BWX Technologies, Inc.
a McDermott company

3001-030225 0001 **BWXT of Ohio, Inc.**

1 Mound Road
P.O. Box 3030
Miamisburg, Ohio 45343-3030
(937) 865-4020

ER-152/02
June 18, 2002

Mr. Richard B. Provencher, Director
Miamisburg Environmental Management Project
U. S. Department of Energy
P. O. Box 66
Miamisburg, OH 45343-0066

ATTENTION: Robert S. Rothman

SUBJECT: Contract No. DE-AC24-97OH20044
VARIOUS DOCUMENTS

REFERENCE: Statement of Work Requirement C.7.1e - Regulator Reports

Dear Mr. Provencher:

Rob Rothman from your office has approved the release of the following documents to the regulators:

- PRS 21, 22, 25, 26, 27, 29 Package, Final
- PRS 28 Package, Final
- PRS 277/278 Package, Final
- PRS 421 Package, Final
- PRS 308 Package, Final

If you or members of your staff have any questions regarding the documents, or if additional support is needed, please contact Dave Rakel at extension 4203.

Sincerely,

Monte A. Williams
Project Manager, Environmental Restoration

MAW/KMA:jdg

Enclosures

cc: Tim Fischer, USEPA, (1) w/attachments
Brian Nickel, OEPA, (1) w/attachments
Ruth Vandegrift, ODH, (1) w/attachments
Paul Lucas, DOE/MEMP, (1) w/attachments
Sue Smiley, DOE/MEMP, (1) w/attachments
Randy Tormey, DOE/HQ, (1) w/attachments
Dann Bird, MMCIC, (3), w/attachments
Craig Hansen, BWXT of Ohio, (1) w/attachments
Dave Rakel, BWXT of Ohio, (1) w/attachments
Karen Arthur, BWXT of Ohio, (1) w/attachments
Monte Williams, BWXT of Ohio, (2) w/attachment
Public Reading Room, (5) w/attachments

