.5E-2	<8.0E-2	1.15E-1 ± 4.9E-2
Tl-208	3.00E-1 ± 5.5E-2	2.54E-1 ± 5.0E-2	2.66E-1 ± 5.6E-2	2.37E-1 ± 6.1E-2	2.97E-1 ± 6.8E-2
Bi-212	8.31E-1 ± 5.4E-1	1.30E0 ± 5.6E-1	<9.4E-1	7.24E-1 ± 7.3E-1	1.13E0 ± 5.1E-1
Pb-212	7.12E-1 ± 8.6E-2	8.46E-1 ± 8.8E-2	8.12E-1 ± 8.8E-2	7.58E-1 ± 9.2E-2	6.98E-1 ± 8.6E-2
Bi-214	6.36E-1 ± 1.3E-1	7.10E-1 ± 1.4E-1	7.39E-1 ± 1.4E-1	6.46E-1 ± 1.3E-1	6.02E-1 ± 1.6E-1
Pb-214	7.69E-1 ± 1.4E-1	8.68E-1 ± 1.3E-1	7.67E-1 ± 1.3E-1	5.73E-1 ± 1.3E-1	8.36E-1 ± 1.3E-1
Ra-226	6.46E-1 ± 1.4E-1	7.21E-1 ± 1.4E-1	7.50E-1 ± 1.5E-1	6.55E-1 ± 1.3E-1	6.11E-1 ± 1.7E-1
Ac-228	8.29E-1 ± 2.9E-1	6.80E-1 ± 2.4E-1	9.54E-1 ± 3.5E-1	9.96E-1 ± 3.0E-1	8.69E-1 ± 3.8E-1
Th-232	8.54E-1 ± 1.6E-1	7.21E-1 ± 1.4E-1	7.57E-1 ± 1.6E-1	6.75E-1 ± 1.7E-1	8.43E-1 ± 1.9E-1
Th-234	1.96E0 ± 1.7E0	1.90E0 ± 1.5E0	2.75E0 ± 1.8E0	2.78E0 ± 1.8E0	2.64E0 ± 1.6E0
U-235	7.71E-1 ± 2.8E-1	7.60E-1 ± 2.7E-1	1.23E0 ± 3.6E-1	1.24E0 ± 4.0E-1	8.86E-1 ± 3.4E-1
U-238	4.28E0 ± 3.6E0	4.14E0 ± 3.2E0	5.99E0 ± 3.7E0	<5.2E0	5.75E0 ± 3.3E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0026W BVSS3083 (9/1/98)	9809-0027W BVSS3084 (9/1/98)	9809-0028W BVSS3085 (9/1/98)	9809-0029W BVSS3086 (9/1/98)	9809-0030W BVSS3088 (9/1/98)
K-40(1)	7.24E0 ± 1.0E0	7.06E0 ± 1.0E0	7.00E0 ± 1.0E0	7.92E0 ± 1.1E0	7.59E0 ± 1.1E0
Cs-137	6.95E-2 ± 3.8E-2	9.94E-2 ± 4.5E-2	7.59E-2 ± 4.9E-2	5.52E-2 ± 5.1E-2	1.23E-1 ± 5.6E-2
Tl-208	2.84E-1 ± 5.9E-2	3.30E-1 ± 6.4E-2	2.84E-1 ± 6.5E-2	3.04E-1 ± 6.4E-2	2.72E-1 ± 6.1E-2
Bi-212	9.51E-1 ± 6.9E-1	8.97E-1 ± 5.4E-1	1.08E0 ± 4.2E-1	1.17E0 ± 5.4E-1	9.46E-1 ± 5.2E-1
Pb-212	6.69E-1 ± 8.1E-2	8.33E-1 ± 9.1E-2	7.57E-1 ± 8.6E-2	8.17E-1 ± 9.1E-2	7.44E-1 ± 8.9E-2
Bi-214	7.27E-1 ± 1.4E-1	8.20E-1 ± 1.5E-1	8.06E-1 ± 1.3E-1	8.30E-1 ± 1.3E-1	6.42E-1 ± 1.3E-1
Pb-214	8.90E-1 ± 1.3E-1	1.06E0 ± 1.4E-1	8.61E-1 ± 1.4E-1	9.05E-1 ± 1.4E-1	7.32E-1 ± 1.1E-1
Ra-226	7.38E-1 ± 1.5E-1	8.33E-1 ± 1.6E-1	8.19E-1 ± 1.4E-1	8.42E-1 ± 1.4E-1	6.52E-1 ± 1.4E-1
Ac-228	1.01E0 ± 3.1E-1	7.22E-1 ± 3.2E-1	7.46E-1 ± 2.8E-1	9.00E-1 ± 2.9E-1	1.08E0 ± 3.4E-1
Th-232	8.08E-1 ± 1.7E-1	9.37E-1 ± 1.8E-1	8.07E-1 ± 1.8E-1	8.64E-1 ± 1.8E-1	7.74E-1 ± 1.7E-1
Th-234	1.53E0 ± 1.5E0	2.07E0 ± 1.7E0	1.56E0 ± 1.4E0	2.68E0 ± 1.7E0	2.43E0 ± 1.8E0
U-235	6.76E-1 ± 3.4E-1	8.22E-1 ± 3.3E-1	5.82E-1 ± 3.0E-1	9.80E-1 ± 3.9E-1	9.06E-1 ± 3.3E-1
U-238	<3.9E0	4.51E0 ± 3.5E0	1.02E1 ± 5.5E0	<4.1E0	8.58E0 ± 5.2E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0031W BVSS3089 (9/1/98)	9809-0032W BVSS3090 (9/1/98)	9809-0033W BVSS3091 (9/1/98)	9809-0034W BVSS3092 (9/1/98)	9809-0035W BVSS3093 (9/1/98)
K-40(1)	7.79E0 ± 1.1E0	8.36E0 ± 1.1E0	6.99E0 ± 1.1E0	8.02E0 ± 1.2E0	8.71E0 ± 1.1E0
Cs-137	1.04E-1 ± 4.1E-2	9.48E-2 ± 6.7E-2	<8.0E-2	6.57E-2 ± 4.3E-2	1.24E-1 ± 5.7E-2
Tl-208	2.59E-1 ± 6.0E-2	3.14E-1 ± 6.1E-2	2.46E-1 ± 5.5E-2	2.08E-1 ± 6.4E-2	2.39E-1 ± 6.7E-2
Bi-212	1.44E0 ± 5.6E-1	1.26E0 ± 7.0E-1	1.07E0 ± 5.2E-1	7.39E-1 ± 5.5E-1	7.16E-1 ± 5.0E-1
Pb-212	8.17E-1 ± 9.3E-2	7.19E-1 ± 8.4E-2	7.80E-1 ± 9.0E-2	6.60E-1 ± 1.1E-1	8.19E-1 ± 9.2E-2
Bi-214	8.61E-1 ± 1.5E-1	6.59E-1 ± 1.5E-1	6.06E-1 ± 1.2E-1	6.12E-1 ± 1.4E-1	8.20E-1 ± 1.5E-1
Pb-214	8.94E-1 ± 1.4E-1	8.21E-1 ± 1.3E-1	8.03E-1 ± 1.4E-1	6.51E-1 ± 1.2E-1	8.88E-1 ± 1.3E-1
Ra-226	8.74E-1 ± 1.6E-1	6.69E-1 ± 1.5E-1	6.15E-1 ± 1.3E-1	6.21E-1 ± 1.4E-1	8.33E-1 ± 1.6E-1
Ac-228	7.29E-1 ± 3.4E-1	7.79E-1 ± 2.7E-1	6.65E-1 ± 3.2E-1	8.75E-1 ± 2.6E-1	1.15E0 ± 3.5E-1
Th-232	7.37E-1 ± 1.7E-1	8.94E-1 ± 1.7E-1	7.00E-1 ± 1.6E-1	5.91E-1 ± 1.8E-1	6.78E-1 ± 1.9E-1
Th-234	1.92E0 ± 2.1E0	3.00E0 ± 1.6E0	2.97E0 ± 2.1E0	3.97E0 ± 2.0E0	2.11E0 ± 1.9E0
U-235	2.00E0 ± 4.7E-1	6.95E-1 ± 3.3E-1	5.95E-1 ± 3.4E-1	1.11E0 ± 3.8E-1	2.12E0 ± 5.3E-1
U-238	<4.3E0	6.73E0 ± 5.9E0	6.48E0 ± 4.3E0	7.13E0 ± 5.4E0	<4.8E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0036W BVSS3094 (9/1/98)	9809-0037W BVSS3096 (9/1/98)	9809-0038W BVSS3097 (9/1/98)	9809-0039W BVSS3098 (9/1/98)	9809-0040W BVSS3099 (9/1/98)
K-40(1)	8.83E0 ± 1.2E0	6.89E0 ± 1.1E0	7.35E0 ± 1.2E0	6.71E0 ± 1.1E0	6.33E0 ± 1.0E0
Cs-137	1.08E-1 ± 4.8E-2	4.56E-1 ± 9.2E-2	3.08E-1 ± 7.6E-2	<6.2E-2	3.98E-1 ± 9.1E-2
Tl-208	2.63E-1 ± 7.1E-2	4.18E-1 ± 8.6E-2	3.62E-1 ± 7.1E-2	1.76E-1 ± 6.1E-2	2.94E-1 ± 7.9E-2
Bi-212	1.23E0 ± 5.3E-1	1.40E0 ± 8.7E-1	1.68E0 ± 6.2E-1	9.22E-1 ± 4.7E-1	1.33E0 ± 5.7E-1
Pb-212	6.85E-1 ± 1.1E-1	1.20E0 ± 1.2E-1	9.92E-1 ± 1.1E-1	6.77E-1 ± 8.7E-2	9.28E-1 ± 1.1E-1
Bi-214	5.02E-1 ± 1.4E-1	7.41E-1 ± 1.5E-1	9.07E-1 ± 1.7E-1	5.75E-1 ± 1.1E-1	7.03E-1 ± 1.4E-1
Pb-214	6.70E-1 ± 1.2E-1	7.90E-1 ± 1.6E-1	8.58E-1 ± 1.5E-1	5.97E-1 ± 1.3E-1	8.45E-1 ± 1.3E-1
Ra-226	5.09E-1 ± 1.4E-1	7.52E-1 ± 1.6E-1	9.20E-1 ± 1.8E-1	5.84E-1 ± 1.2E-1	7.14E-1 ± 1.5E-1
Ac-228	6.73E-1 ± 2.7E-1	1.54E0 ± 4.6E-1	8.85E-1 ± 3.6E-1	8.70E-1 ± 2.6E-1	1.13E0 ± 3.5E-1
Th-232	7.48E-1 ± 2.0E-1	1.19E0 ± 2.4E-1	1.03E0 ± 2.0E-1	5.00E-1 ± 1.7E-1	8.36E-1 ± 2.3E-1
Th-234	1.53E0 ± 1.5E0	1.57E1 ± 5.2E0	1.51E1 ± 4.9E0	2.76E0 ± 2.1E0	9.14E0 ± 4.1E0
U-235	1.02E0 ± 2.9E-1	1.22E1 ± 2.1E0	1.33E1 ± 2.2E0	2.37E0 ± 5.6E-1	1.67E1 ± 2.7E0
U-238	1.01E1 ± 6.5E0	3.20E1 ± 1.3E1	3.70E1 ± 1.1E1	1.52E1 ± 6.6E0	2.33E1 ± 9.9E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0041W BVSS3100 (9/1/98)	9809-0042W BVSS3101 (9/1/98)	9809-0043W BVSS3102 (9/1/98)	9809-
K-40(1)	6.10E0 ± 9.8E-1	7.49E0 ± 1.0E0		
Cs-137	8.66E-2 ± 5.8E-2	1.97E-1 ± 7.4E-		
Tl-208	4.63E-1 ± 8.5E-2	3.05E-1 ± 7.2E-2		
Bi-212	1.81E0 ± 6.7E-1	5.31E-1 ± 5.7E-1		
Pb-212	1.33E0 ± 1.2E-1	8.71E-1 ± 9.4E-2		
Bi-214	3.98E-1 ± 1.5E-1	6.90E-1 ± 1.3E-1		
Pb-214	5.05E-1 ± 1.4E-1	7.05E-1 ± 1.1E-1	6	
Ra-226	4.04E-1 ± 1.5E-1	7.00E-1 ± 1.4E-1	6.	
Ac-228	1.35E0 ± 4.5E-1	8.86E-1 ± 3.4E-1	8.8	
Th-232	1.32E0 ± 2.4E-1	8.66E-1 ± 2.0E-1	7.93	
Th-234	3.76E1 ± 9.5E0	1.79E1 ± 5.0E0	<	
U-235	2.48E1 ± 4.0E0	6.39E0 ± 1.2E0	1.95E-	-1 ± 5.6E-2
U-238	9.03E1 ± 1.4E1	4.65E1 ± 1.1E1	<3.	<3.4E0

3102-3108
Leached
55 pCi/gm

- ± 2.8E-1
.06E-1 ± 1.7E-1
2.26E0 ± 1.4E0
7.23E-1 ± 2.7E-1
6.25E0 ± 5.4E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0046W BVSS3105 (9/1/98)	9809-0047W BVSS3106 (9/1/98)	9809-0048W BVSS3107 (9/1/98)	9809-0049W BVSS3108 (9/1/98)	9809-0050W METHOD BLANK
K-40(1)	7.27E0 ± 1.1E0	9.81E0 ± 1.2E0	7.16E0 ± 9.7E-1	7.86E0 ± 1.0E0	9.54E-1 ± 4.8E-1
Cs-137	2.62E-1 ± 5.9E-2	1.06E-1 ± 4.6E-2	5.89E-2 ± 3.4E-2	1.61E-1 ± 5.3E-2	<3.2E-2
Tl-208	2.36E-1 ± 5.8E-2	2.40E-1 ± 5.6E-2	2.47E-1 ± 4.9E-2	2.15E-1 ± 5.6E-2	5.39E-2 ± 2.7E-2
Bi-212	9.32E-1 ± 5.6E-1	1.26E0 ± 4.9E-1	7.57E-1 ± 3.3E-1	<8.2E-1	<3.9E-1
Pb-212	7.67E-1 ± 8.5E-2	6.88E-1 ± 8.1E-2	6.22E-1 ± 7.6E-2	5.63E-1 ± 7.1E-2	9.90E-2 ± 3.9E-2
Bi-214	6.63E-1 ± 1.1E-1	6.21E-1 ± 1.4E-1	7.47E-1 ± 1.2E-1	5.32E-1 ± 1.2E-1	2.29E-1 ± 7.4E-2
Pb-214	8.25E-1 ± 1.2E-1	6.78E-1 ± 1.1E-1	7.20E-1 ± 1.2E-1	7.00E-1 ± 1.3E-1	2.25E-1 ± 7.1E-2
Ra-226	6.73E-1 ± 1.2E-1	6.31E-1 ± 1.4E-1	7.58E-1 ± 1.3E-1	5.40E-1 ± 1.2E-1	2.32E-1 ± 7.6E-2
Ac-228	7.93E-1 ± 3.1E-1	8.67E-1 ± 3.1E-1	6.92E-1 ± 2.6E-1	4.96E-1 ± 2.7E-1	<2.8E-1
Th-232	6.71E-1 ± 1.6E-1	6.81E-1 ± 1.6E-1	7.01E-1 ± 1.4E-1	6.11E-1 ± 1.6E-1	1.53E-1 ± 7.8E-2
Th-234	1.66E0 ± 1.6E0	<8.9E-1	<7.6E-1	<7.9E-1	<5.5E-1
U-235	1.65E0 ± 4.5E-1	1.22E-1 ± 5.5E-2	8.52E-2 ± 3.6E-2	1.09E-1 ± 4.0E-2	<5.0E-2
U-238	7.06E0 ± 3.8E0	<3.4E0	<3.0E0	<3.3E0	<2.4E0

(1)Antech Method A-524 (Gamma Spectrometry), units are pCi/gram, and error estimates are 2 standard deviations.

	U-235 pCi/g	Composit pCi/g	Average 3 samples per segment	
BVSS-3054	0.528			
VSS-3055	1.45			
BVSS-3056	1.44			
BVSS-3057	0.874			
BVSS-3058	1.27		1.11	0.97
BVSS-3060		2.76		
BVSS-3061	0.718			
BVSS-3062	1.15			
BVSS-3063	0.69			
BVSS-3064	0.547			
BVSS-3065	1.17			
BVSS-3067		0.938	0.855	
BVSS-3068	0.677			
BVSS-3069	0.758			
BVSS-3070	1.04			
BVSS-3071	0.594			
BVSS-3072	1.2			
BVSS-3074		0.949	0.85	
BVSS-3075	0.924			
BVSS-3076	0.819			
BVSS-3077	0.717			
BVSS-3078	0.76			
BVSS-3079	1.23			
BVSS-3081		1.24	0.89	
BVSS-3082	0.886			
BVSS-3083	0.676			
3VSS-3084	0.822			
BVSS-3085	0.582			
BVSS-3086	0.98			
BVSS-3088		0.906	0.79	
BVSS-3089	2			
BVSS-3090	0.70			
BVSS-3091	0.60			
BVSS-3092	1.11			
BVSS-3093	2.12			
BVSS-3094		1.02	[redacted]	
	29.02	1.30		Average of composits
AV ~ 30 Samples	0.967		[redacted]	
SD	0.396			

Table 1
GAMMA Data Table
Westinghouse Electric Company
Antech Ltd. Project No. 99-0133W
Soil Characterization; Blairsville Soil Samples
Charge Order No. 122284-SA286; Blairsville

Parameter	Sample Identification 9902-0306W BV-SS-1126 (2/25/99)	9902-0307W BV-SS-1127 (2/25/99)	9902-0308W BV-SS-1128 (2/25/99)	9902-0309W BV-SS-1129 (2/25/99)
K-40(1)	8.43E0 ± 1.1E0	7.04E0 ± 1.0E0	6.85E0 ± 9.3E-1	7.96E0 ± 1.1E0
Co-60	<5.1E-2	<5.1E-2	<5.5E-2	<4.5E-2
Cs-137	1.39E-1 ± 5.0E-2	7.89E-2 ± 6.7E-2	1.12E-1 ± 6.1E-2	8.55E-2 ± 4.4E-2
Tl-208	3.34E-1 ± 5.9E-2	2.69E-1 ± 7.2E-2	2.97E-1 ± 7.0E-2	2.90E-1 ± 5.3E-2
Bi-212	<1.2E0	<1.1E0	<1.2E0	<1.2E0
Pb-212	8.87E-1 ± 1.4E-1	7.50E-1 ± 1.6E-1	6.90E-1 ± 1.4E-1	6.99E-1 ± 1.5E-1
Bi-214	6.99E-1 ± 1.3E-1	6.90E-1 ± 1.2E-1	7.14E-1 ± 1.2E-1	6.92E-1 ± 1.3E-1
Pb-214	6.13E-1 ± 1.3E-1	6.86E-1 ± 1.3E-1	6.41E-1 ± 1.3E-1	8.69E-1 ± 1.4E-1
Ac-228	6.72E-1 ± 1.6E-1	7.37E-1 ± 1.6E-1	8.59E-1 ± 1.3E-1	6.94E-1 ± 1.5E-1
U-235	9.64E-1 ± 1.5E-1	7.11E-1 ± 1.2E-1	7.70E-1 ± 1.1E-1	1.07E0 ± 1.6E-1
U-238	<1.2E1	<1.1E1	<1.0E1	<1.1E1
Am-241	<4.9E-1	<5.2E-1	<5.0E-1	<4.8E-1

See footnotes at end of table.

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Table 1
(Continued)

Parameter	Sample Identification 9902-0310W BV-SS-1130 (2/25/99)	9902-0311W BV-SS-1131 (2/25/99)	9902-0312W BV-SS-1132 (2/25/99)	9902-0313W BV-SS-1133 (2/25/99)
K-40(1)	8.22E0 ± 1.1E0	8.08E0 ± 1.0E0	7.42E0 ± 1.1E0	8.03E0 ± 1.1E0
Co-60	<6.2E-2	<5.5E-2	<6.1E-2	<5.2E-2
Cs-137	8.11E-2 ± 4.8E-2	<8.0E-2	5.26E-2 ± 5.0E-2	6.82E-2 ± 4.0E-2
Tl-208	3.00E-1 ± 5.7E-2	2.51E-1 ± 5.8E-2	3.36E-1 ± 6.0E-2	2.69E-1 ± 6.3E-2
Bi-212	<1.1E0	9.63E-1 ± 7.4E-1	<1.2E0	9.69E-1 ± 7.5E-1
Pb-212	6.02E-1 ± 1.6E-1	6.42E-1 ± 1.5E-1	7.51E-1 ± 1.7E-1	6.83E-1 ± 1.5E-1
Bi-214	5.32E-1 ± 1.1E-1	5.12E-1 ± 1.1E-1	5.96E-1 ± 1.2E-1	5.39E-1 ± 1.2E-1
Pb-214	6.69E-1 ± 1.2E-1	5.54E-1 ± 9.9E-2	5.98E-1 ± 1.3E-1	6.30E-1 ± 1.4E-1
Ac-228	7.19E-1 ± 1.5E-1	6.33E-1 ± 1.5E-1	6.57E-1 ± 1.5E-1	7.11E-1 ± 1.6E-1
U-235	1.38E0 ± 1.9E-1	1.22E0 ± 1.6E-1	9.39E-1 ± 1.5E-1	8.27E-1 ± 1.3E-1
U-238	2.79E0 ± 1.6E0	<1.1E1	<1.0E1	<1.0E1
Am-241	<5.3E-1	<5.4E-1	<4.6E-1	<5.2E-1

See footnotes at end of table.

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Table 1
(Continued)

Parameter	Sample Identification 9902-0314W BV-SS-1134 (2/25/99)	9902-0315W BV-SS-1135 (2/25/99)	9902-0316W BV-SS-1136 (2/25/99)	9902-0317W BV-SS-1137 (2/25/99)
K-40(1)	7.06E0 ± 1.0E0	6.11E0 ± 9.3E-1	6.06E0 ± 1.0E0	6.49E0 ± 9.2E-1
Co-60	<4.9E-2	<5.4E-2	<5.3E-2	<5.0E-2
Cs-137	5.67E-2 ± 4.4E-2	5.01E-2 ± 4.3E-2	<9.6E-2	4.13E-2 ± 3.6E-2
Tl-208	2.90E-1 ± 5.5E-2	2.51E-1 ± 4.8E-2	2.38E-1 ± 5.4E-2	2.57E-1 ± 6.0E-2
Bi-212	<1.2E0	<1.1E0	3.75E-1 ± 5.0E-1	1.05E0 ± 6.6E-1
Pb-212	7.29E-1 ± 1.2E-1	4.95E-1 ± 1.3E-1	7.84E-1 ± 1.3E-1	6.82E-1 ± 1.4E-1
Bi-214	<6.6E-1	5.62E-1 ± 1.2E-1	5.34E-1 ± 1.2E-1	5.08E-1 ± 1.1E-1
Pb-214	6.08E-1 ± 1.1E-1	5.67E-1 ± 1.2E-1	6.87E-1 ± 1.1E-1	6.49E-1 ± 1.0E-1
Ac-228	6.55E-1 ± 1.4E-1	5.88E-1 ± 1.4E-1	6.80E-1 ± 1.5E-1	6.06E-1 ± 1.4E-1
U-235	7.67E-1 ± 1.3E-1	1.22E0 ± 1.7E-1	1.12E0 ± 1.7E-1	8.43E-1 ± 1.3E-1
U-238	2.09E0 ± 1.4E0	4.66E0 ± 3.6E0	<1.2E1	<9.7E0
Am-241	<4.3E-1	<4.5E-1	<5.1E-1	<4.6E-1

See footnotes at end of table.

MAR 15 '99 11:15 FR ANTECH LTD. 724 722 5208 TO 82843337 P.06/12

Table 1
(Continued)

Parameter	Sample Identification 9902-0318W BV-SS-1138 (2/25/99)	9902-0319W BV-SS-1139 (2/25/99)	9902-0320W BV-SS-1140 (2/25/99)	9902-0321W BV-SS-1141 (2/25/99)
K-40(1)	5.56E0 ± 9.5E-1	6.31E0 ± 9.8E-1	5.59E0 ± 9.1E-1	6.03E0 ± 9.9E-1
Co-60	<6.8E-2	<6.2E-2	<6.1E-2	<5.7E-2
Cs-137	1.06E-1 ± 4.5E-2	7.93E-2 ± 6.1E-2	<8.4E-2	<9.6E-2
Tl-208	<1.3E-1	2.82E-1 ± 6.1E-2	2.17E-1 ± 6.9E-2	2.68E-1 ± 5.6E-2
Bi-212	<1.1E0	<1.1E0	<1.1E0	<1.1E0
Pb-212	4.96E-1 ± 1.2E-1	7.51E-1 ± 1.2E-1	6.34E-1 ± 1.0E-1	5.73E-1 ± 1.5E-1
Bi-214	5.15E-1 ± 1.1E-1	4.56E-1 ± 1.3E-1	6.96E-1 ± 1.3E-1	5.87E-1 ± 1.2E-1
Pb-214	3.94E-1 ± 1.1E-1	6.20E-1 ± 1.1E-1	5.33E-1 ± 1.0E-1	5.36E-1 ± 1.2E-1
Ac-228	6.31E-1 ± 1.4E-1	6.27E-1 ± 1.5E-1	6.26E-1 ± 1.4E-1	5.88E-1 ± 1.4E-1
U-235	1.04E0 ± 1.5E-1	4.92E-1 ± 1.1E-1	1.00E0 ± 1.4E-1	6.09E-1 ± 1.2E-1
U-238	<9.6E0	<8.7E0	<8.8E0	<1.1E+1
Am-241	<4.9E-1	<4.9E-1	<4.9E-1	<4.9E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9902-0322W BV-SS-1142 (2/25/99)	9902-0323W BV-SS-1143 (2/25/99)	9902-0324W BV-SS-1144 (2/25/99)	9902-0325W BV-SS-1145 (2/25/99)
K-40(1)	6.70E0 ± 9.5E-1	6.50E0 ± 9.7E-1	6.97E0 ± 9.3E-1	5.83E0 ± 9.0E-1
Co-60	<5.5E-2	<4.7E-2	<5.4E-2	<5.4E-2
Cs-137	4.26E-2 ± 4.3E-2	<8.3E-2	6.47E-2 ± 3.4E-2	<7.3E-2
Tl-208	2.72E-1 ± 5.2E-2	2.31E-1 ± 7.6E-2	2.63E-1 ± 4.9E-2	2.43E-1 ± 5.7E-2
Bi-212	<1.0E0	<1.2E0	8.22E-1 ± 5.5E-1	<9.2E-1
Pb-212	7.93E-1 ± 1.2E-1	5.37E-1 ± 1.5E-1	5.13E-1 ± 1.2E-1	6.82E-1 ± 1.1E-1
Bi-214	<5.6E-1	5.74E-1 ± 1.2E-1	4.64E-1 ± 1.1E-1	5.37E-1 ± 1.1E-1
Pb-214	5.64E-1 ± 1.1E-1	5.88E-1 ± 1.3E-1	5.00E-1 ± 1.1E-1	4.91E-1 ± 1.1E-1
Ac-228	5.60E-1 ± 1.4E-1	8.18E-1 ± 1.3E-1	5.08E-1 ± 1.2E-1	5.60E-1 ± 1.2E-1
U-235	9.29E-1 ± 1.5E-1	7.76E-1 ± 1.3E-1	9.25E-1 ± 1.5E-1	1.09E0 ± 1.4E-1
U-238	<1.1E1	<1.0E1	3.38E0 ± 3.2E0	<8.9E0
Am-241	<4.8E-1	<4.9E-1	<4.4E-1	<4.8E-1

See footnotes at end of table.

MAR 15 '99 11:16 FR ANTECH LTD. 724 722 5208 TO 82843357 P.08/12

Table 1
(Continued)

Parameter	Sample Identification 9902-0326W BV-SS-1146 (2/25/99)	9902-0327W BV-SS-1147 (2/25/99)	9902-0328W BV-SS-1148 (2/25/99)	9902-0329W BV-SS-1149 (2/25/99)
K-40(1)	6.39E0 ± 8.6E-1	6.88E0 ± 1.0E0	6.41E0 ± 9.1E-1	6.54E0 ± 9.0E-1
Co-60	<6.2E-2	<3.1E-2	<6.0E-2	<4.1E-2
Cs-137	5.61E-2 ± 5.7E-2	5.60E-2 ± 4.1E-2	7.33E-2 ± 4.7E-2	1.12E-1 ± 5.1E-2
Tl-208	2.32E-1 ± 6.2E-2	2.00E-1 ± 4.8E--2	2.28E-1 ± 4.7E-2	2.28E-1 ± 5.9E-2
Bi-212	<1.0E0	<9.9E-1	7.12E-1 ± 5.5E-1	<9.2E-1
Pb-212	7.15E-1 ± 1.4E-1	6.49E-1 ± 1.4E-1	4.44E-1 ± 1.4E-1	5.56E-1 ± 1.3E-1
Bi-214	5.26E-1 ± 1.2E-1	6.14E-1 ± 1.2E-1	<5.3E-1	6.81E-1 ± 1.1E-1
Pb-214	5.80E-1 ± 1.2E-1	5.46E-1 ± 1.1E-1	5.41E-1 ± 1.2E-1	5.52E-1 ± 1.1E-1
Ac-228	5.96E-1 ± 1.4E-1	6.08E-1 ± 1.5E-1	5.43E-1 ± 1.3E-1	7.89E-1 ± 1.2E-1
U-235	8.76E-1 ± 1.3E-1	7.43E-1 ± 1.4E-1	5.67E-1 ± 1.1E-1	8.43E-1 ± 1.3E-1
U-238	<9.3E0	<9.8E0	<9.9E0	<8.8E0
Am-241	5.0E-1	<4.9E-1	<4.4E-1	<4.7E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9902-0330W BV-SS-1150 (2/25/99)	9902-0331W BV-SS-1151 (2/25/99)	9902-0332W BV-SS-1152 (2/25/99)	9902-0333W BV-SS-1153 (2/25/99)
K-40(1)	6.15E0 ± 8.5E-1	5.78E0 ± 9.6E-1	6.17E0 ± 8.9E-1	6.92E0 ± 9.0E-1
Co-60	<4.3E-2	<5.1E-2	<5.7E-2	<3.9E-2
Cs-137	<8.4E-2	3.43E-2 ± 4.1E-2	6.16E-2 ± 3.9E-2	9.00E-2 ± 5.5E-2
Tl-208	1.92E-1 ± 5.9E-2	2.89E-1 ± 5.5E-2	2.25E-1 ± 4.6E-2	2.50E-1 ± 6.1E-2
Bi-212	1.09E0 ± 5.2E-1	1.09E0 ± 5.8E-1	<9.4E-1	5.97E-1 ± 4.5E-1
Pb-212	6.64E-1 ± 1.0E-1	6.99E-1 ± 1.2E-1	5.32E-1 ± 1.3E-1	7.32E-1 ± 1.5E-1
Bi-214	5.40E-1 ± 1.0E-1	<6.5E-1	4.51E-1 ± 1.1E-1	5.29E-1 ± 9.3E-2
Pb-214	4.93E-1 ± 9.8E-2	5.98E-1 ± 1.1E-1	4.99E-1 ± 1.1E-1	5.47E-1 ± 1.2E-1
Ac-228	5.60E-1 ± 1.2E-1	5.94E-1 ± 1.5E-1	5.32E-1 ± 1.3E-1	6.81E-1 ± 1.4E-1
U-235	5.24E-1 ± 9.7E-2	9.96E-1 ± 1.6E-1	8.80E-1 ± 1.4E-1	7.03E-1 ± 1.2E-1
U-238	<7.3E0	3.62E0 ± 1.3E0	<1.0E1	<9.3E0
Am-241	<4.4E-1	<4.7E-1	<4.5E-1	<4.7E-1

See footnotes at end of table.

MAR 15 '99 11:16 FR ANTECH LTD. 724 722 5208 TO 82843357 P.10/12

Table 1
(Continued)

Parameter	Sample Identification 9902-0334W BV-SS-1154 (2/25/99)	9902-0335W BV-SS-1155 (2/25/99)	9902-0336W BV-SS-1156 (2/25/99)	9902-0337W BV-SS-1157 (2/25/99)
K-40(1)	6.18E0 ± 9.3E-1	5.88E0 ± 8.5E-1	7.03E0 ± 9.2E-1	6.36E0 ± 8.7E-1
Co-60	<6.2E-2	< 5.0E-2	< 4.4E-2	< 4.5E-2
Cs-137	5.32E-2 ± 4.4E-2	< 7.9E-2	9.14E-2 ± 4.6E-2	<6.9E-2
Tl-208	2.52E-1 ± 6.4E-2	2.11E-1 ± 6.4E-2	2.57E-1 ± 6.0E-2	2.35E-1 ± 4.6E-2
Bi-212	<1.0E0	<9.9E-1	< 9.1E-1	< 9.3E-1
Pb-212	6.89E-1 ± 1.2E-1	7.43E-1 ± 1.1E-1	6.66E-1 ± 1.3E-1	5.85E-1 ± 1.3E-1
Bi-214	5.45E-1 ± 1.1E-1	5.79E-1 ± 1.2E-1	5.25E-1 ± 1.1E-1	< 5.4E-1
Pb-214	5.90E-1 ± 1.1E-1	6.03E-1 ± 9.2E-2	5.34E-1 ± 9.2E-2	5.46E-1 ± 1.1E-1
Ac-228	5.86E-1 ± 1.4E-1	6.51E-1 ± 1.3E-1	6.16E-1 ± 1.3E-1	5.68E-1 ± 1.3E-1
U-235	8.49E-1 ± 1.4E-1	1.16E0 ± 1.5E-1	6.06E-1 ± 1.1E-1	7.67E-1 ± 1.2E-1
U-238	<1.1E1	< 1.0E1	< 8.0E0	< 1.0E1
Am-241	<4.7E-1	< 5.2E-1	< 4.6E-1	< 4.2E-1

See footnotes at end of table.

MAR 15 '99 11:17 FR ANTECH LTD. 724 722 5208 TO 8284335? P.11/12

Table 1
(Continued)

Parameter	Sample Identification 9902-0338W BV-SS-1158 (2/25/99)	9902-0339W BV-SS-1159 (2/25/99)	9902-0340W BV-SS-1160 (2/25/99)	9902-0341W BV-SS-1161 (2/25/99)
K-40(1)	6.50E0 ± 8.9E-1	5.78E0 ± 8.0E-1	5.81E0 ± 8.7E-1	6.67E0 ± 9.4E-1
Co-60	< 5.0E-2	< 4.8E-2	< 4.8E-2	< 5.5E-2
Cs-137	6.23E-2 ± 3.7E-2	5.89E-2 ± 3.5E-2	4.79E-2 ± 4.0E-2	6.46E-2 ± 4.4E-2
Tl-208	2.06E-1 ± 4.6E-2	2.40E-1 ± 5.7E-2	2.43E-1 ± 4.7E-2	< 1.3E-1
Bi-212	6.15E-1 ± 4.9E-1	< 9.7E-1	< 9.9E-1	< 1.0E0
Pb-212	7.25E-1 ± 1.1E-1	4.80E-1 ± 1.2E-1	6.04E-1 ± 1.0E-1	6.07E-1 ± 1.4E-1
Bi-214	4.85E-1 ± 1.0E-1	5.56E-1 ± 1.1E-1	4.90E-1 ± 1.1E-1	4.81E-1 ± 1.1E-1
Pb-214	5.56E-1 ± 9.8E-2	4.80E-1 ± 1.0E-1	6.25E-1 ± 9.8E-2	5.06E-1 ± 1.1E-1
Ac-228	5.85E-1 ± 1.2E-1	6.52E-1 ± 1.3E-1	5.72E-1 ± 1.3E-1	6.21E-1 ± 1.4E-1
U-235	< 5.3E-1	5.90E-1 ± 1.0E-1	8.87E-1 ± 1.4E-1	1.39E0 ± 1.9E-1
U-238	< 9.5E0	< 8.4E0	3.22E0 ± 1.4E0	< 1.0E1
Am-241	< 4.1E-1	< 4.2E-1	< 4.4E-1	< 5.1E-1

(1)Antech Method A-524 (Gamma Spectrometry), units are pCi/gram, and error estimates are 2 standard deviations.

7.8
2.4
9.6

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

4.4

February 8, 1999

Mr. Joe Nardi
Westinghouse Electric Company
Energy Center West, Bay 508 B
P. O. Box 355
Pittsburgh, PA 15230

Soil Characterization; Purchase Order No. 122284-SA286
CHESWICK COMPOSITE; WALTZ MILL; Energy Center
Antech Ltd. Project No. 98-0379W

Dear Mr. Nardi:

Enclosed are analytical results for samples submitted by Westinghouse Electric Company. Samples were received and logged in for analysis on September 16, 1998.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Emery J. Grohregin

Emery J. Grohregin
Supervisor

EJG:swt

Enclosures

ANTECH LTD.
CASE NARRATIVE Attachment

Discussion of Radioanalytical Results

The data summary report presents analytical results from four differing methods in a tabular format.

The codes GS, A1, and A2 are representative of Antech Ltd. Waltz Mill Site procedures for gamma spectrometry and alpha spectrometry of uranium (and thorium) in soils. Code AB represents analytical results obtained from an outside lab (Alpha Spec).

While the sensitivity of gamma analyses is considerably lower than alpha for several of the isotopes of interest, **^{235}U and ^{238}U gamma results in soils are very reliable**. The amount of sample presented for analysis is on the order of tens to hundreds of grams of soil, whereas in most alpha spectrometry procedures, the sample used is in the one gram range. Unfortunately, the gamma spectral regions of interest for ^{230}Th and ^{232}Th are affected by the presence of the other nuclides in these samples, hence the minimum detectable activities are relatively high.

In listing recoveries, our alpha method recoveries vary significantly. However, each data result is proportional to an internal reference standard. It appears the other lab had very good chemical recoveries.

It is clear from the gamma results that, at a minimum, **their ^{235}U data are questionable.** *Assuming uranium enrichment is a critical factor in the ultimate determination of sample dispensation, those data may be the most important of the set.* For each sample analyzed, the other lab's ^{235}U values are inconsistent with our results. In several cases, virtually no activity was observed for this analyte. Although they mention that sample inhomogeniety could be a factor in poor results for ^{234}U and ^{238}U, they do not state anything regarding ^{235}U.

Our methods are insubstantial for the determination of thorium via alpha spectrometry. We plan to develop procedures for thorium in soil. We will advise you accordingly, when we have completed our method development.

Radioanalytical Data Summary Report February 5,1999
Soil Assay via Alpha & Gamma Spectrometry

Client: Joe Nardi Project: 98-0379W and 98-0627W

Case Narrative: Five samples were analyzed for U and Th by different procedures.

Sample ID	Code	Recovery	U-234	U-235	U-238	Th-230	Th-232	
9809-0253w (only 69g/GS)	GS	na	< 51	3.5	< 3.8	< 7.9	< 22	Activity
								error
	A1	13%	10.8	0.518	1.34	-	-	Activity
			2	0.34	0.48			error
	A2	95%	6.28	0.727	1.64	-	-	Activity
			0.62	0.11	0.19			error
	AB	mean 102	11.9	0.3	3.3	1.2	0.8	Activity
			2.68	0.8	1.5	0.75	0.7	error
9809-0254w	GS	na	64	2.6	3.98	< 2.6	< 6.5	Activity
			12	0.27	1			error
	A1	9	160	8.21	9.35	-	-	Activity
			25	1.8	1.9			error
	A2	14	48.2	1.72	1.76	-	-	Activity
			6.5	0.42	0.39			error
	AB	102	110	1.9	6.1	1.1	0.4	Activity
			7.6	1.2	1.9	0.75	0.6	error
9809-0255w	GS	na	< 11	0.93	3.79	< 2.0	< 5.3	Activity
				0.091	0.9			error
	A1	8	21.8	1.1	3.14	-	-	Activity
			4.2	0.56	0.96			error
	A2	72	31.2	4.75	4.45	-	-	Activity
			3	0.51	0.47			error
	AB	102	23.2	0.3	3.7	1.2	0.9	Activity
			3.48	0.7	1.5	0.74	0.6	error
9809-0256w	GS	na	231	9.24	< 2.3	< 4.9	< 13	Activity
			35	0.8				error
	A1	14	113	8.08	15.8	-	-	Activity
			16	1.6	2.6			error
	A2	3	263	16.1	31	-	-	Activity
			68	4.8	8.5			error
	AB	102	143	3.3	23.4	1.3	0.7	Activity
			8.58	1.5	3.53	0.77	0.7	error
9812-0353w	GS	na	< 63	3.72	31	< 11	< 29	Activity
				0.8	6.3			error
	A1	47	80.4	3.86	10.22	-	-	Activity
			8	0.6	1.2			error
	A2	38	0.56	< .05	0.45	-	-	Activity
			0.13		0.1			error
	AB	102	4.3	0	1.8	1.9	2.4	Activity
			1.6	0.6	1.2	0.87	0.98	error

Bugs

clean pile

under road

casting sand

< 30

Gamma Spec shows U+Th daughters Yet looks like

Legend: GS - Gamma Spec, A1 - Alpha via WEC OI-86-4 Procedure, A2 - EIChrom Test
AB - Alpha Spec from sub-contracted lab.

w/o w/o

99% U238 49%

.71% U235 2% = 25.

** TOTAL PAGE

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 98-0379W
CLIENT: Purchase Order Number: 122284-SA286

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
9809-0253W	A composite	9809-0254W	B composite
9809-0255W	C composite	9809-0256W	D composite
9901-0353W	12-0356W(BV-SS-1043)		

C: SHIPPING/RECEIVING COMMENTS:

FOR SAMPLE 9901-0353W, REFER TO PROJECT 98-0627W, SAMPLE # 9812-0356W. Final report 2/5/99.

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
Please refer to the attached Case Narrative about reported results.

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format.

Antech Ltd., Waltz Mill Site Chain of Custody Record

Page 1 of —

Project Name: Cheswick Composite Project #: _____ Sampler: _____ (Print/Sign)

Client P.O. _____

Charge # 122284-SA286

Relinquished by: (Print/Sign) _____ Date _____ Time _____ Received by (Print/Sign) _____ Date _____ Time _____

Relinquished by: (Print/Sign) _____ Date _____ Time _____ Received by: (Print/Sign) _____ Date _____ Time _____

Lab Use Only
Project # 98-0379W

Estimated Report Date
2 3 4 7 10 14 21 28 45 60 90
calendar days after receipt date
DUE 10/30/98

Container Legend
- L = Bottle, 1L poly
- 5 = bottle, 500mL poly
- 2 = bottle, 250mL poly
- 1 = bottle, 100mL poly
- B = Bag, lg poly (12"x12")
- b = bag, sm poly (6"x6")
- F = Filter, 52mm
- f = filter, 28mm
- G = Jar, 1L Glass
- g = Jar, 500mL glass

* 10CFR61 list: gamma spec, H-3, C-14, Fe-55, Ni-63, Sr-90, Tc-99, I-129, americium, curium, plutonium

SAMPLE ID NUMBER	DATE	TIME	SAMPLE INFORMATION DESCRIPTION	container type (see legend)	# of containers	analyze suspended solids (SS)	grab sample	composite sample	WETCHEM: pH	conductivity/resistivity	hardness	total dissolved solids(TDS)	total suspended solids(TSS)	anions(F, Cl, PO4, SO4)	METALS: ICP scan (CLP metals)	ICP scan (full elemental)	AA (elemental) specify	TCLP metals	RADIOCHEMISTRY: gross alpha	gross beta	gamma spec	H-3	C-14	Iron (Fe-55 Fe-59)	Nickel (Ni-59 Ni-63)	Strontium (Sr-89 Sr-90)	Technicium (Tc-99)	Iodine (I-129)	americium	curium	plutonium	uranium	thorium	10CFR61 *(see list)	by alpha spec	Lab Use Only Lab Sample #
A	5/27		C-SS-967																															
	5/27		C-SS-968																															9809-0253W
	5/27		C-SS-972		6															X												X	
	6/11		C-SS-1023																														X	
	6/11		C-SS-1033																															
	6/15		C-SS-1038																	X													X	9809-0254W
	7/1		BV-SS-3000																															
	7/1		BV-SS-3002																															
	7/1		BV-SS-3006																															
(B)	7/1		BV-SS 3007																															

Special Instructions _____

	Yes	No
Nuclear Safety?	☐	☒
Site Remediation?	☐	☒
Utah Disposal?	☐	☒

Sample Disposition
- ☐ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

Results to: JOE Nardi

Invoice to: _____

Lab Use Only
Sample Condition Upon Receipt _____

Required LOD (Limit of Detection) for Radioanalysis

Antech Ltd., Waltz Mill Site Chain of Custody Record

Client P.O. _____

Charge # 122284-SA286

Project Name: _____ Project #: _____ Sampler: _____ (Print/Sign)

Relinquished by:(Print/Sign) _____ Date ____ Time ____ Received by:(Print/Sign) _____ Date ____ Time ____

Relinquished by:(Print/Sign) _____ Date ____ Time ____ Received by (Print/Sign) _____ Date ____ Time ____

Lab Use Only
Project # 98-0379W

Estimated Report Date

2 3 4 7 10 14 21 30 45 60 90

calendar days after receipt date

Container Legend

- L = Bottle, 1L poly
- 5 = bottle, 500mL poly
- 2 = bottle, 250mL poly
- 1 = bottle, 100mL poly
- B = Bag, lg poly (12"x12")
- b = bag, sm poly (6"x6")
- F = Filter, 52mm
- f = filter, 26mm
- G = Jar, 1L Glass
- g = Jar, 500mL glass

* 10CFR61 list: gamma spec, H-3, C-14, Fe-55, Ni-63, Sr-90, Tc-99, I-129, americium, curium, plutonium

SAMPLE ID NUMBER	DATE	TIME	SAMPLE INFORMATION DESCRIPTION	container type (see legend)	# of containers	analyze suspended solids (SS)	grab sample	composite sample	WETCHEM: pH	conductivity/resistivity	hardness	total dissolved solids(TDS)	total suspended solids(TSS)	anions(F, Cl, PO4, SO4)	METALS: ICP scan (CLP metals)	ICP scan (full elemental)	AA (elemental) specify	TCLP metals	RADIOCHEMISTRY: gross alpha	gross beta	gamma spec	H-3	C-14	Iron (Fe-55 Fe-59)	Nickel (Ni-59 Ni-63)	Strontium (Sr-89 Sr-90)	Technicium (Tc-99)	Iodine (I-129)	by alpha spec: americium	curium	plutonium	uranium	thorium	10CFR61 *(see list)	Lab Use Only Lab Sample #
	7/1		BV-SS-3010																																
			BV-SS-3013																																
			BV-SS-3019																																
			BV-SS-3022																																
			BV-SS-3025																																
B			BV-SS-3031																																
			BV-SS-3032																																
			BV-SS-3037																																
			BV-SS-3042																																
			BV-SS-3047																																

Special Instructions _____

	Yes	No
Nuclear Safety?	☐	☐
Site Remediation?	☐	☐
Utah Disposal?	☐	☐

Sample Disposition
- ☐ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

Results to: _____

Invoice to: _____

Lab Use Only
Sample Condition Upon Receipt _____

Required LOD (Limit of Detection) for Radioanalysis _____

FEB 08 '99 11:17 FR ANTECH LTD. 724 722 5208 TO 82843337 P.03/05

Antech Ltd., Waltz Mill Site Chain of Custody Record

Page 3 of ___

Project Name: _____ Project #: _____ Sampler: _____ (Print/Sign)

Client P.O. _____

Charge # 122284-SA286

Relinquished by: (Print/Sign) _____ Date ___ Time ___ Received by (Print/Sign) _____ Date ___ Time ___

Relinquished by (Print/Sign) _____ Date ___ Time ___ Received by (Print/Sign) _____ Date ___ Time ___

Lab Use Only
Project # 98-0379W

Estimated Report Date

2 3 4 7 10 14 21 30 45 60 90

calendar days after receipt date

Container Legend

L = Bottle, 1L poly
5 = bottle, 500mL poly
2 = bottle, 250mL poly
1 = bottle, 100mL poly
B = Bag, lg poly (12"x12")
b = bag, sm poly (6"x6")
F = Filter, 52mm
f = filter, 26mm
G = Jar, 1L Glass
g = Jar, 500mL glass

* 10CFR61 list: gamma spec, H-3, C-14, Fe-55, Ni-63, Sr-90, Tc-99, I-129, americium, curium, plutonium

SAMPLE ID NUMBER	DATE	TIME	SAMPLE INFORMATION DESCRIPTION	container type (see legend)	# of containers	analyze suspended solids (SS)	grab sample	composite sample	WETCHEM: pH	WETCHEM: conductivity/resistivity	WETCHEM: hardness	WETCHEM: total dissolved solids (TDS)	WETCHEM: total suspended solids (TSS)	WETCHEM: anions (F, Cl, PO4, SO4)	METALS: ICP scan (CLP metals)	METALS: ICP scan (full elemental)	METALS: AA (elemental) specify	METALS: TCLP metals	RADIOCHEMISTRY: gross alpha	RADIOCHEMISTRY: gross beta	RADIOCHEMISTRY: gamma spec	RADIOCHEMISTRY: H-3	RADIOCHEMISTRY: C-14	RADIOCHEMISTRY: Iron (Fe-55 Fe-59)	RADIOCHEMISTRY: Nickel (Ni-59 Ni-63)	RADIOCHEMISTRY: Strontium (Sr-89 Sr-90)	RADIOCHEMISTRY: Technicium (Tc-99)	RADIOCHEMISTRY: Iodine (I-129)	RADIOCHEMISTRY: americium (by alpha spec)	RADIOCHEMISTRY: curium	RADIOCHEMISTRY: plutonium	RADIOCHEMISTRY: uranium	RADIOCHEMISTRY: thorium	RADIOCHEMISTRY: 10CFR61 *(see list)	Lab Use Only Lab Sample #
	9/1		BV-SS-3052																															
	9/1		BV-SS-3060																X										X					9809-0255W
			BV-SS-3067																															
			BV-SS-3074																															
			BV-SS-3081																															
			BV-SS-3088																															
			BV-SS-3094																															
			BV-SS-3096																															
			BV-SS-3097																X										X					9809-0256W
	V		BV-SS-3098																															

Special Instructions _____

	Yes	No
Nuclear Safety?	☐	☐
Site Remediation?	☐	☐
Utah Disposal?	☐	☐

Sample Disposition
- ☐ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

Results to: _____

Invoice to: _____

Lab Use Only
Sample Condition Upon Receipt _____

Required LOD (Limit of Detection) for Radioanalysis

Antech Ltd., Waltz Mill Site Chain of Custody Record

Project Name: _____ Project #: _____ Sampler: _____ (Print/Sign)

Client P.O. _____

Charge # 122284-SA286

Relinquished by:(Print/Sign) _____ Date ____ Time ____ Received by:(Print/Sign) _____ Date ____ Time ____

Relinquished by:(Print/Sign) _____ Date ____ Time ____ Received by:(Print/Sign) _____ Date ____ Time ____

Lab Use Only
Project # 98-037W

** TOTAL PAGE.05 **

Estimated Report Date

1 2 3 4 7 10 14 21 30 45 60 90

calendar days after receipt date

Container Legend

L = Bottle, 1L poly
5 = bottle, 500mL poly
2 = bottle, 250mL poly
1 = bottle, 100mL poly
B = Bag, lg poly (12"x12")
b = bag, sm poly (6"x8")
F = Filter, 52mm
f = filter, 26mm
G = Jar, 1L Glass
g = Jar, 500mL glass

SAMPLE ID NUMBER	SAMPLE INFORMATION DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze suspended solids (SS)	grab sample	composite sample	WETCHEM: pH	conductivity/resistivity	hardness	total dissolved solids(TDS)	total suspended solids(TSS)	anions(F, Cl, PO4, SO4)	METALS: ICP scan (CLP metals)	ICP scan (full elemental)	AA (elemental) specify	TCLP metals	RADIOCHEMISTRY: gross alpha	gross beta	gamma spec	H-3	C-14	Iron (Fe-55 Fe-59)	Nickel (Ni-59 Ni-63)	Strontium (Sr-89 Sr-90)	Technicium (Tc-99)	Iodine (I-129)	americium	curium	plutonium	uranium	thorium	10CFR61 * (see list)	by alpha spec	Lab Use Only Lab Sample #
(D)	9/1		BV-SS-3099																															
	9/1		BV-SS-3100																															
	9/1		BV-SS-3101																															
			BLANK																X													X		9809-025W

* 10CFR61 list:
gamma spec
H-3
C-14
Fe-55
Ni-63
Sr-90
Tc-99
I-129
americium
curium
plutonium

Special Instructions _____

	Yes	No
Nuclear Safety?	☐	☐
Site Remediation?	☐	☐
Utah Disposal?	☐	☐

Sample Disposition
- ☐ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

Results to: _____

Invoice to _____

Lab Use Only
Sample Condition Upon Receipt _____

Required LOD (Limit of Detection) for Radioanalysis

ATTACHMENT A-3

SAMPLE LOG

	A	B	C
1	SAMPLE NUMBER	DATE	SAMPLE COMMENTS OR LOCATION
2	BV-SS-366	6/1/98	Dirt from around Cow Palace TC pipe
3	BV-SS-367	6/2/98	Scraping from inside Cow Palace TC pipe
4	BV-SS-368	6/3/98	Miscellaneous dirt from around Cow Palace TC pipe
5	BV-SS-369	6/3/98	Miscellaneous dirt from around Cow Palace TC pipe
6	BV-SS-370	6/3/98	Miscellaneous dirt from around Cow Palace TC pipe
7	BV-SS-371	6/4/98	Cow Palace SE dirt pile S end
8	BV-SS-372	6/4/98	Cow Palace SE dirt pile middle
9	BV-SS-373	6/4/98	Cow Palace SE dirt pile N end
10	BV-SS-374	6/4/98	Cow Palace NE dirt pile S end
11	BV-SS-375	6/4/98	Cow Palace NE dirt pile N end
12	BV-SS-376	6/4/98	Cow Palace ENE dirt pile S end
13	BV-SS-377	6/4/98	Cow Palace ENE dirt pile N end
14	BV-SS-378	6/4/98	Cow Palace N dirt pile E end
15	BV-SS-379	6/4/98	Cow Palace N dirt pile W end
16	BV-SS-380	6/4/98	Cow Palace W dirt pile N end
17	BV-SS-381	6/4/98	Cow Palace W dirt pile Mid-N
18	BV-SS-382	6/4/98	Cow Palace W dirt pile Mid-S
19	BV-SS-383	6/4/98	Cow Palace W dirt pile S end
20	BV-SS-384	6/8/98	Cow Palace TC pipe contents
21	BV-SS-385	6/8/98	Cow Palace W corner sump floor
22	BV-SS-386	6/8/98	Cow Palace N corner sump floor
23	BV-SS-387	6/8/98	Cow Palace middle sump floor
24	BV-SS-388	6/8/98	Cow Palace S corner sump floor
25	BV-SS-389	6/8/98	Cow Palace E corner sump floor
26	BV-SS-390	6/8/98	Cow Palace NW wall left
27	BV-SS-391	6/8/98	Cow Palace NW wall right
28	BV-SS-392	6/8/98	Cow Palace NE wall left
29	BV-SS-393	6/8/98	Cow Palace NE wall right
30	BV-SS-394	6/8/98	Cow Palace SE wall left
31	BV-SS-395	6/8/98	Cow Palace SE wall right
32	BV-SS-396	6/8/98	Cow Palace SW wall left
33	BV-SS-397	6/8/98	Cow Palace SW wall right - under TC pipe
34	BV-SS-398	6/22/98	55 Gal. Drum TC pipe
35	BV-SS-399	6/30/98	Metal bar found in CP with S/N "D310NB" stamp
36	BV-SS-400	7/6/98	Finishing Area 1st T/C pipe joint at S trough; Pre-Removal
37	BV-SS-401	7/6/98	Finishing Area 2nd T/C pipe joint at S trough; Pre-Removal
38	BV-SS-402	7/6/98	Finishing Area under floor drain; Pre-Removal
39	BV-SS-403	7/6/98	Drum B-1313; Finishing Area T/C pipe contents
40	BV-SS-404	7/6/98	Bag B-1312; Finishing Area T/C pipe trench dirt
41	BV-SS-405	7/6/98	Finishing Area T/C trench 0m N
42	BV-SS-406	7/6/98	Finishing Area T/C trench 1m N
43	BV-SS-407	7/6/98	Finishing Area T/C trench 2m N
44	BV-SS-408	7/6/98	Finishing Area T/C trench 3m N
45	BV-SS-409	7/6/98	Finishing Area T/C trench dirt put back into hole as fill
46	BV-SS-410	6/25/98	Cow Palace Inside sump
47	BV-SS-411	6/25/98	Cow Palace Inside sump
48	BV-SS-412	6/25/98	Cow Palace Inside sump
49	BV-SS-413	6/25/98	Cow Palace Inside sump

	A	B	C
50	BV-SS-414	6/25/98	Cow Palace Inside sump
51	BV-SS-415	6/25/98	Cow Palace Inside sump
52	BV-SS-416	6/25/98	Cow Palace Inside sump
53	BV-SS-417	6/25/98	Cow Palace Inside sump
54	BV-SS-418	6/25/98	Cow Palace Inside sump
55	BV-SS-419	6/25/98	Cow Palace Inside sump
56	BV-SS-420	6/25/98	Cow Palace Outside sump
57	BV-SS-421	6/25/98	Cow Palace Outside sump
58	BV-SS-422	6/25/98	Cow Palace Outside sump
59	BV-SS-423	6/25/98	Cow Palace Outside sump
60	BV-SS-424	6/25/98	Cow Palace Outside sump
61	BV-SS-425	6/25/98	Cow Palace Outside sump
62	BV-SS-426	6/25/98	Cow Palace Outside sump
63	BV-SS-427	6/25/98	Cow Palace Outside sump
64	BV-SS-428	6/25/98	Cow Palace Outside sump
65	BV-SS-429	6/25/98	Cow Palace Outside sump
66	BV-SS-430	6/24/98	Cow Palace drainline trench side N meters: 1
67	BV-SS-431	6/24/98	Cow Palace drainline trench side N meters: 2
68	BV-SS-432	6/24/98	Cow Palace drainline trench side N meters: 3
69	BV-SS-433	6/24/98	Cow Palace drainline trench side N meters: 4
70	BV-SS-434	6/24/98	Cow Palace drainline trench side N meters: 5
71	BV-SS-435	6/24/98	Cow Palace drainline trench side N meters: 6
72	BV-SS-436	6/24/98	Cow Palace drainline trench side N meters: 7
73	BV-SS-437	6/24/98	Cow Palace drainline trench side N meters: 8
74	BV-SS-438	6/24/98	Cow Palace drainline trench side N meters: 9
75	BV-SS-439	6/24/98	Cow Palace drainline trench side N meters: 10
76	BV-SS-440	6/24/98	Cow Palace drainline trench side N meters: 0
77	BV-SS-441	6/24/98	Cow Palace drainline trench side N meters: 11
78	BV-SS-442	6/24/98	Cow Palace drainline trench side N meters: 12
79	BV-SS-443	6/24/98	Cow Palace drainline trench side N meters: 13
80	BV-SS-444	6/24/98	Cow Palace drainline trench side N meters: 14
81	BV-SS-445	6/24/98	Cow Palace drainline trench side N meters: 15
82	BV-SS-446	6/24/98	Cow Palace drainline trench side N meters: 16
83	BV-SS-447	6/24/98	Cow Palace drainline trench side N meters: 17
84	BV-SS-448	6/24/98	Cow Palace drainline trench side N meters: 18
85	BV-SS-449	6/24/98	Cow Palace drainline trench side N meters: 19
86	BV-SS-450	6/24/98	Cow Palace drainline trench side N meters: 20
87	BV-SS-451	6/24/98	Cow Palace drainline trench side N meters: 21
88	BV-SS-452	6/24/98	Cow Palace drainline trench side N meters: 22
89	BV-SS-453	6/24/98	Cow Palace drainline trench bottom N meters: 0
90	BV-SS-454	6/24/98	Cow Palace drainline trench bottom N meters: 1
91	BV-SS-455	6/24/98	Cow Palace drainline trench bottom N meters: 2
92	BV-SS-456	6/24/98	Cow Palace drainline trench bottom N meters: 3
93	BV-SS-457	6/24/98	Cow Palace drainline trench bottom N meters: 4
94	BV-SS-458	6/24/98	Cow Palace drainline trench bottom N meters: 5
95	BV-SS-459	6/24/98	Cow Palace drainline trench bottom N meters: 6
96	BV-SS-460	6/24/98	Cow Palace drainline trench bottom N meters: 7
97	BV-SS-461	6/24/98	Cow Palace drainline trench bottom N meters: 8
98	BV-SS-462	6/24/98	Cow Palace drainline trench bottom N meters: 9
99	BV-SS-463	6/24/98	Cow Palace drainline trench bottom N meters: 10
100	BV-SS-464	6/24/98	Cow Palace drainline trench bottom N meters: 11

	A	B	C
101	BV-SS-465	6/24/98	Cow Palace drainline trench bottom N meters: 12
102	BV-SS-466	6/24/98	Cow Palace drainline trench bottom N meters: 13
103	BV-SS-467	6/24/98	Cow Palace drainline trench bottom N meters: 14
104	BV-SS-468	6/24/98	Cow Palace drainline trench bottom N meters: 15
105	BV-SS-469	6/24/98	Cow Palace drainline trench bottom N meters: 16
106	BV-SS-470	6/24/98	Cow Palace drainline trench bottom N meters: 17
107	BV-SS-471	6/24/98	Cow Palace drainline trench bottom N meters: 18
108	BV-SS-472	6/24/98	Cow Palace drainline trench bottom N meters: 19
109	BV-SS-473	6/24/98	Cow Palace drainline trench bottom N meters: 20
110	BV-SS-474	6/24/98	Cow Palace drainline trench bottom N meters: 21
111	BV-SS-475	6/24/98	Cow Palace drainline trench bottom N meters: 22
112	BV-SS-476	7/14/98	Cow Palace lagoon Yellow material
113	BV-SS-477	7/14/98	Cow Palace lagoon material @ 8m NE
114	BV-SS-478	7/14/98	Cow Palace N-S lagoon trench ash-type material
115	BV-SS-479	7/14/98	Cow Palace lagoon trench meters NE: 0
116	BV-SS-480	7/14/98	Cow Palace lagoon trench meters NE: 2
117	BV-SS-481	7/14/98	Cow Palace lagoon trench meters NE: 4
118	BV-SS-482	7/14/98	Cow Palace lagoon trench meters NE: 6
119	BV-SS-483	7/14/98	Cow Palace lagoon trench meters NE: 8
120	BV-SS-484	7/14/98	Cow Palace lagoon trench meters NE: 10
121	BV-SS-485	7/14/98	Cow Palace lagoon trench meters NE: 12
122	BV-SS-486	7/14/98	Cow Palace lagoon trench meters NE: 14A
123	BV-SS-487	7/14/98	Cow Palace lagoon trench meters NE: 14B
124	BV-SS-488	7/14/98	Cow Palace lagoon trench meters NE: 16
125	BV-SS-489	7/14/98	Cow Palace lagoon trench meters NE: 18
126	BV-SS-490	7/14/98	Cow Palace lagoon trench meters NE: 20
127	BV-SS-491	7/14/98	Cow Palace lagoon trench meters NE: 22
128	BV-SS-492	7/14/98	Cow Palace lagoon trench meters NE: 24
129	BV-SS-493	7/14/98	Cow Palace lagoon trench meters NE: 26
130	BV-SS-494	7/14/98	Cow Palace lagoon trench meters NE: 28
131	BV-SS-495	7/14/98	Cow Palace lagoon trench meters NE: 30
132	BV-SS-496	10/15/98	Pellet found in Cow Palace
133	BV-SS-497	10/15/98	Hot dirt around pellet
134	BV-SS-498	10/15/98	Composite dirt around pellet
135	BV-SS-499	10/16/98	Cow Palace @ 45,72 Lower ash line
136	BV-SS-1000	10/16/98	Cow Palace @ 52,71 Upper ash line
137	BV-SS-1001	10/16/98	Cow Palace new road X=0-20
138	BV-SS-1002	10/16/98	Cow Palace new road X=20-40
139	BV-SS-1003	10/16/98	Cow Palace new road X=40-60
140	BV-SS-1004	10/16/98	Cow Palace new road X=60-80
141	BV-SS-1005	10/16/98	Cow Palace new road X=80-100
142	BV-SS-1006	10/16/98	Dirt around Pine tree - composite
143	BV-SS-1007	10/20/98	x28,y26 L. Bed center trench
144	BV-SS-1008	10/20/98	x24,y24 L. Bed center trench
145	BV-SS-1009	10/20/98	x20,y21 L. Bed center trench
146	BV-SS-1010	10/20/98	x15,y17 L. Bed center trench
147	BV-SS-1011	10/20/98	x2,y15 L. Bed center trench
148	BV-SS-1012	11/4/98	x45, y65-80 24" to 36" trench
149	BV-SS-1013	11/4/98	x65, y55-70 18" to 24" trench
150	BV-SS-1014	11/4/98	x75, y50-72 18" to 24" trench
151	BV-SS-1015	11/4/98	x50-72, y60 0"to 18" trench

	A	B	C
152	BV-SS-1016	11/4/98	x50-72, y60 18" to 30" trench
153	BV-SS-1017	11/4/98	x50, y60-65 0" to 12" trench
154	BV-SS-1018	11/4/98	x50, y60-65 12" to 36" trench
155	BV-SS-1019	11/4/98	#1 rock pile laydown composite
156	BV-SS-1020	11/4/98	#2 rock pile laydown composite
157	BV-SS-1021	11/4/98	#3 rock pile laydown composite
158	BV-SS-1022	11/4/98	#4 rock pile laydown composite
159	BV-SS-1023	11/4/98	#1 sub-drainline soil composite
160	BV-SS-1024	11/4/98	#2 sub-drainline soil composite
161	BV-SS-1025	11/4/98	#3 sub-drainline soil composite
162	BV-SS-1026	11/16/98	Cow Palace basin X48,Y88 ~4 feet #1
163	BV-SS-1027	11/16/98	Cow Palace basin X48,Y88 ~4 feet #2
164	BV-SS-1028	11/16/98	Cow Palace basin X48,Y88 ~4 feet Bucket
165	BV-SS-1029	12/15/98	Cow Pal. Road trench X=50, 18-24"
166	BV-SS-1030	12/15/98	Cow PAL ROAD TRENCH X=50, 24-30"
167	BV-SS-1031	12/15/98	COW PAL ROAD TRENCH X=45,24-30"
168	BV-SS-1032	12/15/98	COW PAL ROAD TRENCH X=48,24-30"
169	BV-SS-1033	12/15/98	COW PAL ROAD TRENCH X=48,18-24"
170	BV-SS-1034	12/15/98	COW PAL ROAD TRENCH X=45 18-24"
171	BV-SS-1035	12/15/98	Field West of Westro Debris
172	BV-SS-1036	12/17/98	SC-35, 0-5'
173	BV-SS-1037	12/17/98	SC35, 5-10'
174	BV-SS-1038	12/17/98	SC45,0-5'
175	BV-SS-1039	12/17/98	SC-45 5-10'
176	BV-SS-1040	12/17/98	COW PAL ROAD X=43 18-24"
177	BV-SS-1041	12/17/98	COW PAL TRENCH X35, Y65, 12"
178	BV-SS-1042	12/17/98	I/S COW PAL TRENCH X33,Y65, 18"
179	BV-SS-1043	12/22/98	Field West of Westro X30, Y26
180	BV-SS-1044	12/28/98	I/S COW PAL TRENCH X8, 52Y
181	BV-SS-1045	1/14/99	SC- 1 22-25"
182	BV-SS-1046	1/14/99	SC-2 29-32"
183	BV-SS-1047	1/14/99	SC-3B 11-13", '
184	BV-SS-1048	1/14/99	SC-4 12-15"
185	BV-SS-1049	1/14/99	SC-4 23-25"
186	BV-SS-1050	1/14/99	SC-5 18-21"
187	BV-SS-1051	1/14/99	SC-6 36-38"
188	BV-SS-1052	1/14/99	SC-7 35-37"
189	BV-SS-1053	1/14/99	SC-8 11-13"
190	BV-SS-1054	1/14/99	SC-8 35-37"
191	BV-SS-1055	1/14/99	SC-9 23-25"
192	BV-SS-1056	1/14/99	SC-9 46-48"
193	BV-SS-1057	1/14/99	SC-10 34-36"
194	BV-SS-1058	1/14/99	SC-11 41-43"
195	BV-SS-1059	1/14/99	SC-11 71-73"
196	BV-SS-1060	1/14/99	SC-14 41-43"
197	BV-SS-1061	1/14/99	SC-15 12-14"
198	BV-SS-1062	1/14/99	SC-16 23-25"
199	BV-SS-1063	1/14/99	SC-16 36-38"
200	BV-SS-1064	1/14/99	SC-17 34-36"
201	BV-SS-1065	1/14/99	SC-18 17-19"
202	BV-SS-1066	1/14/99	SC-18 36-38"

	A	B	C	
203	BV-SS-1067	1/14/99	SC-19	24-26"
204	BV-SS-1068	1/14/99	SC-19	36-38
205	BV-SS-1069	1/14/99	SC-20	8-10"
206	BV-SS-1070	1/14/99	SC-20	27-29"
207	BV-SS-1071	1/14/99	SC-21	4-6"
208	BV-SS-1072	1/14/99	SC-21	36-38"
209	BV-SS-1073	1/14/99	SC-22	22-24"
210	BV-SS-1074	1/14/99	SC-22	44-46"
211	BV-SS-1075	1/14/99	SC23	16-18"
212	BV-SS-1076	1/14/99	SC23	37-39"
213	BV-SS-1077	1/14/99	SC-24	4-6"
214	BV-SS-1078	1/14/99	SC-24	24-26"
215	BV-SS-1079	1/14/99	SC-25	4-6"
216	BV-SS-1080	1/14/99	SC-25	25-27"
217	BV-SS-1081	1/14/99	SC-26	47-49
218	BV-SS-1082	1/14/99	SC-27	32-34"
219	BV-SS-1083	1/14/99	SC-28	36-38"
220	BV-SS-1084	1/14/99	SC-28	24-26"
221	BV-SS-1085	1/14/99	SC-29	8-10"
222	BV-SS-1086	1/14/99	SC-30	6-8"
223	BV-SS-1087	1/14/99	SC-31	8-10"
224	BV-SS-1088	1/14/99	SC-31	34-36"
225	BV-SS-1089	1/14/99	SC32	28-30"
226	BV-SS-1090	1/14/99	SC-33	18-20"
227	BV-SS-1091	1/14/99	SC-33	40-42"
228	BV-SS-1092	1/14/99	SC-34	17-19"
229	BV-SS-1093	1/14/99	SC-34	48-50"
230	BV-SS-1094	1/14/99	SC-35	4-6"
231	BV-SS-1095	1/14/99	SC-35	30-32"
232	BV-SS-1096	1/14/99	SC-35	106-108"
233	BV-SS-1097	1/14/99	SC-36	16-18"
234	BV-SS-1098	1/14/99	SC-36	60-62"
235	BV-SS-1099	1/14/99	SC-38	18-20"
236	BV-SS-1100	1/14/99	SC-38	60-62"
237	BV-SS-1101	1/14/99	SC-39	6-8"
238	BV-SS-1102	1/14/99	SC-39	22-24"
239	BV-SS-1103	1/14/99	SC-40	14-16"
240	BV-SS-1104	1/14/99	SC-40	36-38"
241	BV-SS-1105	1/14/99	SC-41	16-18"
242	BV-SS-1106	1/14/99	SC-41	34-36"
243	BV-SS-1107	1/14/99	SC-42	26-28"
244	BV-SS-1108	1/14/99	SC-42	108-110"
245	BV-SS-1109	1/14/99	SC-43	24-26"
246	BV-SS-1110	1/14/99	SC-43	108-110"
247	BV-SS-1111	1/14/99	SC-44	120-122"
248	BV-SS-1112	1/14/99	SC-44	154-156"
249	BV-SS-1113	1/14/99	SC-45	28-30"
250	BV-SS-1114	1/14/99	SC-45	72--74"
251	BV-SS-1115	1/14/99	SC-46	72-74"
252	BV-SS-1116	1/14/99	SC-46	98-100'
253	BV-SS-1117	1/14/99	SC-47	27-29"

	A	B	C	
254	BV-SS-1118	1/14/99	SC47	71-73"
255	BV-SS-1119	1/14/99	SC-37	18-20"
256	BV-SS-1120			
257	BV-SS-1121			
258	BV-SS-1122			
259	BV-SS-1123			
260	BV-SS-1124			
261	BV-SS-1125			
262	BV-SS-1126	2/25/99	Clean Dirt Pile Section 1-6	
263	BV-SS-1127	2/25/99	Clean Dirt Pile Section 1-7	
264	BV-SS-1128	2/25/99	Clean Dirt Pile Section 1-8	
265	BV-SS-1129	2/25/99	Clean Dirt Pile Section 1-9	
266	BV-SS-1130	2/25/99	Clean Dirt Pile Section 1-10	
267	BV-SS-1131	2/25/99	Clean Dirt Pile Section 1-11	
268	BV-SS-1132	2/25/99	Clean Dirt Pile Section 2-6	
269	BV-SS-1133	2/25/99	Clean Dirt Pile Section 2-7	
270	BV-SS-1134	2/25/99	Clean Dirt Pile Section 2-8	
271	BV-SS-1135	2/25/99	Clean Dirt Pile Section 2-9	
272	BV-SS-1136	2/25/99	Clean Dirt Pile Section 2-10	
273	BV-SS-1137	2/25/99	Clean Dirt Pile Section 2-11	
274	BV-SS-1138	2/25/99	Clean Dirt Pile Section 3-6	
275	BV-SS-1139	2/25/99	Clean Dirt Pile Section 3-7	
276	BV-SS-1140	2/25/99	Clean Dirt Pile Section 3-8	
277	BV-SS-1141	2/25/99	Clean Dirt Pile Section 3-9	
278	BV-SS-1142	2/25/99	Clean Dirt Pile Section 3-10	
279	BV-SS-1143	2/25/99	Clean Dirt Pile Section 3-11	
280	BV-SS-1144	2/25/99	Clean Dirt Pile Section 4-6	
281	BV-SS-1145	2/25/99	Clean Dirt Pile Section 4-7	
282	BV-SS-1146	2/25/99	Clean Dirt Pile Section 4-8	
283	BV-SS-1147	2/25/99	Clean Dirt Pile Section 4-9	
284	BV-SS-1148	2/25/99	Clean Dirt Pile Section 4-10	
285	BV-SS-1149	2/25/99	Clean Dirt Pile Section 4-11	
286	BV-SS-1150	2/25/99	Clean Dirt Pile Section 5-6	
287	BV-SS-1151	2/25/99	Clean Dirt Pile Section 5-7	
288	BV-SS-1152	2/25/99	Clean Dirt Pile Section 5-8	
289	BV-SS-1153	2/25/99	Clean Dirt Pile Section5-9	
290	BV-SS-1154	2/25/99	Clean Dirt Pile Section 5-10	
291	BV-SS-1155	2/25/99	Clean Dirt Pile Section 5-11	
292	BV-SS-1156	2/25/99	Clean Dirt Pile Section 6-6	
293	BV-SS-1157	2/25/99	Clean Dirt Pile Section 6-7	
294	BV-SS-1158	2/25/99	Clean Dirt Pile Section 6-8	
295	BV-SS-1159	2/25/99	Clean Dirt Pile Section 6-9	
296	BV-SS-1160	2/25/99	Clean Dirt Pile Section 6-10	
297	BV-SS-1161	2/25/99	Clean Dirt Pile Section 6-11	
298	BV-SS-3000	15-Jun-98	Bag # B-3000	
299	BV-SS-3001	15-Jun-98	Bag # B-3001	
300	BV-SS-3002	15-Jun-98	Bag # B-3002	
301	BV-SS-3003	15-Jun-98	Bag # B-3003	
302	BV-SS-3004	15-Jun-98	Bag # B-3004	
303	BV-SS-3005	15-Jun-98	Bag # B-3005	
304	BV-SS-3006	15-Jun-98	Bag # B-3006	

	A	B	C
305	BV-SS-3007	15-Jun-98	Bag # B-3007
306	BV-SS-3008	15-Jun-98	Bag # B-3008
307	BV-SS-3009	15-Jun-98	Bag # B-3009
308	BV-SS-3010	15-Jun-98	Bag # B-3010
309	BV-SS-3011	15-Jun-98	Bag # B-3011
310	BV-SS-3012	15-Jun-98	Bag # B-3012
311	BV-SS-3013	15-Jun-98	Bag # B-3013
312	BV-SS-3014	15-Jun-98	Bag # B-3014
313	BV-SS-3015	15-Jun-98	Bag # B-3015
314	BV-SS-3016	16-Jun-98	Bag # B-3016
315	BV-SS-3017	16-Jun-98	Bag # B-3017
316	BV-SS-3018	16-Jun-98	Bag # B-3018
317	BV-SS-3019	16-Jun-98	Bag # B-3019
318	BV-SS-3020	16-Jun-98	Bag # B-3020
319	BV-SS-3021	16-Jun-98	Bag # B-3021
320	BV-SS-3022	16-Jun-98	Bag # B-3022
321	BV-SS-3023	16-Jun-98	Bag # B-3023
322	BV-SS-3024	16-Jun-98	Bag # B-3024
323	BV-SS-3025	16-Jun-98	Bag # B-3025
324	BV-SS-3026	16-Jun-98	Bag # B-3026
325	BV-SS-3027	16-Jun-98	Bag # B-3027
326	BV-SS-3028	16-Jun-98	Bag # B-3028
327	BV-SS-3029	16-Jun-98	Bag # B-3029
328	BV-SS-3030	16-Jun-98	Bag # B-3030
329	BV-SS-3031	16-Jun-98	Bag # B-3031
330	BV-SS-3032	22-Jun-98	Bag # B-3032
331	BV-SS-3033	22-Jun-98	Bag # B-3033
332	BV-SS-3034	22-Jun-98	Bag # B-3034
333	BV-SS-3035	22-Jun-98	Bag # B-3035
334	BV-SS-3036	22-Jun-98	Bag # B-3036
335	BV-SS-3037	22-Jun-98	Bag # B-3037
336	BV-SS-3038	22-Jun-98	Bag # B-3038
337	BV-SS-3039	22-Jun-98	Bag # B-3039
338	BV-SS-3040	22-Jun-98	Bag # B-3040
339	BV-SS-3041	22-Jun-98	Bag # B-3041
340	BV-SS-3042	22-Jun-98	Bag # B-3042
341	BV-SS-3043	22-Jun-98	Bag # B-3043
342	BV-SS-3044	22-Jun-98	Bag # B-3044
343	BV-SS-3045	22-Jun-98	Bag # B-3045
344	BV-SS-3046	22-Jun-98	Bag # B-3046
345	BV-SS-3047	22-Jun-98	Bag # B-3047
346	BV-SS-3049	22-Jun-98	Bag # B-3049
347	BV-SS-3050	22-Jun-98	Bag # B-3050
348	BV-SS-3051	22-Jun-98	Bag # B-3051
349	BV-SS-3052	22-Jun-98	Bag # B-3052
350	BV-SS-3053	22-Jun-98	Bag # B-3053
351	BV-SS-3054		Dirt section #1 Sample 1 X= 60 Y= -8
352	BV-SS-3055		Dirt section #1 Sample 2 X= 48 Y= -8
353	BV-SS-3056		Dirt section #1 Sample 3 X= 53 Y= -5
354	BV-SS-3057		Dirt section #1 Sample 4 X= 60 Y= -2
355	BV-SS-3058		Dirt section #1 Sample 5 X= 48 Y= -2

	A	B	C
356	BV-SS-3059		Dirt section #1 Sample 6
357	BV-SS-3060		Dirt section #1 Sample 7
358	BV-SS-3061		Dirt section #2 Sample 1 X= 60 Y= 2
359	BV-SS-3062		Dirt section #2 Sample 2 X= 48 Y= 2
360	BV-SS-3063		Dirt section #2 Sample 3 X= 53 Y= 3
361	BV-SS-3064		Dirt section #2 Sample 4 X= 60 Y= 4
362	BV-SS-3065		Dirt section #2 Sample 5 X= 48 Y= 4
363	BV-SS-3066		Dirt section #2 Sample 6
364	BV-SS-3067		Dirt section #2 Sample 7
365	BV-SS-3068		Dirt section #3 Sample 1 X= 60 Y= 6
366	BV-SS-3069		Dirt section #3 Sample 2 X= 48 Y= 6
367	BV-SS-3070		Dirt section #3 Sample 3 X= 53 Y= 7
368	BV-SS-3071		Dirt section #3 Sample 4 X= 60 Y= 8
369	BV-SS-3072		Dirt section #3 Sample 5 X= 48 Y= 8
370	BV-SS-3073		Dirt section #3 Sample 6
371	BV-SS-3074		Dirt section #3 Sample 7
372	BV-SS-3075		Dirt section #4 Sample 1 X= 60 Y= 12
373	BV-SS-3076		Dirt section #4 Sample 2 X= 48 Y= 11
374	BV-SS-3077		Dirt section #4 Sample 3 X= 53 Y= 13
375	BV-SS-3078		Dirt section #4 Sample 4 X= 60 Y= 14
376	BV-SS-3079		Dirt section #4 Sample 5 X= 48 Y= 14
377	BV-SS-3080		Dirt section #4 Sample 6
378	BV-SS-3081		Dirt section #4 Sample 7
379	BV-SS-3082		Dirt section #5 Sample 1 X= 60 Y= 16
380	BV-SS-3083		Dirt section #5 Sample 2 X= 48 Y= 16
381	BV-SS-3084		Dirt section #5 Sample 3 X= 53 Y= 17
382	BV-SS-3085		Dirt section #5 Sample 4 X= 60 Y= 18
383	BV-SS-3086		Dirt section #5 Sample 5 X= 48 Y= 18
384	BV-SS-3087		Dirt section #5 Sample 6
385	BV-SS-3088		Dirt section #5 Sample 7
386	BV-SS-3089		Dirt section #6 Sample 1 X= 43 Y= 6
387	BV-SS-3090		Dirt section #6 Sample 2 X= 39 Y= 6
388	BV-SS-3091		Dirt section #6 Sample 3 X= 41 Y= 14
389	BV-SS-3092		Dirt section #6 Sample 4 X= 44 Y= 16
390	BV-SS-3093		Dirt section #6 Sample 5 X= 39 Y= 16
391	BV-SS-3094		Dirt section #6 Sample 6
392	BV-SS-3095		Dirt section #6 Sample 7
393	BV-SS-3096		Trench 1 across road Sample 1
394	BV-SS-3097		Trench 1 across road Sample 2
395	BV-SS-3098		Trench 1 across road Sample 3
396	BV-SS-3099		Trench 2 across road Sample 1
397	BV-SS-3100		Trench 2 across road Sample 2
398	BV-SS-3101		Trench 2 across road Sample 3
399	BV-SS-3102		Tank & Distribution box
400	BV-SS-3103		East trench Leech bed
401	BV-SS-3104		East trench Leech bed
402	BV-SS-3105		Center trench leech bed
403	BV-SS-3106		Center trench leech bed
404	BV-SS-3107		West trench leech bed
405	BV-SS-3108		West trench leech bed
406	BV-SS-3109	10/16/98	Drum B-3109

	A	B	C
407	BV-SS-3110	10/16/98	Drum B-3110
408	BV-SS-3111	10/16/98	Drum B-3111
409	BV-SS-3112	10/16/98	Drum B-3112

ATTACHMENT A-4

ANALYTICAL LABORATORY DATA SHEETS

Antech Ltd.

One Triangle Drive • Export, Pennsylvania 15632 • Phone: (724) 733-1161 • Fax: (724) 327-7793

August 13, 1998

Mr. Joe Nardi
Westinghouse Electric Company
Energy Center West, Bay 508 B
P. O. Box 355
Pittsburgh, PA 15230

Soil Characterization; Purchase Order No. 122284SA286
Soils BV-SS-366 thru 3052; Blairsville; Energy Center
Antech Ltd. Project No. 98-0303W

Dear Mr. Nardi:

Enclosed are analytical results for samples submitted by Westinghouse Electric Company. Samples were received and logged in for analysis on July 23, 1998.

Appropriate ASTM/EPA methods were used and are indicated accordingly on the data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd.'s Statement of Qualifications. If you have any questions, please call me at 724-722-~~5219~~-5212.

Sincerely,

Shannon W. Thompson
Lead Analyst/Project Manager

SWT:mlm

Enclosures

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 98-0303W
CLIENT: Purchase Order Number: 122284SA286

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
9807-0268W	BV-SS-366	9807-0269W	BV-SS-367
9807-0270W	BV-SS-368	9807-0271W	BV-SS-369
9807-0272W	BV-SS-370	9807-0273W	BV-SS-371
9807-0274W	BV-SS-372	9807-0275W	BV-SS-373
9807-0276W	BV-SS-374	9807-0277W	BV-SS-375
9807-0278W	BV-SS-376	9807-0279W	BV-SS-377
9807-0280W	BV-SS-378	9807-0281W	BV-SS-379
9807-0282W	BV-SS-380	9807-0283W	BV-SS-381
9807-0284W	BV-SS-382	9807-0285W	BV-SS-383
9807-0286W	BV-SS-384	9807-0287W	BV-SS-385
9807-0288W	BV-SS-386	9807-0289W	BV-SS-387
9807-0290W	BV-SS-388	9807-0291W	BV-SS-389
9807-0292W	BV-SS-390	9807-0293W	BV-SS-391
9807-0294W	BV-SS-392	9807-0295W	BV-SS-393
9807-0296W	BV-SS-394	9807-0297W	BV-SS-395
9807-0298W	BV-SS-396	9807-0299W	BV-SS-397
9807-0300W	BV-SS-398	9807-0301W	BV-SS-399
9807-0302W	BV-SS-3000	9807-0303W	BV-SS-3002
9807-0304W	BV-SS-3006	9807-0305W	BV-SS-3007
9807-0306W	BV-SS-3010	9807-0307W	BV-SS-3013
9807-0308W	BV-SS-3019	9807-0309W	BV-SS-3022
9807-0310W	BV-SS-3025	9807-0311W	BV-SS-3031
9807-0312W	BV-SS-3032	9807-0313W	BV-SS-3037
9807-0314W	BV-SS-3042	9807-0315W	BV-SS-3047
9807-0316W	BV-SS-3052		

C: SHIPPING/RECEIVING COMMENTS:

Final Report

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
Sample results reported on an "as received" basis.

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format.

Table 1
General Data Table
Westinghouse Electric Company
Antech Ltd. Project No. 98-0303W
Soil Characterization; Soils BV-SS-366 thru 3052
Charge Order No. 122284SA286; Blairsville

Parameter	Sample Identification 9807-0268W BV-SS-366 (7/1/98)	9807-0269W BV-SS-367 (7/1/98)	9807-0270W BV-SS-368 (7/1/98)	9807-0271W BV-SS-369 (7/1/98)	9807-0272W BV-SS-370 (7/1/98)
K-40(1)	6.10E-1 ± 3.2E-1	<6.2E1	7.99E0 ± 2.1E0	6.94E0 ± 1.0E0	5.26E0 ± 1.5E0
Mn-54	<4.5E-2	1.23E1 ± 4.6E0	<9.8E-2	<4.3E-2	<1.0E-1
Co-60	<3.8E-2	<4.2E0	<9.6E-2	<5.1E-2	8.32E-2 ± 6.7E-2
Cs-137	<5.2E-2	<6.2E0	<1.0E-1	4.34E-2 ± 3.1E-2	<9.0E-2
Eu-155	<3.3E-1	7.77E1 ± 2.3E1	<2.9E-1	<1.9E-1	<3.2E-1
Tl-208	1.08E-1 ± 4.8E-2	2.10E2 ± 2.8E1	2.09E-1 ± 8.4E-2	2.67E-1 ± 5.4E-2	2.00E-1 ± 7.8E-2
Bi-212	<7.8E-1	8.03E2 ± 1.5E2	<1.3E0	1.18E0 ± 4.6E-1	1.93E0 ± 9.0E-1
Pb-212	4.38E-1 ± 7.3E-2	5.94E2 ± 5.0E1	6.15E-1 ± 1.4E-1	6.05E-1 ± 8.5E-2	4.31E-1 ± 1.3E-1
Bi-214	4.71E-1 ± 1.2E-1	<1.1E1	5.57E-1 ± 1.6E-1	5.17E-1 ± 1.2E-1	<2.3E-1
Pb-214	4.43E-1 ± 1.2E-1	<1.0E1	5.48E-1 ± 2.4E-1	6.17E-1 ± 1.0E-1	<1.9E-1
Ra-226	4.78E-1 ± 1.2E-1	<1.0E1	5.65E-1 ± 1.7E-1	5.25E-1 ± 1.2E-1	<1.8E-1
Ac-228	6.61E-1 ± 2.5E-1	7.05E2 ± 8.2E1	7.05E-1 ± 4.2E-1	7.17E-1 ± 3.7E-1	<5.0E-1
Ra-228	<3.8E-1	7.05E2 ± 8.2E1	7.05E-1 ± 4.2E-1	7.17E-1 ± 3.7E-1	<5.0E-1
Th-228	4.38E-1 ± 7.3E-2	8.03E2 ± 1.5E2	6.15E-1 ± 1.4E-1	1.18E0 ± 4.6E-1	1.93E0 ± 9.0E-1
Th-232	3.06E-1 ± 1.4E-1	5.96E2 ± 7.9E1	5.94E-1 ± 2.4E-1	7.59E-1 ± 1.5E-1	<1.7E-1
Th-234	1.53E1 ± 4.8E0	5.79E3 ± 1.3E3	<1.6E0	<1.3E0	<1.8E0
U-235	1.06E1 ± 1.8E0	5.95E2 ± 1.1E2	5.70E-1 ± 4.2E-1	1.34E0 ± 3.8E-1	1.66E0 ± 5.6E-1
U-238	4.64E1 ± 9.9E0	1.79E4 ± 1.6E3	<8.7E0	<4.4E0	<9.2E0
Am-241	<4.7E-1	<3.2E1	<6.6E-1	<2.8E-1	<6.8E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0273W BV-SS-371 (7/1/98)	9807-0274W BV-SS-372 (7/1/98)	9807-0275W BV-SS-373 (7/1/98)	9807-0276W BV-SS-374 (7/1/98)	9807-0277W BV-SS-375 (7/1/98)
K-40	8.90E0 ± 1.3E0	9.08E0 ± 1.2E0	7.16E0 ± 1.8E0	7.90E0 ± 1.1E0	5.81E0 ± 1.7E-1
Mn-54	<7.9E-2	<5.3E-2	<9.2E-2	<5.6E-2	<9.3E-2
Co-60	<8.8E-2	<6.8E-2	<9.2E-2	<4.6E-2	<7.9E-2
Cs-137	<9.8E-2	5.59E-2 ± 3.3E-2	1.24E-1 ± 6.4E-2	3.84E-2 ± 2.8E-2	<1.1E-1
Eu-155	<1.8E-1	<2.0E-1	<4.6E-1	<2.0E-1	<4.5E-1
Tl-208	2.70E-1 ± 1.8E-1	2.31E-1 ± 6.2E-2	3.74E-1 ± 1.1E-1	2.16E-1 ± 6.8E-2	2.27E-1 ± 9.6E-2
Bi-212	8.25E-1 ± 9.2E-1	1.25E0 ± 6.1E-1	9.36E-1 ± 8.3E-1	NA	1.64E0 ± 1.1E0
Pb-212	6.92E-1 ± 1.3E-1	8.21E-1 ± 9.3E-2	6.50E-1 ± 1.5E-1	6.00E-1 ± 8.2E-2	4.48E-1 ± 1.3E-1
Bi-214	6.05E-1 ± 3.4E-1	<2.5E-1	4.62E-1 ± 1.6E-1	4.34E-1 ± 1.0E-1	3.99E-1 ± 1.5E-1
Pb-214	5.78E-1 ± 2.1E-1	7.03E-1 ± 1.4E-1	3.11E-1 ± 1.6E-1	5.71E-1 ± 1.2E-1	4.06E-1 ± 1.9E-1
Ra-226	6.14E-1 ± 3.4E-1	<2.4E-1	<1.8E-1	4.41E-1 ± 1.1E-1	<2.0E-1
Ac-228	1.10E0 ± 5.1E-1	9.31E-1 ± 3.4E-1	<5.8E-1	7.03E-1 ± 2.7E-1	<5.8E-1
Ra-228	1.10E0 ± 5.1E-1	9.31E-1 ± 3.4E-1	<5.8E-1	7.03E-1 ± 2.7E-1	<5.8E-1
Th-228	8.25E-1 ± 9.2E-1	1.25E0 ± 6.1E-1	9.36E-1 ± 8.3E-1	<6.8E-2	1.64E0 ± 1.1E0
Th-232	7.67E-1 ± 5.1E-1	6.57E-1 ± 1.8E-1	1.06E0 ± 3.0E-1	6.13E-1 ± 1.9E-1	<1.9E-1
Th-234	<1.2E0	<1.2E0	7.44E0 ± 7.7E0	2.21E0 ± 1.7E0	1.30E1 ± 1.0E1
U-235	4.26E-1 ± 3.5E-1	8.72E-1 ± 2.9E-1	6.11E0 ± 1.4E0	9.46E-1 ± 3.6E-1	5.56E0 ± 1.3E0
U-238	<9.2E0	<4.6E0	2.75E1 ± 9.9E0	5.40E0 ± 5.2E0	2.08E1 ± 1.9E1
Am-241	<2.9E-1	<2.6E-1	<9.8E-1	<2.7E-1	<9.5E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0278W BV-SS-376 (7/1/98)	9807-0279W BV-SS-377 (7/1/98)	9807-0280W BV-SS-378 (7/1/98)	9807-0281W BV-SS-379 (7/1/98)	9807-0282W BV-SS-380 (7/1/98)
K-40	4.52E0 ± 1.4E0	4.03E00 ± 1.3E00	7.11E0 ± 1.1E0	6.00E0 ± 1.7E0	7.01E0 ± 1.0E0
Mn-54	<8.5E-2	<8.4E-2	5.49E-2 ± 2.8E-2	<9.4E-2	<4.2E-2
Co-60	<1.0E-1	<9.8E-2	<5.4E-2	<9.0E-2	<5.1E-2
Cs-137	<9.1E-2	<1.1E-1	9.14E-2 ± 5.4E-2	<9.0E-2	<5.8E-2
Eu-155	<4.3E-1	<4.8E-1	<2.5E-1	<4.0E-1	1.7E-1
Tl-208	1.72E-1 ± 7.7E-2	1.22E-1 ± 8.7E-2	2.39E-1 ± 5.8E-2	2.46E-1 ± 8.7E-2	1.98E-1 ± 5.9E-2
Bi-212	<1.4E0	<1.3E0	9.55E-1 ± 4.7E-1	<1.3E0	7.20E-1 ± 6.6E-1
Pb-212	4.37E-1 ± 1.1E-1	3.73E-1 ± 1.1E-1	6.40E-1 ± 8.3E-2	4.80E-1 ± 1.2E-1	6.01E-1 ± 7.7E-2
Bi-214	3.01E-1 ± 1.4E-1	3.46E-1 ± 1.2E-1	4.85E-1 ± 1.2E-1	5.02E-1 ± 1.7E-1	4.87E-1 ± 1.1E-1
Pb-214	3.40E-1 ± 1.7E-1	3.28E-1 ± 1.6E-1	5.24E-1 ± 9.9E-2	3.52E-1 ± 1.7E-1	5.04E-1 ± 1.1E-1
Ra-226	<1.7E-1	3.52E-1 ± 1.3E-1	<2.1E-1	5.09E-1 ± 1.7E-1	4.95E-1 ± 1.2E-1
Ac-228	4.76E-1 ± 3.5E-1	4.76E-1 ± 3.5E-1	5.25E-1 ± 3.4E-1	8.24E-1 ± 4.3E-1	<4.3E-1
Ra-228	<4.9E-1	<4.3E-1	5.25E-1 ± 3.4E-1	<5.0E-1	<4.3E-1
Th-228	4.37E-1 ± 1.1E-1	3.73E-1 ± 1.1E-1	9.55E-1 ± 4.7E-1	4.80E-1 ± 1.2E-1	7.20E-1 ± 6.6E-1
Th-232	4.90E-1 ± 2.2E-1	<1.6E-1	6.79E-1 ± 1.6E-1	6.99E-1 ± 2.5E-1	5.62E-1 ± 1.7E-1
Th-234	<2.7E0	<3.4E0	8.67E0 ± 2.8E0	7.00E0 ± 6.4E0	<9.6E-1
U-235	5.67E0 ± 1.3E0	1.05E1 ± 2.2E0	2.27E0 ± 5.6E-1	5.01E0 ± 1.1E0	3.04E-1 ± 2.6E-1
U-238	<1.2E1	<1.5E1	1.36E1 ± 5.2E0	<1.3E1	<3.6E0
Am-241	<8.8E-1	<1.1E0	<3.4E-1	<8.6E-1	<2.1E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0283W BV-SS-381 (7/1/98)	9807-0284W BV-SS-382 (7/1/98)	9807-0285W BV-SS-383 (7/1/98)	9807-0286W BV-SS-384 (7/1/98)	9807-0287W BV-SS-385 (7/1/98)
K-40	7.19E0 ± 1.1E0	7.83E0 ± 1.1E0	8.09E0 ± 1.1E0	<3.4E1	6.21E0 ± 1.6E0
Mn-54	<4.8E-2	<4.2E-2	<5.6E-2	<4.9E0	<8.2E-2
Co-60	<5.8E-2	<5.2E-2	<6.1E-2	<3.1E0	<9.6E-2
Cs-137	2.41E-1 ± 8.1E-2	1.61E-1 ± 5.5E-2	9.02E-2 ± 4.9E-2	<6.2E0	8.35E-2 ± 7.3E-2
Eu-155	<2.0E-1	<1.8E-1	<1.7E-1	<3.4E1	<4.6E-1
Tl-208	2.85E-1 ± 6.0E-2	2.82E-1 ± 6.5E-2	2.50E-1 ± 6.1E-2	2.94E1 ± 7.0E0	2.42E-1 ± 8.3E-2
Bi-212	5.99E-1 ± 6.8E-1	9.60E-1 ± 4.9E-1	1.12E0 ± 6.0E-1	1.31E2 ± 6.4E1	<1.4E0
Pb-212	6.36E-1 ± 8.7E-2	6.76E-1 ± 8.8E-2	7.12E-1 ± 8.8E-2	6.37E1 ± 8.4E0	4.74E-1 ± 1.2E-1
Bi-214	5.43E-1 ± 1.4E-1	5.74E-1 ± 1.2E-1	4.82E-1 ± 1.1E-1	<1.1E1	6.03E-1 ± 1.5E-1
Pb-214	7.56E-1 ± 1.3E-1	6.97E-1 ± 1.3E-1	5.98E-1 ± 1.3E-1	<1.2E1	4.51E-1 ± 2.0E-1
Ra-226	5.51E-1 ± 1.4E-1	5.82E-1 ± 1.3E-1	4.90E-1 ± 1.1E-1	<1.1E1	1.7E-1
Ac-228	7.42E-1 ± 3.3E-1	7.28E-1 ± 2.9E-1	6.29E-1 ± 2.3E-1	7.72E1 ± 3.1E1	4.44E-1 ± 3.6E-1
Ra-228	7.42E-1 ± 3.3E-1	7.28E-1 ± 2.9E-1	6.29E-1 ± 2.3E-1	<3.1E1	4.9E-1
Th-228	5.99E-1 ± 6.8E-1	9.60E-1 ± 4.9E-1	1.12E0 ± 6.0E-1	1.31E2 ± 6.4E1	4.74E-1 ± 1.2E-1
Th-232	8.10E-1 ± 1.7E-1	8.03E-1 ± 1.9E-1	7.10E-1 ± 1.7E-1	8.35E1 ± 2.0E1	6.89E-1 ± 2.4E-1
Th-234	2.63E0 ± 1.8E0	<1.1E0	<8.5E-1	1.44E4 ± 3.1E3	<3.1E0
U-235	3.55E-1 ± 2.7E-1	3.14E-1 ± 2.7E-1	<8.8E-2	1.38E3 ± 2.4E2	9.35E0 ± 2.0E0
U-238	<4.9E0	<4.2E0	<3.5E0	7.75E4 ± 3.6E3	<1.4E1
Am-241	<2.6E-1	<2.5E-1	<2.3E-1	<4.3E1	<1.0E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0288W BV-SS-386 (7/1/98)	9807-0289W BV-SS-387 (7/1/98)	9807-0290W BV-SS-388 (7/1/98)	9807-0291W BV-SS-389 (7/1/98)	9807-0292W BV-SS-390 (7/1/98)
K-40	6.72E0 ± 1.0E0	7.37E0 ± 1.0E0	6.27E0 ± 1.7E0	5.67E0 ± 9.0E-1	7.79E0 ± 1.1E0
Mn-54	<5.1E-2	<5.3E-2	<9.0E-2	<5.1E-1	<5.1E-2
Co-60	<3.6E-2	<4.1E-2	<1.0E-1	<4.6E-2	<5.5E-2
Cs-137	<4.6E-2	<4.5E-2	<8.6E-2	<5.0E-2	<5.3E-2
Eu-155	1.7E-1	<3.1E-1	<4.5E-1	<4.8E-1	<2.0E-1
Tl-208	2.43E-1 ± 5.7E-2	2.21E-1 ± 6.0E-2	2.04E-1 ± 7.7E-2	2.33E-1 ± 6.2E-2	2.24E-1 ± 5.1E-2
Bi-212	6.14E-1 ± 4.3E-1	1.02E0 ± 4.6E-1	<1.3E0	9.65E-1 ± 4.8E-1	5.15E-1 ± 5.8E-1
Pb-212	6.10E-1 ± 1.0E-1	6.20E-1 ± 8.2E-2	4.16E-1 ± 1.1E-1	5.63E-1 ± 7.3E-2	6.67E-1 ± 8.2E-2
Bi-214	5.13E-1 ± 1.2E-1	5.70E-1 ± 1.1E-1	4.58E-1 ± 1.4E-1	3.97E-1 ± 9.8E-2	5.14E-1 ± 1.1E-1
Pb-214	5.27E-1 ± 9.5E-2	5.75E-1 ± 1.1E-1	4.07E-1 ± 1.7E-1	4.81E-1 ± 1.2E-1	6.18E-1 ± 1.3E-1
Ra-226	5.21E-1 ± 1.2E-1	5.78E-1 ± 1.1E-1	<1.7E-1	4.03E-1 ± 1.0E-1	5.22E-1 ± 1.2E-1
Ac-228	6.49E-1 ± 3.2E-1	6.32E-1 ± 2.9E-1	5.97E-1 ± 3.4E-1	7.11E-1 ± 2.7E-1	8.10E-1 ± 2.5E-1
Ra-228	<4.1E-1	6.32E-1 ± 2.9E-1	<4.9E-1	<3.6E-1	8.10E-1 ± 2.5E-1
Th-228	6.14E-1 ± 4.3E-1	1.02E0 ± 4.6E-1	4.16E-1 ± 1.1E-1	9.65E-1 ± 4.8E-1	5.15E-1 ± 5.8E-1
Th-232	6.92E-1 ± 1.6E-1	6.28E-1 ± 1.7E-1	5.81E-1 ± 2.2E-1	6.63E-1 ± 1.8E-1	6.38E-1 ± 1.5E-1
Th-234	<8.5E-1	5.68E0 ± 3.3E0	6.47E0 ± 6.8E0	2.40E1 ± 7.0E1	<1.1E0
U-235	2.37E-1 ± 5.9E-2	1.07E1 ± 1.8E0	9.33E0 ± 2.0E0	3.65E1 ± 5.8E0	8.40E-1 ± 3.2E-1
U-238	<3.7E0	1.79E1 ± 8.0E0	2.42E1 ± 1.3E1	4.72E1 ± 8.6E0	<4.2E0
Am-241	<2.3E-1	<4.6E-1	<9.7E-1	<6.9E-1	<2.5E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0293W BV-SS-391 (7/1/98)	9807-0294W BV-SS-392 (7/1/98)	9807-0295W BV-SS-393 (7/1/98)	9807-0296W BV-SS-394 (7/1/98)	9807-0297W BV-SS-395 (7/1/98)
K-40	5.66E0 ± 8.9E-1	1.6E0	5.34E0 ± 8.6E-1	5.51E0 ± 8.4E-1	5.50E0 ± 1.6E0
Mn-54	<5.1E-2	<1.0E-1	2.64E-2 ± 2.6E-2	<4.5E-2	<9.1E-2
Co-60	<5.1E-2	<9.8E-2	<5.0E-2	<3.9E-2	<1.0E-1
Cs-137	<4.8E-2	1.74E-1 ± 9.1E-2	<4.3E-2	<3.0E-2	<1.1E-1
Eu-155	<1.8E-1	<3.0E-1	<1.9E-1	<1.3E-1	3.4E-1
Tl-208	2.17E-1 ± 6.1E-2	2.28E-1 ± 9.2E-2	1.99E-1 ± 5.8E-2	1.82E-1 ± 5.3E-2	1.93E-1 ± 1.0E-1
Bi-212	6.52E-1 ± 4.5E-1	<1.2E0	8.28E-1 ± 5.2E-1	6.31E-1 ± 4.7E-1	<1.4E0
Pb-212	6.14E-1 ± 7.5E-2	5.47E-1 ± 1.3E-1	6.20E-1 ± 7.7E-2	5.32E-1 ± 6.7E-2	4.75E-1 ± 1.4E-1
Bi-214	5.10E-1 ± 1.1E-1	7.00E-1 ± 1.6E-1	4.68E-1 ± 1.1E-1	4.62E-1 ± 9.2E-2	5.67E-1 ± 1.9E-1
Pb-214	5.89E-1 ± 1.0E-1	4.94E-1 ± 2.1E-1	5.19E-1 ± 1.1E-1	4.70E-1 ± 9.1E-2	4.86E-1 ± 2.2E-1
Ra-226	5.17E-1 ± 1.2E-1	<1.9E-1	<1.9E-1	4.70E-1 ± 9.7E-2	<2.0E-1
Ac-228	4.70E-1 ± 2.7E-1	9.42E-1 ± 4.0E-1	6.22E-1 ± 2.9E-1	6.11E-1 ± 2.2E-1	6.60E-1 ± 4.4E-1
Ra-228	4.70E-1 ± 2.7E-1	<5.2E-1	6.22E-1 ± 2.9E-1	6.11E-1 ± 2.2E-1	<5.8E-1
Th-228	6.52E-1 ± 4.5E-1	5.47E-1 ± 1.3E-1	8.28E-1 ± 5.2E-1	6.31E-1 ± 4.7E-1	4.75E-1 ± 1.4E-1
Th-232	6.16E-1 ± 1.7E-1	<1.8E-1	5.67E-1 ± 1.7E-1	5.16E-1 ± 1.5E-1	5.48E-1 ± 2.9E-1
Th-234	1.58E0 ± 1.3E0	<2.1E0	<1.2E0	<8.3E-1	5.39E0 ± 5.6E0
U-235	4.74E-1 ± 2.1E-1	2.62E0 ± 7.0E-1	1.37E0 ± 4.0E-1	3.89E-1 ± 2.0E-1	1.96E0 ± 5.9E-1
U-238	<4.0E0	<9.9E0	<4.0E0	<3.4E0	2.10E1 ± 1.1E1
Am-241	<2.6E-1	<7.2E-1	<2.4E-1	<2.0E-1	<8.0E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0298W BV-SS-396 (7/1/98)	9807-0299W BV-SS-397 (7/1/98)	9807-0300W BV-SS-398 (7/1/98)	9807-0301W BV-SS-399 (7/1/98)	9807-0302W BV-SS-3000 (7/1/98)
K-40	6.22E0 ± 9.8E-1	5.59E0 ± 9.6E-1	5.74E-1 ± 5.0E-1	<4.1E1	<2.7E0
Mn-54	<3.8E-2	<6.9E-2	<6.5E-2	<4.8E0	<9.2E-2
Co-60	<4.9E-2	<5.3E-2	<6.6E-2	<3.7E0	<1.0E-1
Cs-137	<7.4E-2	1.39E-1 ± 8.2E-2	<8.9E-2	<4.9E0	<1.1E-1
Eu-155	<3.0E-1	<6.4E-1	<4.3E-1	<2.2E1	<3.2E-1
Tl-208	2.07E-1 ± 6.7E-2	4.79E-1 ± 9.9E-2	2.51E-1 ± 1.7E-1	<5.0E0	2.17E-1 ± 7.3E-2
Bi-212	1.25E0 ± 5.5E-1	1.45E0 ± 8.8E-1	<1.2E0	<6.7E1	<1.2E0
Pb-212	5.64E-1 ± 9.3E-2	1.17E0 ± 1.2E-1	4.97E-1 ± 1.2E-1	<9.0E0	4.61E-1 ± 1.2E-1
Bi-214	5.76E-1 ± 1.3E-1	4.79E-1 ± 1.6E-1	4.16E-1 ± 2.6E-1	<9.5E0	<2.4E-1
Pb-214	5.96E-1 ± 1.1E-1	5.42E-1 ± 1.5E-1	2.11E-1 ± 1.2E-1	<1.2E1	4.86E-1 ± 2.1E-1
Ra-226	5.85E-1 ± 1.4E-1	<2.3E-1	<2.0E-1	<9.6E0	<1.8E-1
Ac-228	7.60E-1 ± 3.1E-1	1.02E0 ± 5.0E-1	<5.3E-1	<1.3E1	<5.0E-1
Ra-228	<4.4E-1	1.02E0 ± 5.0E-1	<5.3E-1	<1.3E1	<5.0E-1
Th-228	1.25E0 ± 5.5E-1	1.45E0 ± 8.8E-1	4.97E-1 ± 1.2E-1	<9.0E0	4.61E-1 ± 1.2E-1
Th-232	5.89E-1 ± 1.9E-1	1.36E0 ± 2.8E-1	<1.9E-1	<9.4E0	<1.7E-1
Th-234	6.64E0 ± 2.9E0	1.08E2 ± 2.4E1	3.75E1 ± 9.3E0	2.83E3 ± 6.3E2	<1.8E0
U-235	3.37E0 ± 7.1E-1	3.01E1 ± 4.9E0	1.28E1 ± 2.2E0	6.49E2 ± 1.1E2	2.41E0 ± 7.3E-1
U-238	4.47E1 ± 9.4E0	2.32E2 ± 2.4E1	1.86E2 ± 2.4E1	3.10E4 ± 2.3E3	<9.8E0
Am-241	<3.9E-1	<9.8E-1	<6.3E-1	<2.3E1	<7.0E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0303W BV-SS-3002 (7/1/98)	9807-0304W BV-SS-3006 (7/1/98)	9807-0305W BV-SS-3007 (7/1/98)	9807-0306W BV-SS-3010 (7/1/98)	9807-0307W BV-SS-3013 (7/1/98)
K-40	7.63E0 ± 2.0E0	7.44E0 ± 1.1E0	7.39E0 ± 1.2E0	5.51E0 ± 1.5E0	7.23E0 ± 1.9E0
Mn-54	<1.1E-1	<4.1E-2	<5.8E-2	<1.2E-1	<9.5E-2
Co-60	<8.1E-2	<5.2E-2	<4.7E-2	<1.2E-1	<1.1E-1
Cs-137	<1.2E-1	<6.1E-2	<6.9E-2	<1.3E-1	<1.1E-1
Eu-155	<3.8E-1	<2.5E-1	2.67E-1 ± 1.8E-1	<3.1E-1	<4.0E-1
Tl-208	1.88E-1 ± 9.3E-2	2.48E-1 ± 5.3E-2	2.10E-1 ± 7.4E-2	2.73E-1 ± 1.9E-1	2.04E-1 ± 1.1E-1
Bi-212	8.40E-1 ± 9.2E-1	6.51E-1 ± 5.1E-1	<8.8E-1	<1.5E0	<1.4E0
Pb-212	5.06E-1 ± 1.3E-1	6.77E-1 ± 8.6E-2	6.13E-1 ± 9.9E-2	6.55E-1 ± 1.6E-1	5.30E-1 ± 1.3E-1
Bi-214	6.56E-1 ± 1.7E-1	5.42E-1 ± 1.3E-1	5.61E-1 ± 1.4E-1	<3.8E-1	6.18E-1 ± 1.7E-1
Pb-214	4.80E-1 ± 2.2E-1	5.74E-1 ± 1.2E-1	7.22E-1 ± 1.3E-1	5.83E-1 ± 2.3E-1	4.48E-1 ± 2.0E-1
Ra-226	<2.1E-1	5.50E-1 ± 1.4E-1	5.69E-1 ± 1.4E-1	<3.3E-1	<2.0E-1
Ac-228	8.39E-1 ± 4.3E-1	<5.1E-1	1.05E0 ± 3.2E-1	8.54E-1 ± 5.3E-1	4.79E-1 ± 3.6E-1
Ra-228	<5.6E-1	<5.1E-1	1.05E0 ± 3.2E-1	<6.9E-1	<5.4E-1
Th-228	8.40E-1 ± 9.2E-1	6.51E-1 ± 5.1E-1	6.13E-1 ± 9.9E-2	6.55E-1 ± 1.6E-1	5.30E-1 ± 1.3E-1
Th-232	5.34E-1 ± 2.7E-1	7.05E-1 ± 1.5E-1	5.98E-1 ± 2.1E-1	7.77E-1 ± 5.5E-1	5.80E-1 ± 3.0E-1
Th-234	<2.3E0	2.92E0 ± 2.1E0	2.24E0 ± 2.1E0	3.88E0 ± 3.3E0	<2.6E0
U-235	3.08E0 ± 7.8E-1	2.86E0 ± 5.9E-1	3.33E0 ± 6.5E-1	2.38E0 ± 6.7E-1	5.52E0 ± 1.3E0
U-238	<1.2E1	<5.4E0	<5.9E0	<7.9E0	<1.3E1
Am-241	<8.2E-1	<3.2E-1	<3.4E-1	<4.2E-1	<9.1E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0308W BV-SS-3019 (7/1/98)	9807-0309W BV-SS-3022 (7/1/98)	9807-0310W BV-SS-3025 (7/1/98)	9807-0311W BV-SS-3031 (7/1/98)	9807-0312W BV-SS-3032 (7/1/98)
K-40	7.48E0 ± 1.2E0	6.34E0 ± 1.1E0	5.99E0 ± 1.6E0	6.94E0 ± 1.1E0	8.14E0 ± 1.2E0
Mn-54	<5.8E-2	<5.7E-2	<8.7E-2	<5.9E-2	<6.5E-2
Co-60	<5.9E-2	<4.9E-2	<9.8E-2	<6.1E-1	<5.4E-2
Cs-137	6.49E-2 ± 5.0E-2	<6.3E-2	<1.3E-1	<6.3E-2	1.14E-1 ± 6.2E-2
Eu-155	<2.8E-1	<2.5E-1	<3.8E-1	<2.7E-1	1.91E-1 ± 1.6E-1
Tl-208	2.22E-1 ± 6.1E-2	2.10E-1 ± 6.2E-2	1.57E-1 ± 7.7E-2	2.29E-1 ± 5.1E-2	2.29E-1 ± 7.4E-2
Bi-212	9.93E-1 ± 5.1E-1	7.37E-1 ± 7.0E-1	<1.5E0	1.02E0 ± 3.7E-1	1.08E0 ± 4.3E-1
Pb-212	6.64E-1 ± 8.8E-2	7.10E-1 ± 8.9E-2	4.55E-1 ± 1.2E-1	6.40E-1 ± 8.6E-2	7.56E-1 ± 9.1E-2
Bi-214	5.64E-1 ± 1.4E-1	5.92E-1 ± 1.2E-1	5.33E-1 ± 1.5E-1	4.54E-1 ± 1.4E-1	5.90E-1 ± 1.3E-1
Pb-214	6.13E-1 ± 1.2E-1	5.75E-1 ± 1.2E-1	4.38E-1 ± 1.9E-1	6.79E-1 ± 1.2E-1	5.29E-1 ± 1.2E-1
Ra-226	5.73E-1 ± 1.4E-1	<2.2E-1	5.41E-1 ± 1.6E-1	4.61E-1 ± 1.4E-1	5.99E-1 ± 1.3E-1
Ac-228	1.01E0 ± 3.3E-1	5.71E-1 ± 3.2E-1	5.69E-1 ± 3.8E-1	7.97E-1 ± 2.6E-1	6.50E-1 ± 2.8E-1
Ra-228	1.01E0 ± 3.3E-1	<4.9E-1	<5.4E-1	7.97E-1 ± 2.6E-1	6.50E-1 ± 2.8E-1
Th-228	9.93E-1 ± 5.1E-1	7.37E-1 ± 7.0E-1	4.55E-1 ± 1.2E-1	1.02E0 ± 3.7E-1	1.08E0 ± 4.3E-1
Th-232	6.32E-1 ± 1.7E-1	5.96E-1 ± 1.8E-1	4.46E-1 ± 2.2E-1	6.51E-1 ± 1.4E-1	6.51E-1 ± 2.1E-1
Th-234	2.44E0 ± 2.1E0	3.45E0 ± 2.2E0	<2.2E0	4.94E0 ± 2.4E0	2.65E0 ± 1.8E0
U-235	3.99E0 ± 8.5E-1	2.99E0 ± 6.7E-1	3.71E0 ± 8.8E-1	4.41E0 ± 8.6E-1	1.79E0 ± 4.7E-1
U-238	<6.0E0	6.38E0 ± 6.8E0	<1.1E1	<7.1E0	1.06E1 ± 6.4E0
Am-241	<3.6E-1	<3.4E-1	<8.6E-1	<3.6E-1	<3.1E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0313W BV-SS-3037 (7/1/98)	9807-0314W BV-SS-3042 (7/1/98)	9807-0315W BV-SS-3047 (7/1/98)	9807-0316W BV-SS-3052 (7/1/98)	9807-0317W Method Blank
K-40	7.86E0 ± 1.2E0	7.87E0 ± 2.1E0	7.20E0 ± 1.1E0	8.47E0 ± 1.2E0	1.21E0 ± 4.5E-1
Mn-54	<6.8E-2	<1.0E-1	4.18E-2 ± 2.7E-2	<5.4E-2	<3.8E-2
Co-60	<6.0E-2	<1.1E-1	<4.0E-2	<5.6E-2	<4.0E-2
Cs-137	7.72E-2 ± 3.0E-2	<1.2E-1	<6.3E-2	8.00E-2 ± 5.1E-2	<3.6E-2
Eu-155	1.74E-1 ± 1.6E-1	<4.3E-1	<2.5E-1	2.83E-1 ± 1.9E-1	<1.0E-1
Tl-208	2.24E-1 ± 6.3E-2	2.05E-1 ± 9.8E-2	2.61E-1 ± 5.4E-2	2.74E-1 ± 6.1E-2	6.31E-1 ± 2.7E-2
Bi-212	7.73E-1 ± 6.4E-1	1.09E0 ± 1.0E0	1.23E0 ± 5.3E-1	5.53E-1 ± 4.6E-1	<5.7E-1
Pb-212	6.08E-1 ± 8.3E-2	5.63E-1 ± 1.4E-1	5.92E-1 ± 8.0E-2	7.43E-1 ± 8.8E-2	1.17E-1 ± 4.5E-2
Bi-214	5.99E-1 ± 1.5E-1	3.91E-1 ± 1.7E-1	4.20E-1 ± 1.1E-1	5.69E-1 ± 1.4E-1	1.91E-1 ± 8.6E-2
Pb-214	7.20E-1 ± 1.4E-1	6.00E-1 ± 2.4E-1	6.09E-1 ± 1.3E-1	6.62E-1 ± 1.1E-1	2.37E-1 ± 7.9E-2
Ra-226	6.08E-1 ± 1.5E-1	3.97E-1 ± 1.7E-1	<2.2E-1	5.78E-1 ± 1.4E-1	<1.4E-1
Ac-228	9.78E-1 ± 3.3E-1	8.35E-1 ± 4.8E-1	7.31E-1 ± 2.9E-1	5.22E-1 ± 3.6E-1	<2.2E-1
Ra-228	<5.2E-1	<5.7E-1	7.31E-1 ± 2.9E-1	5.22E-1 ± 3.6E-1	<2.2E-1
Th-228	7.73E-1 ± 6.4E-1	1.09E0 ± 1.0E0	1.23E0 ± 5.3E-1	5.53E-1 ± 4.6E-1	1.17E-1 ± 4.5E-2
Th-232	6.35E-1 ± 1.8E-1	5.82E-1 ± 2.8E-1	7.41E-1 ± 1.5E-1	7.79E-1 ± 1.7E-1	<9.4E-2
Th-234	1.37E0 ± 1.4E0	<2.7E0	4.51E0 ± 2.3E0	3.37E0 ± 2.4E0	<5.6E-1
U-235	2.24E0 ± 5.4E-1	5.44E0 ± 1.2E0	4.62E0 ± 9.0E-1	2.78E0 ± 6.2E-1	<5.1E-2
U-238	<5.2E0	<1.3E1	1.05E1 ± 6.9E0	1.32E1 ± 6.1E0	<2.4E0
Am-241	<3.1E-1	<9.2E-1	<3.6E-1	<3.6E-1	<1.3E-1

(1) Analytical Method: A-524, units are pCi/g, error estimates are 2 standard deviations.

ANTECH LTD.

	DATE	TIME	TO/FROM	MODE	MIN/SEC	PGS	CMD#	STATUS
22	08/14	14:03 (W)	ENERGY CENTER	UF--S	03'45"	013	241	OK

Antech Ltd.

WESTINGHOUSE WALTZ MILL SITE

FAX COVER SHEET

PAGE 1 OF 13

TO: JOE NARDI &
IRWIN DOBRUSHIN
FAX (WIN) 284 3357

ANTECH ANALYTICAL LABORATORY
Westinghouse Waltz Mill Site
P.O. Box 158
Madison, PA 15663

Phone (412) 722-5219 or 722-5214
WIN # 224-5219 or 224-5214
FAX (412) [redacted] or 722-5208

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 98-0293W
CLIENT: Purchase Order Number: 122284-SA286

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID
9807-0143W	BV-SS-400
9807-0144W	BV-SS-401
9807-0145W	BV-SS-402
9807-0146W	BV-SS-403
9807-0147W	BV-SS-404
9807-0148W	BV-SS-405
9807-0149W	BV-SS-406
9807-0150W	BV-SS-407
9807-0151W	BV-SS-408
9807-0152W	BV-SS-409
9807-0153W	BV-SS-410
9807-0154W	BV-SS-411
9807-0155W	BV-SS-412
9807-0156W	BV-SS-413
9807-0157W	BV-SS-414
9807-0158W	BV-SS-415
9807-0159W	BV-SS-416
9807-0160W	BV-SS-417
9807-0161W	BV-SS-418
9807-0162W	BV-SS-419
9807-0163W	BV-SS-420
9807-0164W	BV-SS-421
9807-0165W	BV-SS-422
9807-0166W	BV-SS-423
9807-0167W	BV-SS-424
9807-0168W	BV-SS-425
9807-0169W	BV-SS-426
9807-0170W	BV-SS-427
9807-0171W	BV-SS-428
9807-0172W	BV-SS-429
9807-0173W	BV-SS-430
9807-0174W	BV-SS-431
9807-0175W	BV-SS-432
9807-0176W	BV-SS-433
9807-0177W	BV-SS-434
9807-0178W	BV-SS-435
9807-0179W	BV-SS-436
9807-0180W	BV-SS-437
9807-0181W	BV-SS-438
9807-0182W	BV-SS-439
9807-0183W	BV-SS-440
9807-0184W	BV-SS-441
9807-0185W	BV-SS-442
9807-0186W	BV-SS-443
9807-0187W	BV-SS-444
9807-0188W	BV-SS-445
9807-0189W	BV-SS-446
9807-0190W	BV-SS-447
9807-0191W	BV-SS-448
9807-0192W	BV-SS-449
9807-0193W	BV-SS-450
9807-0194W	BV-SS-451
9807-0195W	BV-SS-452
9807-0196W	BV-SS-453
9807-0197W	BV-SS-454
9807-0198W	BV-SS-455
9807-0199W	BV-SS-456
9807-0200W	BV-SS-457
9807-0201W	BV-SS-458
9807-0202W	BV-SS-459
9807-0203W	BV-SS-460
9807-0204W	BV-SS-461
9807-0205W	BV-SS-462
9807-0206W	BV-SS-463
9807-0207W	BV-SS-464
9807-0208W	BV-SS-465
9807-0209W	BV-SS-466
9807-0210W	BV-SS-467
9807-0211W	BV-SS-468
9807-0212W	BV-SS-469
9807-0213W	BV-SS-470
9807-0214W	BV-SS-471
9807-0215W	BV-SS-472
9807-0216W	BV-SS-473

ANTECH LTD.
CASE NARRATIVE

(Continued)

9807-0217W BV-SS-474
9807-0218W BV-SS-475
9807-0219W BV-SS-476
9807-0220W BV-SS-477
9807-0221W BV-SS-478
9807-0222W BV-SS-479
9807-0223W BV-SS-480
9807-0224W BV-SS-481
9807-0225W BV-SS-482
9807-0226W BV-SS-483
9807-0227W BV-SS-484
9807-0228W BV-SS-485
9807-0229W BV-SS-486
9807-0230W BV-SS-487
9807-0231W BV-SS-488
9807-0232W BV-SS-489
9807-0233W BV-SS-490
9807-0234W BV-SS-491
9807-0235W BV-SS-492
9807-0236W BV-SS-493
9807-0237W BV-SS-494
9807-0238W BV-SS-495

C: **SHIPPING/RECEIVING COMMENTS:**

FINAL REPORT: 9/10/98

II. **PREPARATION/ANALYSIS COMMENTS:**

A: **RADIOLOGICAL:**
None

III. **GENERAL COMMENTS:**

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format.

Table 1
General Data Table
Westinghouse Electric Company
Antech Ltd. Project No. 98-0293W
Soil Characterization; Blairsville Samples
Charge Order No. 122284-SA286; Blairsville

Parameter	Sample Identification 9807-0143W BV-SS-400 (7/16/98)	9807-0144W BV-SS-401 (7/16/98)	9807-0145W BV-SS-402 (7/16/98)	9807-0146W BV-SS-403 (7/16/98)
K-40(1)	9.41E0 ± 1.2E0	1.04E1 ± 2.4E0	8.38E0 ± 1.1E0	<5.1E-1
Cs-137	<5.6E-2	<1.1E-1	<4.1E-2	<3.1E-2
Tl-208	2.77E-1 ± 7.0E-2	3.21E-1 ± 9.4E-2	2.78E-1 ± 6.6E-2	<2.3E-2
Bi-212	8.24E-1 ± 5.9E-1	<1.2E0	<5.8E-1	<4.6E-1
Pb-212	8.48E-1 ± 9.1E-2	6.84E-1 ± 1.6E-1	6.86E-1 ± 8.3E-2	8.17E-2 ± 3.6E-2
Bi-214	7.88E-1 ± 1.4E-1	7.98E-1 ± 1.8E-1	8.02E-1 ± 1.3E-1	1.49E-1 ± 4.9E-2
Pb-214	8.61E-1 ± 1.4E-1	7.94E-1 ± 3.1E-1	8.49E-1 ± 1.2E-1	1.86E-1 ± 5.8E-2
Ra-226	8.00E-1 ± 1.5E-1	8.10E-1 ± 1.9E-1	8.14E-1 ± 1.4E-1	1.51E-1 ± 5.0E-2
Ac-228	1.10E0 ± 3.4E-1	4.85E-1 ± 3.9E-1	1.20E0 ± 3.2E-1	<1.5E-1
Ra-228	1.10E0 ± 3.4E-1	<5.1E-1	1.20E0 ± 3.2E-1	<1.5E-1
Th-228	8.24E-1 ± 5.9E-1	8.83E-1 ± 9.8E-1	5.70E-1 ± 5.6E-1	8.17E-2 ± 3.6E-2
Th-232	7.88E-1 ± 2.0E-1	9.13E-1 ± 2.7E-1	7.89E-1 ± 1.9E-1	<6.4E-2
Th-234	2.01E-1 ± 6.3E-2	4.20E-1 ± 1.8E-1	9.37E-2 ± 4.0E-2	2.48E-1 ± 9.3E-2
U-235	5.62E-1 ± 3.1E-1	3.58E0 ± 8.8E-1	8.24E-1 ± 2.5E-1	7.13E0 ± 1.2E0
U-238	7.95E0 ± 4.8E0	<1.2E1	<4.0E0	5.89E0 ± 3.5E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0147W BV-SS-404 (7/16/98)	9807-0148W BV-SS-405 (7/16/98)	9807-0149W BV-SS-406 (7/16/98)	9807-0150W BV-SS-407 (7/16/98)
K-40(1)	7.56E0 ± 1.1E0	9.08E0 ± 2.2E0	9.43E0 ± 1.2E0	9.79E0 ± 1.2E0
Cs-137	<4.7E-2	<1.2E-1	<4.6E-2	<5.3E-2
Tl-208	2.41E-1 ± 5.5E-2	1.75E-1 ± 8.0E-2	2.81E-1 ± 6.3E-2	3.03E-1 ± 6.4E-2
Bi-212	6.93E-1 ± 7.2E-1	<1.5E0	1.12E0 ± 6.3E-1	8.49E-1 ± 5.0E-1
Pb-212	7.53E-1 ± 8.7E-2	6.22E-1 ± 1.5E-1	8.98E-1 ± 9.8E-2	8.29E-1 ± 9.2E-2
Bi-214	7.72E-1 ± 1.3E-1	7.03E-1 ± 1.9E-1	9.86E-1 ± 1.6E-1	7.65E-1 ± 1.6E-1
Pb-214	8.55E-1 ± 1.3E-1	7.48E-1 ± 3.0E-1	9.45E-1 ± 1.5E-1	8.89E-1 ± 1.4E-1
Ra-226	7.83E-1 ± 1.4E-1	7.14E-1 ± 2.0E-1	1.00E0 ± 1.7E-1	7.77E-1 ± 1.7E-1
Ac-228	7.96E-1 ± 2.9E-1	4.93E-1 ± 4.4E-1	8.79E-1 ± 3.1E-1	1.01E0 ± 3.4E-1
Ra-228	7.96E-1 ± 2.9E-1	<5.2E-1	8.79E-1 ± 3.1E-1	1.01E0 ± 3.4E-1
Th-228	6.93E-1 ± 7.2E-1	6.22E-1 ± 1.5E-1	1.12E0 ± 6.3E-1	8.49E-1 ± 5.0E-1
Th-232	6.86E-1 ± 1.6E-1	4.98E-1 ± 2.3E-1	8.00E-1 ± 1.8E-1	8.61E-1 ± 1.8E-1
Th-234	2.04E-1 ± 9.9E-2	6.84E-1 ± 2.4E-1	2.49E-1 ± 8.1E-2	2.95E-1 ± 9.3E-2
U-235	1.96E0 ± 4.8E-1	4.68E0 ± 1.1E0	3.29E-1 ± 3.1E-1	8.09E-1 ± 3.3E-1
U-238	<4.8E0	<1.2E1	<4.1E0	<4.1E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0151W BV-SS-408 (7/16/98)	9807-0152W BV-SS-409 (7/16/98)	9807-0153W BV-SS-410 (7/16/98)	9807-0154W BV-SS-411 (7/16/98)
K-40(1)	1.01E1 ± 1.2E0	7.50E0 ± 1.1E0	7.36E0 ± 2.0E0	6.23E0 ± 1.0E0
Cs-137	<5.3E-2	<4.2E-2	<1.0E-1	<4.7E-2
Tl-208	2.38E-1 ± 7.2E-2	2.52E-1 ± 6.4E-2	3.02E-1 ± 8.2E-2	2.58E-1 ± 6.5E-2
Bi-212	8.47E-1 ± 7.6E-1	7.68E-1 ± 4.5E-1	<1.6E0	8.40E-1 ± 4.9E-1
Pb-212	8.21E-1 ± 9.2E-2	6.15E-1 ± 8.0E-2	4.31E-1 ± 1.4E-1	6.56E-1 ± 8.3E-2
Bi-214	7.56E-1 ± 1.5E-1	8.79E-1 ± 1.4E-1	5.38E-1 ± 2.3E-1	7.05E-1 ± 1.4E-1
Pb-214	9.46E-1 ± 1.4E-1	8.43E-1 ± 1.2E-1	5.46E-1 ± 2.2E-1	4.15E-1 ± 1.1E-1
Ra-226	7.68E-1 ± 1.5E-1	8.92E-1 ± 1.5E-1	5.46E-1 ± 2.4E-1	7.16E-1 ± 1.4E-1
Ac-228	1.32E0 ± 3.5E-1	9.46E-1 ± 3.3E-1	6.97E-1 ± 5.2E-1	6.12E-1 ± 2.7E-1
Ra-228	1.32E0 ± 3.5E-1	9.46E-1 ± 3.3E-1	6.97E-1 ± 5.2E-1	6.12E-1 ± 2.7E-1
Th-228	8.47E-1 ± 7.6E-1	7.68E-1 ± 4.5E-1	4.31E-1 ± 1.4E-1	8.40E-1 ± 4.9E-1
Th-232	6.76E-1 ± 2.1E-1	7.16E-1 ± 1.8E-1	8.58E-1 ± 2.3E-1	7.34E-1 ± 1.8E-1
Th-234	3.08E-1 ± 9.6E-2	2.89E-1 ± 1.0E-1	5.65E0 ± 6.3E0	3.93E0 ± 2.6E0
U-235	7.91E-1 ± 2.6E-1	1.63E0 ± 4.1E-1	4.56E0 ± 1.1E0	6.76E0 ± 1.2E0
U-238	6.46E0 ± 4.7E0	<4.2E0	2.25E1 ± 9.8E0	1.07E1 ± 6.6E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0155W BV-SS-412 (7/16/98)	9807-0156W BV-SS-413 (7/16/98)	9807-0157W BV-SS-414 (7/16/98)	9807-0158W BV-SS-415 (7/16/98)
K-40(1)	4.94E0 ± 1.6E0	5.01E0 ± 1.0E0	6.29E0 ± 1.0E0	6.33E0 ± 1.0E0
Cs-137	<1.1E-1	<4.2E-2	<5.0E-2	<5.7E-2
Tl-208	2.32E-1 ± 8.6E-2	2.35E-1 ± 6.7E-2	1.80E-1 ± 5.5E-2	2.24E-1 ± 6.7E-2
Bi-212	<1.5E0	1.11E0 ± 4.6E-1	8.65E-1 ± 4.6E-1	9.18E-1 ± 4.7E-1
Pb-212	4.85E-1 ± 1.2E-1	5.75E-1 ± 8.5E-2	4.59E-1 ± 8.4E-2	6.42E-1 ± 8.4E-2
Bi-214	6.08E-1 ± 1.7E-1	5.47E-1 ± 1.4E-1	6.68E-1 ± 1.4E-1	6.43E-1 ± 1.4E-1
Pb-214	4.98E-1 ± 2.2E-1	6.05E-1 ± 1.4E-1	7.41E-1 ± 1.2E-1	6.57E-1 ± 1.1E-1
Ra-226	6.17E-1 ± 1.7E-1	5.56E-1 ± 1.4E-1	6.78E-1 ± 1.4E-1	6.53E-1 ± 1.5E-1
Ac-228	6.54E-1 ± 4.4E-1	7.29E-1 ± 3.4E-1	7.15E-1 ± 2.9E-1	7.40E-1 ± 3.3E-1
Ra-228	6.54E-1 ± 4.4E-1	7.29E-1 ± 3.4E-1	7.15E-1 ± 2.9E-1	7.40E-1 ± 3.3E-1
Th-228	4.85E-1 ± 1.2E-1	1.11E0 ± 4.6E-1	8.65E-1 ± 4.6E-1	9.18E-1 ± 4.7E-1
Th-232	6.59E-1 ± 2.4E-1	6.68E-1 ± 1.9E-1	5.13E-1 ± 1.6E-1	6.37E-1 ± 1.9E-1
Th-234	<2.2E0	5.76E0 ± 2.5E0	2.78E0 ± 2.4E0	9.13E0 ± 3.5E0
U-235	2.39E0 ± 6.5E-1	2.05E0 ± 5.0E-1	8.16E0 ± 1.4E0	6.45E0 ± 1.2E0
U-238	<1.1E1	1.26E1 ± 4.7E0	<7.0E0	1.80E1 ± 7.8E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0159W BV-SS-416 (7/16/98)	9807-0160W BV-SS-417 (7/16/98)	9807-0161W BV-SS-418 (7/16/98)	9807-0162W BV-SS-419 (7/16/98)
K-40[1]	7.00E0 ± 1.1E0	5.68E0 ± 1.0E0	6.70E0 ± 1.8E0	6.39E0 ± 9.7E-1
Cs-137	<4.2E-2	<5.3E-2	<1.0E-1	<5.7E-2
Tl-208	1.88E-1 ± 7.2E-2	2.14E-1 ± 6.2E-2	2.82E-1 ± 8.0E-2	2.16E-1 ± 5.9E-2
Bi-212	1.29E0 ± 5.3E-1	8.37E-1 ± 4.8E-1	9.29E-1 ± 8.6E-1	1.20E0 ± 5.9E-1
Pb-212	5.99E-1 ± 8.8E-2	5.50E-1 ± 9.0E-2	5.12E-1 ± 1.4E-1	6.36E-1 ± 8.3E-2
Bi-214	6.59E-1 ± 1.5E-1	5.82E-1 ± 1.3E-1	5.66E-1 ± 2.1E-1	6.22E-1 ± 1.4E-1
Pb-214	6.73E-1 ± 1.3E-1	5.53E-1 ± 1.2E-1	4.93E-1 ± 2.2E-1	7.05E-1 ± 1.3E-1
Ra-226	6.69E-1 ± 1.5E-1	5.91E-1 ± 1.4E-1	5.75E-1 ± 2.2E-1	6.32E-1 ± 1.4E-1
Ac-228	1.01E0 ± 3.6E-1	9.25E-1 ± 2.8E-1	5.39E-1 ± 3.8E-1	4.91E-1 ± 2.1E-1
Ra-228	1.01E0 ± 3.6E-1	9.25E-1 ± 2.8E-1	5.39E-1 ± 3.8E-1	4.91E-1 ± 2.1E-1
Th-228	1.29E0 ± 5.3E-1	8.37E-1 ± 4.8E-1	9.29E-1 ± 8.6E-1	1.20E0 ± 5.9E-1
Th-232	5.34E-1 ± 2.1E-1	6.09E-1 ± 1.8E-1	8.00E-1 ± 2.3E-1	6.14E-1 ± 1.7E-1
Th-234	9.76E0 ± 3.4E0	2.08E0 ± 1.6E0	9.58E0 ± 1.1E1	1.25E1 ± 4.1E0
U-235	7.17E0 ± 1.3E0	1.56E0 ± 4.8E-1	3.57E1 ± 7.3E0	1.88E1 ± 3.0E0
U-238	2.12E1 ± 1.1E1	<4.9E0	3.97E1 ± 2.2E1	3.05E1 ± 7.2E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0163W BV-SS-420 (7/16/98)	9807-0164W BV-SS-421 (7/16/98)	9807-0165W BV-SS-422 (7/16/98)	9807-0166W BV-SS-423 (7/16/98)
K-40(1)	5.95E0 ± 9.9E-1	8.19E0 ± 2.0E0	7.68E0 ± 2.0E0	5.43E0 ± 1.5E0
Cs-137	<6.7E-2	<9.9E-2	<1.1E-1	<1.1E-1
Tl-208	2.19E-1 ± 5.4E-2	2.84E-1 ± 1.0E-1	2.38E-1 ± 9.8E-2	2.02E-1 ± 8.3E-2
Bi-212	9.82E-1 ± 4.2E-1	<9.5E-1	1.11E0 ± 8.3E-1	<1.5E0
Pb-212	6.76E-1 ± 7.8E-2	5.82E-1 ± 1.4E-1	3.67E-1 ± 1.3E-1	3.74E-1 ± 1.0E-1
Bi-214	6.32E-1 ± 1.2E-1	5.36E-1 ± 1.8E-1	6.57E-1 ± 1.6E-1	4.78E-1 ± 1.4E-1
Pb-214	6.10E-1 ± 1.1E-1	4.97E-1 ± 2.1E-1	4.43E-1 ± 1.9E-1	3.41E-1 ± 1.7E-1
Ra-226	6.42E-1 ± 1.3E-1	5.44E-1 ± 1.8E-1	6.67E-1 ± 1.6E-1	4.86E-1 ± 1.4E-1
Ac-228	7.34E-1 ± 2.2E-1	7.11E-1 ± 4.8E-1	<3.7E-1	5.25E-1 ± 3.5E-1
Ra-228	7.34E-1 ± 2.2E-1	7.11E-1 ± 4.8E-1	<5.5E-1	5.25E-1 ± 3.5E-1
Th-228	9.82E-1 ± 4.2E-1	7.97E-1 ± 7.2E-1	1.11E0 ± 8.3E-1	3.74E-1 ± 1.0E-1
Th-232	6.22E-1 ± 1.5E-1	8.06E-1 ± 2.8E-1	6.77E-1 ± 2.8E-1	5.75E-1 ± 2.4E-1
Th-234	1.77E0 ± 1.8E0	<1.6E0	<2.3E0	<2.0E0
U-235	2.15E0 ± 4.5E-1	7.14E-1 ± 5.1E-1	3.31E0 ± 8.8E-1	3.22E0 ± 8.1E-1
U-238	<4.4E0	<8.7E0	<1.2E1	<1.1E1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0167W BV-SS-424 (7/16/98)	9807-0168W BV-SS-425 (7/16/98)	9807-0169W BV-SS-426 (7/16/98)	9807-0170W BV-SS-427 (7/16/98)
K-40(1)	5.92E0 ± 9.8E-1	7.77E0 ± 1.1E0	4.47E0 ± 1.6E0	7.41E0 ± 1.1E0
Cs-137	<5.2E-2	6.21E-2 ± 3.7E-2	<1.1E-1	9.09E-2 ± 3.7E-2
Tl-208	2.59E-1 ± 6.3E-2	2.92E-1 ± 6.1E-2	2.20E-1 ± 9.3E-2	2.55E-1 ± 6.5E-2
Bi-212	6.52E-1 ± 5.0E-1	1.28E0 ± 6.1E-1	<1.0E0	8.21E-1 ± 7.2E-1
Pb-212	5.73E-1 ± 8.0E-2	6.24E-1 ± 8.2E-2	4.36E-1 ± 1.2E-1	7.27E-1 ± 8.8E-2
Bi-214	5.17E-1 ± 1.4E-1	6.23E-1 ± 1.2E-1	4.18E-1 ± 1.7E-1	6.33E-1 ± 1.5E-1
Pb-214	5.27E-1 ± 1.0E-1	7.81E-1 ± 1.1E-1	4.62E-1 ± 2.1E-1	8.78E-1 ± 1.4E-1
Ra-226	5.25E-1 ± 1.5E-1	6.32E-1 ± 1.3E-1	4.25E-1 ± 1.7E-1	6.42E-1 ± 1.6E-1
Ac-228	8.24E-1 ± 2.9E-1	9.19E-1 ± 2.5E-1	<5.6E-1	5.72E-1 ± 3.4E-1
Ra-228	8.24E-1 ± 2.9E-1	9.19E-1 ± 2.5E-1	<5.6E-1	5.72E-1 ± 3.4E-1
Th-228	6.52E-1 ± 5.0E-1	1.28E0 ± 6.1E-1	7.29E-1 ± 7.0E-1	8.21E-1 ± 7.2E-1
Th-232	7.37E-1 ± 1.8E-1	8.31E-1 ± 1.7E-1	6.25E-1 ± 2.7E-1	7.25E-1 ± 1.8E-1
Th-234	1.81E0 ± 1.6E0	1.79E0 ± 1.8E0	<1.8E0	<1.2E0
U-235	5.11E0 ± 9.8E-1	3.57E0 ± 7.3E-1	1.51E0 ± 5.4E-1	1.37E0 ± 4.8E-1
U-238	<5.8E0	5.01E0 ± 3.6E0	<9.5E0	<4.5E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0171W BV-SS-428 (7/16/98)	9807-0172W BV-SS-429 (7/16/98)	9807-0173W BV-SS-430 (7/16/98)	9807-0174W BV-SS-431 (7/16/98)
K-40(1)	7.52E0 ± 1.1E0	5.26E0 ± 1.6E0	6.51E0 ± 1.1E0	8.18E0 ± 1.2E0
Cs-137	7.28E-2 ± 3.9E-2	<1.2E-1	<5.7E-2	<6.0E-2
Tl-208	2.26E-1 ± 6.4E-2	2.02E-1 ± 8.6E-2	2.93E-1 ± 6.2E-2	2.89E-1 ± 6.3E-2
Bi-212	5.94E-1 ± 5.4E-1	1.17E0 ± 9.7E-1	1.24E0 ± 5.5E-1	1.23E0 ± 6.1E-1
Pb-212	5.71E-1 ± 7.8E-2	4.44E-1 ± 1.2E-1	6.68E-1 ± 8.3E-2	8.12E-1 ± 9.4E-2
Bi-214	4.84E-1 ± 1.2E-1	5.25E-1 ± 1.6E-1	5.46E-1 ± 1.3E-1	6.39E-1 ± 1.4E-1
Pb-214	6.28E-1 ± 1.2E-1	5.01E-1 ± 2.0E-1	6.86E-1 ± 1.2E-1	7.62E-1 ± 1.4E-1
Ra-226	4.91E-1 ± 1.3E-1	5.33E-1 ± 1.7E-1	5.54E-1 ± 1.3E-1	6.48E-1 ± 1.4E-1
Ac-228	5.60E-1 ± 2.8E-1	7.35E-1 ± 4.4E-1	9.44E-1 ± 2.9E-1	8.16E-1 ± 2.6E-1
Ra-228	5.60E-1 ± 2.8E-1	7.35E-1 ± 4.4E-1	9.44E-1 ± 2.9E-1	8.16E-1 ± 2.6E-1
Th-228	5.94E-1 ± 5.4E-1	1.17E0 ± 9.7E-1	1.24E0 ± 5.5E-1	1.23E0 ± 6.1E-1
Th-232	6.43E-1 ± 1.8E-1	5.73E-1 ± 2.4E-1	8.34E-1 ± 1.8E-1	8.22E-1 ± 1.8E-1
Th-234	2.30E0 ± 1.8E0	<2.0E0	<1.1E0	1.65E0 ± 1.2E0
U-235	4.05E0 ± 7.9E-1	1.96E0 ± 6.2E-1	5.03E-1 ± 2.8E-1	6.47E-1 ± 3.1E-1
U-238	<5.2E0	<1.0E1	5.65E0 ± 5.0E0	<4.6E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0175W BV-SS-432 (7/16/98)	9807-0176W BV-SS-433 (7/16/98)	9807-0177W BV-SS-434 (7/16/98)	9807-0178W BV-SS-435 (7/16/98)
K-40(1)	8.13E0 ± 1.1E0	1.05E1 ± 1.3E0	7.47E0 ± 1.0E0	8.23E0 ± 1.1E0
Cs-137	<5.5E-2	8.94E-2 ± 3.8E-2	<5.6E-2	7.53E-2 ± 3.9E-2
Tl-208	2.69E-1 ± 5.4E-2	3.63E-1 ± 7.2E-2	2.73E-1 ± 5.7E-2	2.80E-1 ± 5.2E-2
Bi-212	1.13E0 ± 4.8E-1	1.36E0 ± 6.2E-1	7.84E-1 ± 6.8E-1	1.58E0 ± 5.9E-1
Pb-212	7.17E-1 ± 8.9E-2	8.67E-1 ± 9.8E-2	7.61E-1 ± 8.4E-2	7.88E-1 ± 8.6E-2
Bi-214	5.66E-1 ± 1.1E-1	7.91E-1 ± 1.5E-1	5.21E-1 ± 1.2E-1	5.30E-1 ± 1.1E-1
Pb-214	5.91E-1 ± 1.2E-1	9.12E-1 ± 1.4E-1	5.41E-1 ± 1.0E-1	6.16E-1 ± 1.1E-1
Ra-226	5.74E-1 ± 1.2E-1	8.03E-1 ± 1.6E-1	5.29E-1 ± 1.2E-1	5.38E-1 ± 1.1E-1
Ac-228	8.15E-1 ± 3.0E-1	7.55E-1 ± 3.1E-1	8.56E-1 ± 2.7E-1	1.01E0 ± 2.9E-1
Ra-228	8.15E-1 ± 3.0E-1	7.55E-1 ± 3.1E-1	8.56E-1 ± 2.7E-1	1.01E0 ± 2.9E-1
Th-228	1.13E0 ± 4.8E-1	1.36E0 ± 6.2E-1	7.84E-1 ± 6.8E-1	1.58E0 ± 5.9E-1
Th-232	7.64E-1 ± 1.5E-1	1.03E0 ± 2.0E-1	7.76E-1 ± 1.6E-1	7.96E-1 ± 1.5E-1
Th-234	2.41E0 ± 1.5E0	2.43E0 ± 1.5E0	1.51E0 ± 1.4E0	3.54E0 ± 1.5E0
U-235	9.86E-1 ± 3.5E-1	6.03E-1 ± 3.8E-1	1.39E0 ± 4.0E-1	1.28E0 ± 3.1E-1
U-238	<4.0E0	<4.8E0	6.34E0 ± 4.8E0	<4.6E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0179W BV-SS-436 (7/16/98)	9807-0180W BV-SS-437 (7/16/98)	9807-0181W BV-SS-438 (7/16/98)	9807-0182W BV-SS-439 (7/16/98)
K-40(1)	7.28E0 ± 9.9E-1	6.95E0 ± 8.9E-1	6.62E0 ± 1.0E0	7.44E0 ± 1.1E0
Cs-137	<4.3E-2	<4.2E-2	5.76E-2 ± 5.0E-2	<5.0E-2
Tl-208	2.99E-1 ± 5.2E-2	1.91E-1 ± 4.7E-2	2.99E-1 ± 6.0E-2	2.17E-1 ± 5.0E-2
Bi-212	1.21E0 ± 5.8E-1	5.76E-1 ± 6.6E-1	1.29E0 ± 4.5E-1	9.65E-1 ± 4.1E-1
Pb-212	7.28E-1 ± 8.1E-2	5.84E-1 ± 6.8E-2	7.35E-1 ± 8.3E-2	6.90E-1 ± 7.8E-2
Bi-214	5.71E-1 ± 1.1E-1	5.06E-1 ± 9.6E-2	4.74E-1 ± 9.8E-2	6.03E-1 ± 1.1E-1
Pb-214	5.65E-1 ± 1.2E-1	5.56E-1 ± 9.5E-2	5.81E-1 ± 1.2E-1	7.05E-1 ± 1.1E-1
Ra-226	5.80E-1 ± 1.2E-1	5.13E-1 ± 1.0E-1	4.81E-1 ± 1.0E-1	6.12E-1 ± 1.1E-1
Ac-228	8.62E-1 ± 2.4E-1	6.09E-1 ± 1.9E-1	1.13E0 ± 2.7E-1	5.78E-1 ± 2.4E-1
Ra-228	8.62E-1 ± 2.4E-1	6.09E-1 ± 1.9E-1	1.13E0 ± 2.7E-1	5.78E-1 ± 2.4E-1
Th-228	1.21E0 ± 5.8E-1	5.76E-1 ± 6.6E-1	1.29E0 ± 4.5E-1	9.65E-1 ± 4.1E-1
Th-232	8.49E-1 ± 1.5E-1	5.42E-1 ± 1.3E-1	8.50E-1 ± 1.7E-1	6.16E-1 ± 1.4E-1
Th-234	2.04E0 ± 1.7E0	1.80E0 ± 1.4E0	1.29E1 ± 3.8E0	1.90E0 ± 1.4E0
U-235	2.22E0 ± 4.9E-1	1.10E0 ± 3.4E-1	5.34E0 ± 9.8E-1	1.10E0 ± 3.3E-1
U-238	6.46E0 ± 5.4E0	<3.8E0	2.77E1 ± 7.5E0	7.62E0 ± 3.9E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0183W BV-SS-440 (7/16/98)	9807-0184W BV-SS-441 (7/16/98)	9807-0185W BV-SS-442 (7/16/98)	9807-0186W BV-SS-443 (7/16/98)
K-40[1]	7.66E0 ± 1.0E0	7.17E0 ± 1.0E0	6.38E0 ± 9.0E-1	6.18E0 ± 8.6E-1
Cs-137	<5.3E-2	7.06E-2 ± 3.3E-2	<5.0E-2	4.40E-2 ± 3.2E-2
Tl-208	2.94E-1 ± 5.2E-2	2.22E-1 ± 5.6E-2	2.57E-1 ± 5.1E-2	2.16E-1 ± 5.5E-2
Bi-212	8.73E-1 ± 5.3E-1	8.96E-1 ± 4.5E-1	<7.3E-1	7.61E-1 ± 3.5E-1
Pb-212	7.16E-1 ± 8.1E-2	6.28E-1 ± 7.9E-2	6.31E-1 ± 7.5E-2	5.62E-1 ± 7.0E-2
Bi-214	5.86E-1 ± 1.2E-1	4.60E-1 ± 9.8E-2	5.69E-1 ± 1.1E-1	5.51E-1 ± 1.0E-1
Pb-214	6.76E-1 ± 1.2E-1	5.47E-1 ± 1.0E-1	5.94E-1 ± 9.5E-2	5.26E-1 ± 9.0E-2
Ra-226	5.97E-1 ± 1.2E-1	4.67E-1 ± 1.0E-1	5.77E-1 ± 1.2E-1	5.59E-1 ± 1.1E-1
Ac-228	1.09E0 ± 3.3E-1	6.50E-1 ± 2.5E-1	8.19E-1 ± 2.1E-1	7.52E-1 ± 2.0E-1
Ra-228	1.09E0 ± 3.3E-1	6.50E-1 ± 2.5E-1	8.19E-1 ± 2.1E-1	7.52E-1 ± 2.0E-1
Th-228	8.73E-1 ± 5.3E-1	8.96E-1 ± 4.5E-1	6.31E-1 ± 7.5E-2	7.61E-1 ± 3.5E-1
Th-232	8.36E-1 ± 1.5E-1	6.30E-1 ± 1.6E-1	7.31E-1 ± 1.4E-1	6.14E-1 ± 1.6E-1
Th-234	<1.1E0	3.20E0 ± 1.6E0	1.52E0 ± 1.4E0	2.53E0 ± 1.4E0
U-235	7.25E-1 ± 2.8E-1	5.14E-1 ± 2.4E-1	9.46E-1 ± 3.1E-1	1.24E0 ± 3.6E-1
U-238	4.11E0 ± 4.6E0	7.50E0 ± 5.1E0	5.95E0 ± 5.7E0	1.08E1 ± 5.3E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0187W BV-SS-444 (7/16/98)	9807-0188W BV-SS-445 (7/16/98)	9807-0189W BV-SS-446 (7/16/98)	9807-0190W BV-SS-447 (7/16/98)
K-40(1)	3.91E0 ± 7.3E-1	5.74E0 ± 9.1E-1	NA	6.72E0 ± 9.7E-1
Cs-137	<3.9E-2	<4.3E-2	<5.7E-2	7.53E-2 ± 3.8E-2
Tl-208	1.65E-1 ± 4.6E-2	2.30E-1 ± 4.8E-2	2.33E-1 ± 5.0E-2	2.47E-1 ± 5.1E-2
Bi-212	<4.8E-1	1.00E0 ± 3.9E-1	8.86E-1 ± 3.8E-1	1.06E0 ± 5.8E-1
Pb-212	3.88E-1 ± 7.0E-2	6.07E-1 ± 7.5E-2	7.11E-1 ± 7.9E-2	5.70E-1 ± 7.3E-2
Bi-214	4.23E-1 ± 9.6E-2	5.79E-1 ± 1.2E-1	6.04E-1 ± 1.2E-1	4.54E-1 ± 1.2E-1
Pb-214	4.22E-1 ± 1.0E-1	5.80E-1 ± 9.9E-2	6.96E-1 ± 1.0E-1	5.57E-1 ± 9.5E-2
Ra-226	4.29E-1 ± 1.0E-1	5.88E-1 ± 1.2E-1	6.13E-1 ± 1.3E-1	4.60E-1 ± 1.2E-1
Ac-228	5.41E-1 ± 2.5E-1	5.82E-1 ± 2.1E-1	6.60E-1 ± 2.2E-1	8.51E-1 ± 3.2E-1
Ra-228	5.41E-1 ± 2.5E-1	5.82E-1 ± 2.1E-1	6.60E-1 ± 2.2E-1	8.51E-1 ± 3.2E-1
Th-228	4.74E-1 ± 3.0E-1	1.00E0 ± 3.9E-1	8.86E-1 ± 3.8E-1	1.06E0 ± 5.8E-1
Th-232	4.68E-1 ± 1.3E-1	6.54E-1 ± 1.4E-1	6.63E-1 ± 1.4E-1	7.01E-1 ± 1.5E-1
Th-234	2.12E0 ± 1.7E0	1.95E0 ± 1.6E0	2.78E0 ± 1.8E0	2.62E0 ± 1.6E0
U-235	2.70E0 ± 5.5E-1	2.35E0 ± 5.1E-1	1.11E0 ± 3.2E-1	1.61E0 ± 3.8E-1
U-238	5.90E0 ± 4.0E0	1.20E1 ± 4.7E0	<4.0E0	1.10E1 ± 5.1E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0191W BV-SS-448 (7/16/98)	9807-0192W BV-SS-449 (7/16/98)	9807-0193W BV-SS-450 (7/16/98)	9807-0194W BV-SS-451 (7/16/98)
K-40[1]	5.70E0 ± 8.5E-1	5.80E0 ± 8.8E-1	7.47E0 ± 1.0E0	6.06E0 ± 9.1E-1
Cs-137	<4.2E-2	<4.8E-2	<5.4E-2	<4.2E-2
Tl-208	2.12E-1 ± 4.7E-2	2.28E-1 ± 5.0E-2	2.37E-1 ± 5.7E-2	2.23E-1 ± 5.1E-2
Bi-212	<6.6E-1	8.42E-1 ± 4.1E-1	<5.5E-1	<4.8E-1
Pb-212	5.86E-1 ± 7.3E-2	5.80E-1 ± 7.4E-2	6.17E-1 ± 9.4E-2	5.84E-1 ± 7.2E-2
Bi-214	5.59E-1 ± 1.1E-1	4.47E-1 ± 1.1E-1	5.34E-1 ± 1.1E-1	5.65E-1 ± 1.1E-1
Pb-214	6.39E-1 ± 1.0E-1	5.64E-1 ± 1.1E-1	6.34E-1 ± 1.1E-1	5.78E-1 ± 1.1E-1
Ra-226	5.67E-1 ± 1.1E-1	4.53E-1 ± 1.1E-1	5.42E-1 ± 1.1E-1	5.73E-1 ± 1.1E-1
Ac-228	6.78E-1 ± 2.6E-1	6.57E-1 ± 2.3E-1	6.43E-1 ± 2.8E-1	6.64E-1 ± 2.6E-1
Ra-228	6.78E-1 ± 2.6E-1	6.57E-1 ± 2.3E-1	6.43E-1 ± 2.8E-1	6.64E-1 ± 2.6E-1
Th-228	5.86E-1 ± 7.3E-2	8.42E-1 ± 4.1E-1	5.03E-1 ± 4.8E-1	3.93E-1 ± 5.1E-1
Th-232	6.02E-1 ± 1.3E-1	6.48E-1 ± 1.4E-1	6.75E-1 ± 1.6E-1	6.33E-1 ± 1.5E-1
Th-234	3.39E0 ± 1.7E0	2.22E0 ± 1.6E0	2.75E0 ± 2.0E0	1.03E0 ± 8.8E-1
U-235	2.43E0 ± 5.2E-1	1.47E0 ± 3.7E-1	3.65E0 ± 7.2E-1	<8.1E-2
U-238	7.62E0 ± 4.8E0	9.34E0 ± 3.8E0	1.18E1 ± 5.9E0	<3.4E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0195W BV-SS-452 (7/16/98)	9807-0196W BV-SS-453 (7/16/98)	9807-0197W BV-SS-454 (7/16/98)	9807-0198W BV-SS-455 (7/16/98)
K-40(1)	7.07E0 ± 9.8E-1	1.15E1 ± 1.8E0	7.97E0 ± 1.1E0	8.78E0 ± 1.2E0
Cs-137	<4.6E-2	<9.0E-2	<5.6E-2	6.07E-2 ± 3.4E-2
Tl-208	1.66E-1 ± 5.1E-2	4.48E-1 ± 9.3E-2	3.29E-1 ± 6.2E-2	3.00E-1 ± 6.5E-2
Bi-212	<7.6E-1	1.55E0 ± 8.2E-1	1.56E0 ± 5.4E-1	9.44E-1 ± 6.7E-1
Pb-212	5.79E-1 ± 7.5E-2	1.24E0 ± 1.4E-1	8.29E-1 ± 8.7E-2	7.78E-1 ± 1.2E-1
Bi-214	4.67E-1 ± 1.2E-1	1.02E0 ± 2.0E-1	6.49E-1 ± 1.2E-1	6.28E-1 ± 1.5E-1
Pb-214	6.27E-1 ± 1.0E-1	9.50E-1 ± 1.8E-1	7.32E-1 ± 1.1E-1	7.32E-1 ± 1.4E-1
Ra-226	4.74E-1 ± 1.2E-1	7.04E0 ± 2.1E-1	6.99E-1 ± 1.3E-1	6.38E-1 ± 1.6E-1
Ac-228	8.06E-1 ± 3.1E-1	9.98E-1 ± 4.1E-1	8.12E-1 ± 3.2E-1	7.90E-1 ± 3.4E-1
Ra-228	8.06E-1 ± 3.1E-1	9.98E-1 ± 4.1E-1	8.12E-1 ± 3.2E-1	7.90E-1 ± 3.4E-1
Th-228	5.79E-1 ± 7.5E-2	1.55E0 ± 8.2E-1	1.56E0 ± 5.4E-1	9.44E-1 ± 6.7E-1
Th-232	4.72E-1 ± 1.5E-1	1.27E0 ± 2.7E-1	9.34E-1 ± 1.8E-1	8.52E-1 ± 1.9E-1
Th-234	2.75E0 ± 1.9E0	<1.9E0	2.43E0 ± 2.0E0	1.67E0 ± 1.8E0
U-235	7.24E-1 ± 3.1E-1	1.47E0 ± 5.0E-1	1.09E0 ± 3.4E-1	1.41E0 ± 4.1E-1
U-238	<4.1E0	1.42E1 ± 7.3E0	5.26E0 ± 6.3E0	9.33E0 ± 8.7E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0199W BV-SS-456 (7/16/98)	9807-0200W BV-SS-457 (7/16/98)	9807-0201W BV-SS-458 (7/16/98)	9807-0202W BV-SS-459 (7/16/98)
K-40(1)	7.75E0 ± 1.1E0	8.43E0 ± 1.1E0	7.33E0 ± 9.8E-1	7.13E0 ± 1.0E0
Cs-137	<6.5E-2	<5.4E-2	<5.0E-2	<5.7E-2
Tl-208	3.37E-1 ± 6.0E-2	2.62E-1 ± 5.9E-2	1.92E-1 ± 5.1E-2	2.75E-1 ± 6.1E-2
Bi-212	9.72E-1 ± 4.8E-1	7.12E-1 ± 5.4E-1	1.01E0 ± 5.2E-1	1.72E0 ± 6.2E-1
Pb-212	7.16E-1 ± 8.7E-2	7.79E-1 ± 8.7E-2	7.28E-1 ± 8.1E-2	7.12E-1 ± 8.6E-2
Bi-214	5.47E-1 ± 1.2E-1	6.12E-1 ± 1.3E-1	6.81E-1 ± 1.2E-1	5.15E-1 ± 1.1E-1
Pb-214	6.39E-1 ± 1.2E-1	7.89E-1 ± 1.2E-1	5.80E-1 ± 1.0E-1	6.13E-1 ± 1.0E-1
Ra-226	5.55E-1 ± 1.3E-1	6.21E-1 ± 1.4E-1	6.91E-1 ± 1.3E-1	5.23E-1 ± 1.2E-1
Ac-228	9.96E-1 ± 3.1E-1	9.00E-1 ± 2.6E-1	8.05E-1 ± 2.6E-1	8.87E-1 ± 2.7E-1
Ra-228	9.96E-1 ± 3.1E-1	9.06E-1 ± 2.6E-1	8.05E-1 ± 2.6E-1	8.87E-1 ± 2.7E-1
Th-228	9.72E-1 ± 4.8E-1	7.12E-1 ± 5.4E-1	1.01E0 ± 5.2E-1	1.72E0 ± 6.2E-1
Th-232	9.57E-1 ± 1.7E-1	7.46E-1 ± 1.7E-1	5.46E-1 ± 1.4E-1	7.80E-1 ± 1.7E-1
Th-234	1.69E0 ± 1.8E0	2.81E0 ± 2.0E0	1.65E0 ± 1.2E0	2.88E0 ± 1.7E0
U-235	1.41E0 ± 4.0E-1	1.81E0 ± 3.9E-1	1.81E0 ± 4.2E-1	2.29E0 ± 5.4E-1
U-238	<4.5E0	6.61E0 ± 4.8E0	4.95E0 ± 4.0E0	9.30E0 ± 5.3E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0203W BV-SS-460 (7/16/98)	9807-0204W BV-SS-461 (7/16/98)	9807-0205W BV-SS-462 (7/16/98)	9807-0206W BV-SS-463 (7/16/98)
K-40[1]	7.85E0 ± 1.0E0	7.74E0 ± 1.0E0	8.73E0 ± 1.2E0	7.32E0 ± 1.0E0
Cs-137	<4.5E-2	<5.4E-2	<5.7E-2	<4.5E-2
Tl-208	2.71E-1 ± 5.2E-2	2.01E-1 ± 4.8E-2	2.64E-1 ± 6.3E-2	2.33E-1 ± 6.0E-2
Bi-212	9.69E-1 ± 6.4E-1	7.23E-1 ± 4.6E-1	1.17E0 ± 4.4E-1	6.02E-1 ± 4.7E-1
Pb-212	6.90E-1 ± 7.9E-2	5.70E-1 ± 7.6E-2	7.34E-1 ± 8.5E-2	6.30E-1 ± 7.8E-2
Bi-214	5.27E-1 ± 1.2E-1	5.25E-1 ± 1.2E-1	6.75E-1 ± 1.3E-1	5.66E-1 ± 1.2E-1
Pb-214	5.64E-1 ± 1.1E-1	5.68E-1 ± 1.2E-1	6.20E-1 ± 1.1E-1	6.20E-1 ± 1.0E-1
Ra-226	5.35E-1 ± 1.2E-1	5.33E-1 ± 1.2E-1	6.85E-1 ± 1.4E-1	5.75E-1 ± 1.3E-1
Ac-228	8.27E-1 ± 2.7E-1	7.34E-1 ± 3.0E-1	7.58E-1 ± 3.2E-1	8.29E-1 ± 2.7E-1
Ra-228	8.27E-1 ± 2.7E-1	7.34E-1 ± 3.0E-1	7.58E-1 ± 3.2E-1	8.29E-1 ± 2.7E-1
Th-228	9.69E-1 ± 6.4E-1	7.23E-1 ± 4.6E-1	1.17E0 ± 4.4E-1	6.02E-1 ± 4.7E-1
Th-232	7.71E-1 ± 1.5E-1	5.70E-1 ± 1.4E-1	7.51E-1 ± 1.8E-1	6.62E-1 ± 1.7E-1
Th-234	1.03E1 ± 4.1E0	5.42E0 ± 2.7E0	6.05E0 ± 2.6E0	1.15E1 ± 3.8E0
U-235	9.27E0 ± 1.5E0	7.42E0 ± 1.3E0	2.95E0 ± 6.1E-1	8.24E0 ± 1.4E0
U-238	3.43E1 ± 9.6E0	1.41E1 ± 5.8E0	9.63E0 ± 5.7E0	2.35E1 ± 7.7E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0207W BV-SS-464 (7/16/98)	9807-0208W BV-SS-465 (7/16/98)	9807-0209W BV-SS-466 (7/16/98)	9807-0210W BV-SS-467 (7/16/98)
K-40[1]	6.28E0 ± 9.1E-1	7.99E0 ± 1.1E0	6.83E0 ± 9.3E-1	6.79E0 ± 9.4E-1
Cs-137	4.59E-2 ± 2.9E-2	<7.2E-2	<4.6E-2	<3.8E-2
Tl-208	2.09E-1 ± 4.9E-2	1.73E-1 ± 5.7E-2	2.22E-1 ± 4.7E-2	2.12E-1 ± 4.6E-2
Bi-212	5.08E-1 ± 4.3E-1	5.92E-1 ± 6.6E-1	6.63E-1 ± 3.4E-1	6.30E-1 ± 3.4E-1
Pb-212	5.92E-1 ± 7.6E-2	5.83E-1 ± 8.0E-2	4.57E-1 ± 6.2E-2	5.67E-1 ± 6.9E-2
Bi-214	4.58E-1 ± 1.1E-1	5.97E-1 ± 1.3E-1	4.90E-1 ± 9.8E-2	5.79E-1 ± 1.1E-1
Pb-214	5.61E-1 ± 1.1E-1	6.66E-1 ± 1.1E-1	5.25E-1 ± 9.5E-2	5.85E-1 ± 1.0E-1
Ra-226	4.65E-1 ± 1.1E-1	6.06E-1 ± 1.3E-1	4.97E-1 ± 1.0E-1	5.68E-1 ± 1.1E-1
Ac-228	4.45E-1 ± 2.9E-1	5.44E-1 ± 2.3E-1	5.74E-1 ± 1.8E-1	7.06E-1 ± 2.8E-1
Ra-228	4.45E-1 ± 2.9E-1	5.44E-1 ± 2.3E-1	5.74E-1 ± 1.8E-1	7.06E-1 ± 2.8E-1
Th-228	5.08E-1 ± 4.3E-1	5.92E-1 ± 6.6E-1	6.63E-1 ± 3.4E-1	6.30E-1 ± 3.4E-1
Th-232	5.94E-1 ± 1.4E-1	4.93E-1 ± 1.6E-1	6.32E-1 ± 1.3E-1	6.02E-1 ± 1.3E-1
Th-234	4.49E0 ± 2.1E0	<1.3E0	3.23E0 ± 1.7E0	5.06E0 ± 2.4E0
U-235	2.38E0 ± 5.2E-1	1.02E0 ± 3.9E-1	1.14E0 ± 3.1E-1	3.43E0 ± 6.5E-1
U-238	1.38E1 ± 6.4E0	<4.4E0	7.02E0 ± 5.1E0	<5.7E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0211W BV-SS-468 (7/16/98)	9807-0212W BV-SS-469 (7/16/98)	9807-0213W BV-SS-470 (7/16/98)	9807-0214W BV-SS-471 (7/16/98)
K-40[1]	4.99E0 ± 8.8E-1	4.51E0 ± 7.9E-1	6.78E0 ± 9.6E-1	6.93E0 ± 1.0E0
Cs-137	<4.8E-2	<3.4E-2	<4.5E-2	<5.4E-2
Tl-208	1.96E-1 ± 6.1E-2	1.60E-1 ± 4.8E-2	1.73E-1 ± 5.9E-2	1.91E-1 ± 5.3E-2
Bi-212	1.11E0 ± 4.9E-1	<6.8E-1	5.96E-1 ± 4.4E-1	1.14E0 ± 4.9E-1
Pb-212	6.45E-1 ± 7.9E-2	4.97E-1 ± 7.1E-2	5.81E-1 ± 7.6E-2	5.74E-1 ± 7.1E-2
Bi-214	5.11E-1 ± 1.1E-1	3.50E-1 ± 1.1E-1	5.94E-1 ± 1.1E-1	5.44E-1 ± 1.1E-1
Pb-214	5.76E-1 ± 1.2E-1	5.07E-1 ± 1.0E-1	6.32E-1 ± 1.0E-1	5.49E-1 ± 1.1E-1
Ra-226	5.19E-1 ± 1.2E-1	3.56E-1 ± 1.1E-1	6.03E-1 ± 1.1E-1	5.52E-1 ± 1.2E-1
Ac-228	5.84E-1 ± 2.9E-1	5.89E-1 ± 2.4E-1	6.63E-1 ± 2.4E-1	8.14E-1 ± 3.2E-1
Ra-228	5.84E-1 ± 2.9E-1	5.89E-1 ± 2.4E-1	6.63E-1 ± 2.4E-1	8.14E-1 ± 3.2E-1
Th-228	1.11E0 ± 4.9E-1	4.97E-1 ± 7.1E-2	5.96E-1 ± 4.4E-1	1.14E0 ± 4.9E-1
Th-232	5.58E-1 ± 1.7E-1	4.56E-1 ± 1.4E-1	4.91E-1 ± 1.7E-1	5.43E-1 ± 1.5E-1
Th-234	2.61E1 ± 6.6E0	6.23E0 ± 2.3E0	<1.1E0	1.28E0 ± 1.1E0
U-235	8.27E0 ± 1.4E0	2.40E0 ± 4.8E-1	7.53E-1 ± 2.9E-1	9.69E-1 ± 3.0E-1
U-238	4.69E1 ± 8.9E0	1.37E1 ± 5.2E0	<3.9E0	7.82E0 ± 3.5E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0215W BV-SS-472 (7/16/98)	9807-0216W BV-SS-473 (7/16/98)	9807-0217W BV-SS-474 (7/16/98)	9807-0218W BV-SS-475 (7/16/98)
K-40[1]	5.80E0 ± 9.0E-1	6.01E0 ± 8.6E-1	5.09E0 ± 7.9E-1	6.94E0 ± 9.8E-1
Cs-137	<4.5E-2	<3.9E-2	<4.3E-2	<5.2E-2
Tl-208	2.29E-1 ± 5.1E-2	2.09E-1 ± 5.4E-2	2.19E-1 ± 5.8E-2	1.93E-1 ± 5.8E-2
Bi-212	6.66E-1 ± 5.3E-1	1.13E0 ± 5.4E-1	7.37E-1 ± 4.7E-1	1.01E0 ± 5.2E-1
Pb-212	6.52E-1 ± 8.0E-2	5.69E-1 ± 7.2E-2	6.57E-1 ± 7.5E-2	6.04E-1 ± 7.8E-2
Bi-214	5.91E-1 ± 1.1E-1	4.53E-1 ± 1.1E-1	4.81E-1 ± 9.2E-2	5.59E-1 ± 1.1E-1
Pb-214	5.99E-1 ± 9.3E-2	6.37E-1 ± 1.1E-1	6.23E-1 ± 1.0E-1	5.21E-1 ± 1.1E-1
Ra-226	6.00E-1 ± 1.2E-1	4.60E-1 ± 1.1E-1	4.88E-1 ± 9.7E-2	5.67E-1 ± 1.2E-1
Ac-228	6.78E-1 ± 2.9E-1	6.47E-1 ± 1.5E-1	4.48E-1 ± 2.3E-1	7.22E-1 ± 2.5E-1
Ra-228	6.78E-1 ± 2.9E-1	6.47E-1 ± 1.5E-1	4.48E-1 ± 2.3E-1	7.22E-1 ± 2.5E-1
Th-228	6.66E-1 ± 5.3E-1	1.13E0 ± 5.4E-1	7.37E-1 ± 4.7E-1	1.01E0 ± 5.2E-1
Th-232	6.52E-1 ± 1.4E-1	5.93E-1 ± 1.5E-1	6.21E-1 ± 1.7E-1	5.50E-1 ± 1.7E-1
Th-234	1.01E1 ± 3.7E0	1.42E1 ± 4.0E0	8.06E0 ± 3.3E0	3.63E0 ± 2.0E0
U-235	8.30E0 ± 1.4E0	6.86E0 ± 1.2E0	8.11E0 ± 1.4E0	1.70E0 ± 4.7E-1
U-238	1.76E1 ± 7.2E0	3.31E1 ± 9.1E0	1.87E1 ± 6.4E0	<4.1E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0219W BV-SS-476 (7/16/98)	9807-0220W BV-SS-477 (7/16/98)	9807-0221W BV-SS-478 (7/16/98)	9807-0222W BV-SS-479 (7/16/98)
K-40(1)	7.85E0 ± 2.5E0	6.41E0 ± 1.1E0	6.48E0 ± 1.1E0	8.90E0 ± 1.2E0
Cs-137	<6.2E-1	4.82E-1 ± 1.2E-1	6.16E-1 ± 1.2E-1	8.41E-2 ± 4.3E-2
Tl-208	<6.3E-1	3.37E-1 ± 1.0E-1	2.99E-1 ± 8.0E-2	2.67E-1 ± 6.9E-2
Bi-212	<7.6E0	<1.4E0	1.34E0 ± 9.5E-1	1.50E0 ± 4.7E-1
Pb-212	<9.2E-1	8.25E-1 ± 1.3E-1	9.41E-1 ± 1.1E-1	7.81E-1 ± 9.4E-2
Bi-214	<1.1E0	7.29E-1 ± 1.8E-1	7.99E-1 ± 1.7E-1	7.33E-1 ± 1.3E-1
Pb-214	<1.4E0	1.02E0 ± 2.0E-1	8.80E-1 ± 1.6E-1	8.40E-1 ± 1.4E-1
Ra-226	<1.2E0	7.40E-1 ± 1.8E-1	8.11E-1 ± 1.8E-1	7.44E-1 ± 1.4E-1
Ac-228	<1.6E0	1.11E0 ± 5.3E-1	1.30E0 ± 4.3E-1	8.52E-1 ± 3.1E-1
Ra-228	<1.6E0	1.11E0 ± 5.3E-1	1.30E0 ± 4.3E-1	8.52E-1 ± 3.1E-1
Th-228	<9.3E-1	8.25E-1 ± 1.3E-1	1.34E0 ± 9.5E-1	1.50E0 ± 4.7E-1
Th-232	<9.8E-1	9.57E-1 ± 2.9E-1	8.51E-1 ± 2.3E-1	7.58E-1 ± 2.0E-1
Th-234	5.00E2 ± 1.1E2	8.25E1 ± 1.9E1	4.81E1 ± 1.1E1	1.40E0 ± 1.3E0
U-235	5.85E1 ± 9.8E0	3.08E1 ± 5.0E0	1.83E1 ± 3.1E0	5.01E-1 ± 2.4E-1
U-238	2.06E4 ± 8.1E2	2.49E2 ± 2.7E1	9.76E1 ± 1.6E1	<4.8E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0223W BV-SS-480 (7/16/98)	9807-0224W BV-SS-481 (7/16/98)	9807-0225W BV-SS-482 (7/16/98)	9807-0226W BV-SS-483 (7/16/98)
K-40(1)	8.49E0 ± 1.3E0	8.38E0 ± 1.2E0	7.05E0 ± 1.2E0	8.25E0 ± 1.2E0
Cs-137	2.10E-1 ± 7.3E-2	7.87E-2 ± 6.9E-2	<6.8E-2	2.18E-1 ± 6.1E-2
Tl-208	2.17E-1 ± 5.7E-2	3.12E-1 ± 6.5E-2	2.21E-1 ± 7.7E-2	2.66E-1 ± 7.1E-2
Bi-211	9.33E-1 ± 7.2E-1	9.63E-1 ± 4.8E-1	1.05E0 ± 8.1E-1	<8.8E-1
Pb-212	7.75E-1 ± 1.0E-1	7.70E-1 ± 9.4E-2	7.29E-1 ± 9.1E-2	6.23E-1 ± 8.8E-2
Bi-214	6.26E-1 ± 1.5E-1	7.76E-1 ± 1.5E-1	6.30E-1 ± 1.4E-1	8.40E-1 ± 1.6E-1
Pb-214	8.36E-1 ± 1.5E-1	9.05E-1 ± 1.5E-1	8.46E-1 ± 1.4E-1	7.32E-1 ± 1.5E-1
Ra-226	6.37E-1 ± 1.5E-1	7.88E-1 ± 1.6E-1	6.40E-1 ± 1.4E-1	8.52E-1 ± 1.7E-1
Ac-228	1.11E0 ± 3.9E-1	8.40E-1 ± 3.1E-1	7.57E-1 ± 3.4E-1	9.47E-1 ± 3.5E-1
Ra-228	1.11E0 ± 3.9E-1	8.40E-1 ± 3.1E-1	7.57E-1 ± 3.4E-1	9.47E-1 ± 3.5E-1
Th-228	9.33E-1 ± 7.2E-1	9.63E-1 ± 4.8E-1	1.05E0 ± 8.1E-1	5.34E-1 ± 5.5E-1
Th-232	6.15E-1 ± 1.6E-1	8.87E-1 ± 1.9E-1	6.27E-1 ± 2.2E-1	7.57E-1 ± 2.0E-1
Th-234	3.94E0 ± 2.3E0	1.38E0 ± 1.2E0	3.47E0 ± 2.1E0	2.32E1 ± 5.9E0
U-235	1.63E0 ± 4.5E-1	5.67E-1 ± 3.0E-1	1.75E0 ± 4.9E-1	1.91E0 ± 4.8E-1
U-238	8.59E0 ± 4.7E0	5.74E0 ± 4.6E0	1.13E1 ± 7.0E0	4.20E1 ± 9.4E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0227W BV-SS-484 (7/16/98)	9807-0228W BV-SS-485 (7/16/98)	9807-0229W BV-SS-486 (7/16/98)	9807-0230W BV-SS-487 (7/16/98)
K-40[1]	7.22E0 ± 2.0E0	7.22E0 ± 1.2E0	7.62E0 ± 1.1E0	8.51E0 ± 1.2E0
Cs-137	2.77E-1 ± 9.4E-2	5.58E-1 ± 1.2E-1	2.95E-1 ± 7.8E-2	3.63E-1 ± 7.8E-2
Tl-208	2.72E-1 ± 1.2E-1	2.49E-1 ± 7.1E-2	2.71E-1 ± 6.9E-2	3.09E-1 ± 6.2E-2
Bi-212	<1.8E0	8.96E-1 ± 6.8E-1	<1.1E0	1.53E0 ± 6.5E-1
Pb-212	7.43E-1 ± 1.8E-1	7.99E-1 ± 1.0E-1	7.23E-1 ± 9.4E-2	8.12E-1 ± 9.5E-2
Bi-214	7.55E-1 ± 2.6E-1	7.77E-1 ± 1.6E-1	7.63E-1 ± 1.6E-1	7.54E-1 ± 1.5E-1
Pb-214	8.61E-1 ± 3.5E-1	7.48E-1 ± 1.6E-1	8.30E-1 ± 1.3E-1	7.98E-1 ± 1.4E-1
Ra-226	7.67E-1 ± 2.7E-1	7.88E-1 ± 1.7E-1	7.95E-1 ± 1.6E-1	7.65E-1 ± 1.6E-1
Ac-228	4.83E-1 ± 5.1E-1	9.42E-1 ± 3.8E-1	8.04E-1 ± 3.4E-1	1.29E0 ± 3.5E-1
Ra-228	<6.1E-1	9.42E-1 ± 3.8E-1	8.04E-1 ± 3.4E-1	1.29E0 ± 3.5E-1
Th-228	7.43E-1 ± 1.8E-1	8.96E-1 ± 6.8E-1	7.23E-1 ± 9.4E-2	1.53E0 ± 6.5E-1
Th-232	7.72E-1 ± 3.3E-1	7.07E-1 ± 2.0E-1	7.69E-1 ± 2.0E-1	8.79E-1 ± 1.8E-1
Th-234	1.34E1 ± 1.1E1	2.35E1 ± 6.0E0	7.28E0 ± 2.2E0	5.61E0 ± 2.0E0
U-235	2.84E0 ± 8.1E-1	4.39E0 ± 8.9E-1	1.27E0 ± 4.1E-1	9.01E-1 ± 3.6E-1
U-238	4.44E1 ± 2.1E1	4.81E1 ± 1.5E1	1.86E1 ± 7.1E0	9.19E0 ± 7.9E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0231W BV-SS-488 (7/16/98)	9807-0232W BV-SS-489 (7/16/98)	9807-0233W BV-SS-490 (7/16/98)	9807-0234W BV-SS-491 (7/16/98)
K-40[1]	7.74E0 ± 1.3E0	7.18E0 ± 1.2E0	8.26E0 ± 2.2E0	8.54E0 ± 1.1E0
Cs-137	3.17E-1 ± 9.6E-2	2.63E-1 ± 8.1E-2	7.83E-2 ± 7.0E-2	<5.2E-2
Tl-208	2.15E-1 ± 8.0E-2	2.96E-1 ± 7.0E-2	1.91E-1 ± 1.0E-1	2.14E-1 ± 6.6E-2
Bi-212	<1.1E0	<7.2E-1	8.80E-1 ± 9.3E-1	1.06E0 ± 8.6E-1
Pb-212	7.63E-1 ± 9.8E-2	7.31E-1 ± 9.6E-2	5.91E-1 ± 1.4E-1	6.06E-1 ± 9.0E-2
Bi-214	7.92E-1 ± 1.5E-1	8.70E-1 ± 1.5E-1	7.18E-1 ± 2.3E-1	7.53E-1 ± 1.5E-1
Pb-214	8.62E-1 ± 1.5E-1	8.67E-1 ± 1.4E-1	5.79E-1 ± 2.6E-1	7.78E-1 ± 1.3E-1
Ra-226	8.04E-1 ± 1.6E-1	8.[illegible]E-1 ± 1.6E-1	7.38E-1 ± 2.3E-1	7.65E-1 ± 1.6E-1
Ac-228	8.87E-1 ± 3.6E-1	1.13E0 ± 3.4E-1	3.45E-1 ± 3.9E-1	7.95E-1 ± 2.4E-1
Ra-228	8.87E-1 ± 3.6E-1	1.13E0 ± 3.4E-1	3.45E-1 ± 3.9E-1	7.95E-1 ± 2.4E-1
Th-228	7.63E-1 ± 9.8E-2	6.77E-1 ± 6.3E-1	8.80E-1 ± 9.3E-1	1.06E0 ± 8.6E-1
Th-232	6.12E-1 ± 2.3E-1	8.42E-1 ± 2.0E-1	5.44E-1 ± 2.9E-1	6.08E-1 ± 1.9E-1
Th-234	3.98E0 ± 2.2E0	4.95E0 ± 2.5E0	<2.2E0	2.41E0 ± 1.7E0
U-235	1.32E0 ± 4.3E-1	3.47E0 ± 7.6E-1	1.49E0 ± 5.5E-1	8.28E-1 ± 3.1E-1
U-238	<5.7E0	1.07E1 ± 6.9E0	1.14E1 ± 9.8E0	<4.7E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0235W BV-SS-492 (7/16/98)	9807-0236W BV-SS-493 (7/16/98)	9807-0237W BV-SS-494 (7/16/98)	9807-0238W BV-SS-495 (7/16/98)
K-40(1)	6.53E0 ± 1.1E0	7.87E0 ± 1.1E0	6.29E0 ± 1.1E0	7.25E0 ± 1.0E0
Cs-137	3.05E-1 ± 7.1E-2	2.14E-1 ± 6.6E-2	2.85E-1 ± 7.7E-2	2.31E-1 ± 6.8E-2
Tl-208	2.94E-1 ± 6.2E-2	2.63E-1 ± 5.9E-2	1.98E-1 ± 5.5E-2	1.73E-1 ± 7.0E-2
Bi-212	<6.3E-1	1.04E0 ± 4.7E-1	9.18E-1 ± 3.9E-1	6.80E-1 ± 4.2E-1
Pb-212	7.66E-1 ± 9.2E-2	6.07E-1 ± 8.1E-2	6.40E-1 ± 9.3E-2	6.18E-1 ± 8.8E-2
Bi-214	7.26E-1 ± 1.4E-1	6.65E-1 ± 1.4E-1	6.65E-1 ± 1.4E-1	6.83E-1 ± 1.5E-1
Pb-214	7.15E-1 ± 1.4E-1	7.89E-1 ± 1.2E-1	8.74E-1 ± 1.4E-1	7.34E-1 ± 1.3E-1
Ra-226	7.37E-1 ± 1.5E-1	6.75E-1 ± 1.4E-1	6.76E-1 ± 1.4E-1	6.93E-1 ± 1.5E-1
Ac-228	6.54E-1 ± 3.5E-1	4.58E-1 ± 3.0E-1	6.39E-1 ± 3.8E-1	6.60E-1 ± 2.8E-1
Ra-228	6.54E-1 ± 3.5E-1	4.58E-1 ± 3.0E-1	6.39E-1 ± 3.8E-1	6.60E-1 ± 2.8E-1
Th-228	5.82E-1 ± 6.6E-1	1.04E0 ± 4.7E-1	9.18E-1 ± 3.9E-1	6.80E-1 ± 4.2E-1
Th-232	8.35E-1 ± 1.8E-1	7.48E-1 ± 1.7E-1	5.64E-1 ± 1.6E-1	4.93E-1 ± 2.0E-1
Th-234	1.43E1 ± 4.2E0	4.46E0 ± 2.0E0	1.62E0 ± 1.8E0	2.10E0 ± 1.7E0
U-235	5.10E0 ± 1.0E0	1.64E0 ± 4.5E-1	1.05E0 ± 4.1E-1	8.20E-1 ± 2.9E-1
U-238	2.17E1 ± 8.1E0	1.16E1 ± 5.9E0	<4.9E0	5.84E0 ± 6.1E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9807-0239W METHOD BLANK (7/16/98)
K-40(1)	6.94E-1 ± 4.2E-1
Cs-137	<2.6E-2
Tl-208	<3.8E-2
Bi-214	<5.9E-1
Pb-212	1.05E-1 ± 3.6E-2
Bi-214	1.92E-2 ± 7.4E-2
Pb-214	2.19E-1 ± 7.3E-2
Ra-226	1.94E-1 ± 7.6E-2
Ac-228	<1.8E-1
Ra-228	<1.9E-1
Th-228	1.05E-1 ± 3.6E-2
Th-232	<8.7E-2
Th-234	<5.5E-1
U-235	<5.0E-2
U-238	<2.2E0

(1)Antech Method A-524 (Gamma Spectrometry), units are pCi/gram, and error estimates are 2 standard deviations.

Antech Ltd.

One Triangle Lane • Export, Pennsylvania 15632 • Phone: (724) 733-1161 • Fax: (724) 327-7793

September 23, 1998

Mr. Joe Nardi
Westinghouse Electric Company
Energy Center West, Bay 508 B
P. O. Box 355
Pittsburgh, PA 15230

Soil Characterization; Purchase Order No. 122284-SA286
Blairsville Soil Samples; WALTZ MILL; Energy Center
Antech Ltd. Project No. 98-0348W

Dear Mr. Nardi:

Enclosed are analytical results for samples submitted by Westinghouse Electric Company. Samples were received and logged in for analysis on September 1, 1998.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

W. Thomas Frenchek
for.
Shannon W. Thompson
Lead Analyst/Project Manager

SWT:ejg

Enclosures

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 98-0348W
CLIENT: Purchase Order Number: 122284-SA286

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
9809-0001W	BVSS3054	9809-0002W	BVSS3055
9809-0003W	BVSS3056	9809-0004W	BVSS3057
9809-0005W	BVSS3058	9809-0006W	BVSS3060
9809-0007W	BVSS3061	9809-0008W	BVSS3062
9809-0009W	BVSS3063	9809-0010W	BVSS3064
9809-0011W	BVSS3065	9809-0012W	BVSS3067
9809-0013W	BVSS3068	9809-0014W	BVSS3069
9809-0015W	BVSS3070	9809-0016W	BVSS3071
9809-0017W	BVSS3072	9809-0018W	BVSS3074
9809-0019W	BVSS3075	9809-0020W	BVSS3076
9809-0021W	BVSS3077	9809-0022W	BVSS3078
9809-0023W	BVSS3079	9809-0024W	BVSS3081
9809-0025W	BVSS3082	9809-0026W	BVSS3083
9809-0027W	BVSS3084	9809-0028W	BVSS3085
9809-0029W	BVSS3086	9809-0030W	BVSS3088
9809-0031W	BVSS3089	9809-0032W	BVSS3090
9809-0033W	BVSS3091	9809-0034W	BVSS3092
9809-0035W	BVSS3093	9809-0036W	BVSS3094
9809-0037W	BVSS3096	9809-0038W	BVSS3097
9809-0039W	BVSS3098	9809-0040W	BVSS3099
9809-0041W	BVSS3100	9809-0042W	BVSS3101
9809-0043W	BVSS3102	9809-0044W	BVSS3103
9809-0045W	BVSS3104	9809-0046W	BVSS3105
9809-0047W	BVSS3106	9809-0048W	BVSS3107
9809-0049W	BVSS3108		

C: SHIPPING/RECEIVING COMMENTS:

FINAL REPORT: 9/23/98

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
None

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format.

Table 1
General Data Table
Westinghouse Electric Company
Antech Ltd. Project No. 98-0348W
Soil Characterization; Blairsville Soil Samples
Charge Order No. 122284-SA286; WALTZ MILL

Parameter	Sample Identification 9809-0001W BVSS3054 (9/1/98)	9809-0002W BVSS3055 (9/1/98)	9809-0003W BVSS3056 (9/1/98)	9809-0004W BVSS3057 (9/1/98)	9809-0005W BVSS3058 (9/1/98)
K-40(1)	6.94E0 ± 1.0E0	8.19E0 ± 1.2E0	8.23E0 ± 1.1E0	8.57E0 ± 1.1E0	7.32E0 ± 1.8E0
Cs-137	9.17E-2 ± 5.2E-2	1.43E-1 ± 4.8E-2	9.92E-2 ± 4.5E-2	1.04E-1 ± 4.7E-2	<9.3E-2
Tl-208	2.77E-1 ± 6.3E-2	2.93E-1 ± 6.1E-2	2.26E-1 ± 5.4E-2	2.33E-1 ± 5.2E-2	3.57E-1 ± 1.1E-1
Bi-212	6.49E-1 ± 4.0E-1	1.00E0 ± 6.5E-1	8.55E-1 ± 6.3E-1	1.22E0 ± 4.6E-1	<1.4E0
Pb-212	7.58E-1 ± 8.5E-2	7.78E-1 ± 9.1E-2	8.90E-1 ± 9.7E-2	7.58E-1 ± 8.3E-2	3.62E-1 ± 2.9E-1
Bi-214	6.82E-1 ± 1.4E-1	7.55E-1 ± 1.3E-1	7.10E-1 ± 1.2E-1	7.90E-1 ± 1.3E-1	6.37E-1 ± 1.6E-1
Pb-214	8.26E-1 ± 1.3E-1	8.60E-1 ± 1.3E-1	8.47E-1 ± 1.3E-1	7.62E-1 ± 1.2E-1	6.40E-1 ± 2.6E-1
Ra-226	6.93E-1 ± 1.4E-1	7.67E-1 ± 1.4E-1	7.21E-1 ± 1.3E-1	8.01E-1 ± 1.4E-1	6.47E-1 ± 1.6E-1
Ac-228	5.93E-1 ± 2.4E-1	8.66E-1 ± 3.3E-1	1.05E0 ± 3.5E-1	8.79E-1 ± 3.9E-1	1.01E0 ± 5.0E-1
Th-232	7.87E-1 ± 1.8E-1	8.34E-1 ± 1.7E-1	6.42E-1 ± 1.5E-1	6.62E-1 ± 1.5E-1	1.01E0 ± 3.2E-1
Th-234	<1.3E0	4.38E0 ± 2.3E0	2.93E0 ± 1.8E0	2.64E0 ± 1.7E0	<1.8E0
U-235	5.28E-1 ± 3.6E-1	1.45E0 ± 3.8E-1	1.44E0 ± 3.7E-1	8.74E-1 ± 3.7E-1	1.27E0 ± 4.6E-1
U-238	<4.0E0	<4.3E0	<4.0E0	5.76E0 ± 3.5E0	<9.3E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0006W BVSS3060 (9/1/98)	9809-0007W BVSS3061 (9/1/98)	9809-0008W BVSS3062 (9/1/98)	9809-0009W BVSS3063 (9/1/98)	9809-0010W BVSS3064 (9/1/98)
K-40(1)	8.95E0 ± 1.2E0	7.09E0 ± 1.0E0	8.40E0 ± 2.1E0	8.68E0 ± 1.2E0	7.23E0 ± 1.1E0
Cs-137	NA ± <7.5E-2	9.38E-2 ± 4.4E-2	9.84E-2 ± 7.9E-2	7.75E-2 ± 4.5E-2	7.67E-2 ± 6.2E-2
Tl-208	2.83E-1 ± 6.3E-2	2.59E-1 ± 5.2E-2	3.36E-1 ± 9.1E-2	2.84E-1 ± 5.6E-2	2.51E-1 ± 6.9E-2
Bi-212	1.11E0 ± 6.8E-1	7.80E-1 ± 5.5E-1	1.80E0 ± 8.0E-1	7.10E-1 ± 4.7E-1	1.44E0 ± 5.1E-1
Pb-212	7.73E-1 ± 9.0E-2	6.96E-1 ± 8.7E-2	4.80E-1 ± 2.9E-1	7.83E-1 ± 9.0E-2	6.84E-1 ± 8.8E-2
Bi-214	6.48E-1 ± 1.4E-1	5.61E-1 ± 1.1E-1	5.15E-1 ± 1.6E-1	6.24E-1 ± 1.2E-1	7.31E-1 ± 1.4E-1
Pb-214	6.94E-1 ± 1.2E-1	7.76E-1 ± 1.1E-1	5.51E-1 ± 2.2E-1	7.31E-1 ± 1.5E-1	8.24E-1 ± 1.3E-1
Ra-226	6.58E-1 ± 1.4E-1	5.70E-1 ± 1.2E-1	5.23E-1 ± 1.7E-1	6.34E-1 ± 1.3E-1	7.42E-1 ± 1.5E-1
Ac-228	9.70E-1 ± 3.9E-1	9.16E-1 ± 3.1E-1	8.54E-1 ± 4.8E-1	9.34E-1 ± 3.0E-1	9.34E-1 ± 3.3E-1
Th-232	8.04E-1 ± 1.8E-1	7.35E-1 ± 1.5E-1	9.54E-1 ± 2.6E-1	8.08E-1 ± 1.6E-1	7.14E-1 ± 2.0E-1
Th-234	2.86E0 ± 2.1E0	<1.2E0	<1.9E0	2.24E0 ± 1.6E0	1.52E0 ± 1.3E0
U-235	2.76E0 ± 6.0E-1	7.18E-1 ± 3.4E-1	1.15E0 ± 4.6E-1	6.90E-1 ± 3.0E-1	5.47E-1 ± 2.8E-1
U-238	<5.6E0	<4.4E0	<9.4E0	4.90E0 ± 3.3E0	3.94E0 ± 4.6E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0011W BVSS3065 (9/1/98)	9809-0012W BVSS3067 (9/1/98)	9809-0013W BVSS3068 (9/1/98)	9809-0014W BVSS3069 (9/1/98)	9809-0015W BVSS3070 (9/1/98)
K-40(1)	8.46E0 ± 1.2E0	7.62E0 ± 1.0E0	7.63E0 ± 1.1E0	6.29E0 ± 1.7E0	6.69E0 ± 9.8E-1
Cs-137	8.39E-2 ± 4.9E-2	1.01E-1 ± 4.9E-2	1.04E-1 ± 4.5E-2	1.26E-1 ± 6.9E-2	1.59E-1 ± 4.9E-2
Tl-208	2.70E-1 ± 5.5E-2	2.05E-1 ± 7.0E-2	2.81E-1 ± 6.3E-2	2.98E-1 ± 9.9E-2	2.87E-1 ± 5.8E-2
Bi-212	9.69E-1 ± 4.7E-1	1.09E0 ± 6.3E-1	1.03E0 ± 6.5E-1	<1.3E0	1.32E0 ± 6.0E-1
Pb-212	6.53E-1 ± 9.5E-2	6.79E-1 ± 8.2E-2	7.44E-1 ± 8.6E-2	4.45E-1 ± 3.0E-1	6.85E-1 ± 8.0E-2
Bi-214	7.29E-1 ± 1.5E-1	5.42E-1 ± 1.1E-1	6.94E-1 ± 1.4E-1	7.77E-1 ± 1.6E-1	6.78E-1 ± 1.5E-1
Pb-214	7.44E-1 ± 1.3E-1	6.47E-1 ± 1.2E-1	7.64E-1 ± 1.4E-1	5.77E-1 ± 2.4E-1	7.56E-1 ± 1.2E-1
Ra-226	7.40E-1 ± 1.6E-1	5.50E-1 ± 1.1E-1	7.05E-1 ± 1.5E-1	7.89E-1 ± 1.7E-1	6.88E-1 ± 1.6E-1
Ac-228	8.14E-1 ± 3.3E-1	8.38E-1 ± 3.2E-1	6.15E-1 ± 2.4E-1	1.03E0 ± 4.8E-1	9.06E-1 ± 3.0E-1
Th-232	7.68E-1 ± 1.6E-1	5.83E-1 ± 2.0E-1	7.99E-1 ± 1.8E-1	8.46E-1 ± 2.8E-1	8.16E-1 ± 1.7E-1
Th-234	3.52E0 ± 1.8E0	2.25E0 ± 1.8E0	<1.1E0	<1.6E0	1.86E0 ± 1.7E0
U-235	1.17E0 ± 3.8E-1	9.38E-1 ± 3.7E-1	6.77E-1 ± 3.0E-1	7.58E-1 ± 3.6E-1	1.04E0 ± 3.1E-1
U-238	7.68E0 ± 3.5E0	<4.6E0	<4.1E0	<9.2E0	4.07E0 ± 3.7E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0016W BVSS3071 (9/1/98)	9809-0017W BVSS3072 (9/1/98)	9809-0018W BVSS3074 (9/1/98)	9809-0019W BVSS3075 (9/1/98)	9809-0020W BVSS3076 (9/1/98)
K-40(1)	7.35E0 ± 1.1E0	7.63E0 ± 1.0E0	6.88E0 ± 1.0E0	6.97E0 ± 1.0E0	7.82E0 ± 1.1E0
Cs-137	1.70E-1 ± 6.8E-2	1.47E-1 ± 5.7E-2	7.69E-2 ± 4.5E-2	1.04E-1 ± 4.6E-2	<5.2E-2
Tl-208	2.32E-1 ± 5.9E-2	2.62E-1 ± 6.1E-2	2.89E-1 ± 5.9E-2	2.71E-1 ± 5.2E-2	2.79E-1 ± 5.9E-2
Bi-212	1.19E0 ± 4.2E-1	1.42E0 ± 5.4E-1	1.41E0 ± 4.9E-1	8.93E-1 ± 5.5E-1	7.05E-1 ± 6.3E-1
Pb-212	6.58E-1 ± 8.4E-2	7.65E-1 ± 8.7E-2	7.56E-1 ± 8.9E-2	7.50E-1 ± 8.6E-2	7.82E-1 ± 8.9E-2
Bi-214	6.88E-1 ± 1.4E-1	6.82E-1 ± 1.3E-1	6.35E-1 ± 1.2E-1	6.58E-1 ± 1.1E-1	6.87E-1 ± 1.4E-1
Pb-214	8.08E-1 ± 1.4E-1	9.62E-1 ± 1.4E-1	7.44E-1 ± 1.2E-1	7.26E-1 ± 1.2E-1	7.88E-1 ± 1.3E-1
Ra-226	6.99E-1 ± 1.4E-1	6.93E-1 ± 1.4E-1	6.45E-1 ± 1.3E-1	6.68E-1 ± 1.2E-1	6.98E-1 ± 1.5E-1
Ac-228	7.73E-1 ± 3.2E-1	1.10E0 ± 3.0E-1	1.04E0 ± 3.6E-1	8.40E-1 ± 3.2E-1	8.59E-1 ± 2.8E-1
Th-232	6.58E-1 ± 1.7E-1	7.46E-1 ± 1.7E-1	8.22E-1 ± 1.7E-1	7.69E-1 ± 1.5E-1	7.92E-1 ± 1.7E-1
Th-234	1.88E0 ± 1.7E0	2.64E0 ± 1.8E0	2.68E0 ± 1.8E0	2.78E0 ± 1.4E0	3.17E0 ± 2.1E0
U-235	5.94E-1 ± 3.1E-1	1.20E0 ± 4.0E-1	9.49E-1 ± 3.3E-1	9.24E-1 ± 3.6E-1	8.19E-1 ± 3.5E-1
U-238	7.60E0 ± 6.1E0	5.52E0 ± 5.5E0	1.26E1 ± 6.0E0	<4.9E0	6.91E0 ± 4.3E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0021W BVSS3077 (9/1/98)	9809-0022W BVSS3078 (9/1/98)	9809-0023W BVSS3079 (9/1/98)	9809-0024W BVSS3081 (9/1/98)	9809-0025W BVSS3082 (9/1/98)
K-40(1)	7.97E0 ± 1.1E0	7.79E0 ± 1.0E0	6.99E0 ± 1.0E0	7.32E0 ± 1.2E0	7.34E0 ± 1.1E0
Cs-137	1.05E-1 ± 6.4E-2	1.00E-1 ± 5.0E-2	6.73E-2 ± 4.5E-2	<8.0E-2	1.15E-1 ± 4.9E-2
Tl-208	3.00E-1 ± 5.5E-2	2.54E-1 ± 5.0E-2	2.66E-1 ± 5.6E-2	2.37E-1 ± 6.1E-2	2.97E-1 ± 6.8E-2
Bi-212	8.31E-1 ± 5.4E-1	1.30E0 ± 5.6E-1	<9.4E-1	7.24E-1 ± 7.3E-1	1.13E0 ± 5.1E-1
Pb-212	7.12E-1 ± 8.6E-2	8.46E-1 ± 8.8E-2	8.12E-1 ± 8.8E-2	7.58E-1 ± 9.2E-2	6.98E-1 ± 8.6E-2
Bi-214	6.36E-1 ± 1.3E-1	7.10E-1 ± 1.4E-1	7.39E-1 ± 1.4E-1	6.46E-1 ± 1.3E-1	6.02E-1 ± 1.6E-1
Pb-214	7.69E-1 ± 1.4E-1	8.68E-1 ± 1.3E-1	7.67E-1 ± 1.3E-1	5.73E-1 ± 1.3E-1	8.36E-1 ± 1.3E-1
Ra-226	6.46E-1 ± 1.4E-1	7.21E-1 ± 1.4E-1	7.50E-1 ± 1.5E-1	6.55E-1 ± 1.3E-1	6.11E-1 ± 1.7E-1
Ac-228	8.29E-1 ± 2.9E-1	6.80E-1 ± 2.4E-1	9.54E-1 ± 3.5E-1	9.96E-1 ± 3.0E-1	8.69E-1 ± 3.8E-1
Th-232	8.54E-1 ± 1.6E-1	7.21E-1 ± 1.4E-1	7.57E-1 ± 1.6E-1	6.75E-1 ± 1.7E-1	8.43E-1 ± 1.9E-1
Th-234	1.96E0 ± 1.7E0	1.90E0 ± 1.5E0	2.75E0 ± 1.8E0	2.78E0 ± 1.8E0	2.64E0 ± 1.6E0
U-235	7.71E-1 ± 2.8E-1	7.60E-1 ± 2.7E-1	1.23E0 ± 3.6E-1	1.24E0 ± 4.0E-1	8.86E-1 ± 3.4E-1
U-238	4.28E0 ± 3.6E0	4.14E0 ± 3.2E0	5.99E0 ± 3.7E0	<5.2E0	5.75E0 ± 3.3E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0026W BVSS3083 (9/1/98)	9809-0027W BVSS3084 (9/1/98)	9809-0028W BVSS3085 (9/1/98)	9809-0029W BVSS3086 (9/1/98)	9809-0030W BVSS3088 (9/1/98)
K-40(1)	7.24E0 ± 1.0E0	7.06E0 ± 1.0E0	7.00E0 ± 1.0E0	7.92E0 ± 1.1E0	7.59E0 ± 1.1E0
Cs-137	6.95E-2 ± 3.8E-2	9.94E-2 ± 4.5E-2	7.59E-2 ± 4.9E-2	5.52E-2 ± 5.1E-2	1.23E-1 ± 5.6E-2
Tl-208	2.84E-1 ± 5.9E-2	3.30E-1 ± 6.4E-2	2.84E-1 ± 6.5E-2	3.04E-1 ± 6.4E-2	2.72E-1 ± 6.1E-2
Bi-212	9.51E-1 ± 6.9E-1	8.97E-1 ± 5.4E-1	1.08E0 ± 4.2E-1	1.17E0 ± 5.4E-1	9.46E-1 ± 5.2E-1
Pb-212	6.69E-1 ± 8.1E-2	8.33E-1 ± 9.1E-2	7.57E-1 ± 8.6E-2	8.17E-1 ± 9.1E-2	7.44E-1 ± 8.9E-2
Bi-214	7.27E-1 ± 1.4E-1	8.20E-1 ± 1.5E-1	8.06E-1 ± 1.3E-1	8.30E-1 ± 1.3E-1	6.42E-1 ± 1.3E-1
Pb-214	8.90E-1 ± 1.3E-1	1.06E0 ± 1.4E-1	8.61E-1 ± 1.4E-1	9.05E-1 ± 1.4E-1	7.32E-1 ± 1.1E-1
Ra-226	7.38E-1 ± 1.5E-1	8.33E-1 ± 1.6E-1	8.19E-1 ± 1.4E-1	8.42E-1 ± 1.4E-1	6.52E-1 ± 1.4E-1
Ac-228	1.01E0 ± 3.1E-1	7.22E-1 ± 3.2E-1	7.46E-1 ± 2.8E-1	9.00E-1 ± 2.9E-1	1.08E0 ± 3.4E-1
Th-232	8.08E-1 ± 1.7E-1	9.37E-1 ± 1.8E-1	8.07E-1 ± 1.8E-1	8.64E-1 ± 1.8E-1	7.74E-1 ± 1.7E-1
Th-234	1.53E0 ± 1.5E0	2.07E0 ± 1.7E0	1.56E0 ± 1.4E0	2.68E0 ± 1.7E0	2.43E0 ± 1.8E0
U-235	6.76E-1 ± 3.4E-1	8.22E-1 ± 3.3E-1	5.82E-1 ± 3.0E-1	9.80E-1 ± 3.9E-1	9.06E-1 ± 3.3E-1
U-238	<3.9E0	4.51E0 ± 3.5E0	1.02E1 ± 5.5E0	<4.1E0	8.58E0 ± 5.2E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0031W BVSS3089 (9/1/98)	9809-0032W BVSS3090 (9/1/98)	9809-0033W BVSS3091 (9/1/98)	9809-0034W BVSS3092 (9/1/98)	9809-0035W BVSS3093 (9/1/98)
K-40(1)	7.79E0 ± 1.1E0	8.36E0 ± 1.1E0	6.99E0 ± 1.1E0	8.02E0 ± 1.2E0	8.71E0 ± 1.1E0
Cs-137	1.04E-1 ± 4.1E-2	9.48E-2 ± 6.7E-2	<8.0E-2	6.57E-2 ± 4.3E-2	1.24E-1 ± 5.7E-2
Tl-208	2.59E-1 ± 6.0E-2	3.14E-1 ± 6.1E-2	2.46E-1 ± 5.5E-2	2.08E-1 ± 6.4E-2	2.39E-1 ± 6.7E-2
Bi-212	1.44E0 ± 5.6E-1	1.26E0 ± 7.0E-1	1.07E0 ± 5.2E-1	7.39E-1 ± 5.5E-1	7.16E-1 ± 5.0E-1
Pb-212	8.17E-1 ± 9.3E-2	7.19E-1 ± 8.4E-2	7.80E-1 ± 9.0E-2	6.60E-1 ± 1.1E-1	8.19E-1 ± 9.2E-2
Bi-214	8.61E-1 ± 1.5E-1	6.59E-1 ± 1.5E-1	6.06E-1 ± 1.2E-1	6.12E-1 ± 1.4E-1	8.20E-1 ± 1.5E-1
Pb-214	8.94E-1 ± 1.4E-1	8.21E-1 ± 1.3E-1	8.03E-1 ± 1.4E-1	6.51E-1 ± 1.2E-1	8.88E-1 ± 1.3E-1
Ra-226	8.74E-1 ± 1.6E-1	6.69E-1 ± 1.5E-1	6.15E-1 ± 1.3E-1	6.21E-1 ± 1.4E-1	8.33E-1 ± 1.6E-1
Ac-228	7.29E-1 ± 3.4E-1	7.79E-1 ± 2.7E-1	6.65E-1 ± 3.2E-1	8.75E-1 ± 2.6E-1	1.15E0 ± 3.5E-1
Th-232	7.37E-1 ± 1.7E-1	8.94E-1 ± 1.7E-1	7.00E-1 ± 1.6E-1	5.91E-1 ± 1.8E-1	6.78E-1 ± 1.9E-1
Th-234	1.92E0 ± 2.1E0	3.00E0 ± 1.6E0	2.97E0 ± 2.1E0	3.97E0 ± 2.0E0	2.11E0 ± 1.9E0
U-235	2.00E0 ± 4.7E-1	6.95E-1 ± 3.3E-1	5.95E-1 ± 3.4E-1	1.11E0 ± 3.8E-1	2.12E0 ± 5.3E-1
U-238	<4.3E0	6.73E0 ± 5.9E0	6.48E0 ± 4.3E0	7.13E0 ± 5.4E0	<4.8E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0036W BVSS3094 (9/1/98)	9809-0037W BVSS3096 (9/1/98)	9809-0038W BVSS3097 (9/1/98)	9809-0039W BVSS3098 (9/1/98)	9809-0040W BVSS3099 (9/1/98)
K-40(1)	8.83E0 ± 1.2E0	6.89E0 ± 1.1E0	7.35E0 ± 1.2E0	6.71E0 ± 1.1E0	6.33E0 ± 1.0E0
Cs-137	1.08E-1 ± 4.8E-2	4.56E-1 ± 9.2E-2	3.08E-1 ± 7.6E-2	<6.2E-2	3.98E-1 ± 9.1E-2
Tl-208	2.63E-1 ± 7.1E-2	4.18E-1 ± 8.6E-2	3.62E-1 ± 7.1E-2	1.76E-1 ± 6.1E-2	2.94E-1 ± 7.9E-2
Bi-212	1.23E0 ± 5.3E-1	1.40E0 ± 8.7E-1	1.68E0 ± 6.2E-1	9.22E-1 ± 4.7E-1	1.33E0 ± 5.7E-1
Pb-212	6.85E-1 ± 1.1E-1	1.20E0 ± 1.2E-1	9.92E-1 ± 1.1E-1	6.77E-1 ± 8.7E-2	9.28E-1 ± 1.1E-1
Bi-214	5.02E-1 ± 1.4E-1	7.41E-1 ± 1.5E-1	9.07E-1 ± 1.7E-1	5.75E-1 ± 1.1E-1	7.03E-1 ± 1.4E-1
Pb-214	6.70E-1 ± 1.2E-1	7.90E-1 ± 1.6E-1	8.58E-1 ± 1.5E-1	5.97E-1 ± 1.3E-1	8.45E-1 ± 1.3E-1
Ra-226	5.09E-1 ± 1.4E-1	7.52E-1 ± 1.6E-1	9.20E-1 ± 1.8E-1	5.84E-1 ± 1.2E-1	7.14E-1 ± 1.5E-1
Ac-228	6.73E-1 ± 2.7E-1	1.54E0 ± 4.6E-1	8.85E-1 ± 3.6E-1	8.70E-1 ± 2.6E-1	1.13E0 ± 3.5E-1
Th-232	7.48E-1 ± 2.0E-1	1.19E0 ± 2.4E-1	1.03E0 ± 2.0E-1	5.00E-1 ± 1.7E-1	8.36E-1 ± 2.3E-1
Th-234	1.53E0 ± 1.5E0	1.57E1 ± 5.2E0	1.51E1 ± 4.9E0	2.76E0 ± 2.1E0	9.14E0 ± 4.1E0
U-235	1.02E0 ± 2.9E-1	1.22E1 ± 2.1E0	1.33E1 ± 2.2E0	2.37E0 ± 5.6E-1	1.67E1 ± 2.7E0
U-238	1.01E1 ± 6.5E0	3.20E1 ± 1.3E1	3.70E1 ± 1.1E1	1.52E1 ± 6.6E0	2.33E1 ± 9.9E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0041W BVSS3100 (9/1/98)	9809-0042W BVSS3101 (9/1/98)	9809-0043W BVSS3102 (9/1/98)	9[illegible]
K-40(1)	6.10E0 ± 9.8E-1	7.49E0 ± 1.0E0		
Cs-137	8.66E-2 ± 5.8E-2	1.97E-1 ± 7.4E-[illegible]		
Tl-208	4.63E-1 ± 8.5E-2	3.05E-1 ± 7.2E-2		
Bi-212	1.81E0 ± 6.7E-1	5.31E-1 ± 5.7E-1		
Pb-212	1.33E0 ± 1.2E-1	8.71E-1 ± 9.4E-2		
Bi-214	3.98E-1 ± 1.5E-1	6.90E-1 ± 1.3E-1		
Pb-214	5.05E-1 ± 1.4E-1	7.05E-1 ± 1.1E-1	6	
Ra-226	4.04E-1 ± 1.5E-1	7.00E-1 ± 1.4E-1	6.[illegible]	
Ac-228	1.35E0 ± 4.5E-1	8.86E-1 ± 3.4E-1	8.8[illegible]	
Th-232	1.32E0 ± 2.4E-1	8.66E-1 ± 2.0E-1	7.93[illegible]	
Th-234	3.76E1 ± 9.5E0	1.79E1 ± 5.0E0	<	
U-235	2.48E1 ± 4.0E0	6.39E0 ± 1.2E0	1.95E-[illegible]	
U-238	9.03E1 ± 1.4E1	4.65E1 ± 1.1E1	<3.	

3102-3108
Leached
55 pCi/gm

[illegible] ± 2.8E-1
[illegible].06E-1 ± 1.7E-1
2.26E0 ± 1.4E0
[illegible]-1 ± 5.6E-2 7.23E-1 ± 2.7E-1
<3.4E0 6.25E0 ± 5.4E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9809-0046W BVSS3105 (9/1/98)	9809-0047W BVSS3106 (9/1/98)	9809-0048W BVSS3107 (9/1/98)	9809-0049W BVSS3108 (9/1/98)	9809-0050W METHOD BLANK
K-40(1)	7.27E0 ± 1.1E0	9.81E0 ± 1.2E0	7.16E0 ± 9.7E-1	7.86E0 ± 1.0E0	9.54E-1 ± 4.8E-1
Cs-137	2.62E-1 ± 5.9E-2	1.06E-1 ± 4.6E-2	5.89E-2 ± 3.4E-2	1.61E-1 ± 5.3E-2	<3.2E-2
Tl-208	2.36E-1 ± 5.8E-2	2.40E-1 ± 5.6E-2	2.47E-1 ± 4.9E-2	2.15E-1 ± 5.6E-2	5.39E-2 ± 2.7E-2
Bi-212	9.32E-1 ± 5.6E-1	1.26E0 ± 4.9E-1	7.57E-1 ± 3.3E-1	<8.2E-1	<3.9E-1
Pb-212	7.67E-1 ± 8.5E-2	6.88E-1 ± 8.1E-2	6.22E-1 ± 7.6E-2	5.63E-1 ± 7.1E-2	9.90E-2 ± 3.9E-2
Bi-214	6.63E-1 ± 1.1E-1	6.21E-1 ± 1.4E-1	7.47E-1 ± 1.2E-1	5.32E-1 ± 1.2E-1	2.29E-1 ± 7.4E-2
Pb-214	8.25E-1 ± 1.2E-1	6.78E-1 ± 1.1E-1	7.20E-1 ± 1.2E-1	7.00E-1 ± 1.3E-1	2.25E-1 ± 7.1E-2
Ra-226	6.73E-1 ± 1.2E-1	6.31E-1 ± 1.4E-1	7.58E-1 ± 1.3E-1	5.40E-1 ± 1.2E-1	2.32E-1 ± 7.6E-2
Ac-228	7.93E-1 ± 3.1E-1	8.67E-1 ± 3.1E-1	6.92E-1 ± 2.6E-1	4.96E-1 ± 2.7E-1	<2.8E-1
Th-232	6.71E-1 ± 1.6E-1	6.81E-1 ± 1.6E-1	7.01E-1 ± 1.4E-1	6.11E-1 ± 1.6E-1	1.53E-1 ± 7.8E-2
Th-234	1.66E0 ± 1.6E0	<8.9E-1	<7.6E-1	<7.9E-1	<5.5E-1
U-235	1.65E0 ± 4.5E-1	1.22E-1 ± 5.5E-2	8.52E-2 ± 3.6E-2	1.09E-1 ± 4.0E-2	<5.0E-2
U-238	7.06E0 ± 3.8E0	<3.4E0	<3.0E0	<3.3E0	<2.4E0

(1)Antech Method A-524 (Gamma Spectrometry), units are pCi/gram, and error estimates are 2 standard deviations.

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 98-0518W
CLIENT: Purchase Order Number: 122284-SA286

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
9811-0063W	BV-SS-1007	9811-0064W	BV-SS-1008
9811-0065W	BV-SS-1009	9811-0066W	BV-SS-1010
9811-0067W	BV-SS-1011	9811-0068W	BV-SS-1012
9811-0069W	BV-SS-1013	9811-0070W	BV-SS-1014
9811-0071W	BV-SS-1015	9811-0072W	BV-SS-1016
9811-0073W	BV-SS-1017	9811-0074W	BV-SS-1018
9811-0075W	BV-SS-1019	9811-0076W	BV-SS-1020
9811-0077W	BV-SS-1021	9811-0078W	BV-SS-1022
9811-0079W	BV-SS-1023	9811-0080W	BV-SS-1024
9811-0081W	BV-SS-1025		

C: SHIPPING/RECEIVING COMMENTS:

NONE

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:

NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format.

Table 1
General Data Table
Westinghouse Electric Company
Antech Ltd. Project No. 98-0518W
Soil Characterization; Blairsville Soils
Charge Order No. 122284-SA286; Blairsville

Parameter	Sample Identification 9811-0063W BV-SS-1007 (10/22/98)	9811-0064W BV-SS-1008 (10/22/98)	9811-0065W BV-SS-1009 (10/22/98)	9811-0066W BV-SS-1010 (10/22/98)	9811-0067W BV-SS-1011 (10/22/98)
K-40(1)	6.46E0 ± 9.3E-1	7.65E0 ± 1.1E0	7.57E0 ± 1.0E0	7.78E0 ± 1.1E0	8.09E0 ± 1.1E0
Co-60	<4.3E-2	<3.7E-2	<4.8E-2	<4.0E-2	<4.7E-2
Cs-137	<6.2E-2	1.57E-1 ± 5.5E-2	<4.9E-2	<7.2E-2	<8.6E-2
Eu-154	<1.7E-1	<1.3E-1	<1.2E-1	<1.5E-1	<1.4E-1
Tl-208	2.14E-1 ± 5.1E-2	2.29E-1 ± 5.7E-2	2.20E-1 ± 5.5E-2	2.41E-1 ± 5.0E-2	2.39E-1 ± 6.0E-2
Bi-212	8.83E-1 ± 4.8E-1	9.28E-1 ± 5.5E-1	<9.3E-1	<8.8E-1	<1.0E0
Pb-212	4.83E-1 ± 1.1E-1	5.17E-1 ± 1.2E-1	5.45E-1 ± 1.3E-1	6.89E-1 ± 1.3E-1	8.88E-1 ± 1.2E-1
Bi-214	4.66E-1 ± 1.2E-1	6.56E-1 ± 1.1E-1	6.64E-1 ± 1.2E-1	7.07E-1 ± 1.2E-1	7.02E-1 ± 1.2E-1
Pb-214	5.96E-1 ± 8.3E-2	5.50E-1 ± 9.1E-2	6.55E-1 ± 9.3E-2	7.58E-1 ± 9.3E-2	7.44E-1 ± 9.9E-2
Ac-228	<3.6E-1	<3.5E-1	6.34E-1 ± 1.3E-1	7.11E-1 ± 1.4E-1	7.41E-1 ± 1.5E-1
U-235	<2.2E-1	<2.9E-1	<2.6E-1	<3.2E-1	<2.9E-1
U-238	<6.9E0	<7.5E0	<7.0E0	<8.9E0	<8.4E0
Am-241	<1.9E-1	<2.2E-1	<2.2E-1	<2.5E-1	<2.3E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9811-0068W BV-SS-1012 (11/4/98)	9811-0069W BV-SS-1013 (11/4/98)	9811-0070W BV-SS-1014 (11/4/98)	9811-0071W BV-SS-1015 (11/4/98)	9811-0072W BV-SS-1016 (11/4/98)
K-40(1)	5.91E0 ± 9.3E-1	7.69E0 ± 1.07E0	8.21E0 ± 1.1E0	7.38E0 ± 1.0E0	7.03E0 ± 1.0E0
Co-60	<4.1E-2	<5.5E-2	<6.3E-2	<4.7E-2	<4.9E-2
Cs-137	<6.2E-2	<8.3E-2	1.23E-1 ± 5.4E-2	1.35E-1 ± 5.3E-2	1.02E-1 ± 5.4E-2
Eu-154	<1.6E-1	<1.8E-1	<1.7E-1	<1.5E-1	<1.5E-1
Tl-208	2.92E-1 ± 5.6E-2	2.70E-1 ± 5.8E-2	3.01E-1 ± 6.8E-2	2.66E-1 ± 5.8E-2	2.71E-1 ± 6.2E-2
Bi-212	<9.4E-1	1.04E0 ± 5.7E-1	<1.0E0	<1.0E0	1.45E0 ± 6.8E-1
Pb-212	7.43E-1 ± 1.0E-1	7.31E-1 ± 1.1E-1	6.37E-1 ± 1.4E-1	6.40E-1 ± 1.3E-1	7.09E-1 ± 1.3E-1
Bi-214	6.27E-1 ± 1.1E-1	6.08E-1 ± 1.2E-1	7.78E-1 ± 1.2E-1	7.51E-1 ± 1.3E-1	7.47E-1 ± 1.2E-1
Pb-214	6.61E-1 ± 8.7E-2	6.71E-1 ± 1.0E-1	8.12E-1 ± 1.0E-1	8.16E-1 ± 1.1E-1	7.83E-1 ± 1.1E-1
Ac-228	6.22E-1 ± 1.6E-1	7.23E-1 ± 1.5E-1	7.33E-1 ± 1.5E-1	6.67E-1 ± 1.6E-1	8.06E-1 ± 1.3E-1
U-235	1.28E0 ± 1.1E-1	2.17E0 ± 1.7E-1	2.43E0 ± 1.8E-1	4.40E0 ± 2.9E-1	3.99E0 ± 2.5E-1
U-238	———	5.21E0 ± 2.4E0	6.40E0 ± 2.6E0	<1.0E1	9.88E0 ± 2.6E0
Am-241	———	<3.0E-1	<3.2E-1	<3.4E-1	<3.4E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification				
	9811-0073W BV-SS-1017 (11/4/98)	9811-0074W BV-SS-1018 (11/4/98)	9811-0075W BV-SS-1019 (11/4/98)	9811-0076W BV-SS-1020 (11/4/98)	9811-0077W BV-SS-1021 (11/4/98)
K-40(1)	6.27E0 ± 8.6E-1	6.43E0 ± 9.3E-1	6.92E0 ± 1.1E0	8.14E0 ± 1.1E0	7.09E0 ± 1.1E0
Co-60	<3.2E-2	<5.0E-2	<5.7E-2	<5.5E-2	<6.0E-2
Cs-137	7.53E-2 ± 4.2E-2	<6.9E-2	<7.7E-2	<9.3E-2	3.64E-1 ± 8.1E-2
Eu-154	<1.3E-1	<1.5E-1	<1.6E-1	<1.9E-1	<1.7E-1
Tl-208	1.94E-1 ± 4.5E-2	2.18E-1 ± 5.6E-2	2.34E-1 ± 6.6E-2	2.77E-1 ± 6.3E-2	2.96E-1 ± 7.3E-2
Bi-212	<8.5E-1	<9.8E-1	<1.1E0	<1.0E0	<1.1E0
Pb-212	6.02E-1 ± 8.6E-2	5.90E-1 ± 1.2E-1	7.33E-1 ± 1.1E-1	8.68E-1 ± 1.2E-1	7.52E-1 ± 1.4E-1
Bi-214	6.53E-1 ± 1.0E-1	6.12E-1 ± 1.1E-1	7.34E-1 ± 1.3E-1	7.68E-1 ± 1.3E-1	7.12E-1 ± 1.3E-1
Pb-214	6.78E-1 ± 8.6E-2	6.88E-1 ± 9.1E-2	6.86E-1 ± 1.0E-1	8.96E-1 ± 1.2E-1	8.11E-1 ± 1.1E-1
Ac-228	5.83E-1 ± 1.2E-1	7.04E-1 ± 1.3E-1	6.89E-1 ± 1.4E-1	7.83E-1 ± 1.4E-1	8.66E-1 ± 1.4E-1
U-235	1.67E0 ± 1.3E-1	1.87E0 ± 1.4E-1	1.59E0 ± 1.3E-1	3.97E0 ± 2.6E-1	4.32E0 ± 2.9E-1
U-238	<9.5E0	6.69E0 ± 1.3E0	3.66E0 ± 2.4E0	5.15E0 ± 2.9E0	9.36E0 ± 3.4E0
Am-241	<2.5E-1	<2.8E-1	<2.9E-1	<3.3E-1	<3.9E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9811-0078W BV-SS-1022 (11/4/98)	9811-0079W BV-SS-1023 (11/4/98)	9811-0080W BV-SS-1024 (11/4/98)	9811-0081W BV-SS-1025 (11/4/98)
K-40(1)	7.84E0 ± 1.1E0	7.36E0 ± 1.1E0	6.34E0 ± 9.4E-1	7.54E0 ± 1.1E0
Co-60	<6.1E-2	<6.0E-2	<4.8E-2	<3.4E-2
Cs-137	<8.6E-2	<5.4E-2	<4.6E-2	<5.6E-2
Eu-154	<1.9E-1	<1.7E-1	<1.6E-1	<1.3E-1
Tl-208	2.68E-1 ± 6.3E-2	2.03E-1 ± 5.6E-2	2.48E-1 ± 5.8E-2	2.48E-1 ± 6.0E-2
Bi-212	<1.1E0	7.46E-1 ± 6.6E-1	<9.6E-1	<1.0E0
Pb-212	8.74E-1 ± 1.2E-1	6.44E-1 ± 1.3E-1	5.41E-1 ± 1.3E-1	6.31E-1 ± 1.3E-1
Bi-214	7.84E-1 ± 1.3E-1	7.01E-1 ± 1.2E-1	6.01E-1 ± 1.1E-1	6.08E-1 ± 1.1E-1
Pb-214	8.24E-1 ± 9.8E-2	5.97E-1 ± 1.0E-1	6.18E-1 ± 9.6E-2	5.69E-1 ± 1.0E-1
Ac-228	6.80E-1 ± 1.5E-1	7.35E-1 ± 1.4E-1	6.84E-1 ± 1.1E-1	6.68E-1 ± 1.2E-1
U-235	1.51E0 ± 1.3E-1	2.49E0 ± 1.8E-1	2.72E0 ± 1.9E-1	2.07E0 ± 1.5E-1
U-238	<1.1E1	<9.7E0	5.49E0 ± 9.6E-1	<9.1E0
Am-241	<2.9E-1	<2.9E-1	<2.9E-1	<3.0E-1

(1)Antech Method A-524 (Gamma Spectrometry), units are pCi/gram, and error estimates are 2 standard deviations.

Figure 3.1

Antech Ltd., Waltz Mill Site Chain of Custody Record

Client [illegible] 22284-542

Charge # _____

Project Name: Blairsville SMP Project #: _____ Sampler: Todd Boutigam (Printed Name) (Signature)

Relinquished by (Signature and Printed Name)	Date	Time	Received by (Signature and Printed Name)	Date	Time
Todd S. Boutigam	11-4-98	15:06	W.T. FRENCHER	11-4-98	15:06
Relinquished by (Signature and Printed Name)	Date	Time	Received by (Signature and Printed Name)	Date	Time

Lab Use Only
Project # [illegible]

Sample ID Number	Sample Description: Date	Time	Description	Type: Composite	Type: Grab	WETCHEM: pH	WETCHEM: conductivity	WETCHEM: TDS	WETCHEM: TSS	WETCHEM: Hardness	WETCHEM: anions(F,Cl,SO4)	METALS: ICP scan (metals)	METALS: ICP scan (elemental)	METALS: AA (elemental)	RADIOCHEMISTRY: gross alpha	RADIOCHEMISTRY: gross beta	RADIOCHEMISTRY: gamma spec*	RADIOCHEMISTRY: H-3*	RADIOCHEMISTRY: C-14*	RADIOCHEMISTRY: Fe-55*	RADIOCHEMISTRY: Ni-59	RADIOCHEMISTRY: Ni-63*	RADIOCHEMISTRY: Sr-89/90*	RADIOCHEMISTRY: Tc-99*	RADIOCHEMISTRY: I-129*	RADIOCHEMISTRY: Americium*	RADIOCHEMISTRY: Neptunium	RADIOCHEMISTRY: Plutonium*	RADIOCHEMISTRY: Uranium	RADIOCHEMISTRY: 10CFR61 *(included)	# of Containers	Lab Use Only LAB I.D.
BV-SS-1007	10-22	1500	Soil		X										X																	9811-0043
BV-SS-1008	10-22	1500	Soil		X										X																	9811-0044
BV-SS-1009	10-22	1500	Soil		X										X																	9811-0045
BV-SS-1010	10-22	1500	Soil		X										X																	9811-0046
BV-SS-1011	10-22	1500	Soil		X										X																	9811-0065
BV-SS-1012	11-4	1330	Soil		X										X																	9811-0070
BV-SS-1013	11-4	1330	Soil		X										X																	9811-0071
BV-SS-1014	11-4	1330	Soil		X										X																	9811-0072
BV-SS-1015	11-4	1330	Soil		X										X																	9811-0073
BV-SS-1016	11-4	1330	Soil		X										X																	9811-0074
BV-SS-1017	11-4	1330	Soil		X										X																	9811-0075

Requested Laboratory Analysis

Special Instructions
* 1 Week TAT *

Nuclear Safety Related? ☐ Yes ☒ No

Site Remediation? ☒ Yes ☐ No

Sample Disposition
☐ Return to Client
☐ Disposal
☒ Archive per P.O.

Results to: Irwin Dobrustin
Energy Center

Invoice to:

Lab Use Only
Sample Condition Upon Receipt

FOR RADIOANALYSIS(i.e. gamma, gross alpha/beta)
Required Limit of Detection (LOD)?

JUN 02 '99 15:32 FR ANTECH LTD.

Client F 12284-SA2

Charge# ?

Figure 3.1

Antech Ltd., Waltz Mill Site Chain of Custody Record

Project Name: Blairsville SMP Project #: Sampler: Todd Brautigam (Printed Name) Todd S. Brautigam (Signature)

Relinquished by: (Signature and Printed Name) Todd S. Brautigam Date 11-4-98 Time 13:06

Received by: (Signature and Printed Name) W.T. Frenchek Date 11-4-98 Time 13:06

Relinquished by: (Signature and Printed Name) Date Time

Received by: (Signature and Printed Name) Date Time

Lab Use Only Project # [illegible]

Sample ID Number	Sample Description: Date	Time	Description	Type	Composite	Grab	pH	conductivity	TDS	TSS	Hardness	anions(F,Cl,SO4)	ICP scan (metals)	ICP scan (elemental)	AA (elemental)	gross alpha	gross beta	gamma spec*	H-3*	C-14*	Fe-55*	Ni-59	Ni-63*	Sr-89/90*	Tc-99*	I-129*	Americium*	Neptunium	Plutonium*	Uranium	10CFR61 *(included)	# of Containers	Lab Use Only LAB I.D.
BV-SS-1018	11-4	1340	Soil	X															X														9811-002
BV-SS-1019	11-4	1340	Soil	X															X														9811-00[illegible]
BV-SS-1020	11-4	1340	Soil	X															X														9811-00[illegible]
BV-SS-1021	11-4	1340	Soil	X															X														9811-00[illegible]
BV-SS-1022	11-4	1340	Soil	X															X														9811-00[illegible]
BV-SS-1023	11-4	1340	Soil	X															X														9811-00[illegible]
BV-SS-1024	11-4	1340	Soil	X															X														9811-00[illegible]
BV-SS-1025	11-4	1340	Soil	X															X														

Requested Laboratory Analysis: WETCHEM, METALS, RADIOCHEMISTRY

Special Instructions: * 1 Week TAT *

Nuclear Safety Related? ☐ Yes ☒ No

Site Remediation? ☒ Yes ☐ No

Sample Disposition: ☐ Return to Client ☐ Disposal ☒ Archive per P.O.

Results to: Irwin Dobrushin Energy Center

Invoice to:

Lab Use Only Sample Condition Upon Receipt

FOR RADIOANALYSIS(i.e. gamma, gross alpha/beta) Required Limit of Detection (LOD)?

JUN 02 '99 16:32 FR ANTECH LTD. T24 T22 0200 TO 0200 [illegible]

ample ID : 9811-0209W Acquisition date : 17-NOV-1998 07:53:39

MS Gamma Spectroscopy Report generated 17-NOV-1998 08:04:24

onfi tion : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_98110209W_DET1_500MLMAR_68.CNF;1

---- Sample Information ----

ample Title	: BV-SS-1026W		
ample ID	: 9811-0209W	Sample Quantity	: 5.48510E+02 gram
ample Type	: soil	Sample Geometry	:
ample Number	: 68	Spctrm Collector	: gamma
ample Collector	:	Sample Analyst	: gamma

---- Sample Deposition Information ----

ep. Correction?	: No	Dep. Duration	:
eposition Start	:	Deposition End	: 16-NOV-1998 12:00:00

---- Sample Decay/Count Information ----

ample Date	: 16-NOV-1998 12:00:00	Acquisition date	: 17-NOV-1998 07:53:39
ecay time	: 0 19:53:39.89	% dead time	: 4.5%
lapsed live time	: 0 00:10:00.00	Elapsed real time	: 0 00:10:28.51

---- Detector Parameters ----

nergy cal. time	: 5-SEP-1997 13:21:13.	Energy cal. oper.	: gamma
etector name	: det1	Counting geometry	: 500ml_Mar
ffic. cal. time	: 1-AUG-1997 08:21:35.	Effic. cal. oper.	: gamma

---- Processing Parameters ----

art channel	: 5	End channel	: 4096
nsitivity	: 4.50000	Gaussian Sens.	: 10.00000
itical level?	: Yes	Propagate Errors?	: Yes
npirical Eff?	: No	Library-based eff	: No
nerg lerance	: 1.00000	Half life ratio	: 10.00000
unc limit	: 60.00000	WTM error limit	: 3.00000
)A Width (FWHM)	: 3.00000	MDA Confid Level	: 5.00000 %

→ Lagoon

Brief Report

Nuclide	Activity pCi/gram	2-Sigma Error
K-40	1.57	1.19
CS-137	0.443	0.130
HG-203	0.961	0.327
TL-208	1.82	0.242
BI212	6.04	1.82
PB-212	5.18	0.766
BI-214	0.552	0.178
RA-223	267.	36.3
RA-224	19.5	12.8
RA-226S	1.842E+04	1.048E+03
AC-228	0.409	0.223
U-234	1.070E+04	2.835E+03
U-235	936.	89.4
U-238C	26.0	14.0
ANH	0.394	0.103
Total Activity :	3.039E+04	

Minimum Detectable Activity Report

Nuclide	Bckgnd Sum	Energy (keV)	MDA (pCi/gram)
CO-60	3.	1332.50	7.2200E-02
CU-1	7.	1274.44	2.7669E-01
PB-2	431.	351.87	6.0007E-01
TH-234	9919.	63.20	3.1801E+01
AM-241	9336.	59.54	4.8614E+00

Approved by: W. T. French Jr. Approval Date: 11 / 17 / 98

ample ID : 9811-0211W Acquisition date : 17-NOV-1998 07:42:07

MS Gamma Spectroscopy Report generated 17-NOV-1998 07:57:38

onfi ıtion : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_98110211W_C_MB500GTS_67.CNF;1

---- Sample Information ----

ample Title	: BV-SS-1028 98-0542W		
ample ID	: 9811-0211W	Sample Quantity	: 1.05195E+03 GRAM
ample Type	: SOIL	Sample Geometry	:
ample Number	: 67	Spctrm Collector	: gamma
ample Collector	:	Sample Analyst	: gamma

---- Sample Deposition Information ----

ep. Correction?	: No	Dep. Duration	:
eposition Start	:	Deposition End	: 16-NOV-1998 12:00:00

---- Sample Decay/Count Information ----

ample Date	: 16-NOV-1998 12:00:00	Acquisition date	: 17-NOV-1998 07:42:07
ecay time	: 0 19:42:07.27	% dead time	: 1.6%
lapsed live time	: 0 00:15:00.00	Elapsed real time	: 0 00:15:14.44

---- Detector Parameters ----

nergy cal. time	: 6-OCT-1998 17:24:33.	Energy cal. oper.	: gamma
etector name	: C	Counting geometry	: MB500gts
ffic. cal. time	: 6-OCT-1998 17:28:22.	Effic. cal. oper.	: gamma

---- Processing Parameters ----

tart channel	: 5	End channel	: 8192
ensitivity	: 4.50000	Gaussian Sens.	: 10.00000
ritical level?	: Yes	Propagate Errors?	: Yes
mpirical Eff?	: No	Library-based eff	: No
nerr olerance	: 1.00000	Half life ratio	: 10.00000
bur e limit	: 60.00000	WTM error limit	: 3.00000
DA h..h (FWHM)	: 3.00000	MDA Confid Level	: 5.00000 %

Bri eport

	Nuclide	Activity pCi/GRAM	2-Sigma Error
	K-40	2.12	0.795
	CS-137	0.370	7.525E-02
NO →	HG-203	9.843E-02	5.719E-02
	TL-208	0.455	9.037E-02
	BI212	1.24	0.491
	PB-212	1.30	0.187
	BI-214	0.507	0.101
	RA-224	5.80	3.55
INTERFERED BY U-235 →	RA-226S	3.287E+03	319.
	AC-228	0.338	0.107
	U-234	3.678E+03	723.
	U-235	194.	17.3
	ANH	0.109	4.854E-02
	Total Activity :	7.171E+03	

Minimum Detectable Activity Report

Nuclide	Bckgnd Sum	Energy (keV)	MDA (pCi/GRAM)
CO-60	6.	1332.50	3.4977E-02
EU-154	9.	1274.44	1.1354E-01
PB-214	239.	351.87	2.0079E-01
TH	4364.	63.20	9.6491E+00
AM	3938.	59.54	1.4304E+00

Approved by: [signature] Approval Date: 11 / 17 / 98

ample ID : 9811-0210W Acquisition date : 17-NOV-1998 08:08:59

MS Gamma Spectroscopy Report generated 17-NOV-1998 08:19:21

onf ıtion : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_98110210W_DET1_500MLMAR_69.CNF;1

---- Sample Information ----

ample Title	: BV-SS-1027 98-0542W		
ample ID	: 9811-0210W	Sample Quantity	: 5.97820E+02 gram
ample Type	: soil	Sample Geometry	:
ample Number	: 69	Spctrm Collector	: gamma
ample Collector	:	Sample Analyst	: gamma

---- Sample Deposition Information ----

ep. Correction?	: No	Dep. Duration	:
eposition Start	:	Deposition End	: 16-NOV-1998 12:00:00

---- Sample Decay/Count Information ----

ample Date	: 16-NOV-1998 12:00:00	Acquisition date	: 17-NOV-1998 08:08:59
ecay time	: 0 20:08:59.41	% dead time	: 0.9%
lapsed live time	: 0 00:10:00.00	Elapsed real time	: 0 00:10:05.34

---- Detector Parameters ----

nergy cal. time	: 5-SEP-1997 13:21:13.	Energy cal. oper.	: gamma
etector name	: det1	Counting geometry	: 500ml_Mar
ffic. cal. time	: 1-AUG-1997 08:21:35.	Effic. cal. oper.	: gamma

---- Processing Parameters ----

tart channel	: 5	End channel	: 4096
ensitivity	: 4.50000	Gaussian Sens.	: 10.00000
ritical level?	: Yes	Propagate Errors?	: Yes
mpi al Eff?	: No	Library-based eff	: No
ne olerance	: 1.00000	Half life ratio	: 10.00000
bun ce limit	: 60.00000	WTM error limit	: 3.00000
DA Width (FWHM)	: 3.00000	MDA Confid Level	: 5.00000 %

ief Nuclide Activity Report
ample ID : 9811-0210W

Acquisition date : 17-NOV-1998 08:08:59

rief ort

	Nuclide	Activity pCi/gram	2-Sigma Error
	K-40	3.82	0.988
	CS-137	0.396	0.119
No →	HG-203	0.120	9.041E-02
	TL-208	0.404	8.783E-02
	BI212	1.79	0.761
	PB-212	0.708	0.253
	BI-214	0.594	0.171
	PB-214	0.728	0.181
NTERFERED BY U-235 →	RA-226S	2.942E+03	169.
	AC-228	0.509	0.192
	U-234	4.221E+03	890.
	U-235	173.	14.5
	U-238C	14.3	8.16

	Total Activity :	7.359E+03	

$\frac{U^{238}}{U^{235}} = 0.083$ 65% U^{235}

Minimum Detectable Activity Report

Nuclide	Bckgnd Sum	Energy (keV)	MDA (pCi/gram)
CO-60	8.	1332.50	9.6781E-02
EU-1[illegible]	4.	1274.44	1.9237E-01
TH-[illegible]	2023.	63.20	1.3271E+01
AM-2[illegible]	1906.	59.54	2.0301E+00

Approved by: W.Y. Frenchel Approval Date: 11 / 17 / 98

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

February 5, 1999

Mr. Joe Nardi
Westinghouse Electric Company
Energy Center West, Bay 508 B
P. O. Box 355
Pittsburgh, PA 15230

Soil Characterization; Purchase Order No. 122284-SA286
Blairsville SMP; Waltz Mill; Energy Center
Antech Ltd. Project No. 98-0475W

Dear Mr. Nardi:

Enclosed are analytical results for samples submitted by Westinghouse Electric Company. Samples were received and logged in for analysis on October 19, 1998.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Shannon W. Thompson
Lead Analyst/Project Manager

SWT:ejg

Enclosures

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 98-0475W
CLIENT: Purchase Order Number: 122284-SA286

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
9810-0302W	BV-SS-499	9810-0303W	BV-SS-1000
9810-0304W	BV-SS-1001	9810-0305W	BV-SS-1002
9810-0306W	BV-SS-1003	9810-0307W	BV-SS-1004
9810-0308W	BV-SS-1005	9810-0309W	BV-SS-1006
9810-0310W	BV-SS-3109	9810-0311W	BV-SS-3110
9810-0312W	BV-SS-3111	9810-0313W	BV-SS-3112

C: SHIPPING/RECEIVING COMMENTS:

None

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
Ra-224 in sample 9810-0311W =2.12E0 (+/-1.0E0).

Ra-226 is indeterminable as a result of U-235 activity.

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format.

Table 1
General Data Table
Westinghouse Electric Company
Antech Ltd. Project No. 98-0475W
Soil Characterization; Blairsville SMP
Charge Order No. 122284-SA286; Waltz Mill

Parameter	Sample Identification 9810-0302W BV-SS-499 (10/16/98)	9810-0303W BV-SS-1000 (10/16/98)	9810-0304W BV-SS-1001 (10/16/98)	9810-0305W BV-SS-1002 (10/16/98)
K-40(1)	5.78E0 ± 9.8E-1	5.88E0 ± 9.7E-1	9.36E0 ± 1.3E0	1.00E1 ± 1.3E0
Co-60	<4.9E-2	<5.7E-2	<6.3E-2	<4.9E-2
Cs-137	1.99E-1 ± 5.5E-2	<7.7E-2	2.25E-1 ± 7.4E-2	1.06E-1 ± 8.2E-2
Eu-154	<1.5E-1	<1.3E-1	<2.1E-1	<1.2E-1
Tl-208	2.42E-1 ± 5.4E-2	2.13E-1 ± 6.4E-2	3.09E-1 ± 6.6E-2	2.69E-1 ± 6.5E-2
Bi-212	<8.9E-1	<1.4E0	<1.2E0	<9.9E-1
Pb-212	5.21E-1 ± 1.2E-1	5.08E-1 ± 1.5E-1	6.17E-1 ± 1.4E-1	5.38E-1 ± 1.3E-1
Bi-214	5.68E-1 ± 1.2E-1	5.14E-1 ± 1.4E-1	7.88E-1 ± 1.4E-1	7.05E-1 ± 1.3E-1
Pb-214	5.76E-1 ± 1.0E-1	5.12E-1 ± 1.3E-1	6.37E-1 ± 1.1E-1	7.14E-1 ± 1.1E-1
Ac-228	7.35E-1 ± 1.1E-1	6.14E-1 ± 1.2E-1	8.11E-1 ± 1.8E-1	7.30E-1 ± 1.5E-1
U-234	2.78E0 ± 2.0E-1	1.95E1 ± 1.0E0	<3.2E-1	<3.0E-1
U-235	9.10E0 ± 2.6E0	2.13E2 ± 3.1E1	<8.5E0	<9.3E0
U-238	<3.2E-1	<9.7E-1	<2.7E-1	<2.4E-1
Am-241				

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9810-0306W BV-SS-1003 (10/16/98)	9810-0307W BV-SS-1004 (10/16/98)	9810-0308W BV-SS-1005 (10/16/98)	9810-0309W BV-SS-1006 (10/16/98)
K-40(1)	9.34E0 ± 1.3E0	8.12E0 ± 1.2E0	8.88E0 ± 1.2E0	6.36E0 ± 1.1E0
Co-60	<6.1E-2	<6.1E-2	<5.6E-2	<6.8E-2
Cs-137	1.14E-1 ± 5.9E-2	1.18E-1 ± 5.9E-2	1.01E-1 ± 5.8E-2	1.19E-1 ± 1.1E-1
Eu-154	<1.2E-1	<1.5E-1	<1.2E-1	<2.1E-1
Tl-208	3.06E-1 ± 6.5E-2	3.10E-1 ± 6.3E-2	2.73E-1 ± 6.1E-2	2.37E-1 ± 1.1E-1
Bi-212	9.63E-1 ± 5.8E-1	<9.4E-1	<1.2E0	<1.9E0
Pb-212	7.71E-1 ± 1.3E-1	8.49E-1 ± 1.1E-1	6.45E-1 ± 1.3E-1	4.16E-1 ± 2.0E-1
Bi-214	6.96E-1 ± 1.3E-1	6.77E-1 ± 1.3E-1	7.68E-1 ± 1.2E-1	6.96E-1 ± 1.6E-1
Pb-214	7.04E-1 ± 9.6E-2	6.81E-1 ± 8.9E-2	6.62E-1 ± 9.2E-2	8.08E-1 ± 2.0E-1
Ac-228	7.34E-1 ± 1.5E-1	7.72E-1 ± 1.4E-1	8.21E-1 ± 1.3E-1	7.42E-1 ± 2.8E-1
U-234	<3.1E-1	<3.0E-1	<2.8E-1	8.46E2 ± 3.3E2
U-235	<7.9E0	<8.7E0	<8.6E0	3.99E1 ± 2.1E0
U-238	<2.8E-1	<2.5E-1	<2.3E-1	9.97E2 ± 6.0E1
Am-241				<1.8E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9810-0310W BV-SS-3109 (10/16/98)	9810-0311W BV-SS-3110 (10/16/98)	9810-0312W BV-SS-3111 (10/16/98)	9810-0313W BV-SS-3112 (10/16/98)
K-40(1)	7.07E0 ± 1.1E0	6.21E0 ± 1.1E0	6.02E0 ± 1.0E0	6.79E0 ± 1.0E0
Co-60	<5.4E-2	<8.8E-2	<4.2E-2	<6.8E-2
Cs-137	7.52E-2 ± 8.1E-2	<1.6E-1	1.60E-1 ± 7.8E-2	<1.2E-1
Eu-154	<1.5E-1	<2.1E-1	<1.9E-1	<1.8E-1
Tl-208	2.22E-1 ± 9.1E-2	2.28E-1 ± 1.2E-1	2.45E-1 ± 8.5E-2	1.84E-1 ± 1.1E-1
Bi-212	<1.5E0	<1.9E0	<1.3E0	<1.8E0
Pb-212	4.22E-1 ± 1.7E-1	6.33E-1 ± 1.2E-1	6.34E-1 ± 1.6E-1	4.24E-1 ± 2.0E-1
Bi-214	7.15E-1 ± 1.6E-1	6.61E-1 ± 2.4E-1	6.54E-1 ± 1.5E-1	5.08E-1 ± 1.8E-1
Pb-214	4.50E-1 ± 1.7E-1	6.89E-1 ± 2.5E-1	6.96E-1 ± 1.5E-1	8.00E-1 ± 1.9E-1
Ac-228	8.64E-1 ± 2.2E-1	<5.0E-1	7.21E-1 ± 2.1E-1	5.93E-1 ± 2.1E-1
U-234	6.21E2 ± 2.5E2	8.07E2 ± 3.4E2	5.83E2 ± 2.2E2	8.57E2 ± 3.1E2
U-235	2.41E1 ± 1.3E0	4.59E1 ± 4.1E0	2.02E1 ± 1.1E0	3.86E1 ± 1.9E0
U-238	6.45E2 ± 5.3E1	1.29E3 ± 9.4E1	4.54E2 ± 4.0E1	1.03E3 ± 7.6E1
Am-241	<1.4E0	<1.9E0	<1.1E0	<1.6E0

(1)Antech Method A-524 (Gamma Spectrometry), units are pCi/gram, and error estimates are 2 standard deviations.

Figure 3.1

Antech Ltd., Waltz Mill Site Chain of Custody Record

Client 2284-SH28E

Charge # _____

Project Name: Bluffsville SMP Project #: _____ Sampler: Todd Brautigam (Printed Name) Todd Brautigam (Signature)

Relinquished by:(Signature and Printed Name) Todd Brautigam Date 10-17-98 Time 1450

Received by:(Signature and Printed Name) A. Ashton/Aug. Kinsley Date 10/19/98 Time 2:47

Relinquished by:(Signature and Printed Name) Date Time

Received by:(Signature and Printed Name) Date Time

Lab Use Only
Project # 98-04475

DUE 11/19/98

Requested Laboratory Analysis

Sample ID Number	Sample Description: Date	Time	Description	Type: Composite	Grab	WETCHEM: pH	conductivity	TDS	TSS	Hardness	anions(F,Cl,SO4)	METALS: ICP scan (metals)	ICP scan (elemental)	AA (elemental)	RADIOCHEMISTRY: gross alpha	gross beta	gamma spec*	H-3*	C-14*	Fe-55*	Ni-59	Ni-63*	Sr-89/90*	Tc-99*	I-129*	Americium*	Neptunium	Plutonium*	Uranium	10CFR61 *(included)	# of Containers	Lab Use Only: LAB I.D.
BV-SS-999	10-16	0800	Dirt		X										X																	9810-0300
BV-SS-1000	10-16	1000	Dirt	X											X																	9810-0302
BV-SS-1001	10-16	1020	Dirt	X											X																	9810-0304
BV-SS-1002	10-16	1030	Dirt	X											X																	9810-0305
BV-SS-1003	10-16	1050	Dirt	X											X																	9810-0306
BV-SS-1004	10-16	1100	Dirt	X											X																	9810-0307
BV-SS-1005	10-16	1110	Dirt	X											X																	9810-0308
BV-SS-1006	10-16	1120	Dirt	X											X																	9810-0309
BV-SS-3109	10-16	1400	Dirt	X											X																	9810-0310
BV-SS-3110	10-16	1410	Dirt	X											X																	9810-0311
BV-SS-3111	10-16	1420	Dirt	X											X																	9810-0312

Special Instructions: Standard TAT

Nuclear Safety Related? ☐ Yes ☒ No

Site Remediation? ☒ Yes ☐ No

Sample Disposition: ☐ Return to Client ☐ Disposal ☒ Archive per P.O.

Results to: Joe Nardi, Energy Center

Invoice to: _____

Lab Use Only
Sample Condition Upon Receipt

FOR RADIOANALYSIS(i.e. gamma, gross alpha/beta) Required Limit of Detection (LOD)?

Client 122284-SA28

Charge #

Figure 3

Antech Ltd., Waltz Mill Site Chain of Custody Record

Project Name: Blairsville SMP

Project #:

Sampler: Todd Brautigam (Printed Name) [signature] (Signature)

Relinquished by: (Signature and Printed Name) Date Time

Received by: (Signature and Printed Name) A. Pishninzi [signature] Date 10/19/98 Time 2:47

Relinquished by: (Signature and Printed Name) [signature] Date 10-19-98 Time 1450

Received by: (Signature and Printed Name) Date Time

Lab Use Only
Project # [illegible]

Sample ID Number	Sample Description: Date	Time	Description	Type	Composite	Grab	pH	conductivity	TDS	TSS	Hardness	anions(F,Cl,SO4)	ICP scan (metals)	ICP scan (elemental)	AA (elemental)	gross alpha	gross beta	gamma spec*	H-3*	C-14*	Fe-55*	Ni-59	Ni-63*	Sr-89/90*	Tc-99*	I-129*	Americium*	Neptunium	Plutonium*	Uranium	10CFR61 *(included)	# of Containers	Lab Use Only LAB I.D.
BV55-3112	10-16	1430	Pirt	X																													9810-0315

Requested Laboratory Analysis: WETCHEM, METALS, RADIOCHEMISTRY

Special Instructions

Nuclear Safety Related? ☐ Yes ☐ No

Site Remediation? ☐ Yes ☐ No

Sample Disposition
☐ Return to Client
☐ Disposal
☒ Archive per P.O.

Results to: Joe Nardi
Energy Center

Invoice to:

Lab Use Only
Sample Condition Upon Receipt

FOR RADIOANALYSIS(i.e. gamma, gross alpha/beta)
Required Limit of Detection (LOD)?

Antech Ltd.

Waltz Mill Site

FAX Cover Sheet

Page 1 of 9 (including cover)

To: IRWIN DOBRUSHIN

From: TOM FRENCHEK

Antech Ltd., Waltz Mill Site
P. O. Box 158
Madison, PA 15663-0158

Phone: (724)722-5219 Lab Mgr
WIN 224-5219

FAX: (724)722-5208
WIN 224-5208

(724)722-5212 WM Remediation Project Mgr
WIN 224-5212

(724)722-5214 Laboratory
WIN 224-5214

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

February 5, 1999

Mr. Joe Nardi
Westinghouse Electric Company
Energy Center West, Bay 508 B
P. O. Box 355
Pittsburgh, PA 15230

Soil Characterization; Purchase Order No. 122284-SA286
Blairsville Soils; Blairsville; Energy Center
Antech Ltd. Project No. 98-0518W

Dear Mr. Nardi:

Enclosed are analytical results for samples submitted by Westinghouse Electric Company. Samples were received on November 4, 1998 and logged in for analysis on November 5, 1998.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Shannon W. Thompson
Lead Analyst/Project Manager

SWT:swt

Enclosures

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

March 15, 1999

Mr. Joe Nardi
Westinghouse Electric Company
Energy Center West, Bay 508 B
P. O. Box 355
Pittsburgh, PA 15230

Soil Characterization; Purchase Order No. 122284-SA286
Blairsville Soil Samples; Blairsville; Energy Center
Antech Ltd. Project No. 99-0133W

Dear Mr. Nardi:

Enclosed are analytical results for samples submitted by Westinghouse Electric Company. Samples were received on February 25, 1999 and logged in for analysis on February 26, 1999.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Shannon W. Thompson
Lead Analyst/Project Manager

SWT:rks

Enclosures

Table 1
GAMMA Spectrometry Data Table
Westinghouse Electric Company
Antech Ltd. Project No. 99-0049W
Soil Characterization; Blairsville SMP
Charge Order No. 122284-SA286; Blairsville

Parameter	Sample Identification				
	9901-0265W bv-ss-1044 (1/21/99)	9901-0266W bv-ss-1045 (1/21/99)	9901-0267W bv-ss-1046 (1/21/99)	9901-0268W bv-ss-1047 (1/21/99)	9901-0269W bv-ss-1048 (1/21/99)
K-40(1)	8.34E0 ± 1.5E0	1.08E+1 ± 1.7E0	9.03E0 ± 1.4E0	6.09E0 ± 1.1E0	6.49E0 ± 1.5E0
Co-60	<1.3E-1	<8.3E-2	<7.1E-2	<6.3E-2	<9.3E-2
Cs-137	4.58E-1 ± 1.6E-1	<1.0E-1	<9.4E-2	1.39E-1 ± 6.6E-2	3.64E-1 ± 1.2E-1
Tl-208	4.40E0 ± 3.5E-1	3.30E-1 ± 1.1E-1	<1.8E-1	1.67E-1 ± 6.6E-2	<2.1E-1
Bi-212	1.26E+1 ± 2.3E0	1.40E0 ± 1.1E0	<1.5E0	<1.0E0	<2.1E0
Pb-212	1.21E+1 ± 1.3E+0	9.72E-1 ± 2.4E-1	6.43E-1 ± 2.0E-1	3.13E-1 ± 1.4E-1	7.87E-1 ± 2.2E-1
Bi-214	6.10E-1 ± 2.4E-1	8.54E-1 ± 2.2E-1	<9.1E-1	5.08E-1 ± 1.2E-1	7.02E-1 ± 1.8E-1
Pb-214	6.86E-1 ± 3.1E-1	7.21E-1 ± 2.0E-1	4.85E-1 ± 1.4E-1	3.46E-1 ± 1.3E-1	6.89E-1 ± 1.8E-1
Ac-228	1.23E+1 ± 6.5E-1	9.60E-1 ± 2.6E-1	8.56E-1 ± 1.8E-1	<3.9E-1	7.84E-1 ± 2.7E-1
U-235	4.89E0 ± 5.3E-1	<7.5E-1	<6.8E-1	<5.9E-1	2.96E0 ± 3.7E-1
U-238	9.47E+1 ± 1.2E+1	<1.5E+1	<1.5E+1	<9.2E0	<2.0E+1
Am-241	<1.9E0	<6.8E-1	<5.8E-1	<4.1E-1	<8.8E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0270W bv-ss-1049 (1/21/99)	9901-0271W bv-ss-1050 (1/21/99)	9901-0272W bv-ss-1051 (1/21/99)	9901-0273W bv-ss-1052 (1/21/99)	9901-0274W bv-ss-1053 (1/21/99)
K-40(1)	5.68E0 ± 1.0E0	7.48E0 ± 1.3E0	4.94E0 ± 1.0E0	9.16E0 ± 1.4E0	7.05E0 ± 1.2E0
Co-60	<6.3E-2	<6.5E-2	<7.0E-2	<7.3E-2	<6.8E-2
Cs-137	<6.0E-2	<6.3E-2	<5.7E-2	<7.8E-2	<9.2E-2
Tl-208	1.91E-1 ± 6.6E-2	2.46E-1 ± 8.6E-2	<1.7E-1	<1.4E-1	2.48E-1 ± 7.5E-2
Bi-212	<1.2E0	<1.5E0	<1.2E0	<1.6E0	<1.5E0
Pb-212	3.99E-1 ± 1.5E-1	5.44E-1 ± 1.8E-1	5.14E-1 ± 1.6E-1	6.61E-1 ± 1.9E-1	6.36E-1 ± 1.8E-1
Bi-214	4.55E-1 ± 1.1E-1	6.42E-1 ± 1.4E-1	4.29E-1 ± 1.3E-1	8.05E-1 ± 1.6E-1	5.62E-1 ± 1.4E-1
Pb-214	4.43E-1 ± 1.2E-1	7.01E-1 ± 1.5E-1	5.26E-1 ± 1.3E-1	6.27E-1 ± 1.5E-1	7.51E-1 ± 1.5E-1
Ac-228	5.57E-1 ± 1.6E-1	8.02E-1 ± 2.0E-1	6.70E-1 ± 1.9E-1	<5.5E-1	7.32E-1 ± 1.8E-1
U-235	<4.2E-1	<4.9E-1	<6.0E-1	<5.4E-1	<6.5E-1
U-238	<9.5E0	<10.0E0	<1.2E+1	<1.2E+1	<1.2E+1
Am-241	<4.3E-1	<4.7E-1	<4.4E-1	<5.6E-1	<4.9E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0275W bv-ss-1054 (1/21/99)	9901-0276W bv-ss-1055 (1/21/99)	9901-0277W bv-ss-1056 (1/21/99)	9901-0280W bv-ss-1058 (1/21/99)	9901-0281W bv-ss-1059 (1/21/99)
K-40(1)	1.00E+1 ± 1.6E0	1.12E+1 ± 1.7E0	5.73E0 ± 1.0E0	9.92E0 ± 1.7E0	1.22+1 ± 1.7E0
Co-60	<1.0E-1	<8.7E-2	<5.7E-2	<7.4E-2	<7.6E-2
Cs-137	<9.4E-2	<8.9E-2	<7.1E-2	<1.0E-1	<8.1E-2
Tl-208	3.29E-1 ± 7.4E-2	3.73E-1 ± 7.7E-2	3.04E-1 ± 8.1E-2	4.15E-1 ± 1.1E-1	<1.9E-1
Bi-212	8.68E-1 ± 9.2E-1	<1.5E0	<1.4E0	1.17E0 ± 1.0E0	<1.7E0
Pb-212	7.11E-1 ± 2.1E-1	7.11E-1 ± 2.4E-1	7.53E-1 ± 1.3E-1	9.67E-1 ± 2.4E-1	7.98E-1 ± 2.4E-1
Bi-214	<10.0E-1	8.79E-1 ± 1.8E-1	6.00E-1 ± 1.5E-1	8.21E-1 ± 2.0E-1	7.45E-1 ± 1.7E-1
Pb-214	8.21E-1 ± 1.9E-1	9.24E-1 ± 1.8E-1	4.52E-1 ± 1.3E-1	1.19E0 ± 2.1E-1	8.11E-1 ± 1.7E-1
Ac-228	7.99E-1 ± 2.2E-1	1.11E0 ± 2.3E-1	6.94E-1 ± 2.0E-1	1.02E0 ± 1.7E-1	9.06E-1 ± 2.2E-1
U-235	<7.9E-1	<7.4E-1	<5.2E-1	<7.5E-1	<7.4E-1
U-238	<1.7E+1	<1.4E+1	<1.1E+1	<9.6E0	<9.9E0
Am-241	<6.2E-1	<6.0E-1	<4.9E-1	7.9E-1	<5.7E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0282W bv-ss-1060 (1/21/99)	9901-0283W bv-ss-1061 (1/21/99)	9901-0284W bv-ss-1062 (1/21/99)	9901-0285W bv-ss-1063 (1/21/99)	9901-0286W bv-ss-1064 (1/21/99)
K-40(1)	1.08E+1 ± 1.6E0	7.28E0 ± 1.3E0	6.52E0 ± 1.3E0	9.69E0 ± 1.6E0	5.85E0 ± 1.1E0
Co-60	<7.1E-2	<8.1E-2	<8.8E-2	<1.0E-1	<6.8E-2
Cs-137	<7.8E-2	<8.5E-2	2.99E-1 ± 9.7E-2	1.67E-1 ± 9.9E-2	<8.0E-2
Tl-208	4.47E-1 ± 7.9E-2	1.86E-1 ± 7.8E-2	3.45E-1 ± 7.8E-2	3.41E-1 ± 1.1E-1	2.59E-1 ± 6.4E-2
Bi-212	1.08E0 ± 9.6E-1	2.14E0 ± 9.3E-1	<1.9E0	<1.7E0	4.85E-1 ± 5.8E-1
Pb-212	6.48E-1 ± 2.1E-1	6.26E-1 ± 1.8E-1	8.82E-1 ± 1.6E-1	9.88E-1 ± 1.8E-1	5.78E-1 ± 1.5E-1
Bi-214	9.36E-1 ± 1.8E-1	6.35E-1 ± 1.6E-1	1.44E0 ± 1.9E-1	9.29E-1 ± 2.0E-1	<6.7E-1
Pb-214	9.01E-1 ± 1.7E-1	4.91E-1 ± 1.6E-1	1.63E0 ± 2.2E-1	1.07E-1 ± 1.9E-1	4.35E-1 ± 1.4E-1
Ac-228	1.04E0 ± 2.1E-1	6.95E-1 ± 2.3E-1	5.92E-1 ± 1.8E-1	6.55E-1 ± 2.1E-1	5.79E-1 ± 1.7E-1
U-235	<6.7E-1	<6.3E-1	1.52E0 ± 7.6E-1	<7.8E-1	<5.4E-1
U-238	<1.2E+1	<1.2E+1	<1.4E+1	<1.7E+1	<9.3E0
Am-241	<5.5E-1	<6.1E-1	<7.3E-1	<8.1E-1	<4.4E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0287W bv-ss-1065 (1/21/99)	9901-0288W bv-ss-1066 (1/21/99)	9901-0289W bv-ss-1067 (1/21/99)	9901-0290W bv-ss-1068 (1/21/99)	9901-0291W bv-ss-1069 (1/21/99)
K-40[1]	7.37E0 ± 1.3E0	7.92E0 ± 1.4E0	7.23E0 ± 1.3E0	6.67E0 ± 1.2E0	9.72E0 ± 1.7E0
Co-60	<8.9E-2	<5.3E-2	<6.7E-2	<6.7E-2	<1.1E-1
Cs-137	7.45E-2 ± 5.3E-2	<8.7E-2	<8.0E-2	<7.1E-2	3.19E-1 ± 1.0E-1
Tl-208	2.43E-1 ± 6.5E-2	1.51E-1 ± 7.9E-2	3.03E-1 ± 6.4E-2	3.09E-1 ± 7.4E-2	1.91E0 ± 1.7E-1
Bi-212	<1.5E0	<1.2E0	<1.5E0	<1.4E0	5.42E0 ± 1.7E0
Pb-212	5.30E-1 ± 1.8E-1	5.70E-1 ± 1.7E-1	7.11E-1 ± 1.8E-1	6.71E-1 ± 1.7E-1	5.18E0 ± 6.2E-1
Bi-214	5.37E-1 ± 1.4E-1	5.27E-1 ± 1.7E-1	<7.8E-1	4.87E-1 ± 1.2E-1	<9.2E-1
Pb-214	6.44E-1 ± 1.6E-1	4.86E-1 ± 1.2E-1	5.33E-1 ± 1.4E-1	4.54E-1 ± 1.3E-1	7.74E-1 ± 1.8E-1
Ac-228	4.90E-1 ± 1.7E-1	5.60E-1 ± 2.1E-1	<5.1E-1	7.49E-1 ± 1.8E-1	4.92E0 ± 3.8E-1
U-235	<7.2E-1	<5.6E-1	<6.3E-1	<5.2E-1	NA
U-238	<1.2E+1	<1.2E+1	<1.1E+1	9.2E0	<1.7E+1
Am-241	<5.1E-1	<5.1E-1	<5.1E-1	<5.3E-1	<9.4E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification				
	9901-0292W bv-ss-1070 (1/21/99)	9901-0293W bv-ss-1071 (1/21/99)	9901-0294W bv-ss-1072 (1/21/99)	9901-0295W bv-ss-1073 (1/21/99)	9901-0296W bv-ss-1074 (1/21/99)
K-40(1)	7.99E0 ± 1.4E0	7.40E0 ± 1.7E0	9.37E0 ± 1.4E0	7.38E0 ± 1.3E0	6.22E0 ± 1.2E0
Co-60	<8.3E-2	<1.0E-1	<8.3E-2	<6.9E-2	<5.0E-2
Cs-137	2.60E-1 ± 9.3E-2	6.40E-1 ± 1.3E-1	<8.4E-2	<7.4E-2	<6.1E-2
Tl-208	3.14E-1 ± 1.0E-1	3.68E-1 ± 1.1E-1	2.55E-1 ± 9.5E-2	2.12E-1 ± 7.3E-2	2.05E-1 ± 9.3E-2
Bi-212	1.28E0 ± 8.1E-1	<1.9E0	<1.6E0	<1.5E0	<1.5E0
Pb-212	9.59E-1 ± 1.7E-1	1.23E0 ± 2.2E-1	6.53E-1 ± 2.0E-1	6.87E-1 ± 1.3E-1	5.00E-1 ± 1.8E-1
Bi-214	8.30E-1 ± 1.7E-1	1.00E0 ± 2.4E-1	8.23E-1 ± 1.6E-1	7.67E-1 ± 1.7E-1	5.75E-1 ± 1.4E-1
Pb-214	8.45E-1 ± 1.6E-1	9.07E-1 ± 2.1E-1	6.53E-1 ± 1.6E-1	8.46E-1 ± 1.5E-1	5.50E-1 ± 1.5E-1
Ac-228	6.80E-1 ± 1.6E-1	1.14E0 ± 3.0E-1	7.62E-1 ± 2.0E-1	6.68E-1 ± 2.0E-1	6.65E-1 ± 1.8E-1
U-235	8.83E-1 ± 1.7E-1	1.25E+1 ± 1.1E0	<6.2E-1	<5.9E-1	<5.34E-1
U-238	7.85E0 ± 5.8E0	2.02E+1 ± 1.0E+1	<1.1E+1	<1.2E+1	<9.5E0
Am-241	<7.5E-1	<1.2E0	<6.1E-1	<5.9E-1	<5.3E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0297W bv-ss-1075 (1/21/99)	9901-0298W bv-ss-1076 (1/21/99)	9901-0299W bv-ss-1077 (1/21/99)	9901-0300W bv-ss-1078 (1/21/99)	9901-0301W bv-ss-1079 (1/21/99)
K-40(1)	8.26E0 ± 1.3E0	6.35E0 ± 1.2E0	7.52E0 ± 1.6E0	8.97E0 ± 1.3E0	5.51E0 ± 1.2E0
Co-60	<8.5E-2	<7.6E-2	<8.2E-2	<7.5E-2	<5.9E-2
Cs-137	2.03E-1 ± 9.8E-2	<6.7E-2	5.99E-1 ± 1.3E-1	<6.7E-2	9.57E-2 ± 6.0E-2
Tl-208	3.92E-1 ± 9.6E-2	2.07E-1 ± 8.4E-2	3.40E-1 ± 9.0E-2	3.76E-1 ± 8.4E-2	1.95E-1 ± 6.9E-2
Bi-212	1.17E0 ± 9.3E-1	<1.3E0	<1.9E0	<1.1E0	<1.6E0
Pb-212	8.73E-1 ± 1.5E-1	4.72E-1 ± 1.1E-1	9.37E-1 ± 2.0E-1	7.93E-1 ± 1.9E-1	5.58E-1 ± 2.0E-1
Bi-214	9.13E-1 ± 1.7E-1	7.29E-1 ± 1.5E-1	<1.2E0	5.98E-1 ± 1.6E-1	5.32E-1 ± 1.6E-1
Pb-214	7.26E-1 ± 1.5E-1	6.69E-1 ± 1.4E-1	8.27E-1 ± 2.1E-1	7.26E-1 ± 1.4E-1	7.11E-1 ± 1.7E-1
Ac-228	7.41E-1 ± 2.0E-1	4.95E-1 ± 2.0E-1	7.68E-1 ± 2.7E-1	7.41E-1 ± 1.9E-1	5.96E-1 ± 2.0E-1
U-235	1.47E0 ± 2.2E-1	<5.6E-1	1.61E+1 ± 1.3E0	<6.4E-1	8.09E0 ± 7.4E-1
U-238	2.52E+1 ± 6.3E0	<1.3E+1	5.87E+1 ± 7.2E0	<1.3E+1	4.76E+1 ± 5.8E0
Am-241	<8.9E-1	<5.5E-1	<1.5E0	<5.9E-1	<1.1E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0302W bv-ss-1080 (1/21/99)	9901-0303W bv-ss-1081 (1/21/99)	9901-0304W bv-ss-1082 (1/21/99)	9901-0305W bv-ss-1083 (1/21/99)	9901-0306W bv-ss-1084 (1/21/99)
K-40(1)	7.22E0 ± 1.2E0	8.12E0 ± 1.3E0	1.08E+1 ± 1.6E0	1.06E+1 ± 1.4E0	6.79E0 ± 1.2E0
Co-60	<7.3E-2	<8.9E-2	<6.7E-2	<7.5E-2	<7.6E-2
Cs-137	<6.2E-2	<6.1E-2	<7.7E-2	<8.0E-2	<7.7E-2
Tl-208	2.28E-1 ± 7.6E-2	2.59E-1 ± 6.3E-2	3.61E-1 ± 7.9E-2	2.86E-1 ± 8.5E-2	<1.5E-1
Bi-212	<1.4E0	<1.3E0	<1.6E0	<1.4E0	<1.2E0
Pb-212	5.46E-1 ± 1.7E-1	7.56E-1 ± 1.8E-1	9.48E-1 ± 1.6E-1	6.40E-1 ± 1.9E-1	5.80E-1 ± 1.6E-1
Bi-214	5.12E-1 ± 1.6E-1	<7.2E-1	6.29E-1 ± 1.5E-1	5.71E-1 ± 1.7E-1	<6.6E-1
Pb-214	6.13E-1 ± 1.4E-1	5.46E-1 ± 1.4E-1	6.92E-1 ± 1.5E-1	5.47E-1 ± 1.5E-1	5.79E-1 ± 1.3E-1
Ac-228	<4.6E-1	<5.5E-1	9.03E-1 ± 2.1E-1	7.46E-1 ± 2.0E-1	5.47E-1 ± 1.7E-1
U-235	<5.7E-1	<5.8E-1	<6.8E-1	<6.2E-1	<6.3E-1
U-238	<1.1E+1	<1.0E+1	<1.2E+1	<1.4E+1	<1.4E+1
Am-241	<5.5E-1	<5.3E-1	<5.3E-1	<5.7E-1	<5.3E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0307W bv-ss-1085 (1/21/99)	9901-0308W bv-ss-1086 (1/21/99)	9901-0309W bv-ss-1087 (1/21/99)	9901-0310W bv-ss-1088 (1/21/99)	9901-0311W bv-ss-1089 (1/21/99)
K-40(1)	5.46E0 ± 1.0E0	6.09E0 ± 8.8E-1	6.28E0 ± 1.2E0	7.67E0 ± 1.2E0	6.93E0 ± 1.2E0
Co-60	<5.3E-2	<4.5E-2	<4.4E-2	<7.0E-2	<5.9E-2
Cs-137	<8.4E-2	<6.9E-2	<7.9E-2	<8.1E-2	<8.3E-2
Tl-208	8.28E-2 ± 5.9E-2	2.51E-1 ± 4.6E-2	2.24E-1 ± 7.3E-2	2.89E-1 ± 7.7E-2	2.49E-1 ± 6.8E-2
Bi-212	<9.4E-1	7.49E-1 ± 5.4E-1	<1.2E0	<1.4E0	<1.4E0
Pb-212	3.16E-1 ± 1.2E-1	5.44E-1 ± 1.3E-1	6.05E-1 ± 1.7E-1	6.71E-1 ± 1.7E-1	4.14E-1 ± 1.5E-1
Bi-214	3.66E-1 ± 1.00E-1	5.87E-1 ± 9.7E-2	6.61E-1 ± 1.6E-1	6.53E-1 ± 1.5E-1	5.92E-1 ± 1.3E-1
Pb-214	<2.0E-1	6.08E-1 ± 1.2E-1	7.05E-1 ± 1.5E-1	5.66E-1 ± 1.5E-1	5.35E-1 ± 1.3E-1
Ac-228	2.45E-1 ± 1.4E-1	6.47E-1 ± 1.3E-1	7.57E-1 ± 1.6E-1	6.22E-1 ± 1.7E-1	6.86E-1 ± 1.7E-1
U-235	NA	1.74E0 ± 2.0E-1	<6.1E-1	<5.8E-1	<6.3E-1
U-238	<9.5E0	7.30E0 ± 1.7E0	<1.1E+1	<1.1E+1	<1.0E+1
Am-241	<4.6E-1	<5.0E-1	<5.3E-1	<5.9E-1	<4.7E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification				
	9901-0312W bv-ss-1090 (1/21/99)	9901-0313W bv-ss-1091 (1/21/99)	9901-0314W bv-ss-1092 (1/21/99)	9901-0315W bv-ss-1093 (1/21/99)	9901-0316W bv-ss-1094 (1/21/99)
K-40(1)	6.30E0 ± 1.2E0	5.65E0 ± 1.1E0	8.45E0 ± 1.5E0	6.59E0 ± 1.2E0	7.97E0 ± 1.4E0
Co-60	<4.5E-2	<3.7E-2	<7.7E-2	<6.4E-2	<7.7E-2
Cs-137	1.20E-1 ± 6.6E-2	<6.1E-2	1.82E-1 ± 7.2E-2	<7.4E-2	<1.4E-1
Tl-208	1.82E-1 ± 5.4E-2	1.71E-1 ± 7.3E-2	3.32E-1 ± 7.7E-2	2.26E-1 ± 8.0E-2	2.93E-1 ± 8.7E-2
Bi-212	<1.1E0	<1.3E0	9.66E-1 ± 6.9E-1	<1.4E0	<2.0E0
Pb-212	4.12E-1 ± 1.5E-1	5.44E-1 ± 1.1E-1	7.70E-1 ± 2.3E-1	5.53E-1 ± 1.7E-1	8.55E-1 ± 2.4E-1
Bi-214	5.55E-1 ± 1.4E-1	4.56E-1 ± 1.3E-1	7.82E-1 ± 1.7E-1	5.98E-1 ± 1.5E-1	<9.9E-1
Pb-214	4.80E-1 ± 1.3E-1	3.54E-1 ± 1.2E-1	8.88E-1 ± 1.8E-1	5.78E-1 ± 1.4E-1	7.69E-1 ± 2.4E-1
Ac-228	3.85E-1 ± 1.6E-1	5.16E-1 ± 1.7E-1	<5.9E-1	5.49E-1 ± 1.8E-1	8.02E-1 ± 2.3E-1
U-235	<6.8E-1	<5.3E-1	2.03E0 ± 2.8E-1	<5.5E-1	1.51E+1 ± 1.2E0
U-238	<1.3E+1	<8.6E0	<1.6E+1	<1.2E+1	3.50E+2 ± 3.2E+1
Am-241	<4.8E-1	<5.0E-1	<6.7E-1	<5.2E-1	<2.3E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0317W bv-ss-1095 (1/21/99)	9901-0318W bv-ss-1096 (1/21/99)	9901-0319W bv-ss-1097 (1/21/99)	9901-0320W bv-ss-1098 (1/21/99)	9901-0321W bv-ss-1099 (1/21/99)
K-40(1)	1.02E+1 ± 1.4E0	4.22E0 ± 8.4E-1	8.22E0 ± 1.3E0	5.86E0 ± 1.1E0	7.45E0 ± 1.4E0
Co-60	<8.2E-2	<4.9E-2	<7.0E-2	<4.9E-2	<7.3E-2
Cs-137	<8.8E-2	<6.3E-2	<6.8E-2	<7.1E-2	1.25E-1 ± 5.7E-2
Tl-208	3.41E-1 ± 9.4E-2	1.58E-1 ± 5.1E-2	3.67E-1 ± 7.2E-2	1.55E-1 ± 6.8E-2	3.63E-1 ± 7.8E-2
Bi-212	<1.5E0	<1.0E0	<1.2E0	<1.3E0	<1.4E0
Pb-212	6.90E-1 ± 2.1E-1	3.70E-1 ± 1.3E-1	8.30E-1 ± 1.5E-1	4.72E-1 ± 1.6E-1	9.21E-1 ± 2.0E-1
Bi-214	7.57E-1 ± 1.4E-1	4.11E-1 ± 1.1E-1	<8.3E-1	4.50E-1 ± 1.5E-1	<7.7E-1
Pb-214	6.50E-1 ± 1.7E-1	3.46E-1 ± 1.0E-1	5.17E-1 ± 1.8E-1	4.90E-1 ± 1.3E-1	8.39E-1 ± 1.7E-1
Ac-228	6.75E-1 ± 2.1E-1	<3.3E-1	6.93E-1 ± 2.0E-1	4.82E-1 ± 1.6E-1	9.52E-1 ± 2.5E-1
U-235	3.78E0 ± 4.0E-1	<4.6E-1	<8.4E-1	<5.5E-1	1.00E0 ± 1.9E-1
U-238	NA ± 7.89E+1	<1.1E+1	<1.1E+1	<9.6E0	<1.4E+1
Am-241	<1.2E+1	<4.5E-1	<6.3E-1	<5.0E-1	<6.4E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0322W bv-ss-1100 (1/21/99)	9901-0323W bv-ss-1101 (1/21/99)	9901-0324W bv-ss-1102 (1/21/99)	9901-0325W bv-ss-1103 (1/21/99)	9901-0326W bv-ss-1104 (1/21/99)
K-40(1)	6.27E0 ± 1.0E0	7.21E0 ± 1.4E0	5.37E0 ± 1.1E0	5.81E0 ± 1.2E0	8.42E0 ± 1.5E0
Co-60	<6.0E-2	<9.1E-2	<7.3E-2	<8.2E-2	<8.6E-2
Cs-137	<6.0E-2	<1.1E-1	<8.5E-2	7.57E-2 ± 6.8E-2	<7.3E-2
Tl-208	1.95E-1 ± 6.9E-2	2.68E-1 ± 7.1E-2	<1.6E-1	4.02E-1 ± 9.0E-2	2.47E-1 ± 6.4E-2
Bi-212	<1.3E0	<1.5E0	<1.4E0	<1.4E0	<1.5E0
Pb-212	6.15E-1 ± 1.6E-1	5.41E-1 ± 1.9E-1	4.61E-1 ± 1.8E-1	6.89E-1 ± 2.0E-1	5.47E-1 ± 1.8E-1
Bi-214	4.87E-1 ± 1.3E-1	8.08E-1 ± 1.7E-1	5.43E-1 ± 1.3E-1	8.25E-1 ± 1.6E-1	4.91E-1 ± 1.5E-1
Pb-214	5.62E-1 ± 1.3E-1	7.58E-1 ± 1.8E-1	4.48E-1 ± 1.4E-1	6.73E-1 ± 1.7E-1	4.66E-1 ± 1.5E-1
Ac-228	6.61E-1 ± 1.7E-1	<5.4E-1	6.17E-1 ± 1.9E-1	6.50E-1 ± 1.9E-1	<5.8E-1
U-235	<5.2E-1	<8.1E-1	<6.1E-1	5.54E0 ± 5.4E-1	<7.2E-1
U-238	<1.1E+1	<1.3E1	<1.1E+1	<1.7E+1	<1.3E+1
Am-241	<5.4E-1	<6.0E-1	<5.3E-1	<1.0E0	<4.9E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0327W bv-ss-1105 (1/21/99)	9901-0328W bv-ss-1106 (1/21/99)	9901-0329W bv-ss-1107 (1/21/99)	9901-0330W bv-ss-1108 (1/21/99)	9901-0331W bv-ss-1109 (1/21/99)
K-40(1)	5.89E0 ± 1.1E0	9.91E0 ± 1.4E0	8.50E0 ± 1.5E0	5.20E0 ± 1.1E0	1.26E+1 ± 1.6E0
Co-60	<6.8E-2	<8.9E-2	<5.1E-2	<7.1E-2	<8.0E-2
Cs-137	8.26E-2 ± 5.7E-2	<8.4E-2	<9.5E-2	<8.1E-2	8.42E-2 ± 7.5E-2
Tl-208	1.92E-1 ± 8.6E-2	3.19E-1 ± 1.0E-1	2.78E-1 ± 7.4E-2	1.91E-1 ± 5.5E-2	4.24E-1 ± 1.1E-1
Bi-212	<1.2E0	<1.7E0	<1.6E0	<1.4E0	<1.7E0
Pb-212	5.90E-1 ± 1.8E-1	9.34E-1 ± 2.1E-1	7.50E-1 ± 2.2E-1	4.47E-1 ± 1.6E-1	1.10E0 ± 2.5E-1
Bi-214	7.45E-1 ± 1.5E-1	6.71E-1 ± 1.8E-1	7.00E-1 ± 1.6E-1	<6.3E-1	8.20E-1 ± 1.8E-1
Pb-214	7.05E-1 ± 1.6E-1	6.79E-1 ± 1.7E-1	8.11E-1 ± 1.6E-1	5.18E-1 ± 1.3E-1	8.93E-1 ± 1.9E-1
Ac-228	7.18E-1 ± 1.8E-1	8.33E-1 ± 2.2E-1	7.27E-1 ± 1.9E-1	<4.2E-1	<6.4E-1
U-235	1.76E0 ± 2.2E-1	<6.3E-1	<7.4E-1	<5.4E-1	<7.2E-1
U-238	<1.1E+1	<1.2E+1	<1.4E+1	<1.1E+1	<1.4E+1
Am-241	<7.1E-1	<6.7E-1	<5.7E-1	<4.7E-1	<7.8E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0332W bv-ss-1110 (1/21/99)	9901-0333W bv-ss-1111 (1/21/99)	9901-0334W bv-ss-1112 (1/21/99)	9901-0335W bv-ss-1113 (1/21/99)	9901-0336W bv-ss-1114 (1/21/99)
K-40(1)	8.54E0 ± 2.0E0	9.65E0 ± 1.7E0	6.81E0 ± 1.2E0	9.82E0 ± 1.5E0	1.14E+1 ± 1.7E0
Co-60	<1.1E-1	<8.3E-2	<6.4E-2	<6.6E-2	<1.0E-1
Cs-137	1.14E-1 ± 9.8E-2	1.56E-1 ± 7.9E-2	<7.4E-2	8.8E-2	<9.4E-2
Tl-208	<2.4E-1	4.06E-1 ± 8.6E-1	2.29E-1 ± 7.8E-2	2.88E-1 ± 9.1E-2	4.39E-1 ± 8.9E-1
Bi-212	8.64E-1 ± 1.0E0	<1.7E0	<1.2E0	<1.7E0	1.94E0 ± 1.1E0
Pb-212	9.96E-1 ± 3.0E-1	8.37E-1 ± 2.4E-1	4.97E-1 ± 1.6E-1	9.48E-1 ± 2.2E-1	8.18E-1 ± 2.4E-1
Bi-214	9.70E-1 ± 2.8E-1	<9.8E-1	3.89E-1 ± 1.4E-1	7.58E-1 ± 1.6E-1	6.58E-1 ± 1.7E-1
Pb-214	1.04E0 ± 2.4E-1	8.96E-1 ± 1.9E-1	4.26E-1 ± 1.4E-1	7.60E-1 ± 1.6E-1	9.24E-1 ± 2.1E-1
Ac-228	<8.9E-1	<6.0E-1	5.27E-1 ± 2.0E-1	9.99E-1 ± 2.2E-1	9.41E-1 ± 2.1E-1
U-235	<9.2E-1	<7.4E-1	<4.6E-1	<6.4E-1	<7.4E-1
U-238	<2.0E+1	<1.2E+1	<1.2E+1	<1.5E+1	<1.5E+1
Am-241	<8.9E-1	<5.9E-1	<5.6E-1	<6.6E-1	<6.1E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0337W bv-ss-1115 (1/21/99)	9901-0338W bv-ss-1116 (1/21/99)	9901-0339W bv-ss-1117 (1/21/99)	9901-0340W bv-ss-1118 (1/21/99)	9901-0341W bv-ss-1119 (1/21/99)
K-40(1)	6.18E0 ± 1.5E0	4.12E0 ± 9.6E-1	8.95E0 ± 1.5E0	4.67E0 ± 1.0E0	5.80E0 ± 1.0E0
Co-60	<1.3E-1	<6.6E-2	<8.7E-2	<6.3E-2	<7.0E-2
Cs-137	5.43E-1 ± 1.3E-1	<7.1E-2	<9.2E-2	<6.3E-2	<7.7E-2
Tl-208	2.52E-1 ± 1.1E-1	<1.3E-1	4.17E-1 ± 1.1E-1	1.68E-1 ± 6.2E-2	2.55E-1 ± 8.0E-1
Bi-212	<2.0E0	<1.3E0	<1.7E0	<1.2E0	<1.0E0
Pb-212	5.83E-1 ± 1.4E-1	4.22E-1 ± 1.5E-1	8.67E-1 ± 2.3E-1	3.90E-1 ± 1.6E-1	6.26E-1 ± 1.2E-1
Bi-214	8.37E-1 ± 2.0E-1	<7.0E-1	8.90E-1 ± 2.1E-1	<6.6E-1	5.19E-1 ± 1.4E-1
Pb-214	6.20E-1 ± 1.7E-1	3.38E-1 ± 1.1E-1	6.99E-1 ± 1.8E-1	4.13E-1 ± 1.3E-1	6.07E-1 ± 1.2E-1
Ac-228	6.19E-1 ± 2.2E-1	<4.3E-1	1.05E0 ± 1.6E-1	<4.0E-1	6.74E-1 ± 1.6E-1
U-235	<7.9E-1	<4.9E-1	<6.8E-1	<5.3E-1	<6.1E-1
U-238	<1.5E+1	<8.9E0	<1.3E+1	<1.1E1	<1.1E+1
Am-241	<7.5E-1	<5.0E-1	<6.8E-1	<4.8E-1	<5.7E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0342W bv-ss-1057 (1/21/99)
K-40(1)	7.35E-1 ± 1.3E-1
Co-60	<7.5E-2
Cs-137	<7.1E-2
Tl-208	1.91E-1 ± 6.3E-2
Bi-212	<1.5E0
Pb-212	6.01E-1 ± 1.7E-1
Bi-214	4.37E-1 ± 1.3E-1
Pb-214	4.87E-1 ± 1.4E-1
Ac-228	<4.5E-1
U-235	<6.4E-1
U-238	<1.2E0
Am-241	<5.5E-1

(1)Antech Method A-524 (Gamma Spectrometry), units are pCi/gram, and error estimates are 2 standard deviations.

Table 1
GAMMA Data Table
Westinghouse Electric Company
Antech Ltd. Project No. 99-0133W
Soil Characterization; Blairsville Soil Samples
Charge Order No. 122284-SA286; Blairsville

Parameter	Sample Identification 9902-0306W BV-SS-1126 (2/25/99)	9902-0307W BV-SS-1127 (2/25/99)	9902-0308W BV-SS-1128 (2/25/99)	9902-0309W BV-SS-1129 (2/25/99)
K-40(1)	8.43E0 ± 1.1E0	7.04E0 ± 1.0E0	6.85E0 ± 9.3E-1	7.96E0 ± 1.1E0
Co-60	<5.1E-2	<5.1E-2	<5.5E-2	<4.5E-2
Cs-137	1.39E-1 ± 5.0E-2	7.89E-2 ± 6.7E-2	1.12E-1 ± 6.1E-2	8.55E-2 ± 4.4E-2
Tl-208	3.34E-1 ± 5.9E-2	2.69E-1 ± 7.2E-2	2.97E-1 ± 7.0E-2	2.90E-1 ± 5.3E-2
Bi-212	<1.2E0	<1.1E0	<1.2E0	<1.2E0
Pb-212	8.87E-1 ± 1.4E-1	7.50E-1 ± 1.6E-1	6.90E-1 ± 1.4E-1	6.99E-1 ± 1.5E-1
Bi-214	6.99E-1 ± 1.3E-1	6.90E-1 ± 1.2E-1	7.14E-1 ± 1.2E-1	6.92E-1 ± 1.3E-1
Pb-214	6.13E-1 ± 1.3E-1	6.86E-1 ± 1.3E-1	6.41E-1 ± 1.3E-1	8.69E-1 ± 1.4E-1
Ac-228	6.72E-1 ± 1.6E-1	7.37E-1 ± 1.6E-1	8.59E-1 ± 1.3E-1	6.94E-1 ± 1.5E-1
U-235	9.64E-1 ± 1.5E-1	7.11E-1 ± 1.2E-1	7.70E-1 ± 1.1E-1	1.07E0 ± 1.6E-1
U-238	<1.2E1	<1.1E1	<1.0E1	<1.1E1
Am-241	<4.9E-1	<5.2E-1	<5.0E-1	<4.8E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9902-0310W BV-SS-1130 (2/25/99)	9902-0311W BV-SS-1131 (2/25/99)	9902-0312W BV-SS-1132 (2/25/99)	9902-0313W BV-SS-1133 (2/25/99)
K-40(1)	8.22E0 ± 1.1E0	8.08E0 ± 1.0E0	7.42E0 ± 1.1E0	8.03E0 ± 1.1E0
Co-60	<6.2E-2	<5.5E-2	<6.1E-2	<5.2E-2
Cs-137	8.11E-2 ± 4.8E-2	<8.0E-2	5.26E-2 ± 5.0E-2	6.82E-2 ± 4.0E-2
Tl-208	3.00E-1 ± 5.7E-2	2.51E-1 ± 5.8E-2	3.36E-1 ± 6.0E-2	2.69E-1 ± 6.3E-2
Bi-212	<1.1E0	9.63E-1 ± 7.4E-1	<1.2E0	9.69E-1 ± 7.5E-1
Pb-212	6.02E-1 ± 1.6E-1	6.42E-1 ± 1.5E-1	7.51E-1 ± 1.7E-1	6.83E-1 ± 1.5E-1
Bi-214	5.32E-1 ± 1.1E-1	5.12E-1 ± 1.1E-1	5.96E-1 ± 1.2E-1	5.39E-1 ± 1.2E-1
Pb-214	6.69E-1 ± 1.2E-1	5.54E-1 ± 9.9E-2	5.98E-1 ± 1.3E-1	6.30E-1 ± 1.4E-1
Ac-228	7.19E-1 ± 1.5E-1	6.33E-1 ± 1.5E-1	6.57E-1 ± 1.5E-1	7.11E-1 ± 1.6E-1
U-235	1.38E0 ± 1.9E-1	1.22E0 ± 1.6E-1	9.39E-1 ± 1.5E-1	8.27E-1 ± 1.3E-1
U-238	2.79E0 ± 1.6E0	<1.1E1	<1.0E1	<1.0E1
Am-241	<5.3E-1	<5.4E-1	<4.6E-1	<5.2E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9902-0314W BV-SS-1134 (2/25/99)	9902-0315W BV-SS-1135 (2/25/99)	9902-0316W BV-SS-1136 (2/25/99)	9902-0317W BV-SS-1137 (2/25/99)
K-40[1]	7.06E0 ± 1.0E0	6.11E0 ± 9.3E-1	6.06E0 ± 1.0E0	6.49E0 ± 9.2E-1
Co-60	<4.9E-2	<5.4E-2	<5.3E-2	<5.0E-2
Cs-137	5.67E-2 ± 4.4E-2	5.01E-2 ± 4.3E-2	<9.6E-2	4.13E-2 ± 3.6E-2
Tl-208	2.90E-1 ± 5.5E-2	2.51E-1 ± 4.8E-2	2.38E-1 ± 5.4E-2	2.57E-1 ± 6.0E-2
Bi-212	<1.2E0	<1.1E0	3.75E-1 ± 5.0E-1	1.05E0 ± 6.6E-1
Pb-212	7.29E-1 ± 1.2E-1	4.95E-1 ± 1.3E-1	7.84E-1 ± 1.3E-1	6.82E-1 ± 1.4E-1
Bi-214	<6.6E-1	5.62E-1 ± 1.2E-1	5.34E-1 ± 1.2E-1	5.08E-1 ± 1.1E-1
Pb-214	6.08E-1 ± 1.1E-1	5.67E-1 ± 1.2E-1	6.87E-1 ± 1.1E-1	6.49E-1 ± 1.0E-1
Ac-228	6.55E-1 ± 1.4E-1	5.88E-1 ± 1.4E-1	6.80E-1 ± 1.5E-1	6.06E-1 ± 1.4E-1
U-235	7.67E-1 ± 1.3E-1	1.22E0 ± 1.7E-1	1.12E0 ± 1.7E-1	8.43E-1 ± 1.3E-1
U-238	2.09E0 ± 1.4E0	4.66E0 ± 3.6E0	<1.2E1	<9.7E0
Am-241	<4.3E-1	<4.5E-1	<5.1E-1	<4.6E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9902-0318W BV-SS-1138 (2/25/99)	9902-0319W BV-SS-1139 (2/25/99)	9902-0320W BV-SS-1140 (2/25/99)	9902-0321W BV-SS-1141 (2/25/99)
K-40(1)	5.56E0 ± 9.5E-1	6.31E0 ± 9.8E-1	5.59E0 ± 9.1E-1	6.03E0 ± 9.9E-1
Co-60	<6.8E-2	<6.2E-2	<6.1E-2	<5.7E-2
Cs-137	1.06E-1 ± 4.5E-2	7.93E-2 ± 6.1E-2	<8.4E-2	<9.6E-2
Tl-208	<1.3E-1	2.82E-1 ± 6.1E-2	2.17E-1 ± 6.9E-2	2.68E-1 ± 5.6E-2
Bi-212	<1.1E0	<1.1E0	<1.1E0	<1.1E0
Pb-212	4.96E-1 ± 1.2E-1	7.51E-1 ± 1.2E-1	6.34E-1 ± 1.0E-1	5.73E-1 ± 1.5E-1
Bi-214	5.15E-1 ± 1.1E-1	4.56E-1 ± 1.3E-1	6.96E-1 ± 1.3E-1	5.87E-1 ± 1.2E-1
Pb-214	3.94E-1 ± 1.1E-1	6.20E-1 ± 1.1E-1	5.33E-1 ± 1.0E-1	5.36E-1 ± 1.2E-1
Ac-228	6.31E-1 ± 1.4E-1	6.27E-1 ± 1.5E-1	6.26E-1 ± 1.4E-1	5.88E-1 ± 1.4E-1
U-235	1.04E0 ± 1.5E-1	4.92E-1 ± 1.1E-1	1.00E0 ± 1.4E-1	6.09E-1 ± 1.2E-1
U-238	<9.6E0	<8.7E0	<8.8E0	<1.1E+1
Am-241	<4.9E-1	<4.9E-1	<4.9E-1	<4.9E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9902-0322W BV-SS-1142 (2/25/99)	9902-0323W BV-SS-1143 (2/25/99)	9902-0324W BV-SS-1144 (2/25/99)	9902-0325W BV-SS-1145 (2/25/99)
K-40[1]	6.70E0 ± 9.5E-1	6.50E0 ± 9.7E-1	6.97E0 ± 9.3E-1	5.83E0 ± 9.0E-1
Co-60	<5.5E-2	<4.7E-2	<5.4E-2	<5.4E-2
Cs-137	4.26E-2 ± 4.3E-2	<8.3E-2	6.47E-2 ± 3.4E-2	<7.3E-2
Tl-208	2.72E-1 ± 5.2E-2	2.31E-1 ± 7.6E-2	2.63E-1 ± 4.9E-2	2.43E-1 ± 5.7E-2
Bi-212	<1.0E0	<1.2E0	8.22E-1 ± 5.5E-1	<9.2E-1
Pb-212	7.93E-1 ± 1.2E-1	5.37E-1 ± 1.5E-1	5.13E-1 ± 1.2E-1	6.82E-1 ± 1.1E-1
Bi-214	<5.6E-1	5.74E-1 ± 1.2E-1	4.64E-1 ± 1.1E-1	5.37E-1 ± 1.1E-1
Pb-214	5.64E-1 ± 1.1E-1	5.88E-1 ± 1.3E-1	5.00E-1 ± 1.1E-1	4.91E-1 ± 1.1E-1
Ac-228	5.60E-1 ± 1.4E-1	8.18E-1 ± 1.3E-1	5.08E-1 ± 1.2E-1	5.60E-1 ± 1.2E-1
U-235	9.29E-1 ± 1.5E-1	7.76E-1 ± 1.3E-1	9.25E-1 ± 1.5E-1	1.09E0 ± 1.4E-1
U-238	<1.1E1	<1.0E1	3.38E0 ± 3.2E0	<8.9E0
Am-241	<4.8E-1	<4.9E-1	<4.4E-1	<4.8E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9902-0326W BV-SS-1146 (2/25/99)	9902-0327W BV-SS-1147 (2/25/99)	9902-0328W BV-SS-1148 (2/25/99)	9902-0329W BV-SS-1149 (2/25/99)
K-40(1)	6.39E0 ± 8.6E-1	6.88E0 ± 1.0E0	6.41E0 ± 9.1E-1	6.54E0 ± 9.0E-1
Co-60	<6.2E-2	<3.1E-2	<6.0E-2	<4.1E-2
Cs-137	5.61E-2 ± 5.7E-2	5.60E-2 ± 4.1E-2	7.33E-2 ± 4.7E-2	1.12E-1 ± 5.1E-2
Tl-208	2.32E-1 ± 6.2E-2	2.00E-1 ± 4.8E--2	2.28E-1 ± 4.7E-2	2.28E-1 ± 5.9E-2
Bi-212	<1.0E0	<9.9E-1	7.12E-1 ± 5.5E-1	<9.2E-1
Pb-212	7.15E-1 ± 1.4E-1	6.49E-1 ± 1.4E-1	4.44E-1 ± 1.4E-1	5.56E-1 ± 1.3E-1
Bi-214	5.26E-1 ± 1.2E-1	6.14E-1 ± 1.2E-1	<5.3E-1	6.81E-1 ± 1.1E-1
Pb-214	5.80E-1 ± 1.2E-1	5.46E-1 ± 1.1E-1	5.41E-1 ± 1.2E-1	5.52E-1 ± 1.1E-1
Ac-228	5.96E-1 ± 1.4E-1	6.08E-1 ± 1.5E-1	5.43E-1 ± 1.3E-1	7.89E-1 ± 1.2E-1
U-235	8.76E-1 ± 1.3E-1	7.43E-1 ± 1.4E-1	5.67E-1 ± 1.1E-1	8.43E-1 ± 1.3E-1
U-238	<9.3E0	<9.8E0	<9.9E0	<8.8E0
Am-241	5.0E-1	<4.9E-1	<4.4E-1	<4.7E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9902-0330W BV-SS-1150 (2/25/99)	9902-0331W BV-SS-1151 (2/25/99)	9902-0332W BV-SS-1152 (2/25/99)	9902-0333W BV-SS-1153 (2/25/99)
K-40(1)	6.15E0 ± 8.5E-1	5.78E0 ± 9.6E-1	6.17E0 ± 8.9E-1	6.92E0 ± 9.0E-1
Co-60	<4.3E-2	<5.1E-2	<5.7E-2	<3.9E-2
Cs-137	<8.4E-2	3.43E-2 ± 4.1E-2	6.16E-2 ± 3.9E-2	9.00E-2 ± 5.5E-2
Tl-208	1.92E-1 ± 5.9E-2	2.89E-1 ± 5.5E-2	2.25E-1 ± 4.6E-2	2.50E-1 ± 6.1E-2
Bi-212	1.09E0 ± 5.2E-1	1.09E0 ± 5.8E-1	<9.4E-1	5.97E-1 ± 4.5E-1
Pb-212	6.64E-1 ± 1.0E-1	6.99E-1 ± 1.2E-1	5.32E-1 ± 1.3E-1	7.32E-1 ± 1.5E-1
Bi-214	5.40E-1 ± 1.0E-1	<6.5E-1	4.51E-1 ± 1.1E-1	5.29E-1 ± 9.3E-2
Pb-214	4.93E-1 ± 9.8E-2	5.98E-1 ± 1.1E-1	4.99E-1 ± 1.1E-1	5.47E-1 ± 1.2E-1
Ac-228	5.60E-1 ± 1.2E-1	5.94E-1 ± 1.5E-1	5.32E-1 ± 1.3E-1	6.81E-1 ± 1.4E-1
U-235	5.24E-1 ± 9.7E-2	9.96E-1 ± 1.6E-1	8.80E-1 ± 1.4E-1	7.03E-1 ± 1.2E-1
U-238	<7.3E0	3.62E0 ± 1.3E0	<1.0E1	<9.3E0
Am-241	<4.4E-1	<4.7E-1	<4.5E-1	<4.7E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9902-0334W BV-SS-1154 (2/25/99)	9902-0335W BV-SS-1155 (2/25/99)	9902-0336W BV-SS-1156 (2/25/99)	9902-0337W BV-SS-1157 (2/25/99)
K-40(1)	6.18E0 ± 9.3E-1	5.88E0 ± 8.5E-1	7.03E0 ± 9.2E-1	6.36E0 ± 8.7E-1
Co-60	<6.2E-2	< 5.0E-2	< 4.4E-2	< 4.5E-2
Cs-137	5.32E-2 ± 4.4E-2	< 7.9E-2	9.14E-2 ± 4.6E-2	<6.9E-2
Tl-208	2.52E-1 ± 6.4E-2	2.11E-1 ± 6.4E-2	2.57E-1 ± 6.0E-2	2.35E-1 ± 4.6E-2
Bi-212	<1.0E0	<9.9E-1	< 9.1E-1	< 9.3E-1
Pb-212	6.89E-1 ± 1.2E-1	7.43E-1 ± 1.1E-1	6.66E-1 ± 1.3E-1	5.85E-1 ± 1.3E-1
Bi-214	5.45E-1 ± 1.1E-1	5.79E-1 ± 1.2E-1	5.25E-1 ± 1.1E-1	< 5.4E-1
Pb-214	5.90E-1 ± 1.1E-1	6.03E-1 ± 9.2E-2	5.34E-1 ± 9.2E-2	5.46E-1 ± 1.1E-1
Ac-228	5.86E-1 ± 1.4E-1	6.51E-1 ± 1.3E-1	6.16E-1 ± 1.3E-1	5.68E-1 ± 1.3E-1
U-235	8.49E-1 ± 1.4E-1	1.16E0 ± 1.5E-1	6.06E-1 ± 1.1E-1	7.67E-1 ± 1.2E-1
U-238	<1.1E1	< 1.0E1	< 8.0E0	< 1.0E1
Am-241	<4.7E-1	< 5.2E-1	< 4.6E-1	< 4.2E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9902-0338W BV-SS-1158 (2/25/99)	9902-0339W BV-SS-1159 (2/25/99)	9902-0340W BV-SS-1160 (2/25/99)	9902-0341W BV-SS-1161 (2/25/99)
K-40(1)	6.50E0 ± 8.9E-1	5.78E0 ± 8.0E-1	5.81E0 ± 8.7E-1	6.67E0 ± 9.4E-1
Co-60	< 5.0E-2	< 4.8E-2	< 4.8E-2	< 5.5E-2
Cs-137	6.23E-2 ± 3.7E-2	5.89E-2 ± 3.5E-2	4.79E-2 ± 4.0E-2	6.46E-2 ± 4.4E-2
Tl-208	2.06E-1 ± 4.6E-2	2.40E-1 ± 5.7E-2	2.43E-1 ± 4.7E-2	< 1.3E-1
Bi-212	6.15E-1 ± 4.9E-1	< 9.7E-1	< 9.9E-1	< 1.0E0
Pb-212	7.25E-1 ± 1.1E-1	4.80E-1 ± 1.2E-1	6.04E-1 ± 1.0E-1	6.07E-1 ± 1.4E-1
Bi-214	4.85E-1 ± 1.0E-1	5.56E-1 ± 1.1E-1	4.90E-1 ± 1.1E-1	4.81E-1 ± 1.1E-1
Pb-214	5.56E-1 ± 9.8E-2	4.80E-1 ± 1.0E-1	6.25E-1 ± 9.8E-2	5.06E-1 ± 1.1E-1
Ac-228	5.85E-1 ± 1.2E-1	6.52E-1 ± 1.3E-1	5.72E-1 ± 1.3E-1	6.21E-1 ± 1.4E-1
U-235	< 5.3E-1	5.90E-1 ± 1.0E-1	8.87E-1 ± 1.4E-1	1.39E0 ± 1.9E-1
U-238	< 9.5E0	< 8.4E0	3.22E0 ± 1.4E0	< 1.0E1
Am-241	< 4.1E-1	< 4.2E-1	< 4.4E-1	< 5.1E-1

(1)Antech Method A-524 (Gamma Spectrometry), units are pCi/gram, and error estimates are 2 standard deviations.

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

March 15, 1999

Mr. Joe Nardi
Westinghouse Electric Company
Energy Center West, Bay 508 B
P. O. Box 355
Pittsburgh, PA 15230

Soil Characterization; Purchase Order No. 122284-SA286
Blairsville Soil Samples; Blairsville; Energy Center
Antech Ltd. Project No. 99-0133W

Dear Mr. Nardi:

Enclosed are analytical results for samples submitted by Westinghouse Electric Company. Samples were received on February 25, 1999 and logged in for analysis on February 26, 1999.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Shannon W. Thompson
Lead Analyst/Project Manager

SWT:rks

Enclosures

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 99-0049W
CLIENT: Purchase Order Number: 122284-SA286

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
9901-0265W	bv-ss-1044	9901-0266W	bv-ss-1045
9901-0267W	bv-ss-1046	9901-0268W	bv-ss-1047
9901-0269W	bv-ss-1048	9901-0270W	bv-ss-1049
9901-0271W	bv-ss-1050	9901-0272W	bv-ss-1051
9901-0273W	bv-ss-1052	9901-0274W	bv-ss-1053
9901-0275W	bv-ss-1054	9901-0276W	bv-ss-1055
9901-0277W	bv-ss-1056	9901-0280W	bv-ss-1058
9901-0281W	bv-ss-1059	9901-0282W	bv-ss-1060
9901-0283W	bv-ss-1061	9901-0284W	bv-ss-1062
9901-0285W	bv-ss-1063	9901-0286W	bv-ss-1064
9901-0287W	bv-ss-1065	9901-0288W	bv-ss-1066
9901-0289W	bv-ss-1067	9901-0290W	bv-ss-1068
9901-0291W	bv-ss-1069	9901-0292W	bv-ss-1070
9901-0293W	bv-ss-1071	9901-0294W	bv-ss-1072
9901-0295W	bv-ss-1073	9901-0296W	bv-ss-1074
9901-0297W	bv-ss-1075	9901-0298W	bv-ss-1076
9901-0299W	bv-ss-1077	9901-0300W	bv-ss-1078
9901-0301W	bv-ss-1079	9901-0302W	bv-ss-1080
9901-0303W	bv-ss-1081	9901-0304W	bv-ss-1082
9901-0305W	bv-ss-1083	9901-0306W	bv-ss-1084
9901-0307W	bv-ss-1085	9901-0308W	bv-ss-1086
9901-0309W	bv-ss-1087	9901-0310W	bv-ss-1088
9901-0311W	bv-ss-1089	9901-0312W	bv-ss-1090
9901-0313W	bv-ss-1091	9901-0314W	bv-ss-1092
9901-0315W	bv-ss-1093	9901-0316W	bv-ss-1094
9901-0317W	bv-ss-1095	9901-0318W	bv-ss-1096
9901-0319W	bv-ss-1097	9901-0320W	bv-ss-1098
9901-0321W	bv-ss-1099	9901-0322W	bv-ss-1100
9901-0323W	bv-ss-1101	9901-0324W	bv-ss-1102
9901-0325W	bv-ss-1103	9901-0326W	bv-ss-1104
9901-0327W	bv-ss-1105	9901-0328W	bv-ss-1106
9901-0329W	bv-ss-1107	9901-0330W	bv-ss-1108
9901-0331W	bv-ss-1109	9901-0332W	bv-ss-1110
9901-0333W	bv-ss-1111	9901-0334W	bv-ss-1112
9901-0335W	bv-ss-1113	9901-0336W	bv-ss-1114
9901-0337W	bv-ss-1115	9901-0338W	bv-ss-1116
9901-0339W	bv-ss-1117	9901-0340W	bv-ss-1118

ANTECH LTD.
CASE NARRATIVE

(Continued)

9901-0341W bv-ss-1119 9901-0342W bv-ss-1057

C: SHIPPING/RECEIVING COMMENTS:

FINAL REPORT: 02/26/99

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
Sample BV-SS-1057 is out of sequence due to a login mistake. Please note that it is analyzed as Antech sample 9901-0342W, the last in the series

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format.

Table 1
GAMMA Spectrometry Data Table
Westinghouse Electric Company
Antech Ltd. Project No. 99-0049W
Soil Characterization; Blairsville SMP
Charge Order No. 122284-SA286; Blairsville

Parameter	Sample Identification				
	9901-0265W bv-ss-1044 (1/21/99)	9901-0266W bv-ss-1045 (1/21/99)	9901-0267W bv-ss-1046 (1/21/99)	9901-0268W bv-ss-1047 (1/21/99)	9901-0269W bv-ss-1048 (1/21/99)
K-40(1)	8.34E0 ± 1.5E0	1.08E+1 ± 1.7E0	9.03E0 ± 1.4E0	6.09E0 ± 1.1E0	6.49E0 ± 1.5E0
Co-60	<1.3E-1	<8.3E-2	<7.1E-2	<6.3E-2	<9.3E-2
Cs-137	4.58E-1 ± 1.6E-1	<1.0E-1	<9.4E-2	1.39E-1 ± 6.6E-2	3.64E-1 ± 1.2E-1
Tl-208	4.40E0 ± 3.5E-1	3.30E-1 ± 1.1E-1	<1.8E-1	1.67E-1 ± 6.6E-2	<2.1E-1
Bi-212	1.26E+1 ± 2.3E0	1.40E0 ± 1.1E0	<1.5E0	<1.0E0	<2.1E0
Pb-212	1.21E+1 ± 1.3E+0	9.72E-1 ± 2.4E-1	6.43E-1 ± 2.0E-1	3.13E-1 ± 1.4E-1	7.87E-1 ± 2.2E-1
Bi-214	6.10E-1 ± 2.4E-1	8.54E-1 ± 2.2E-1	<9.1E-1	5.08E-1 ± 1.2E-1	7.02E-1 ± 1.8E-1
Pb-214	6.86E-1 ± 3.1E-1	7.21E-1 ± 2.0E-1	4.85E-1 ± 1.4E-1	3.46E-1 ± 1.3E-1	6.89E-1 ± 1.8E-1
Ac-228	1.23E+1 ± 6.5E-1	9.60E-1 ± 2.6E-1	8.56E-1 ± 1.8E-1	<3.9E-1	7.84E-1 ± 2.7E-1
U-235	4.89E0 ± 5.3E-1	<7.5E-1	<6.8E-1	<5.9E-1	2.96E0 ± 3.7E-1
U-238	9.47E+1 ± 1.2E+1	<1.5E+1	<1.5E+1	<9.2E0	<2.0E+1
Am-241	<1.9E0	<6.8E-1	<5.8E-1	<4.1E-1	<8.8E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0270W bv-ss-1049 (1/21/99)	9901-0271W bv-ss-1050 (1/21/99)	9901-0272W bv-ss-1051 (1/21/99)	9901-0273W bv-ss-1052 (1/21/99)	9901-0274W bv-ss-1053 (1/21/99)
K-40(1)	5.68E0 ± 1.0E0	7.48E0 ± 1.3E0	4.94E0 ± 1.0E0	9.16E0 ± 1.4E0	7.05E0 ± 1.2E0
Co-60	<6.3E-2	<6.5E-2	<7.0E-2	<7.3E-2	<6.8E-2
Cs-137	<6.0E-2	<6.3E-2	<5.7E-2	<7.8E-2	<9.2E-2
Tl-208	1.91E-1 ± 6.6E-2	2.46E-1 ± 8.6E-2	<1.7E-1	<1.4E-1	2.48E-1 ± 7.5E-2
Bi-212	<1.2E0	<1.5E0	<1.2E0	<1.6E0	<1.5E0
Pb-212	3.99E-1 ± 1.5E-1	5.44E-1 ± 1.8E-1	5.14E-1 ± 1.6E-1	6.61E-1 ± 1.9E-1	6.36E-1 ± 1.8E-1
Bi-214	4.55E-1 ± 1.1E-1	6.42E-1 ± 1.4E-1	4.29E-1 ± 1.3E-1	8.05E-1 ± 1.6E-1	5.62E-1 ± 1.4E-1
Pb-214	4.43E-1 ± 1.2E-1	7.01E-1 ± 1.5E-1	5.26E-1 ± 1.3E-1	6.27E-1 ± 1.5E-1	7.51E-1 ± 1.5E-1
Ac-228	5.57E-1 ± 1.6E-1	8.02E-1 ± 2.0E-1	6.70E-1 ± 1.9E-1	<5.5E-1	7.32E-1 ± 1.8E-1
U-235	<4.2E-1	<4.9E-1	<6.0E-1	<5.4E-1	<6.5E-1
U-238	<9.5E0	<10.0E0	<1.2E+1	<1.2E+1	<1.2E+1
Am-241	<4.3E-1	<4.7E-1	<4.4E-1	<5.6E-1	<4.9E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0275W bv-ss-1054 (1/21/99)	9901-0276W bv-ss-1055 (1/21/99)	9901-0277W bv-ss-1056 (1/21/99)	9901-0280W bv-ss-1058 (1/21/99)	9901-0281W bv-ss-1059 (1/21/99)
K-40(1)	1.00E+1 ± 1.6E0	1.12E+1 ± 1.7E0	5.73E0 ± 1.0E0	9.92E0 ± 1.7E0	1.22+1 ± 1.7E0
Co-60	<1.0E-1	<8.7E-2	<5.7E-2	<7.4E-2	<7.6E-2
Cs-137	<9.4E-2	<8.9E-2	<7.1E-2	<1.0E-1	<8.1E-2
Tl-208	3.29E-1 ± 7.4E-2	3.73E-1 ± 7.7E-2	3.04E-1 ± 8.1E-2	4.15E-1 ± 1.1E-1	<1.9E-1
Bi-212	8.68E-1 ± 9.2E-1	<1.5E0	<1.4E0	1.17E0 ± 1.0E0	<1.7E0
Pb-212	7.11E-1 ± 2.1E-1	7.11E-1 ± 2.4E-1	7.53E-1 ± 1.3E-1	9.67E-1 ± 2.4E-1	7.98E-1 ± 2.4E-1
Bi-214	<10.0E-1	8.79E-1 ± 1.8E-1	6.00E-1 ± 1.5E-1	8.21E-1 ± 2.0E-1	7.45E-1 ± 1.7E-1
Pb-214	8.21E-1 ± 1.9E-1	9.24E-1 ± 1.8E-1	4.52E-1 ± 1.3E-1	1.19E0 ± 2.1E-1	8.11E-1 ± 1.7E-1
Ac-228	7.99E-1 ± 2.2E-1	1.11E0 ± 2.3E-1	6.94E-1 ± 2.0E-1	1.02E0 ± 1.7E-1	9.06E-1 ± 2.2E-1
U-235	<7.9E-1	<7.4E-1	<5.2E-1	<7.5E-1	<7.4E-1
U-238	<1.7E+1	<1.4E+1	<1.1E+1	<9.6E0	<9.9E0
Am-241	<6.2E-1	<6.0E-1	<4.9E-1	7.9E-1	<5.7E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0282W bv-ss-1060 (1/21/99)	9901-0283W bv-ss-1061 (1/21/99)	9901-0284W bv-ss-1062 (1/21/99)	9901-0285W bv-ss-1063 (1/21/99)	9901-0286W bv-ss-1064 (1/21/99)
K-40(1)	1.08E+1 ± 1.6E0	7.28E0 ± 1.3E0	6.52E0 ± 1.3E0	9.69E0 ± 1.6E0	5.85E0 ± 1.1E0
Co-60	<7.1E-2	<8.1E-2	<8.8E-2	<1.0E-1	<6.8E-2
Cs-137	<7.8E-2	<8.5E-2	2.99E-1 ± 9.7E-2	1.67E-1 ± 9.9E-2	<8.0E-2
Tl-208	4.47E-1 ± 7.9E-2	1.86E-1 ± 7.8E-2	3.45E-1 ± 7.8E-2	3.41E-1 ± 1.1E-1	2.59E-1 ± 6.4E-2
Bi-212	1.08E0 ± 9.6E-1	2.14E0 ± 9.3E-1	<1.9E0	<1.7E0	4.85E-1 ± 5.8E-1
Pb-212	6.48E-1 ± 2.1E-1	6.26E-1 ± 1.8E-1	8.82E-1 ± 1.6E-1	9.88E-1 ± 1.8E-1	5.78E-1 ± 1.5E-1
Bi-214	9.36E-1 ± 1.8E-1	6.35E-1 ± 1.6E-1	1.44E0 ± 1.9E-1	9.29E-1 ± 2.0E-1	<6.7E-1
Pb-214	9.01E-1 ± 1.7E-1	4.91E-1 ± 1.6E-1	1.63E0 ± 2.2E-1	1.07E-1 ± 1.9E-1	4.35E-1 ± 1.4E-1
Ac-228	1.04E0 ± 2.1E-1	6.95E-1 ± 2.3E-1	5.92E-1 ± 1.8E-1	6.55E-1 ± 2.1E-1	5.79E-1 ± 1.7E-1
U-235	<6.7E-1	<6.3E-1	1.52E0 ± 7.6E-1	<7.8E-1	<5.4E-1
U-238	<1.2E+1	<1.2E+1	<1.4E+1	<1.7E+1	<9.3E0
Am-241	<5.5E-1	<6.1E-1	<7.3E-1	<8.1E-1	<4.4E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0287W bv-ss-1065 (1/21/99)	9901-0288W bv-ss-1066 (1/21/99)	9901-0289W bv-ss-1067 (1/21/99)	9901-0290W bv-ss-1068 (1/21/99)	9901-0291W bv-ss-1069 (1/21/99)
K-40(1)	7.37E0 ± 1.3E0	7.92E0 ± 1.4E0	7.23E0 ± 1.3E0	6.67E0 ± 1.2E0	9.72E0 ± 1.7E0
Co-60	<8.9E-2	<5.3E-2	<6.7E-2	<6.7E-2	<1.1E-1
Cs-137	7.45E-2 ± 5.3E-2	<8.7E-2	<8.0E-2	<7.1E-2	3.19E-1 ± 1.0E-1
Tl-208	2.43E-1 ± 6.5E-2	1.51E-1 ± 7.9E-2	3.03E-1 ± 6.4E-2	3.09E-1 ± 7.4E-2	1.91E0 ± 1.7E-1
Bi-212	<1.5E0	<1.2E0	<1.5E0	<1.4E0	5.42E0 ± 1.7E0
Pb-212	5.30E-1 ± 1.8E-1	5.70E-1 ± 1.7E-1	7.11E-1 ± 1.8E-1	6.71E-1 ± 1.7E-1	5.18E0 ± 6.2E-1
Bi-214	5.37E-1 ± 1.4E-1	5.27E-1 ± 1.7E-1	<7.8E-1	4.87E-1 ± 1.2E-1	<9.2E-1
Pb-214	6.44E-1 ± 1.6E-1	4.86E-1 ± 1.2E-1	5.33E-1 ± 1.4E-1	4.54E-1 ± 1.3E-1	7.74E-1 ± 1.8E-1
Ac-228	4.90E-1 ± 1.7E-1	5.60E-1 ± 2.1E-1	<5.1E-1	7.49E-1 ± 1.8E-1	4.92E0 ± 3.8E-1
U-235	<7.2E-1	<5.6E-1	<6.3E-1	<5.2E-1	NA
U-238	<1.2E+1	<1.2E+1	<1.1E+1	9.2E0	<1.7E+1
Am-241	<5.1E-1	<5.1E-1	<5.1E-1	<5.3E-1	<9.4E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0292W bv-ss-1070 (1/21/99)	9901-0293W bv-ss-1071 (1/21/99)	9901-0294W bv-ss-1072 (1/21/99)	9901-0295W bv-ss-1073 (1/21/99)	9901-0296W bv-ss-1074 (1/21/99)
K-40(1)	7.99E0 ± 1.4E0	7.40E0 ± 1.7E0	9.37E0 ± 1.4E0	7.38E0 ± 1.3E0	6.22E0 ± 1.2E0
Co-60	<8.3E-2	<1.0E-1	<8.3E-2	<6.9E-2	<5.0E-2
Cs-137	2.60E-1 ± 9.3E-2	6.40E-1 ± 1.3E-1	<8.4E-2	<7.4E-2	<6.1E-2
Tl-208	3.14E-1 ± 1.0E-1	3.68E-1 ± 1.1E-1	2.55E-1 ± 9.5E-2	2.12E-1 ± 7.3E-2	2.05E-1 ± 9.3E-2
Bi-212	1.28E0 ± 8.1E-1	<1.9E0	<1.6E0	<1.5E0	<1.5E0
Pb-212	9.59E-1 ± 1.7E-1	1.23E0 ± 2.2E-1	6.53E-1 ± 2.0E-1	6.87E-1 ± 1.3E-1	5.00E-1 ± 1.8E-1
Bi-214	8.30E-1 ± 1.7E-1	1.00E0 ± 2.4E-1	8.23E-1 ± 1.6E-1	7.67E-1 ± 1.7E-1	5.75E-1 ± 1.4E-1
Pb-214	8.45E-1 ± 1.6E-1	9.07E-1 ± 2.1E-1	6.53E-1 ± 1.6E-1	8.46E-1 ± 1.5E-1	5.50E-1 ± 1.5E-1
Ac-228	6.80E-1 ± 1.6E-1	1.14E0 ± 3.0E-1	7.62E-1 ± 2.0E-1	6.68E-1 ± 2.0E-1	6.65E-1 ± 1.8E-1
U-235	8.83E-1 ± 1.7E-1	1.25E+1 ± 1.1E0	<6.2E-1	<5.9E-1	<5.34E-1
U-238	7.85E0 ± 5.8E0	2.02E+1 ± 1.0E+1	<1.1E+1	<1.2E+1	<9.5E0
Am-241	<7.5E-1	<1.2E0	<6.1E-1	<5.9E-1	<5.3E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0297W bv-ss-1075 (1/21/99)	9901-0298W bv-ss-1076 (1/21/99)	9901-0299W bv-ss-1077 (1/21/99)	9901-0300W bv-ss-1078 (1/21/99)	9901-0301W bv-ss-1079 (1/21/99)
K-40(1)	8.26E0 ± 1.3E0	6.35E0 ± 1.2E0	7.52E0 ± 1.6E0	8.97E0 ± 1.3E0	5.51E0 ± 1.2E0
Co-60	<8.5E-2	<7.6E-2	<8.2E-2	<7.5E-2	<5.9E-2
Cs-137	2.03E-1 ± 9.8E-2	<6.7E-2	5.99E-1 ± 1.3E-1	<6.7E-2	9.57E-2 ± 6.0E-2
Tl-208	3.92E-1 ± 9.6E-2	2.07E-1 ± 8.4E-2	3.40E-1 ± 9.0E-2	3.76E-1 ± 8.4E-2	1.95E-1 ± 6.9E-2
Bi-212	1.17E0 ± 9.3E-1	<1.3E0	<1.9E0	<1.1E0	<1.6E0
Pb-212	8.73E-1 ± 1.5E-1	4.72E-1 ± 1.1E-1	9.37E-1 ± 2.0E-1	7.93E-1 ± 1.9E-1	5.58E-1 ± 2.0E-1
Bi-214	9.13E-1 ± 1.7E-1	7.29E-1 ± 1.5E-1	<1.2E0	5.98E-1 ± 1.6E-1	5.32E-1 ± 1.6E-1
Pb-214	7.26E-1 ± 1.5E-1	6.69E-1 ± 1.4E-1	8.27E-1 ± 2.1E-1	7.26E-1 ± 1.4E-1	7.11E-1 ± 1.7E-1
Ac-228	7.41E-1 ± 2.0E-1	4.95E-1 ± 2.0E-1	7.68E-1 ± 2.7E-1	7.41E-1 ± 1.9E-1	5.96E-1 ± 2.0E-1
U-235	1.47E0 ± 2.2E-1	<5.6E-1	1.61E+1 ± 1.3E0	<6.4E-1	8.09E0 ± 7.4E-1
U-238	2.52E+1 ± 6.3E0	<1.3E+1	5.87E+1 ± 7.2E0	<1.3E+1	4.76E+1 ± 5.8E0
Am-241	<8.9E-1	<5.5E-1	<1.5E0	<5.9E-1	<1.1E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0302W bv-ss-1080 (1/21/99)	9901-0303W bv-ss-1081 (1/21/99)	9901-0304W bv-ss-1082 (1/21/99)	9901-0305W bv-ss-1083 (1/21/99)	9901-0306W bv-ss-1084 (1/21/99)
K-40(1)	7.22E0 ± 1.2E0	8.12E0 ± 1.3E0	1.08E+1 ± 1.6E0	1.06E+1 ± 1.4E0	6.79E0 ± 1.2E0
Co-60	<7.3E-2	<8.9E-2	<6.7E-2	<7.5E-2	<7.6E-2
Cs-137	<6.2E-2	<6.1E-2	<7.7E-2	<8.0E-2	<7.7E-2
Tl-208	2.28E-1 ± 7.6E-2	2.59E-1 ± 6.3E-2	3.61E-1 ± 7.9E-2	2.86E-1 ± 8.5E-2	<1.5E-1
Bi-212	<1.4E0	<1.3E0	<1.6E0	<1.4E0	<1.2E0
Pb-212	5.46E-1 ± 1.7E-1	7.56E-1 ± 1.8E-1	9.48E-1 ± 1.6E-1	6.40E-1 ± 1.9E-1	5.80E-1 ± 1.6E-1
Bi-214	5.12E-1 ± 1.6E-1	<7.2E-1	6.29E-1 ± 1.5E-1	5.71E-1 ± 1.7E-1	<6.6E-1
Pb-214	6.13E-1 ± 1.4E-1	5.46E-1 ± 1.4E-1	6.92E-1 ± 1.5E-1	5.47E-1 ± 1.5E-1	5.79E-1 ± 1.3E-1
Ac-228	<4.6E-1	<5.5E-1	9.03E-1 ± 2.1E-1	7.46E-1 ± 2.0E-1	5.47E-1 ± 1.7E-1
U-235	<5.7E-1	<5.8E-1	<6.8E-1	<6.2E-1	<6.3E-1
U-238	<1.1E+1	<1.0E+1	<1.2E+1	<1.4E+1	<1.4E+1
Am-241	<5.5E-1	<5.3E-1	<5.3E-1	<5.7E-1	<5.3E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0307W bv-ss-1085 (1/21/99)	9901-0308W bv-ss-1086 (1/21/99)	9901-0309W bv-ss-1087 (1/21/99)	9901-0310W bv-ss-1088 (1/21/99)	9901-0311W bv-ss-1089 (1/21/99)
K-40(1)	5.46E0 ± 1.0E0	6.09E0 ± 8.8E-1	6.28E0 ± 1.2E0	7.67E0 ± 1.2E0	6.93E0 ± 1.2E0
Co-60	<5.3E-2	<4.5E-2	<4.4E-2	<7.0E-2	<5.9E-2
Cs-137	<8.4E-2	<6.9E-2	<7.9E-2	<8.1E-2	<8.3E-2
Tl-208	8.28E-2 ± 5.9E-2	2.51E-1 ± 4.6E-2	2.24E-1 ± 7.3E-2	2.89E-1 ± 7.7E-2	2.49E-1 ± 6.8E-2
Bi-212	<9.4E-1	7.49E-1 ± 5.4E-1	<1.2E0	<1.4E0	<1.4E0
Pb-212	3.16E-1 ± 1.2E-1	5.44E-1 ± 1.3E-1	6.05E-1 ± 1.7E-1	6.71E-1 ± 1.7E-1	4.14E-1 ± 1.5E-1
Bi-214	3.66E-1 ± 1.00E-1	5.87E-1 ± 9.7E-2	6.61E-1 ± 1.6E-1	6.53E-1 ± 1.5E-1	5.92E-1 ± 1.3E-1
Pb-214	<2.0E-1	6.08E-1 ± 1.2E-1	7.05E-1 ± 1.5E-1	5.66E-1 ± 1.5E-1	5.35E-1 ± 1.3E-1
Ac-228	2.45E-1 ± 1.4E-1	6.47E-1 ± 1.3E-1	7.57E-1 ± 1.6E-1	6.22E-1 ± 1.7E-1	6.86E-1 ± 1.7E-1
U-235	NA	1.74E0 ± 2.0E-1	<6.1E-1	<5.8E-1	<6.3E-1
U-238	<9.5E0	7.30E0 ± 1.7E0	<1.1E+1	<1.1E+1	<1.0E+1
Am-241	<4.6E-1	<5.0E-1	<5.3E-1	<5.9E-1	<4.7E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0312W bv-ss-1090 (1/21/99)	9901-0313W bv-ss-1091 (1/21/99)	9901-0314W bv-ss-1092 (1/21/99)	9901-0315W bv-ss-1093 (1/21/99)	9901-0316W bv-ss-1094 (1/21/99)
K-40(1)	6.30E0 ± 1.2E0	5.65E0 ± 1.1E0	8.45E0 ± 1.5E0	6.59E0 ± 1.2E0	7.97E0 ± 1.4E0
Co-60	<4.5E-2	<3.7E-2	<7.7E-2	<6.4E-2	<7.7E-2
Cs-137	1.20E-1 ± 6.6E-2	<6.1E-2	1.82E-1 ± 7.2E-2	<7.4E-2	<1.4E-1
Tl-208	1.82E-1 ± 5.4E-2	1.71E-1 ± 7.3E-2	3.32E-1 ± 7.7E-2	2.26E-1 ± 8.0E-2	2.93E-1 ± 8.7E-2
Bi-212	<1.1E0	<1.3E0	9.66E-1 ± 6.9E-1	<1.4E0	<2.0E0
Pb-212	4.12E-1 ± 1.5E-1	5.44E-1 ± 1.1E-1	7.70E-1 ± 2.3E-1	5.53E-1 ± 1.7E-1	8.55E-1 ± 2.4E-1
Bi-214	5.55E-1 ± 1.4E-1	4.56E-1 ± 1.3E-1	7.82E-1 ± 1.7E-1	5.98E-1 ± 1.5E-1	<9.9E-1
Pb-214	4.80E-1 ± 1.3E-1	3.54E-1 ± 1.2E-1	8.88E-1 ± 1.8E-1	5.78E-1 ± 1.4E-1	7.69E-1 ± 2.4E-1
Ac-228	3.85E-1 ± 1.6E-1	5.16E-1 ± 1.7E-1	<5.9E-1	5.49E-1 ± 1.8E-1	8.02E-1 ± 2.3E-1
U-235	<6.8E-1	<5.3E-1	2.03E0 ± 2.8E-1	<5.5E-1	1.51E+1 ± 1.2E0
U-238	<1.3E+1	<8.6E0	<1.6E+1	<1.2E+1	3.50E+2 ± 3.2E+1
Am-241	<4.8E-1	<5.0E-1	<6.7E-1	<5.2E-1	<2.3E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0317W bv-ss-1095 (1/21/99)	9901-0318W bv-ss-1096 (1/21/99)	9901-0319W bv-ss-1097 (1/21/99)	9901-0320W bv-ss-1098 (1/21/99)	9901-0321W bv-ss-1099 (1/21/99)
K-40(1)	1.02E+1 ± 1.4E0	4.22E0 ± 8.4E-1	8.22E0 ± 1.3E0	5.86E0 ± 1.1E0	7.45E0 ± 1.4E0
Co-60	<8.2E-2	<4.9E-2	<7.0E-2	<4.9E-2	<7.3E-2
Cs-137	<8.8E-2	<6.3E-2	<6.8E-2	<7.1E-2	1.25E-1 ± 5.7E-2
Tl-208	3.41E-1 ± 9.4E-2	1.58E-1 ± 5.1E-2	3.67E-1 ± 7.2E-2	1.55E-1 ± 6.8E-2	3.63E-1 ± 7.8E-2
Bi-212	<1.5E0	<1.0E0	<1.2E0	<1.3E0	<1.4E0
Pb-212	6.90E-1 ± 2.1E-1	3.70E-1 ± 1.3E-1	8.30E-1 ± 1.5E-1	4.72E-1 ± 1.6E-1	9.21E-1 ± 2.0E-1
Bi-214	7.57E-1 ± 1.4E-1	4.11E-1 ± 1.1E-1	<8.3E-1	4.50E-1 ± 1.5E-1	<7.7E-1
Pb-214	6.50E-1 ± 1.7E-1	3.46E-1 ± 1.0E-1	5.17E-1 ± 1.8E-1	4.90E-1 ± 1.3E-1	8.39E-1 ± 1.7E-1
Ac-228	6.75E-1 ± 2.1E-1	<3.3E-1	6.93E-1 ± 2.0E-1	4.82E-1 ± 1.6E-1	9.52E-1 ± 2.5E-1
U-235	3.78E0 ± 4.0E-1	<4.6E-1	<8.4E-1	<5.5E-1	1.00E0 ± 1.9E-1
U-238	NA ± 7.89E+1	<1.1E+1	<1.1E+1	<9.6E0	<1.4E+1
Am-241	<1.2E+1	<4.5E-1	<6.3E-1	<5.0E-1	<6.4E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0322W bv-ss-1100 (1/21/99)	9901-0323W bv-ss-1101 (1/21/99)	9901-0324W bv-ss-1102 (1/21/99)	9901-0325W bv-ss-1103 (1/21/99)	9901-0326W bv-ss-1104 (1/21/99)
K-40(1)	6.27E0 ± 1.0E0	7.21E0 ± 1.4E0	5.37E0 ± 1.1E0	5.81E0 ± 1.2E0	8.42E0 ± 1.5E0
Co-60	<6.0E-2	<9.1E-2	<7.3E-2	<8.2E-2	<8.6E-2
Cs-137	<6.0E-2	<1.1E-1	<8.5E-2	7.57E-2 ± 6.8E-2	<7.3E-2
Tl-208	1.95E-1 ± 6.9E-2	2.68E-1 ± 7.1E-2	<1.6E-1	4.02E-1 ± 9.0E-2	2.47E-1 ± 6.4E-2
Bi-212	<1.3E0	<1.5E0	<1.4E0	<1.4E0	<1.5E0
Pb-212	6.15E-1 ± 1.6E-1	5.41E-1 ± 1.9E-1	4.61E-1 ± 1.8E-1	6.89E-1 ± 2.0E-1	5.47E-1 ± 1.8E-1
Bi-214	4.87E-1 ± 1.3E-1	8.08E-1 ± 1.7E-1	5.43E-1 ± 1.3E-1	8.25E-1 ± 1.6E-1	4.91E-1 ± 1.5E-1
Pb-214	5.62E-1 ± 1.3E-1	7.58E-1 ± 1.8E-1	4.48E-1 ± 1.4E-1	6.73E-1 ± 1.7E-1	4.66E-1 ± 1.5E-1
Ac-228	6.61E-1 ± 1.7E-1	<5.4E-1	6.17E-1 ± 1.9E-1	6.50E-1 ± 1.9E-1	<5.8E-1
U-235	<5.2E-1	<8.1E-1	<6.1E-1	5.54E0 ± 5.4E-1	<7.2E-1
U-238	<1.1E+1	<1.3E1	<1.1E+1	<1.7E+1	<1.3E+1
Am-241	<5.4E-1	<6.0E-1	<5.3E-1	<1.0E0	<4.9E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0327W bv-ss-1105 (1/21/99)	9901-0328W bv-ss-1106 (1/21/99)	9901-0329W bv-ss-1107 (1/21/99)	9901-0330W bv-ss-1108 (1/21/99)	9901-0331W bv-ss-1109 (1/21/99)
K-40(1)	5.89E0 ± 1.1E0	9.91E0 ± 1.4E0	8.50E0 ± 1.5E0	5.20E0 ± 1.1E0	1.26E+1 ± 1.6E0
Co-60	<6.8E-2	<8.9E-2	<5.1E-2	<7.1E-2	<8.0E-2
Cs-137	8.26E-2 ± 5.7E-2	<8.4E-2	<9.5E-2	<8.1E-2	8.42E-2 ± 7.5E-2
Tl-208	1.92E-1 ± 8.6E-2	3.19E-1 ± 1.0E-1	2.78E-1 ± 7.4E-2	1.91E-1 ± 5.5E-2	4.24E-1 ± 1.1E-1
Bi-212	<1.2E0	<1.7E0	<1.6E0	<1.4E0	<1.7E0
Pb-212	5.90E-1 ± 1.8E-1	9.34E-1 ± 2.1E-1	7.50E-1 ± 2.2E-1	4.47E-1 ± 1.6E-1	1.10E0 ± 2.5E-1
Bi-214	7.45E-1 ± 1.5E-1	6.71E-1 ± 1.8E-1	7.00E-1 ± 1.6E-1	<6.3E-1	8.20E-1 ± 1.8E-1
Pb-214	7.05E-1 ± 1.6E-1	6.79E-1 ± 1.7E-1	8.11E-1 ± 1.6E-1	5.18E-1 ± 1.3E-1	8.93E-1 ± 1.9E-1
Ac-228	7.18E-1 ± 1.8E-1	8.33E-1 ± 2.2E-1	7.27E-1 ± 1.9E-1	<4.2E-1	<6.4E-1
U-235	1.76E0 ± 2.2E-1	<6.3E-1	<7.4E-1	<5.4E-1	<7.2E-1
U-238	<1.1E+1	<1.2E+1	<1.4E+1	<1.1E+1	<1.4E+1
Am-241	<7.1E-1	<6.7E-1	<5.7E-1	<4.7E-1	<7.8E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0332W bv-ss-1110 (1/21/99)	9901-0333W bv-ss-1111 (1/21/99)	9901-0334W bv-ss-1112 (1/21/99)	9901-0335W bv-ss-1113 (1/21/99)	9901-0336W bv-ss-1114 (1/21/99)
K-40(1)	8.54E0 ± 2.0E0	9.65E0 ± 1.7E0	6.81E0 ± 1.2E0	9.82E0 ± 1.5E0	1.14E+1 ± 1.7E0
Co-60	<1.1E-1	<8.3E-2	<6.4E-2	<6.6E-2	<1.0E-1
Cs-137	1.14E-1 ± 9.8E-2	1.56E-1 ± 7.9E-2	<7.4E-2	8.8E-2	<9.4E-2
Tl-208	<2.4E-1	4.06E-1 ± 8.6E-1	2.29E-1 ± 7.8E-2	2.88E-1 ± 9.1E-2	4.39E-1 ± 8.9E-1
Bi-212	8.64E-1 ± 1.0E0	<1.7E0	<1.2E0	<1.7E0	1.94E0 ± 1.1E0
Pb-212	9.96E-1 ± 3.0E-1	8.37E-1 ± 2.4E-1	4.97E-1 ± 1.6E-1	9.48E-1 ± 2.2E-1	8.18E-1 ± 2.4E-1
Bi-214	9.70E-1 ± 2.8E-1	<9.8E-1	3.89E-1 ± 1.4E-1	7.58E-1 ± 1.6E-1	6.58E-1 ± 1.7E-1
Pb-214	1.04E0 ± 2.4E-1	8.96E-1 ± 1.9E-1	4.26E-1 ± 1.4E-1	7.60E-1 ± 1.6E-1	9.24E-1 ± 2.1E-1
Ac-228	<8.9E-1	<6.0E-1	5.27E-1 ± 2.0E-1	9.99E-1 ± 2.2E-1	9.41E-1 ± 2.1E-1
U-235	<9.2E-1	<7.4E-1	<4.6E-1	<6.4E-1	<7.4E-1
U-238	<2.0E+1	<1.2E+1	<1.2E+1	<1.5E+1	<1.5E+1
Am-241	<8.9E-1	<5.9E-1	<5.6E-1	<6.6E-1	<6.1E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0337W bv-ss-1115 (1/21/99)	9901-0338W bv-ss-1116 (1/21/99)	9901-0339W bv-ss-1117 (1/21/99)	9901-0340W bv-ss-1118 (1/21/99)	9901-0341W bv-ss-1119 (1/21/99)
K-40(1)	6.18E0 ± 1.5E0	4.12E0 ± 9.6E-1	8.95E0 ± 1.5E0	4.67E0 ± 1.0E0	5.80E0 ± 1.0E0
Co-60	<1.3E-1	<6.6E-2	<8.7E-2	<6.3E-2	<7.0E-2
Cs-137	5.43E-1 ± 1.3E-1	<7.1E-2	<9.2E-2	<6.3E-2	<7.7E-2
Tl-208	2.52E-1 ± 1.1E-1	<1.3E-1	4.17E-1 ± 1.1E-1	1.68E-1 ± 6.2E-2	2.55E-1 ± 8.0E-1
Bi-212	<2.0E0	<1.3E0	<1.7E0	<1.2E0	<1.0E0
Pb-212	5.83E-1 ± 1.4E-1	4.22E-1 ± 1.5E-1	8.67E-1 ± 2.3E-1	3.90E-1 ± 1.6E-1	6.26E-1 ± 1.2E-1
Bi-214	8.37E-1 ± 2.0E-1	<7.0E-1	8.90E-1 ± 2.1E-1	<6.6E-1	5.19E-1 ± 1.4E-1
Pb-214	6.20E-1 ± 1.7E-1	3.38E-1 ± 1.1E-1	6.99E-1 ± 1.8E-1	4.13E-1 ± 1.3E-1	6.07E-1 ± 1.2E-1
Ac-228	6.19E-1 ± 2.2E-1	<4.3E-1	1.05E0 ± 1.6E-1	<4.0E-1	6.74E-1 ± 1.6E-1
U-235	<7.9E-1	<4.9E-1	<6.8E-1	<5.3E-1	<6.1E-1
U-238	<1.5E+1	<8.9E0	<1.3E+1	<1.1E1	<1.1E+1
Am-241	<7.5E-1	<5.0E-1	<6.8E-1	<4.8E-1	<5.7E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0342W bv-ss-1057 (1/21/99)
K-40(1)	7.35E-1 ± 1.3E-1
Co-60	<7.5E-2
Cs-137	<7.1E-2
Tl-208	1.91E-1 ± 6.3E-2
Bi-212	<1.5E0
Pb-212	6.01E-1 ± 1.7E-1
Bi-214	4.37E-1 ± 1.3E-1
Pb-214	4.87E-1 ± 1.4E-1
Ac-228	<4.5E-1
U-235	<6.4E-1
U-238	<1.2E0
Am-241	<5.5E-1

(1)Antech Method A-524 (Gamma Spectrometry), units are pCi/gram, and error estimates are 2 standard deviations.

APPENDIX B

SOIL BORING LOGS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-1

Client: Westinghouse Electric Company — Project No. 93132.80
Site Name: Specialty Metals Plant — Date Started: 11/16/98
Location: Blairsville, PA — Date Completed: 11/16/98
Drilling Co.: Pennsylvania Drilling — Field Geologist: J. Clemenich — Depth to GW: —
Driller: Paul Walldell w/Bill Minor — Checked By: W. Baughman — Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408882.59 E 1535328.49
Surface Elev. 988.8

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	4.7/5 94%	Orange-brown to brown silt with some clay and fine sand; moist; cohesive	0.0	
		Abundant rock fragments 4.5'		
5		5.0' Bottom of Boring at 5.0'		
6				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-2

Client: Westinghouse Electric Company Project No. 93132.80
Site Name: Specialty Metals Plant Date Started: 11/16/98
Location: Blairsville, PA Date Completed: 11/16/98
Drilling Co.: Pennsylvania Drilling Field Geologist: J. Clemenich Depth to GW: —
Driller: Paul Walldell with Bill Miner Checked By: W. Baughman Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408806.85 E 1535333.68
Surface Elev. 989.8

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.7/3.7 100%	orange-brown to brown silt and fine sand with black carbonaceous fragments and sandstone fragments; moist; cohesive	0.0	
1				
2				
3		3.7'		Auger Refusal - hit bedrock
4		Bottom of Boring at 3.7'		
5				
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-3a

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/16/98
Date Completed: 11/16/98
Drilling Co: Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Paul Walldell with Bill Minar
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408797.34 E 1535369.12
Surface Elev. 989.1

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	2.7/3.5 77%	orange-brown to brown silt and fine sand with few sandstone fragments; moist; cohesive	0.0	
2		large sandstone fragments 2.3'		
3		3.7'		Auger Refusal - hit bedrock
4		Bottom of Boring at 3.7'		
5				
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-36

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/16/98
Date Completed: 11/16/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Paul Walldell with Bill Moner
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4½" I.D., 8" O.D. hollow Stem auger with 3½" I.D. Split core barrel

Coordinates N 498790.35 E 1535370.89
Surface Elev. 989.9

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0		Brown silt and sand with sandstone fragments; dry; fairly cohesive	0.0	Fill material present in core
		0.9'		
1		concrete fill – zirconium chips		
		1.2'		
		Brown, orange-brown, and dark brown mottled silt and sand with sandstone fragments; dry to moist; fairly cohesive		
2				
3		3.0'		
		Brown, light brown, and orange-brown mottled silt and sand with rock fragments; moist; very cohesive		
4		4.7'		Auger Refusal – hit bedrock
5		Bottom of Boring at 4.7'		
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-4

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Drilling Co.: Pennsylvania Drilling
Driller: Paul Walldell with Bill Minor
Field Geologist: J. Clemenich
Checked By: W. Baughman
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Project No. 93132.80
Date Started: 11/16/98
Date Completed: 11/16/98
Depth to GW: —
Date/Time: —

Coordinates N 408775.90 E 1535388.96
Surface Elev. 989.0

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.1/5 62%	Orange-brown and dark brown mottled silt and sand with sandstone fragments and trace coal fragments; dry; cohesive; fill material	0.0	Zircalay Shavings observed in drill cuttings. Fill material present in core
1		1.2' Thin layer of dark brown fill material 1.3'		
2		Same as above		
3		2.8' Mottled gray-brown large sandstone fragments		
4				
5		5.0' Bottom of Boring at 5'		
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-5

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/17/98
Date Completed: 11/17/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. Hollow Stem auger with 3½" I.D. split core barrel

Coordinates N 40875l.73 E 1535388.09
Surface Elev. 988.1

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.3/3.5 94%	orange brown to light tan silt and fine sand; slightly damp; cohesive; fill material	0.0	
1				
2				
		2.5'		
		Mottled gray-brown sandstone fragments		
3		3.5'		Auger Refusal - hit bedrock
		Bottom of Boring at 3.5'		
4				
5				
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-6

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Drilling Co.: Pennsylvania Drilling
Field Geologist: J Clemenich
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Drilling Method: 4¼" I.D., 8" O.D hollow stem auger with 3½" I.D. split core barrel

Project No. 93132.80
Date Started: 11/17/98
Date Completed: 11/17/98
Depth to GW: —
Date/Time: —

Coordinates N 408734.37 E 1535390.36
Surface Elev. 987.1

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.3/5 66%	Orange brown to dark brown silt with fine sand and sandstone fragments; moist; cohesive; fill material		Fill material present in core
1				
2		sandstone fragments 1.7'		
3				
4		Sandstone fragments 3.4'		
5		5.0'		
		Bottom of Boring at 5'		
6				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-7

Client: Westinghouse Electric Company
Project No. 93132.80
Site Name: Specialty Metals Plant
Date Started: 11/17/98
Location: Blairsville, PA
Date Completed: 11/17/98
Drilling Co: Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Date/Time: —
Drilling Method: 9¼" I.D., 8" O.D. hollow stemauger with 3½" I.D. split core barrel

Coordinates N 406773.81 E 1535430.00
Surface Elev. 986.9

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.1/5 62%	Orange-brown and dark brown silt and fine sand with sandstone fragments and trace organic material; semi-cohesive to very cohesive.		
1				
2				
3				
4				
5		5.0'		
		Bottom of Boring at 5'		
6				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-8

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/17/98
Date Completed: 11/17/98
Drilling Co.: Pennsylvania Drilling
Driller: Gary Jones with Bill Miner
Field Geologist: J. Clemenich
Checked By: W. Baughman
Depth to GW: —
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408807.13 E 1535434.76
Surface Elev. 986.9

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.9/5 78%	topsoil and vegetation 0.2'		Fill material present in core
		Medium brown sand and silt with sandstone and limestone fragments and traces of organic material; dry; non-cohesive; fill material 1.7'		
2		Orange-brown silt and fine sand; moist; cohesive 2.4'		
		Dark gray clay and silt 2.6'		
3		Orange brown silt and fine sand; moist; cohesive		
4		Sandstone fragments 5.0'		
5		Bottom of boring at 5'		
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-9

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Project No. 93132.80
Date Started: 11/17/98
Date Completed: 11/17/98
Depth to GW: —
Date/Time: —

Coordinates N 408766.25 E 1535397.79
Surface Elev. 988.2

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	4/4 100%	Brown, orange-brown, and gray mottled silt and fine sand with some sandstone fragments and trace organic material; dry to moist; cohesive; fill material	0.0	Fill material present in cores
3		3.3' Gray and brown sandstone fragments 4.0'		Auger Refusal - hit bedrock
4		Bottom of Boring at 4.0'		
5				
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-10

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Drilling Co. Pennsylvania Drilling
Driller: Gary Jones w/ Bill Minor
Field Geologist: J. Clemenich
Checked By: W. Baughman
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Project No. 93132.80
Date Started: 11/17/98
Date Completed: 11/17/98
Depth to GW: —
Date/Time: —

Coordinates N 408800.20 E 1535390.20
Surface Elev. 987.9

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3/3 100%	Dark brown to orange brown silt and fine sand with coal and sandstone fragments and trace organic material; damp; semi cohesive to cohesive.	0.0	
1				
2				
		Sandstone fragments 2.8' - 3.0'		Auger Refusal - hit bedrock
3		Bottom of Boring at 3.0'		
4				
5				
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-11

Client: Westinghouse Electric Company | Project No. 93132.80
Site Name: Specialty Metals Plant | Date Started: 11/17/98
Location: Blairsville, PA | Date Completed: 11/17/98
Drilling Co. Pennsylvania Drilling | Field Geologist: J. Clemenich | Depth to GW: —
Driller: Gary Jones with Bill Minor | Checked By: W. Baughman | Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408791.56 E 1535475.82
Surface Elev. 986.0

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	4.1/5 82%	Topsoil and vegetative material 0.2'		Fill material present in core.
		Brown silt, clay, and fine sand with abundant sandstone fragments; damp; cohesive - fill material		
3		Roofing tar fragment 3.4'		
4		Dark gray, reddish brown, and brown clay and silt; moist; very cohesive		
5	4.1/5 82%			
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-11

Client: Westinghouse Electric Company — Project No. 93132.80
Site Name: Specialty Metals Plant — Date Started: 11/17/98
Location: Blairsville, PA — Date Completed: 11/17/98
Drilling Co.: Pennsylvania Drilling — Field Geologist: J. Clemenich — Depth to GW: —
Driller: Gary Jones with Bill Minor — Checked By: W. Baughman — Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

DEPTH (FEET)	RECOVERY	Coordinates N ____ E ____ Surface Elev. ____ DESCRIPTION	PID READING (PPM)	REMARKS
8		Dark gray, reddish brown, and brown clay and silt; moist; very cohesive sandstone fragments 8.6'		
9				
10		10.0' Bottom of Boring at 10'		
11				
12				
13				
14				
15				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-12

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/17/98
Date Completed: 11/17/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Minor
Checked By: W. Banghman
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408712.35 E 1535484.04
Surface Elev. 983.7

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.4/5 68%	Brown to orange brown unconsolidated silt and fine sand with abundant sandstone fragments; dry; non cohesive; fill material	0.0	Fill material present in core
2		2.1' Orange-brown to tan clay and silt with sandstone fragments; damp; very cohesive		
5		5.0' Bottom of boring at 5.0'		
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-13

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/18/98
Date Completed: 11/18/98
Drilling Co.: Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Mino
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408783.59 E 1535546.15
Surface Elev. 979.7

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	29/48 73%	Mottled brown to gray silt and fine sand; slightly damp; cohesive; indigenous material	0.0	
1				
2				
3				
4		4.0'		Auger Refusal - hit bedrock
		Bottom of Boring at 4.0'		
5				
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-14

Client: Westinghouse Electric Company
Project No. 93132.80
Site Name: Specialty Metals Plant
Date Started: 11/18/98
Location: Blairsville, PA
Date Completed: 11/18/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones w/ Bill Minor
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollowstem auger with 3½" I.D. Split core sampler

Coordinates N 408719.47 E 1535527.91
Surface Elev. 980.9

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	4.7/5 94%	Medium to dark brown topsoil with organic matter	0.0	
		1.0'		
1		Orange brown to reddish-brown mottled silt with some clay and fine sand; damp; cohesive		
2				
3				
4				
		Large sandstone fragment 4.8'		
		5.0'		
5		Bottom of Boring at 5.0'		
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-15

Client: Westinghouse Electric Company | Project No. 93132.80
Site Name: Specialty Metals Plant | Date Started: 11/18/98
Location: Blairsville, PA | Date Completed: 11/18/98
Drilling Co.: Pennsylvania Drilling | Field Geologist: J. Clemenich | Depth to GW: —
Driller: Gary Jones with Bill Minar | Checked By: W. Baughman | Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 4086 99.69 E 1535309.54
Surface Elev. 991.2

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	2.3/3.5 66%	Solid orange-brown silt and fine to medium sand and some sandstone fragments; dry to slightly damp; semi-cohesive; fill material	0.0	Fill material present in core
3.5'				Auger Refusal - hit bedrock
		Bottom of Boring at 3.5'		

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-16

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Drilling Co.: Pennsylvania Drilling
Driller: Gary Jones with Bill Minor
Drilling Method: 4¼" I.D., 8" O.D. hollowstem auger with 3½" I.D. split core barrel
Field Geologist: J. Clemowich
Checked By: W. Baughman

Project No. 93132.80
Date Started: 11/18/98
Date Completed: 11/18/98
Depth to GW: —
Date/Time: —

Coordinates N 406723.63 E 1535319.31
Surface Elev. 991.6

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.3/5 66%	Dark brown mottled silt and fine sand with some sandstone fragments and trace coal fragments; dry to slightly damp; semi-cohesive; fill material Metal shavings, 1'-1.5'		Fill material present in core
1				
2				
3				
4				
5		5.0'		
		Bottom of Boring at 5.0'		
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-17

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/18/98
Date Completed: 11/18/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Depth to GW: —
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408753.39 E 1535359.08
Surface Elev. 990.5

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3/5 60%	Orange-brown mottled silt with fine to medium sand, sandstone fragments, and trace coal; damp; semi-cohesive; fill material		Fill material present in core
5		5.0'		
		Bottom of Boring at 5.0'		

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-18

Client: Westinghouse Electric Company
Project No. 93132.80
Site Name: Specialty Metals Plant
Date Started: 11/18/98
Location: Blairsville, PA
Date Completed: 11/18/98
Drilling Co: Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408727.26 E 1535343.16
Surface Elev. 990.2

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.3/5 66%	Dark brown silt and fine sand with few sandstone fragments and traces of iron staining; slightly damp; semi-cohesive; fill material		Fill material present in core
		Asphalt fragment 1.5'		
		Asphalt, glass, and concrete fragments 3.2'		
		5.0'		
5		Bottom of Boring at 5.0'		

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-19

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/18/98
Date Completed: 11/18/98
Drilling Co: Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D. 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408763.34 E 1535371.25
Surface Elev. 989.8

DEPTH (FEET)	RECOVERY	DESCRIPTION		PID READING (PPM)	REMARKS
0	4.1/4.5	Orange-brown silt with fine sand, clay,			Small piece of black plastic found among drill cuttings
	91%	and sandstone fragments; slightly damp;			
1		semi-cohesive; fill material			Fill material present in core
		Traces black fill material	1.9'		
2		Large sandstone fragment	2.5'		
		Traces red dye, black fill material	3.3'		
3					
4			4.5'		Auger Refusal-hit bedrock
		Bottom of Boring at 4.5'			
5					
6					
7					
8					

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-20

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 9352-80
Date Started: 11/18/98
Date Completed: 11/18/98
Drilling Co: Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4½" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408730.80 E 1535364.56
Surface Elev. 988.5

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.1/5 62%	Dark brown silt with clay, some fine sandy sandstone fragments, and traces iron staining; damp; cohesive; fill material		Fill material present in core
1				
2		Ash fragments, 1.9'		
		zircalloy chip 2.7'		
3				
4				
5		5.0'		
		Bottom of Boring at 5.0'		
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-21

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/18/98
Date Completed: 11/18/98
Drilling Co: Pennsylvania Drilling
Field Geologist: J. Clemanich
Depth to GW: —
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" split core barrel

Coordinates N 408676.28 E 1535277.03
Surface Elev. 991.9

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	4.8/5 96%	Dark brown silt and fine sand with organics and sandstone fragments		Black brick fragment (~2"x~4"x~4") observed in drill cuttings
				Fill material present in core
1		1.1'		
		Orange-brown sand and silt with sandstone fragments; slightly damp; semi-cohesive; fill material		
2		slight red dye staining 2.4'		
3				B radiation 3x background at 3.1'
4		trace black granular material 4.2'		
5		5.0'		
		Bottom of Boring at 5.0'		
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-22

Client: Westinghouse Electric Company
Project No. 93132
Site Name: Specialty Metals Plant
Date Started: 11/18/98
Location: Blairsville, PA
Date Completed: 11/18/98
Drilling Co: Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Minar
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" split core barrel

Coordinates N 408719.93 E 1535286.31
Surface Elev. 992.7

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	4/5 80%	Dark brown silt and fine sand with sandstone fragments; dry to damp; slightly cohesive		Fill material present in core.
		0.9'		
1		Orange brown to dark brown mottled silt, fine sand, and sandstone fragments; moist; cohesive; fill material		
2		red dye staining 2.0'		
3				
4				
5		5.0'		
		Bottom of Boring at 5.0'		
6				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-23

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/19/98
Date Completed: 11/19/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Depth to GW: —
Date/Time: —
Drilling Method: 4¼" I.D. | 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408769.07 E 1535328.42
Surface Elev. 992.0

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	48/5 96%	Dark brown silt and fine sand with organic material; damp; semi cohesive		Small cement block fragment observed in drill cuttings Fill material present in core
1		small ash fragments 1.2' 1.4'		
2		Orange-brown to dark brown silt and fine sand with sandstone fragments and traces of black ash or coal and red dye staining; moist; cohesive; fill material		
3				
4				
5		5.0'		
		Bottom of Boring at 5.0'		
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-24

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Drilling Co. Pennsylvania Drilling
Driller: Gary Jones with Bill Minor
Field Geologist: J. Clemenich
Checked By: W. Baughman
Drilling Method: 4¼" I.D., 8" O.D. hollowstem auger with 3½" I.D. split core barrel

Project No. 93132.80
Date Started: 11/19/98
Date Completed: 11/19/98
Depth to GW: —
Date/Time: —

Coordinates N 406751.11 E 1535308.59
Surface Elev. 992.9

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	4.0/5 80%	Dark brown silt and fine sand; damp; semi-cohesive		Fill material present in core
1		1.0' Orange-brown silt and fine sand with sandstone fragments; moist; cohesive; fill material		
2				
3				
4				
5		5.0' Bottom of Boring at 5.0'		
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-25

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Drilling Co: Pennsylvania Drilling
Driller: Gary Jones with Bill Minor
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel
Field Geologist: J. Clemenich
Checked By: W. Baughman

Project No. 93132.80
Date Started: 11/19/98
Date Completed: 11/19/98
Depth to GW: —
Date/Time: —

Coordinates N 408762.39 E 1535299.33
Surface Elev. 993.0

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3/3 100%	Dark brown silt, fine sand, sandstone fragments 0.4'		Fill material present in core
1		Orange-brown silt and fine sand with sandstone fragments and traces of black fill material; slightly damp; cohesive		
2				
3		3.0'		Auger Refusal - hit bedrock
		Bottom of Boring at 3.0'		
4				
5				
6				
7				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-26

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/19/98
Date Completed: 11/19/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D. 8" O.D. hollow stem auger with 3½" split core barrel

Coordinates N 408749.86 E 1535299.64
Surface Elev. 993.2

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	4/6/5 92%	Dark brown silt and fine sand with sandstone fragments and organic material; damp; slightly cohesive. 0.6'		Fill material present in core
1		Orange-brown, dark brown, and yellow mottled silt, fine sand, clay, and sandstone fragments; damp; cohesive; fill material		
2				
3				
4		red dye, black granular fragments 4.0'		
5		5.0'		
		Bottom of Boring at 5.0'		
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-27

Client: Westinghouse Electric Company | Project No. 93132.80
Site Name: Specialty Metals Plant | Date Started: 11/19/98
Location: Blairsville, PA | Date Completed: 11/19/98
Drilling Co.: Pennsylvania Drilling | Field Geologist: J. Clemenich | Depth to GW: —
Driller: Gary Jones with Bill Moner | Checked By: W. Baughman | Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408675.63 E 1535297.00
Surface Elev. 991.0

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.3/3.5 94%	Dark brown silt, fine sand, and organic material; damp; semi-cohesive		
		0.8'		
1		Orange-brown mottled silt and fine sand with sandstone fragments throughout; damp; cohesive; fill material		
2				
3		3.5'		Auger refusal - hit bedrock
		Bottom of Boring at 3.5'		
4				
5				
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-28

Client: Westinghouse Electric Company | Project No. 93132.80
Site Name: Specialty Metals Plant | Date Started: 11/19/98
Location: Blairsville, PA | Date Completed: 11/19/98
Drilling Co: Pennsylvania Drilling | Field Geologist: J. Clemenich | Depth to GW: —
Driller: Gary Jones with Bill Mina | Checked By: W. Banghman | Date/Time: —
Drilling Method: 4¼" I.D. 8" O.D. hollow stem auger with 3½" Split core barrel

Coordinates N 408770.23 E 1535280.51
Surface Elev. 994.1

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.8/5 76%	Dark brown silt, fine sand, and organic material; damp; semi-cohesive Limestone fragments 1.1'		Fill material present in core
1		Orange-brown to dark brown silt and fine to medium sand with traces of ash fragments within first two feet of the unit; damp; cohesive; fill material		
2				
3		trace red dye 3.2'		
4				
5		5.0'		
		Bottom of Boring at 5.0'		
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-29

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 9382.80
Date Started: 11/19/98
Date Completed: 11/19/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Mina
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408785.48 E 1535296.03
Surface Elev. 993.6

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	4.7/5 94%	Dark brown silt and fine sand; slightly damp, slightly cohesive		Fill material present in core
1		1.0' Orange-brown mottled silt and fine sand with sandstone fragments and trace black ash; damp; cohesive; fill material.		
2				
3				
4				
5		Large sandstone fragments 5.0' Bottom of Boring at 5.0'		
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-30

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/19/98
Date Completed: 11/19/98
Drilling Co: Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Miner
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408809.55 E 1535284.17
Surface Elev. 993.7

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.7/5 74%	Light gray fine to medium sand with limestone fragments - road construction material		Fill material present in core
1		1.0'		
2		Orange-brown and yellow silt and fine sand with trace ash fragments and sandstone fragments; damp; cohesive; fill material		
3				
4				
5		5.0'		
		Bottom of Boring at 5.0'		
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-31

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/19/98
Date Completed: 11/19/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Mina
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollowstem auger with 3½" I.D. split core barrel

Coordinates N 408797.02 E 1535316.64
Surface Elev. 992.8

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	4.8/5 96%	Dark brown silt and fine sand with sandstone fragments; dry; non-cohesive to slightly cohesive		Fill material present in core
		0.5' Orange-brown mottled silt and fine sand with sandstone fragments; trace small particles black ash; slightly damp; cohesive; fill material		
1				
2				
3				
4				
5		5.0'		
		Bottom of Boring at 5.0'		
6				
7				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-32

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/19/98
Date Completed: 11/19/98
Drilling Co.: Pennsylvania Drilling
Field Geologist: J. Clemenich
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Depth to GW: —
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem augers with 3½" I.D. split core barrel

Coordinates N 408793.53 E 1535326.40
Surface Elev. 992.5

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.4/3.5 97%	Dark brown silt and fine sand with some small sandstone fragments; fill material		Fill material present in core
		0.8'		
1		Orange-brown with yellow silt and fine sand with sandstone fragments; trace ash; slightly damp; cohesive; fill material		
		2.0'		
2		fine sand		
		2.4'		
		Ash		
3				
		sandstone fragments 3.5'		Auger Refusal - hit bedrock
		Bottom of Boring at 3.5'		
4				
5				
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-33

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/19/98
Date Completed: 11/19/98
Drilling Co.: Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" split core barrel

Coordinates N 408792.95 E 1535353.83
Surface Elev. 990.8

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.7/5 74%	Dark brown silt and sand with sandstone and limestone fragments and chunks of black clayey material; Zircaloy shavings; dry; noncohesive		Fill material present in core
1				
2		1.8' Dark brown and red clayey material with asphalt fragments near top of unit; Zircaloy chips		
3		2.5' Orange-brown mottled silt with fine to medium sand, sandstone fragments, ash fragments and an old nail; slightly damp; cohesive; fill material		
4				
5		Sandstone fragments 4.8' 5.0'		
6		Bottom of Boring at 5.0'		
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-34

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132-80
Date Started: 11/23/98
Date Completed: 11/23/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408815.97 E 1535257.62
Surface Elev. 993.8

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	29/5 58%	Dark brown silt and fine sand with sandstone fragments; dry; slightly cohesive; fill material		Fill material present in core
1		1.3'		
2		Orange-brown to brown silt, fine sand, sandstone fragments; damp; semi-cohesive to cohesive; fill material		
3				
4				
5	14/1.5 93%			
6		6.5'		Auger refusal-hit concrete
		Bottom of Boring at 6.5'		
7				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-35

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93111
Date Started: 11/23/98
Date Completed: 11/23/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Mino
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core sampler

Coordinates N 408748.63 E 1535248.16
Surface Elev. 993.6

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	4.8/5 96%	Dark brown and orange-brown silt; fine sand, and sandstone fragments; traces of ash; damp; cohesive; fill material		Fircalay chips found in first 0.5 feet of soil Fill material present in core
1				
2				
3				
4				
5	4.2/5 84%			
6				
7		Black ash fragments 7.0' Red dye staining		
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-35

Client: Westinghouse Electric Company | Project No. 93132.80
Site Name: Specialty Metals Plant | Date Started: 11/23/98
Location: Blairsville, PA | Date Completed: 11/23/98
Drilling Co. Pennsylvania Drilling | Field Geologist: J. Clemenich | Depth to GW: —
Driller: Barry Jones with Bill Minor | Checked By: W. Baughman | Date/Time: —
Drilling Method: 4¼" I.D. 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408748.63 E 1535248.16
Surface Elev. 993.6

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
8		Dark brown and orange brown silt, fine sand, and sandstone fragments; traces of ash; damp; cohesive.		Fill material present in core
9				
10		10.0		
		Bottom of Boring at 10.0'		
11				
12				
13				
14				
15				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-36

Client: Westinghouse Electric Company | Project No. 93132-80
Site Name: Specialty Metals Plant | Date Started: 11/23/98
Location: Blairsville, PA | Date Completed: 11/23/98
Drilling Co.: Pennsylvania Drilling | Field Geologist: J. Clemenich | Depth to GW: —
Driller: Gary Jones with Bill Minor | Checked By: W. Baughman | Date/Time: —
Drilling Method: 4¼" I.D. 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408780.75 E 1535239.99
Surface Elev. 993.6

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.8/5 76%	Orange-brown silt and fine sand with sandstone fragments and traces of black material; damp; cohesive; fill material		Fill material present in core
5.0'				
5	3/3 100%	Black granular fill material mixed with sand and sandstone fragments; non-cohesive		
6.0'				
6		Orange-brown silt and fine sand with sandstone fragments; damp; cohesive; fill material		
8.0'		Bottom of Boring at 8.0'		Auger Refusal-hit bedrock

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-37

Client: Westinghouse Electric Company | Project No. 93132.80
Site Name: Specialty Metals Plant | Date Started: 11/23/98
Location: Blairsville, PA | Date Completed: 11/23/98
Drilling Co. Pennsylvania Drilling | Field Geologist: J. Clemenich | Depth to GW: —
Driller: Gary Jones with Bill Minor | Checked By: W. Baughman | Date/Time: —
Drilling Method: 4¼" I.D. 8" O.D. hollow stem auger with 3½" split core barrel

Coordinates N 408841.11 E 1535273.48
Surface Elev. 993.0

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.2/5 64%	Dark brown topsoil with concrete fragments from adjacent road - Fill material		Fill material present in core
		0.5'		
1		Orange-brown silt and sand with sandstone fragments; cohesive; damp; fill material		
2				
3				
4				
5		5.0'		
		Bottom of Boring at 5.0'		
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-38

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Drilling Co.: Pennsylvania Drilling
Driller: Gary Jones with Bill Minor
Field Geologist: J. Clemenich
Checked By: W. Baughman
Drilling Method: 4¼" I.D. 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Project No. 93132.80
Date Started: 11/23/98
Date Completed: 11/23/98
Depth to GW: —
Date/Time: —

Coordinates N 468879.17 E 1535208.15
Surface Elev. 994.3

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.4/5 68%	Brown silt and fine sand, organic materials, and sandstone and limestone fragments; dry; non-cohesive; fill material		Fill material present in core
1				
2		limestone and slag fragments 1.9'		
		Orange-brown and dark brown mottled silt and fine sand with sandstone fragments; moist; cohesive; fill material		
3		slag fragment 2.8'		
4				
5	3.7/5 74%			
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-38

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/23/98
Date Completed: 11/23/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Mina
Checked By: W. Baughman
Date/Time:
Drilling Method: 4¼" I.D. 8" O.D. hollowstem auger with 3½" split core barrel

Coordinates N 408879.17 E 1535208.15
Surface Elev. 994.3

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
8		Orange-brown and dark brown mottled silt and fine sand with sandstone fragments; dry; non-cohesive; increasing amount of sandstone fragments 8.0'		Fill material present in core.
9				
10		10.0' Bottom of Boring at 10.0'		
11				
12				
13				
14				
15				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-39

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93B2-80
Date Started: 11/23/98
Date Completed: 11/23/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Driller: Gary Jones with Bill Minor
Checked By: W. Banghman
Depth to GW: —
Date/Time: —
Drilling Method: 4¼" I.D. 8" O.D. hollow stem augers with 3½" I.D. split core barrel

Coordinates N 408847.78 E 1535234.26
Surface Elev. 993.5

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3 4/4 95%	Brown silt and sand with limestone and concrete fragments and zircalay chips; damp; slightly cohesive; fill material		Fill material present in core
1		1.0' Orange-brown to brown silt and fine sand with sandstone fragments; damp; cohesive; fill material		
2		Red dye staining 2.2'		
3		Black material and limestone fragments 3.9'		
4		4.0 Bottom of Boring at 4.0'		Auger Refusal - hit bedrock
5				
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-40

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/23/98
Date Completed: 11/23/98
Drilling Co.: Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D., 8" I.D. hollow stem auger with 3½" I.D. split core sampler

Coordinates N 408687.55 E 1535249.98
Surface Elev. 993.8

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.6/5 72%	Dark brown silt and clay with blue slag, limestone fragments, and organic material; slightly damp; cohesive; fill material.		Fill material present in core
1				
2		1.6' Orange-brown silt, fine sand, some clay, and sandstone fragments, damp; cohesive; fill material		
3				
4				
5	3/3 100%			
6				
7		Bottom of Boring at 8.0'		Auger Refusal - hit bedrock
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-41

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/23/98
Date Completed: 11/23/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Driller: Gary Jones with Bill Mina
Checked By: W. Baughman
Depth to GW: —
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core sampler

Coordinates N 408686.81 E 1535227.87
Surface Elev. 994.0

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	2.5/5 50%	Dark brown silt with sandstone, limestone, asphalt, and slag fragments - fill material		Fill material present in core
1				
2	1.9'	Orange-brown silt and fine sand with sandstone fragments; slight traces of black fill material; moist; cohesive		
3				
4				
5	3.7/5 82%			
6				
7				
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-41

Client: Westinghouse Electric Company
Project No. 93132.80
Site Name: Specialty Metals Plant
Date Started: 11/23/98
Location: Blairsville, PA
Date Completed: 11/23/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. Split Core barrel

Coordinates N 408686.81 E 1535227.87
Surface Elev. 994.0

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
8		Orange-brown silt and fine sand with sandstone fragments; slight traces of black fill material; moist; cohesive		Fill material present in core.
9		9.5'		Auger Refusal - hit bedrock
		Bottom of Boring at 9.5'		
10				
11				
12				
13				
14				
15				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-42

Client: Westinghouse Electric Company — Project No. 93132
Site Name: Specialty Metals Plant — Date Started: 11/24/98
Location: Blairsville, PA — Date Completed: 11/24/98
Drilling Co.: Pennsylvania Drilling — Field Geologist: J. Clemenich — Depth to GW: —
Driller: Gary Jones with Bill Minor — Checked By: W. Baughman — Date/Time: —
Drilling Method: 9¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408599.04 E 1535222.98
Surface Elev. 994.2

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	5/5 100%	Gray to brown mottled clay with silt and trace wood fragments; moist, very cohesive; natural fill material	0.0	Natural fill material present in core
5		5.0'		
	4.4/5 88%	same as above with small sandstone fragments	0.0	
7		large sandstone fragment 7.0'		

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-42

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132-80
Date Started: 11/24/98
Date Completed: 11/24/98
Drilling Co.: Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Lewis with Bill Minor
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408599.04 E 1535222.98
Surface Elev. 994.2

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
8		Gray to brown mottled clay with silt and an increasing amount of sandstone fragments; moist; very cohesive; natural fill material		
9				
10	0/5			10'–15' Dry run - no recovery
11				
12				
13				
14				
		15.0'		
15		Bottom of Boring at 15.0'		

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-43

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/24/98
Date Completed: 11/24/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Depth to GW: —
Date/Time: —
Drilling Method: 4¼" I.D., 8" O.D. hollowstem auger with 3½" I.D. split core barrel

Coordinates N 408535.10 E 1535287.91
Surface Elev. 994.7

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.7/5	Gray, brown, and tan clay and silt with		Natural fill material present
	74%	traces of ash fragments; dry and hard,		in core
1		becoming moist towards bottom of		
		sample; very cohesive; natural fill		
2		material.		
3				
4				
5	4.6/5			
	92%	sandstone fragments 5.4'		
6				
		sandstone fragments 7.0'		
8		red dye traces, sandstone fragments 8.0'		

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-43

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/24/98
Date Completed: 11/24/98
Depth to GW: —
Date/Time: —
Drilling Co.: Pennsylvania Drilling
Driller: Gary Jones with Bill Minor
Field Geologist: J. Clemenich
Checked By: W. Baughman
Drilling Method: 4¼" I.D., 8" O.D. Hollowstem Auger with 3½" Splitcore barrel

Coordinates N 408535.10 E 1535287.91
Surface Elev. 994.7

DEPTH (FEET)	RECOVERY	DESCRIPTION		PID READING (PPM)	REMARKS
8					
9		Wood fragments - organic	9.0'		
10	3/3	Black organic material	10.0'		
	100%	Brown mottled clay with some silt; moist	10.2'		
11		Some sand and sandstone fragments	11.0'		
12					
13		Sandstone fragments	13.0'		Auger Refusal - hit bedrock
		Bottom of Boring at 13.0'			
14					
15					

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-44

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Drilling Co. Pennsylvania Drilling
Driller: Gary Jones with Bill Minor
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" split core barrel
Field Geologist: J. Clemenich
Checked By: W. Baughman

Project No. 93132.80
Date Started: 11/24/98
Date Completed: 11/24/98
Depth to GW: —
Date/Time: —

Coordinates N 408525.17 E 1535347.21
Surface Elev. 992.6

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0		Gray and brown mottled clay; damp; increasing moisture content with depth; very cohesive; natural fill material		Natural fill material present in core.
3		small wood fragment - organic 3.5'		
4		small sandstone fragment 4.6'		
5	4.3/5 86%			
8		large sandstone fragment 8.0'		

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-44

Client: Westinghouse Electric Company | Project No. 93132-80
Site Name: Specialty Metals Plant | Date Started: 11/24/98
Location: Blairsville, PA | Date Completed: 11/24/98
Drilling Co.: Pennsylvania Drilling | Field Geologist: J. Clemenich | Depth to GW: —
Driller: Gary Jones with Bill Minor | Checked By: W. Banghman | Date/Time: —
Drilling Method: 4¼" I.D. 8" O.D. hollow stem auger with 3½" split core barrel

Coordinates N 406525.17 E 1535347.21
Surface Elev. 992.6

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
8		Gray and brown mottled clay; damp; increasing moisture content with depth; very cohesive; natural fill material		
9				
10	4.9/5 98%			
11				
12		12.0' Tan and light gray clay; damp; very cohesive		
13				
14				
15		15.0' Bottom of Boring at 15.0'		
16				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-45

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Drilling Co: Pennsylvania Drilling
Driller: Gary Jones, with Bill Minor
Drilling Method: 4¼" I.D., 8" O.D. hollow stem auger with 3½" I.D. split core barrel
Field Geologist: J. Clemenich
Checked By: W. Baughman

Project No. 93132.80
Date Started: 11/24/98
Date Completed: 11/24/98
Depth to GW: —
Date/Time: —

Coordinates N 408571.31 E 1535355.66
Surface Elev. 992.8

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	4.3/5 86%	Brown to gray clay; damp; very cohesive; natural fill material.		Natural fill material present in core.
1				
2				
3		Trace red dye 3.0' Scattered sandstone fragments 3.3'-3.9'		
4				
5	3.8/5 76%			
6		widely scattered sand and sandstone fragments 6.2'-6.8'		
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-45

Client: Westinghouse Electric Company | Project No. 93132.80
Site Name: Specialty Metals Plant | Date Started: 11/24/98
Location: Blairsville, PA | Date Completed: 11/24/98
Drilling Co.: Pennsylvania Drilling | Field Geologist: J. Clemenich | Depth to GW: —
Driller: Gary Jones with Bill Minor | Checked By: W. Baughman | Date/Time: —
Drilling Method: 4¼" I.D. 8" O.D. hollowstem auger with 3½" I.D. split core barrel

Coordinates N 408571.31 E 1535355.66
Surface Elev. 992.8

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
8		Brown to gray clay; damp; very cohesive		
9				
10	0/5			Dry run 10'-15'- no recovery
	0%			
11				
12				
13				
14				
		15.0'		
15		Bottom of Boring at 15.0'		

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-46

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Drilling Co. Pennsylvania Drilling
Driller: Gary Jones with Bill Minor
Drilling Method: 4¼" I.D. 8" O.D. hollow stem auger with 3½" I.D. split core barrel
Field Geologist: J. Clemenich
Checked By: W. Baughman

Project No. 93132.80
Date Started: 11/24/98
Date Completed: 11/24/98
Depth to GW: —
Date/Time: —

Coordinates N 406607.91 E 1535315.71
Surface Elev. 992.9

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	4.8/5 96%	Gray to brown clay with isolated sandstone fragments; damp, with moisture content increasing towards bottom of core; very cohesive; natural fill material		Natural fill material present in core.
5	3.5/4.5 78%	5.5' Mostly sandstone fragments with gray and brown clay		
6		6.0' Black organic material 6.1' Gray clay with traces of silt and sand, some sandstone fragments and organic material; very moist; very cohesive		
7		7.5' Brown silt and sand containing many large sandstone fragments.		
8				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-46

Client: Westinghouse Electric Company
Project No. 93132.80
Site Name: Specialty Metals Plant
Date Started: 11/24/98
Location: Blairsville, PA
Date Completed: 11/24/98
Drilling Co. Pennsylvania Drilling
Field Geologist: J. Clemenich
Depth to GW: —
Driller: Gary Jones with Bill Minor
Checked By: W. Baughman
Date/Time: —
Drilling Method: 4¼" I.D. 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408607.91 E 1535315.71
Surface Elev. 992.9

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
8		Brown silt and sand containing many large sandstone fragments		
9		9.5'		Auger Refusal - hit bedrock
		Bottom of Boring at 9.5'		
10				
11				
12				
13				
14				
15				
16				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SC-47

Client: Westinghouse Electric Company
Site Name: Specialty Metals Plant
Location: Blairsville, PA
Project No. 93132.80
Date Started: 11/24/98
Date Completed: 11/29/98
Drilling Co. Pennsylvania Drilling
Driller: Gary Jones with Bill Minor
Field Geologist: J. Clemenich
Checked By: W. Baughman
Depth to GW: —
Date/Time: —
Drilling Method: 4¼" I.D. 8" O.D. hollow stem auger with 3½" I.D. split core barrel

Coordinates N 408624.22 E 1535314.16
Surface Elev. 992.6

DEPTH (FEET)	RECOVERY	DESCRIPTION	PID READING (PPM)	REMARKS
0	3.8/5.0	Brown and gray clay with some silt, fine sand, and sandstone fragments; damp to moist; very cohesive; natural fill material		Natural fill material present in core.
2		Trace red dye 2.0'		
3		Trace red dye 3.0'		
5		5.0'		
	2.3/3.0	Very dark gray clay with few sandstone pebbles; very moist; very cohesive 5.5'		
6		Dark brown silt and fine sand with large sandstone fragments		
8		Bottom of Boring at 8.0'		Auger Refusal - hit bedrock

APPENDIX C

CHAIN-OF-CUSTODY

CUMMINGS RITE[illegible] CONSU[illegible]NTS, INC.

Chain of C[illegible]ly Record

Page 1 of ____
Lab Q ____

Project Name: (W) Blairsville	**Results To:**	**Invoice To:**
Project Location: Blairsville	Company:	Company:
Project Number: 93132.90	Address:	Address:
Sampled By: (print) Jill Clemente	Phone:	Phone:

Lab ID	Sample Identification	Date	Time	Grab	Composite	Sample Matrix	No. of Bottles	Analyses										Preservatives HCL	HNO3	H2SO4	NaOH	Remarks
	SC-1	11/16/98	12:15																			
	SC-2	↓	12:50																			
	SC-3a	↓	14:10																			
	SC-3b	↓	14:40																			
	SC-4	↓	15:05																			
	SC-5	11/17/98	08:30																			
	SC-6	↓	09:20																			
	SC-7	↓	10:30																			
	SC-8	↓	10:50																			
	SC-9	↓	12:15																			

Turnaround Time Required: Normal ___ Rush ___	**1. Relinquished By: (signature)** [signature]	**Date** 11/17	**Time** [illegible]	**1. Received By: (signature)** [signature] 11/17/98
Sample Disposal: Return to Client ___ Disposal by Lab ___	**2. Relinquished By: (signature)**	**Date**	**Time**	**2. Received By: (signature)**
Known Hazard (flammable/toxic): Yes (comment below) ___ No ___	**3. Relinquished By: (signature)**	**Date**	**Time**	**3. Received By: (signature)**

Special Instructions/Comments:

Sample Condition Upon Receipt:

CUMMINGS RITER CONSULTANTS, INC.

Chain of Custody Record

Page ___ of ___

Lab Qt ___

Project Name: (W) Blairsville	**Results To:**	**Invoice To:**
Project Location: Blairsville	**Company:**	**Company:**
Project Number: 93132.80	**Address:**	**Address:**
Sampled By: (print) Jill D. Clemenich	**Phone:**	**Phone:**

Lab ID	Sample Identification	Date	Time	Grab	Composite	Sample Matrix	No. of Bottles	Analyses	Preservatives HCL	HNO3	H2SO4	NaOH	Remarks
	SC-10	11/17/08	12:35										
	SC-11	↓	13:30										
	SC-12	↓	14:20										

Turnaround Time Required:
Normal ___
Rush ___

Sample Disposal:
Return to Client ___
Disposal by Lab ___

Known Hazard (flammable/toxic):
Yes (comment below) ___
No ___

	Date	Time	
1. Relinquished By: (signature)	11/17	15:10	1. Received By: (signature) 11-17-08
2. Relinquished By: (signature)			2. Received By: (signature)
3. Relinquished By: (signature)			3. Received By: (signature)

Special Instructions/Comments:

Sample Condition Upon Receipt:

CUMMINGS RITEI CONSULTANTS, INC.

Chain of C[illegible]ly Record

Page 2 of [illegible]
Lab Q[illegible]

Project Name: (W) Blairsville	**Results To:**	**Invoice To:**
Project Location: Blairsville	**Company:**	**Company:**
Project Number: 93132.80	**Address:**	**Address:**
Sampled By: (print) Jill D. Clemenich	**Phone:**	**Phone:**

Lab ID	Sample Identification	Date	Time	Grab	Composite	Sample Matrix	No. of Bottles	Analyses	Preservatives: HCL	HNO3	H2SO4	NaOH	Remarks
[illegible]	SC-13	11/18	8:30										
	SC-14	"	9:00										
	SC-15	"	10:35										
	SC-16	"	10:50										
	SC-17	"	12:25										
	SC-18	"	12:45										
	SC-19	"	13:45										
	SC-20	"	14:20										
	SC-21	"	15:30										
	SC-22	↓	15:55										

Turnaround Time Required: [illegible] Normal ___ Rush ___	**1. Relinquished By: (signature)** Jill D. Clemenich	**Date** 11/18/98	**Time** 16:20	**1. Received By: (signature)**
Sample Disposal: Return to Client ___ Disposal by Lab ___	**2. Relinquished By: (signature)**	**Date**	**Time**	**2. Received By: (signature)**
Known Hazard (flammable/toxic): Yes (comment below) ___ No ___	**3. Relinquished By: (signature)**	**Date**	**Time**	**3. Received By: (signature)**

Special Instructions/Comments:

Sample Condition Upon Receipt:

CUMMINGS RITE CONSULTANTS, INC.

Chain of Custody Record

Page ___ of ___

Lab Q ___

Project Name: Westinghouse-SMP	**Results To:**	**Invoice To:**
Project Location: Blairsville	**Company:**	**Company:**
Project Number: 93132.80	**Address:**	**Address:**
Sampled By: (print) Jill D. Clemenich	**Phone:**	**Phone:**

Lab ID	Sample Identification	Date	Time	Grab	Composite	Sample Matrix	No. of Bottles	Analyses	Preservatives HCL	HNO3	H2SO4	NaOH	Remarks
	SC-23	11/19/98	7:50										
	SC-24	"	8:20										
	SC-25	"	9:20										
	SC-26	"	9:40										
	SC-27	"	10:30										
	SC-28	"	11:00										
	SC-29	"	12:20										
	SC-30	"	12:40										
	SC-31	"	13:40										
	SC-32	"	14:30										

Turnaround Time Required: Normal ___ Rush ___	**1. Relinquished By: (signature)** Jill D. Clemenich	**Date** 11/19/98	**Time** 14:40	**1. Received By: (signature)**
Sample Disposal: Return to Client ___ Disposal by Lab ___	**2. Relinquished By: (signature)**	**Date**	**Time**	**2. Received By: (signature)**
Known Hazard (flammable/toxic): Yes (comment below) ___ No ___	**3. Relinquished By: (signature)**	**Date**	**Time**	**3. Received By: (signature)**

Special Instructions/Comments:

Sample Condition Upon Receipt:

CUMMINGS RITE CONSULTANTS, INC.

Chain of C dy Record

Project Name: Westinghouse SMP	**Results To:**	**Invoice To:**
Project Location: Blairsville PA	**Company:**	**Company:**
Project Number: 93132.80	**Address:**	**Address:**
Sampled By: (print) Jill D. Clemenich	**Phone:**	**Phone:**

Lab ID	Sample Identification	Date	Time	Grab	Composite	Sample Matrix	No. of Bottles	Analyses	Preservatives: HCL	HNO3	H2SO4	NaOH	Remarks
	SC-33	11/19/98	14:10										
	SC-34-1,2	11/23/98	8:40										
	SC-35-1,2		9:30										
	SC-36-1,2		10:45										
	SC-37		11:20										
	SC-38-1,2		13:30										
	SC-39		14:20										
	SC-40-1,2		15:40										
	SC-41-1,2	↓	16:20										

Turnaround Time Required: Normal ___ Rush ___	**1. Relinquished By: (signature)** JJP Clemenich	**Date** 11/23/98	**Time** 16:40	**1. Received By: (signature)**
Sample Disposal: Return to Client ___ Disposal by Lab ___	**2. Relinquished By: (signature)**	**Date**	**Time**	**2. Received By: (signature)**
Known Hazard (flammable/toxic): Yes (comment below) ___ No ___	**3. Relinquished By: (signature)**	**Date**	**Time**	**3. Received By: (signature)**

Special Instructions/Comments:

Sample Condition Upon Receipt:

CUMMINGS RITER CONSULTANTS, INC.

Chain of Custody Record

Page 7 of ____

Lab Qt ____

Project Name: (W) Specialty Metals Plant	**Results To:**	**Invoice To:**
Project Location: Blairsville PA	**Company:**	**Company:**
Project Number: 93132.80	**Address:**	**Address:**
Sampled By: (print) Jill D. Clemente	**Phone:**	**Phone:**

Lab ID	Sample Identification	Date	Time	Grab	Composite	Sample Matrix	No. of Bottles	Analyses	Preservatives: HCL	HNO3	H2SO4	NaOH	Remarks
	SC-42-1	11/21/98	8:00										
	SC-42-2	"	8:15										
	SC-43-1	"	9:00										
	SC-43-2	"	9:15										
	SC-43-3	"	9:30										
	SC-44-1	"	10:45										
	SC-44-2	"	10:55										
	SC-44-3	"	11:05										
	SC-45-1	"	11:30										
	SC-45-2	"	12:00										

Turnaround Time Required: Normal ___ Rush ___	**1. Relinquished By: (signature)** Jill Clemente	**Date** 11/24/98	**Time** 14:41	**1. Received By: (signature)**
Sample Disposal: Return to Client ___ Disposal by Lab ___	**2. Relinquished By: (signature)**	**Date**	**Time**	**2. Received By: (signature)**
Known Hazard (flammable/toxic): Yes (comment below) ___ No ___	**3. Relinquished By: (signature)**	**Date**	**Time**	**3. Received By: (signature)**

Special Instructions/Comments:

Sample Condition Upon Receipt:

CUMMINGS RITEI CONSUL...NTS, INC.

Chain of C... ly Record

Page 6 of ____

Lab Q... ____

Project Name: Wharton Metals Plant	**Results To:**	**Invoice To:**
Project Location: Blairsville, PA	**Company:**	**Company:**
Project Number: 98132.80	**Address:**	**Address:**
Sampled By: (print) Jill D. Clemanich	**Phone:**	**Phone:**

Lab ID	Sample Identification	Date	Time	Grab	Composite	Sample Matrix	No. of Bottles	Analyses	Preservatives: HCL	HNO3	H2SO4	NaOH	Remarks
	SC-46-2	11/24/98	13:40										
	SC-46-1	↓	13:15										
	SC-47-1		14:00										
	SC-47-2		14:15										

Turnaround Time Required:
Normal ___
Rush ___

Sample Disposal:
Return to Client ___
Disposal by Lab ___

Known Hazard (flammable/toxic):
Yes (comment below) ___
No ___

	Date	Time	
1. Relinquished By: (signature) Jill Clemanich	11/24/98	14:17	1. Received By: (signature)
2. Relinquished By: (signature)	Date	Time	2. Received By: (signature)
3. Relinquished By: (signature)	Date	Time	3. Received By: (signature)

Special Instructions/Comments:

Sample Condition Upon Receipt:

APPENDIX D

ANALYTICAL REPORTS

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 99-0049W
CLIENT: Purchase Order Number: 122284-SA286

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
9901-0265W	bv-ss-1044	9901-0266W	bv-ss-1045
9901-0267W	bv-ss-1046	9901-0268W	bv-ss-1047
9901-0269W	bv-ss-1048	9901-0270W	bv-ss-1049
9901-0271W	bv-ss-1050	9901-0272W	bv-ss-1051
9901-0273W	bv-ss-1052	9901-0274W	bv-ss-1053
9901-0275W	bv-ss-1054	9901-0276W	bv-ss-1055
9901-0277W	bv-ss-1056	9901-0280W	bv-ss-1058
9901-0281W	bv-ss-1059	9901-0282W	bv-ss-1060
9901-0283W	bv-ss-1061	9901-0284W	bv-ss-1062
9901-0285W	bv-ss-1063	9901-0286W	bv-ss-1064
9901-0287W	bv-ss-1065	9901-0288W	bv-ss-1066
9901-0289W	bv-ss-1067	9901-0290W	bv-ss-1068
9901-0291W	bv-ss-1069	9901-0292W	bv-ss-1070
9901-0293W	bv-ss-1071	9901-0294W	bv-ss-1072
9901-0295W	bv-ss-1073	9901-0296W	bv-ss-1074
9901-0297W	bv-ss-1075	9901-0298W	bv-ss-1076
9901-0299W	bv-ss-1077	9901-0300W	bv-ss-1078
9901-0301W	bv-ss-1079	9901-0302W	bv-ss-1080
9901-0303W	bv-ss-1081	9901-0304W	bv-ss-1082
9901-0305W	bv-ss-1083	9901-0306W	bv-ss-1084
9901-0307W	bv-ss-1085	9901-0308W	bv-ss-1086
9901-0309W	bv-ss-1087	9901-0310W	bv-ss-1088
9901-0311W	bv-ss-1089	9901-0312W	bv-ss-1090
9901-0313W	bv-ss-1091	9901-0314W	bv-ss-1092
9901-0315W	bv-ss-1093	9901-0316W	bv-ss-1094
9901-0317W	bv-ss-1095	9901-0318W	bv-ss-1096
9901-0319W	bv-ss-1097	9901-0320W	bv-ss-1098
9901-0321W	bv-ss-1099	9901-0322W	bv-ss-1100
9901-0323W	bv-ss-1101	9901-0324W	bv-ss-1102
9901-0325W	bv-ss-1103	9901-0326W	bv-ss-1104
9901-0327W	bv-ss-1105	9901-0328W	bv-ss-1106
9901-0329W	bv-ss-1107	9901-0330W	bv-ss-1108
9901-0331W	bv-ss-1109	9901-0332W	bv-ss-1110
9901-0333W	bv-ss-1111	9901-0334W	bv-ss-1112
9901-0335W	bv-ss-1113	9901-0336W	bv-ss-1114
9901-0337W	bv-ss-1115	9901-0338W	bv-ss-1116
9901-0339W	bv-ss-1117	9901-0340W	bv-ss-1118

ANTECH LTD.
CASE NARRATIVE

(Continued)

9901-0341W bv-ss-1119 9901-0342W bv-ss-1057

C: SHIPPING/RECEIVING COMMENTS:

FINAL REPORT: 02/26/99

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
Sample BV-SS-1057 is out of sequence due to a login mistake. Please note that it is analyzed as Antech sample 9901-0342W, the last in the series.

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format.

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

March 15, 1999

Mr. Joe Nardi
Westinghouse Electric Company
Energy Center West, Bay 508 B
P. O. Box 355
Pittsburgh, PA 15230

Soil Characterization; Purchase Order No. 122284-SA286
Blairsville Soil Samples; Blairsville; Energy Center
Antech Ltd. Project No. 99-0133W

Dear Mr. Nardi:

Enclosed are analytical results for samples submitted by Westinghouse Electric Company. Samples were received on February 25, 1999 and logged in for analysis on February 26, 1999.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Shannon W. Thompson
Lead Analyst/Project Manager

SWT:rks

Enclosures

Table 1
GAMMA Spectrometry Data Table
Westinghouse Electric Company
Antech Ltd. Project No. 99-0049W
Soil Characterization; Blairsville SMP
Charge Order No. 122284-SA286; Blairsville

Parameter	Sample Identification				
	9901-0265W bv-ss-1044 (1/21/99)	9901-0266W bv-ss-1045 (1/21/99)	9901-0267W bv-ss-1046 (1/21/99)	9901-0268W bv-ss-1047 (1/21/99)	9901-0269W bv-ss-1048 (1/21/99)
K-40(1)	8.34E0 ± 1.5E0	1.08E+1 ± 1.7E0	9.03E0 ± 1.4E0	6.09E0 ± 1.1E0	6.49E0 ± 1.5E0
Co-60	<1.3E-1	<8.3E-2	<7.1E-2	<6.3E-2	<9.3E-2
Cs-137	4.58E-1 ± 1.6E-1	<1.0E-1	<9.4E-2	1.39E-1 ± 6.6E-2	3.64E-1 ± 1.2E-1
Tl-208	4.40E0 ± 3.5E-1	3.30E-1 ± 1.1E-1	<1.8E-1	1.67E-1 ± 6.6E-2	<2.1E-1
Bi-212	1.26E+1 ± 2.3E0	1.40E0 ± 1.1E0	<1.5E0	<1.0E0	<2.1E0
Pb-212	1.21E+1 ± 1.3E+0	9.72E-1 ± 2.4E-1	6.43E-1 ± 2.0E-1	3.13E-1 ± 1.4E-1	7.87E-1 ± 2.2E-1
Bi-214	6.10E-1 ± 2.4E-1	8.54E-1 ± 2.2E-1	<9.1E-1	5.08E-1 ± 1.2E-1	7.02E-1 ± 1.8E-1
Pb-214	6.86E-1 ± 3.1E-1	7.21E-1 ± 2.0E-1	4.85E-1 ± 1.4E-1	3.46E-1 ± 1.3E-1	6.89E-1 ± 1.8E-1
Ac-228	1.23E+1 ± 6.5E-1	9.60E-1 ± 2.6E-1	8.56E-1 ± 1.8E-1	<3.9E-1	7.84E-1 ± 2.7E-1
U-235	4.89E0 ± 5.3E-1	<7.5E-1	<6.8E-1	<5.9E-1	2.96E0 ± 3.7E-1
U-238	9.47E+1 ± 1.2E+1	<1.5E+1	<1.5E+1	<9.2E0	<2.0E+1
Am-241	<1.9E0	<6.8E-1	<5.8E-1	<4.1E-1	<8.8E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0270W bv-ss-1049 (1/21/99)	9901-0271W bv-ss-1050 (1/21/99)	9901-0272W bv-ss-1051 (1/21/99)	9901-0273W bv-ss-1052 (1/21/99)	9901-0274W bv-ss-1053 (1/21/99)
K-40(1)	5.68E0 ± 1.0E0	7.48E0 ± 1.3E0	4.94E0 ± 1.0E0	9.16E0 ± 1.4E0	7.05E0 ± 1.2E0
Co-60	<6.3E-2	<6.5E-2	<7.0E-2	<7.3E-2	<6.8E-2
Cs-137	<6.0E-2	<6.3E-2	<5.7E-2	<7.8E-2	<9.2E-2
Tl-208	1.91E-1 ± 6.6E-2	2.46E-1 ± 8.6E-2	<1.7E-1	<1.4E-1	2.48E-1 ± 7.5E-2
Bi-212	<1.2E0	<1.5E0	<1.2E0	<1.6E0	<1.5E0
Pb-212	3.99E-1 ± 1.5E-1	5.44E-1 ± 1.8E-1	5.14E-1 ± 1.6E-1	6.61E-1 ± 1.9E-1	6.36E-1 ± 1.8E-1
Bi-214	4.55E-1 ± 1.1E-1	6.42E-1 ± 1.4E-1	4.29E-1 ± 1.3E-1	8.05E-1 ± 1.6E-1	5.62E-1 ± 1.4E-1
Pb-214	4.43E-1 ± 1.2E-1	7.01E-1 ± 1.5E-1	5.26E-1 ± 1.3E-1	6.27E-1 ± 1.5E-1	7.51E-1 ± 1.5E-1
Ac-228	5.57E-1 ± 1.6E-1	8.02E-1 ± 2.0E-1	6.70E-1 ± 1.9E-1	<5.5E-1	7.32E-1 ± 1.8E-1
U-235	<4.2E-1	<4.9E-1	<6.0E-1	<5.4E-1	<6.5E-1
U-238	<9.5E0	<10.0E0	<1.2E+1	<1.2E+1	<1.2E+1
Am-241	<4.3E-1	<4.7E-1	<4.4E-1	<5.6E-1	<4.9E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0275W bv-ss-1054 (1/21/99)	9901-0276W bv-ss-1055 (1/21/99)	9901-0277W bv-ss-1056 (1/21/99)	9901-0280W bv-ss-1058 (1/21/99)	9901-0281W bv-ss-1059 (1/21/99)
K-40(1)	1.00E+1 ± 1.6E0	1.12E+1 ± 1.7E0	5.73E0 ± 1.0E0	9.92E0 ± 1.7E0	1.22+1 ± 1.7E0
Co-60	<1.0E-1	<8.7E-2	<5.7E-2	<7.4E-2	<7.6E-2
Cs-137	<9.4E-2	<8.9E-2	<7.1E-2	<1.0E-1	<8.1E-2
Tl-208	3.29E-1 ± 7.4E-2	3.73E-1 ± 7.7E-2	3.04E-1 ± 8.1E-2	4.15E-1 ± 1.1E-1	<1.9E-1
Bi-212	8.68E-1 ± 9.2E-1	<1.5E0	<1.4E0	1.17E0 ± 1.0E0	<1.7E0
Pb-212	7.11E-1 ± 2.1E-1	7.11E-1 ± 2.4E-1	7.53E-1 ± 1.3E-1	9.67E-1 ± 2.4E-1	7.98E-1 ± 2.4E-1
Bi-214	<10.0E-1	8.79E-1 ± 1.8E-1	6.00E-1 ± 1.5E-1	8.21E-1 ± 2.0E-1	7.45E-1 ± 1.7E-1
Pb-214	8.21E-1 ± 1.9E-1	9.24E-1 ± 1.8E-1	4.52E-1 ± 1.3E-1	1.19E0 ± 2.1E-1	8.11E-1 ± 1.7E-1
Ac-228	7.99E-1 ± 2.2E-1	1.11E0 ± 2.3E-1	6.94E-1 ± 2.0E-1	1.02E0 ± 1.7E-1	9.06E-1 ± 2.2E-1
U-235	<7.9E-1	<7.4E-1	<5.2E-1	<7.5E-1	<7.4E-1
U-238	<1.7E+1	<1.4E+1	<1.1E+1	<9.6E0	<9.9E0
Am-241	<6.2E-1	<6.0E-1	<4.9E-1	7.9E-1	<5.7E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0282W bv-ss-1060 (1/21/99)	9901-0283W bv-ss-1061 (1/21/99)	9901-0284W bv-ss-1062 (1/21/99)	9901-0285W bv-ss-1063 (1/21/99)	9901-0286W bv-ss-1064 (1/21/99)
K-40(1)	1.08E+1 ± 1.6E0	7.28E0 ± 1.3E0	6.52E0 ± 1.3E0	9.69E0 ± 1.6E0	5.85E0 ± 1.1E0
Co-60	<7.1E-2	<8.1E-2	<8.8E-2	<1.0E-1	<6.8E-2
Cs-137	<7.8E-2	<8.5E-2	2.99E-1 ± 9.7E-2	1.67E-1 ± 9.9E-2	<8.0E-2
Tl-208	4.47E-1 ± 7.9E-2	1.86E-1 ± 7.8E-2	3.45E-1 ± 7.8E-2	3.41E-1 ± 1.1E-1	2.59E-1 ± 6.4E-2
Bi-212	1.08E0 ± 9.6E-1	2.14E0 ± 9.3E-1	<1.9E0	<1.7E0	4.85E-1 ± 5.8E-1
Pb-212	6.48E-1 ± 2.1E-1	6.26E-1 ± 1.8E-1	8.82E-1 ± 1.6E-1	9.88E-1 ± 1.8E-1	5.78E-1 ± 1.5E-1
Bi-214	9.36E-1 ± 1.8E-1	6.35E-1 ± 1.6E-1	1.44E0 ± 1.9E-1	9.29E-1 ± 2.0E-1	<6.7E-1
Pb-214	9.01E-1 ± 1.7E-1	4.91E-1 ± 1.6E-1	1.63E0 ± 2.2E-1	1.07E-1 ± 1.9E-1	4.35E-1 ± 1.4E-1
Ac-228	1.04E0 ± 2.1E-1	6.95E-1 ± 2.3E-1	5.92E-1 ± 1.8E-1	6.55E-1 ± 2.1E-1	5.79E-1 ± 1.7E-1
U-235	<6.7E-1	<6.3E-1	1.52E0 ± 7.6E-1	<7.8E-1	<5.4E-1
U-238	<1.2E+1	<1.2E+1	<1.4E+1	<1.7E+1	<9.3E0
Am-241	<5.5E-1	<6.1E-1	<7.3E-1	<8.1E-1	<4.4E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0287W bv-ss-1065 (1/21/99)	9901-0288W bv-ss-1066 (1/21/99)	9901-0289W bv-ss-1067 (1/21/99)	9901-0290W bv-ss-1068 (1/21/99)	9901-0291W bv-ss-1069 (1/21/99)
K-40(1)	7.37E0 ± 1.3E0	7.92E0 ± 1.4E0	7.23E0 ± 1.3E0	6.67E0 ± 1.2E0	9.72E0 ± 1.7E0
Co-60	<8.9E-2	<5.3E-2	<6.7E-2	<6.7E-2	<1.1E-1
Cs-137	7.45E-2 ± 5.3E-2	<8.7E-2	<8.0E-2	<7.1E-2	3.19E-1 ± 1.0E-1
Tl-208	2.43E-1 ± 6.5E-2	1.51E-1 ± 7.9E-2	3.03E-1 ± 6.4E-2	3.09E-1 ± 7.4E-2	1.91E0 ± 1.7E-1
Bi-212	<1.5E0	<1.2E0	<1.5E0	<1.4E0	5.42E0 ± 1.7E0
Pb-212	5.30E-1 ± 1.8E-1	5.70E-1 ± 1.7E-1	7.11E-1 ± 1.8E-1	6.71E-1 ± 1.7E-1	5.18E0 ± 6.2E-1
Bi-214	5.37E-1 ± 1.4E-1	5.27E-1 ± 1.7E-1	<7.8E-1	4.87E-1 ± 1.2E-1	<9.2E-1
Pb-214	6.44E-1 ± 1.6E-1	4.86E-1 ± 1.2E-1	5.33E-1 ± 1.4E-1	4.54E-1 ± 1.3E-1	7.74E-1 ± 1.8E-1
Ac-228	4.90E-1 ± 1.7E-1	5.60E-1 ± 2.1E-1	<5.1E-1	7.49E-1 ± 1.8E-1	4.92E0 ± 3.8E-1
U-235	<7.2E-1	<5.6E-1	<6.3E-1	<5.2E-1	NA
U-238	<1.2E+1	<1.2E+1	<1.1E+1	9.2E0	<1.7E+1
Am-241	<5.1E-1	<5.1E-1	<5.1E-1	<5.3E-1	<9.4E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0292W bv-ss-1070 (1/21/99)	9901-0293W bv-ss-1071 (1/21/99)	9901-0294W bv-ss-1072 (1/21/99)	9901-0295W bv-ss-1073 (1/21/99)	9901-0296W bv-ss-1074 (1/21/99)
K-40(1)	7.99E0 ± 1.4E0	7.40E0 ± 1.7E0	9.37E0 ± 1.4E0	7.38E0 ± 1.3E0	6.22E0 ± 1.2E0
Co-60	<8.3E-2	<1.0E-1	<8.3E-2	<6.9E-2	<5.0E-2
Cs-137	2.60E-1 ± 9.3E-2	6.40E-1 ± 1.3E-1	<8.4E-2	<7.4E-2	<6.1E-2
Tl-208	3.14E-1 ± 1.0E-1	3.68E-1 ± 1.1E-1	2.55E-1 ± 9.5E-2	2.12E-1 ± 7.3E-2	2.05E-1 ± 9.3E-2
Bi-212	1.28E0 ± 8.1E-1	<1.9E0	<1.6E0	<1.5E0	<1.5E0
Pb-212	9.59E-1 ± 1.7E-1	1.23E0 ± 2.2E-1	6.53E-1 ± 2.0E-1	6.87E-1 ± 1.3E-1	5.00E-1 ± 1.8E-1
Bi-214	8.30E-1 ± 1.7E-1	1.00E0 ± 2.4E-1	8.23E-1 ± 1.6E-1	7.67E-1 ± 1.7E-1	5.75E-1 ± 1.4E-1
Pb-214	8.45E-1 ± 1.6E-1	9.07E-1 ± 2.1E-1	6.53E-1 ± 1.6E-1	8.46E-1 ± 1.5E-1	5.50E-1 ± 1.5E-1
Ac-228	6.80E-1 ± 1.6E-1	1.14E0 ± 3.0E-1	7.62E-1 ± 2.0E-1	6.68E-1 ± 2.0E-1	6.65E-1 ± 1.8E-1
U-235	8.83E-1 ± 1.7E-1	1.25E+1 ± 1.1E0	<6.2E-1	<5.9E-1	<5.34E-1
U-238	7.85E0 ± 5.8E0	2.02E+1 ± 1.0E+1	<1.1E+1	<1.2E+1	<9.5E0
Am-241	<7.5E-1	<1.2E0	<6.1E-1	<5.9E-1	<5.3E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0297W bv-ss-1075 (1/21/99)	9901-0298W bv-ss-1076 (1/21/99)	9901-0299W bv-ss-1077 (1/21/99)	9901-0300W bv-ss-1078 (1/21/99)	9901-0301W bv-ss-1079 (1/21/99)
K-40(1)	8.26E0 ± 1.3E0	6.35E0 ± 1.2E0	7.52E0 ± 1.6E0	8.97E0 ± 1.3E0	5.51E0 ± 1.2E0
Co-60	<8.5E-2	<7.6E-2	<8.2E-2	<7.5E-2	<5.9E-2
Cs-137	2.03E-1 ± 9.8E-2	<6.7E-2	5.99E-1 ± 1.3E-1	<6.7E-2	9.57E-2 ± 6.0E-2
Tl-208	3.92E-1 ± 9.6E-2	2.07E-1 ± 8.4E-2	3.40E-1 ± 9.0E-2	3.76E-1 ± 8.4E-2	1.95E-1 ± 6.9E-2
Bi-212	1.17E0 ± 9.3E-1	<1.3E0	<1.9E0	<1.1E0	<1.6E0
Pb-212	8.73E-1 ± 1.5E-1	4.72E-1 ± 1.1E-1	9.37E-1 ± 2.0E-1	7.93E-1 ± 1.9E-1	5.58E-1 ± 2.0E-1
Bi-214	9.13E-1 ± 1.7E-1	7.29E-1 ± 1.5E-1	<1.2E0	5.98E-1 ± 1.6E-1	5.32E-1 ± 1.6E-1
Pb-214	7.26E-1 ± 1.5E-1	6.69E-1 ± 1.4E-1	8.27E-1 ± 2.1E-1	7.26E-1 ± 1.4E-1	7.11E-1 ± 1.7E-1
Ac-228	7.41E-1 ± 2.0E-1	4.95E-1 ± 2.0E-1	7.68E-1 ± 2.7E-1	7.41E-1 ± 1.9E-1	5.96E-1 ± 2.0E-1
U-235	1.47E0 ± 2.2E-1	<5.6E-1	1.61E+1 ± 1.3E0	<6.4E-1	8.09E0 ± 7.4E-1
U-238	2.52E+1 ± 6.3E0	<1.3E+1	5.87E+1 ± 7.2E0	<1.3E+1	4.76E+1 ± 5.8E0
Am-241	<8.9E-1	<5.5E-1	<1.5E0	<5.9E-1	<1.1E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0302W bv-ss-1080 (1/21/99)	9901-0303W bv-ss-1081 (1/21/99)	9901-0304W bv-ss-1082 (1/21/99)	9901-0305W bv-ss-1083 (1/21/99)	9901-0306W bv-ss-1084 (1/21/99)
K-40(1)	7.22E0 ± 1.2E0	8.12E0 ± 1.3E0	1.08E+1 ± 1.6E0	1.06E+1 ± 1.4E0	6.79E0 ± 1.2E0
Co-60	<7.3E-2	<8.9E-2	<6.7E-2	<7.5E-2	<7.6E-2
Cs-137	<6.2E-2	<6.1E-2	<7.7E-2	<8.0E-2	<7.7E-2
Tl-208	2.28E-1 ± 7.6E-2	2.59E-1 ± 6.3E-2	3.61E-1 ± 7.9E-2	2.86E-1 ± 8.5E-2	<1.5E-1
Bi-212	<1.4E0	<1.3E0	<1.6E0	<1.4E0	<1.2E0
Pb-212	5.46E-1 ± 1.7E-1	7.56E-1 ± 1.8E-1	9.48E-1 ± 1.6E-1	6.40E-1 ± 1.9E-1	5.80E-1 ± 1.6E-1
Bi-214	5.12E-1 ± 1.6E-1	<7.2E-1	6.29E-1 ± 1.5E-1	5.71E-1 ± 1.7E-1	<6.6E-1
Pb-214	6.13E-1 ± 1.4E-1	5.46E-1 ± 1.4E-1	6.92E-1 ± 1.5E-1	5.47E-1 ± 1.5E-1	5.79E-1 ± 1.3E-1
Ac-228	<4.6E-1	<5.5E-1	9.03E-1 ± 2.1E-1	7.46E-1 ± 2.0E-1	5.47E-1 ± 1.7E-1
U-235	<5.7E-1	<5.8E-1	<6.8E-1	<6.2E-1	<6.3E-1
U-238	<1.1E+1	<1.0E+1	<1.2E+1	<1.4E+1	<1.4E+1
Am-241	<5.5E-1	<5.3E-1	<5.3E-1	<5.7E-1	<5.3E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0307W bv-ss-1085 (1/21/99)	9901-0308W bv-ss-1086 (1/21/99)	9901-0309W bv-ss-1087 (1/21/99)	9901-0310W bv-ss-1088 (1/21/99)	9901-0311W bv-ss-1089 (1/21/99)
K-40(1)	5.46E0 ± 1.0E0	6.09E0 ± 8.8E-1	6.28E0 ± 1.2E0	7.67E0 ± 1.2E0	6.93E0 ± 1.2E0
Co-60	<5.3E-2	<4.5E-2	<4.4E-2	<7.0E-2	<5.9E-2
Cs-137	<8.4E-2	<6.9E-2	<7.9E-2	<8.1E-2	<8.3E-2
Tl-208	8.28E-2 ± 5.9E-2	2.51E-1 ± 4.6E-2	2.24E-1 ± 7.3E-2	2.89E-1 ± 7.7E-2	2.49E-1 ± 6.8E-2
Bi-212	<9.4E-1	7.49E-1 ± 5.4E-1	<1.2E0	<1.4E0	<1.4E0
Pb-212	3.16E-1 ± 1.2E-1	5.44E-1 ± 1.3E-1	6.05E-1 ± 1.7E-1	6.71E-1 ± 1.7E-1	4.14E-1 ± 1.5E-1
Bi-214	3.66E-1 ± 1.00E-1	5.87E-1 ± 9.7E-2	6.61E-1 ± 1.6E-1	6.53E-1 ± 1.5E-1	5.92E-1 ± 1.3E-1
Pb-214	<2.0E-1	6.08E-1 ± 1.2E-1	7.05E-1 ± 1.5E-1	5.66E-1 ± 1.5E-1	5.35E-1 ± 1.3E-1
Ac-228	2.45E-1 ± 1.4E-1	6.47E-1 ± 1.3E-1	7.57E-1 ± 1.6E-1	6.22E-1 ± 1.7E-1	6.86E-1 ± 1.7E-1
U-235	NA	1.74E0 ± 2.0E-1	<6.1E-1	<5.8E-1	<6.3E-1
U-238	<9.5E0	7.30E0 ± 1.7E0	<1.1E+1	<1.1E+1	<1.0E+1
Am-241	<4.6E-1	<5.0E-1	<5.3E-1	<5.9E-1	<4.7E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0312W bv-ss-1090 (1/21/99)	9901-0313W bv-ss-1091 (1/21/99)	9901-0314W bv-ss-1092 (1/21/99)	9901-0315W bv-ss-1093 (1/21/99)	9901-0316W bv-ss-1094 (1/21/99)
K-40(1)	6.30E0 ± 1.2E0	5.65E0 ± 1.1E0	8.45E0 ± 1.5E0	6.59E0 ± 1.2E0	7.97E0 ± 1.4E0
Co-60	<4.5E-2	<3.7E-2	<7.7E-2	<6.4E-2	<7.7E-2
Cs-137	1.20E-1 ± 6.6E-2	<6.1E-2	1.82E-1 ± 7.2E-2	<7.4E-2	<1.4E-1
Tl-208	1.82E-1 ± 5.4E-2	1.71E-1 ± 7.3E-2	3.32E-1 ± 7.7E-2	2.26E-1 ± 8.0E-2	2.93E-1 ± 8.7E-2
Bi-212	<1.1E0	<1.3E0	9.66E-1 ± 6.9E-1	<1.4E0	<2.0E0
Pb-212	4.12E-1 ± 1.5E-1	5.44E-1 ± 1.1E-1	7.70E-1 ± 2.3E-1	5.53E-1 ± 1.7E-1	8.55E-1 ± 2.4E-1
Bi-214	5.55E-1 ± 1.4E-1	4.56E-1 ± 1.3E-1	7.82E-1 ± 1.7E-1	5.98E-1 ± 1.5E-1	<9.9E-1
Pb-214	4.80E-1 ± 1.3E-1	3.54E-1 ± 1.2E-1	8.88E-1 ± 1.8E-1	5.78E-1 ± 1.4E-1	7.69E-1 ± 2.4E-1
Ac-228	3.85E-1 ± 1.6E-1	5.16E-1 ± 1.7E-1	<5.9E-1	5.49E-1 ± 1.8E-1	8.02E-1 ± 2.3E-1
U-235	<6.8E-1	<5.3E-1	2.03E0 ± 2.8E-1	<5.5E-1	1.51E+1 ± 1.2E0
U-238	<1.3E+1	<8.6E0	<1.6E+1	<1.2E+1	3.50E+2 ± 3.2E+1
Am-241	<4.8E-1	<5.0E-1	<6.7E-1	<5.2E-1	<2.3E0

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0317W bv-ss-1095 (1/21/99)	9901-0318W bv-ss-1096 (1/21/99)	9901-0319W bv-ss-1097 (1/21/99)	9901-0320W bv-ss-1098 (1/21/99)	9901-0321W bv-ss-1099 (1/21/99)
K-40(1)	1.02E+1 ± 1.4E0	4.22E0 ± 8.4E-1	8.22E0 ± 1.3E0	5.86E0 ± 1.1E0	7.45E0 ± 1.4E0
Co-60	<8.2E-2	<4.9E-2	<7.0E-2	<4.9E-2	<7.3E-2
Cs-137	<8.8E-2	<6.3E-2	<6.8E-2	<7.1E-2	1.25E-1 ± 5.7E-2
Tl-208	3.41E-1 ± 9.4E-2	1.58E-1 ± 5.1E-2	3.67E-1 ± 7.2E-2	1.55E-1 ± 6.8E-2	3.63E-1 ± 7.8E-2
Bi-212	<1.5E0	<1.0E0	<1.2E0	<1.3E0	<1.4E0
Pb-212	6.90E-1 ± 2.1E-1	3.70E-1 ± 1.3E-1	8.30E-1 ± 1.5E-1	4.72E-1 ± 1.6E-1	9.21E-1 ± 2.0E-1
Bi-214	7.57E-1 ± 1.4E-1	4.11E-1 ± 1.1E-1	<8.3E-1	4.50E-1 ± 1.5E-1	<7.7E-1
Pb-214	6.50E-1 ± 1.7E-1	3.46E-1 ± 1.0E-1	5.17E-1 ± 1.8E-1	4.90E-1 ± 1.3E-1	8.39E-1 ± 1.7E-1
Ac-228	6.75E-1 ± 2.1E-1	<3.3E-1	6.93E-1 ± 2.0E-1	4.82E-1 ± 1.6E-1	9.52E-1 ± 2.5E-1
U-235	3.78E0 ± 4.0E-1	<4.6E-1	<8.4E-1	<5.5E-1	1.00E0 ± 1.9E-1
U-238	NA ± 7.89E+1	<1.1E+1	<1.1E+1	<9.6E0	<1.4E+1
Am-241	<1.2E+1	<4.5E-1	<6.3E-1	<5.0E-1	<6.4E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0322W bv-ss-1100 (1/21/99)	9901-0323W bv-ss-1101 (1/21/99)	9901-0324W bv-ss-1102 (1/21/99)	9901-0325W bv-ss-1103 (1/21/99)	9901-0326W bv-ss-1104 (1/21/99)
K-40(1)	6.27E0 ± 1.0E0	7.21E0 ± 1.4E0	5.37E0 ± 1.1E0	5.81E0 ± 1.2E0	8.42E0 ± 1.5E0
Co-60	<6.0E-2	<9.1E-2	<7.3E-2	<8.2E-2	<8.6E-2
Cs-137	<6.0E-2	<1.1E-1	<8.5E-2	7.57E-2 ± 6.8E-2	<7.3E-2
Tl-208	1.95E-1 ± 6.9E-2	2.68E-1 ± 7.1E-2	<1.6E-1	4.02E-1 ± 9.0E-2	2.47E-1 ± 6.4E-2
Bi-212	<1.3E0	<1.5E0	<1.4E0	<1.4E0	<1.5E0
Pb-212	6.15E-1 ± 1.6E-1	5.41E-1 ± 1.9E-1	4.61E-1 ± 1.8E-1	6.89E-1 ± 2.0E-1	5.47E-1 ± 1.8E-1
Bi-214	4.87E-1 ± 1.3E-1	8.08E-1 ± 1.7E-1	5.43E-1 ± 1.3E-1	8.25E-1 ± 1.6E-1	4.91E-1 ± 1.5E-1
Pb-214	5.62E-1 ± 1.3E-1	7.58E-1 ± 1.8E-1	4.48E-1 ± 1.4E-1	6.73E-1 ± 1.7E-1	4.66E-1 ± 1.5E-1
Ac-228	6.61E-1 ± 1.7E-1	<5.4E-1	6.17E-1 ± 1.9E-1	6.50E-1 ± 1.9E-1	<5.8E-1
U-235	<5.2E-1	<8.1E-1	<6.1E-1	5.54E0 ± 5.4E-1	<7.2E-1
U-238	<1.1E+1	<1.3E1	<1.1E+1	<1.7E+1	<1.3E+1
Am-241	<5.4E-1	<6.0E-1	<5.3E-1	<1.0E0	<4.9E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0327W bv-ss-1105 (1/21/99)	9901-0328W bv-ss-1106 (1/21/99)	9901-0329W bv-ss-1107 (1/21/99)	9901-0330W bv-ss-1108 (1/21/99)	9901-0331W bv-ss-1109 (1/21/99)
K-40(1)	5.89E0 ± 1.1E0	9.91E0 ± 1.4E0	8.50E0 ± 1.5E0	5.20E0 ± 1.1E0	1.26E+1 ± 1.6E0
Co-60	<6.8E-2	<8.9E-2	<5.1E-2	<7.1E-2	<8.0E-2
Cs-137	8.26E-2 ± 5.7E-2	<8.4E-2	<9.5E-2	<8.1E-2	8.42E-2 ± 7.5E-2
Tl-208	1.92E-1 ± 8.6E-2	3.19E-1 ± 1.0E-1	2.78E-1 ± 7.4E-2	1.91E-1 ± 5.5E-2	4.24E-1 ± 1.1E-1
Bi-212	<1.2E0	<1.7E0	<1.6E0	<1.4E0	<1.7E0
Pb-212	5.90E-1 ± 1.8E-1	9.34E-1 ± 2.1E-1	7.50E-1 ± 2.2E-1	4.47E-1 ± 1.6E-1	1.10E0 ± 2.5E-1
Bi-214	7.45E-1 ± 1.5E-1	6.71E-1 ± 1.8E-1	7.00E-1 ± 1.6E-1	<6.3E-1	8.20E-1 ± 1.8E-1
Pb-214	7.05E-1 ± 1.6E-1	6.79E-1 ± 1.7E-1	8.11E-1 ± 1.6E-1	5.18E-1 ± 1.3E-1	8.93E-1 ± 1.9E-1
Ac-228	7.18E-1 ± 1.8E-1	8.33E-1 ± 2.2E-1	7.27E-1 ± 1.9E-1	<4.2E-1	<6.4E-1
U-235	1.76E0 ± 2.2E-1	<6.3E-1	<7.4E-1	<5.4E-1	<7.2E-1
U-238	<1.1E+1	<1.2E+1	<1.4E+1	<1.1E+1	<1.4E+1
Am-241	<7.1E-1	<6.7E-1	<5.7E-1	<4.7E-1	<7.8E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0332W bv-ss-1110 (1/21/99)	9901-0333W bv-ss-1111 (1/21/99)	9901-0334W bv-ss-1112 (1/21/99)	9901-0335W bv-ss-1113 (1/21/99)	9901-0336W bv-ss-1114 (1/21/99)
K-40(1)	8.54E0 ± 2.0E0	9.65E0 ± 1.7E0	6.81E0 ± 1.2E0	9.82E0 ± 1.5E0	1.14E+1 ± 1.7E0
Co-60	<1.1E-1	<8.3E-2	<6.4E-2	<6.6E-2	<1.0E-1
Cs-137	1.14E-1 ± 9.8E-2	1.56E-1 ± 7.9E-2	<7.4E-2	8.8E-2	<9.4E-2
Tl-208	<2.4E-1	4.06E-1 ± 8.6E-1	2.29E-1 ± 7.8E-2	2.88E-1 ± 9.1E-2	4.39E-1 ± 8.9E-1
Bi-212	8.64E-1 ± 1.0E0	<1.7E0	<1.2E0	<1.7E0	1.94E0 ± 1.1E0
Pb-212	9.96E-1 ± 3.0E-1	8.37E-1 ± 2.4E-1	4.97E-1 ± 1.6E-1	9.48E-1 ± 2.2E-1	8.18E-1 ± 2.4E-1
Bi-214	9.70E-1 ± 2.8E-1	<9.8E-1	3.89E-1 ± 1.4E-1	7.58E-1 ± 1.6E-1	6.58E-1 ± 1.7E-1
Pb-214	1.04E0 ± 2.4E-1	8.96E-1 ± 1.9E-1	4.26E-1 ± 1.4E-1	7.60E-1 ± 1.6E-1	9.24E-1 ± 2.1E-1
Ac-228	<8.9E-1	<6.0E-1	5.27E-1 ± 2.0E-1	9.99E-1 ± 2.2E-1	9.41E-1 ± 2.1E-1
U-235	<9.2E-1	<7.4E-1	<4.6E-1	<6.4E-1	<7.4E-1
U-238	<2.0E+1	<1.2E+1	<1.2E+1	<1.5E+1	<1.5E+1
Am-241	<8.9E-1	<5.9E-1	<5.6E-1	<6.6E-1	<6.1E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0337W bv-ss-1115 (1/21/99)	9901-0338W bv-ss-1116 (1/21/99)	9901-0339W bv-ss-1117 (1/21/99)	9901-0340W bv-ss-1118 (1/21/99)	9901-0341W bv-ss-1119 (1/21/99)
K-40(1)	6.18E0 ± 1.5E0	4.12E0 ± 9.6E-1	8.95E0 ± 1.5E0	4.67E0 ± 1.0E0	5.80E0 ± 1.0E0
Co-60	<1.3E-1	<6.6E-2	<8.7E-2	<6.3E-2	<7.0E-2
Cs-137	5.43E-1 ± 1.3E-1	<7.1E-2	<9.2E-2	<6.3E-2	<7.7E-2
Tl-208	2.52E-1 ± 1.1E-1	<1.3E-1	4.17E-1 ± 1.1E-1	1.68E-1 ± 6.2E-2	2.55E-1 ± 8.0E-1
Bi-212	<2.0E0	<1.3E0	<1.7E0	<1.2E0	<1.0E0
Pb-212	5.83E-1 ± 1.4E-1	4.22E-1 ± 1.5E-1	8.67E-1 ± 2.3E-1	3.90E-1 ± 1.6E-1	6.26E-1 ± 1.2E-1
Bi-214	8.37E-1 ± 2.0E-1	<7.0E-1	8.90E-1 ± 2.1E-1	<6.6E-1	5.19E-1 ± 1.4E-1
Pb-214	6.20E-1 ± 1.7E-1	3.38E-1 ± 1.1E-1	6.99E-1 ± 1.8E-1	4.13E-1 ± 1.3E-1	6.07E-1 ± 1.2E-1
Ac-228	6.19E-1 ± 2.2E-1	<4.3E-1	1.05E0 ± 1.6E-1	<4.0E-1	6.74E-1 ± 1.6E-1
U-235	<7.9E-1	<4.9E-1	<6.8E-1	<5.3E-1	<6.1E-1
U-238	<1.5E+1	<8.9E0	<1.3E+1	<1.1E1	<1.1E+1
Am-241	<7.5E-1	<5.0E-1	<6.8E-1	<4.8E-1	<5.7E-1

See footnotes at end of table.

Table 1
(Continued)

Parameter	Sample Identification 9901-0342W bv-ss-1057 (1/21/99)
K-40(1)	7.35E-1 ± 1.3E-1
Co-60	<7.5E-2
Cs-137	<7.1E-2
Tl-208	1.91E-1 ± 6.3E-2
Bi-212	<1.5E0
Pb-212	6.01E-1 ± 1.7E-1
Bi-214	4.37E-1 ± 1.3E-1
Pb-214	4.87E-1 ± 1.4E-1
Ac-228	<4.5E-1
U-235	<6.4E-1
U-238	<1.2E0
Am-241	<5.5E-1

(1)Antech Method A-524 (Gamma Spectrometry), units are pCi/gram, and error estimates are 2 standard deviations.