3001-0302250001

MOUND

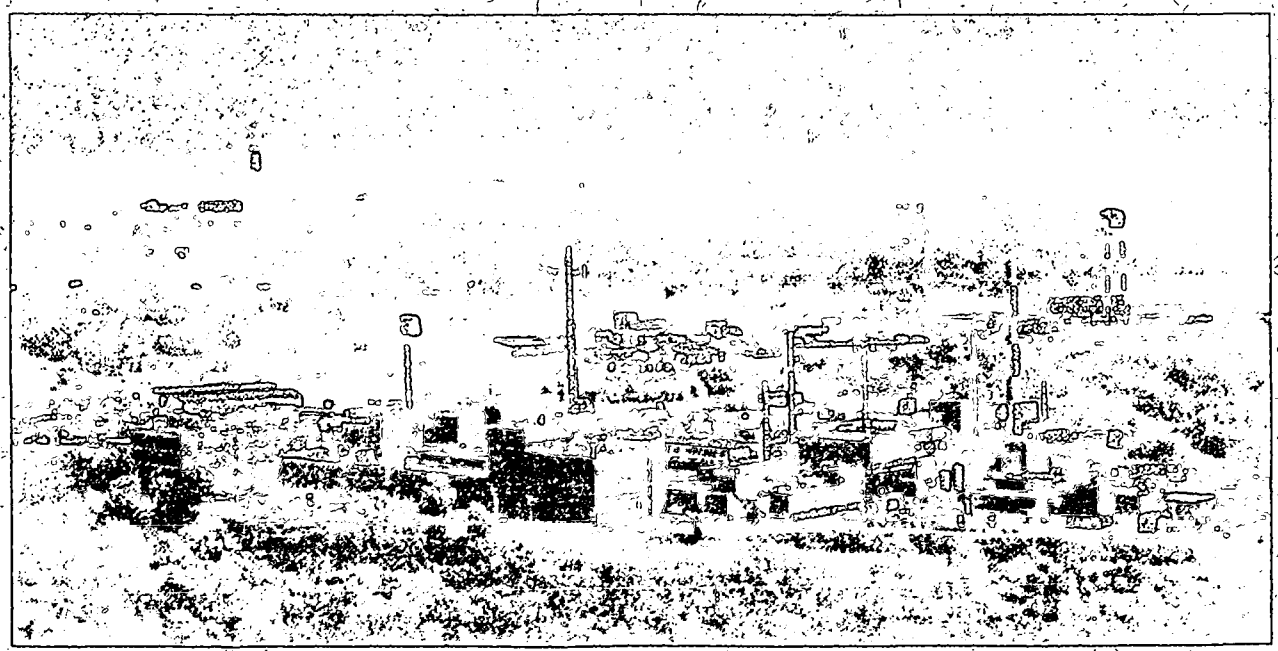
Environmental
Restoration
Program

MOUND PLANT

Potential Release Site Package

PRS 308

FINAL
JUNE 2002



MOUND

Environmental Restoration Program

MOUND PLANT POTENTIAL RELEASE SITE PRS PACKAGE

Notice of Public Review Period

The following Potential Release Site (PRS) fact sheet is available for public review in the CERCLA Public Reading Room, 305 E. Central Ave., Miamisburg, Ohio. Public comment on this document will be accepted April 19, 2001 through May 24, 2001.

PRS 308: Isolated Thorium Hot Spot

Questions can be referred to Paul Lucas at (937) 865-4578.

PRS 308 Package Tracking Sheet

REVISION	DESCRIPTION	DATE
WORKING DRAFT		
DRAFT	Binned FA 19 July 1995	**13 June 1995**
DRAFT PROPOSED FINAL	Incorporates "Supplement-1" narrative and reference document: "Further Assessment Sampling as PRS No. 308, Revision 1, April 1997.	**21 July 1997**
DRAFT	Incorporates "Supplement-1" and narrative changes.	**20 August 1997**
DRAFT	Available for second binning. Binned FA 17 December 1997. Opportune FA sampling conducted in July 2000.	**28 August 1997**
WORKING DRAFT	Addendum 1 created to document FA sampling.	**10 August 2000**
DRAFT	Adjustment accomplished at August 2000 Core Team meeting. Binned FA 18 September 2000.	**17 August 2000**
WORKING DRAFT	Addendum 2 created to document FA sampling.	**10 January 2001**
DRAFT	PRS Data Package adjusted to consolidate evaluation activities history. Addendums deleted.	**15 February 2001**
DRAFT PROPOSED FINAL	Document narrative adjusted at Core Team meeting help on 20 February 2001. Introductory pages to be updated.	**21 February 2001**
PUBLIC REVIEW DRAFT	Core Team review period complete without comments. Document to go for Public Review; 19 April 2001 through 24 May 2001.	**10 April 2001**
FINAL	Public Review resulted in no significant changes.	**June 2002**

The Mound Core Team
P.O. Box 66
Miamisburg, Ohio 45343-0066

Mr. Daniel Bird, AICP
Planning Manager
Miamisburg Mound Community Improvement Corporation
720 Mound Road
COS Bldg. 4221
Miamisburg, Ohio 45342-6714

Dear Mr. Bird:

The Core Team, consisting of the U.S. Department of Energy Miamisburg Environmental Management Project (DOE-MEMP), U.S. Environmental Protection Agency (USEPA), and the Ohio Environmental Protection Agency (OEPA), appreciates your comments on the PRS 308 Data Package. Attached are our responses.

Should the responses to comments require additional detail, please contact Robert Rothman at (937) 865-3823 and we will gladly arrange a meeting or telephone conference.

Sincerely,

DOE/MEMP: _____
Robert S. Rothman, Remedial Project Manager

USEPA: _____
Timothy J. Fischer, Remedial Project Manager

OEPA: _____
Brian K. Nickel, Project Manager

MMCIC Comments
PRS 308 Data Package
Public Review Draft, April 10, 2001

Substantive Comments

1. The PRS 308 Recommendation page indicates that additional sampling was performed in 1997 and 2000 to further assess PRS 308, and that the additional sampling event in September 2000 did not identify levels of concern for the RPS 308 site constituents. The Recommendation page further states that "All September sample results were below guideline values." However, the data summary tables on page 2 of the data package, under the section titled PRS 308 Evaluation Chronological History, compare maximum detected concentrations of the PRS 308 site constituents to 10^{-6} Guideline Criteria. Several of the maximum detected values exceed the 10^{-6} Guideline Values.

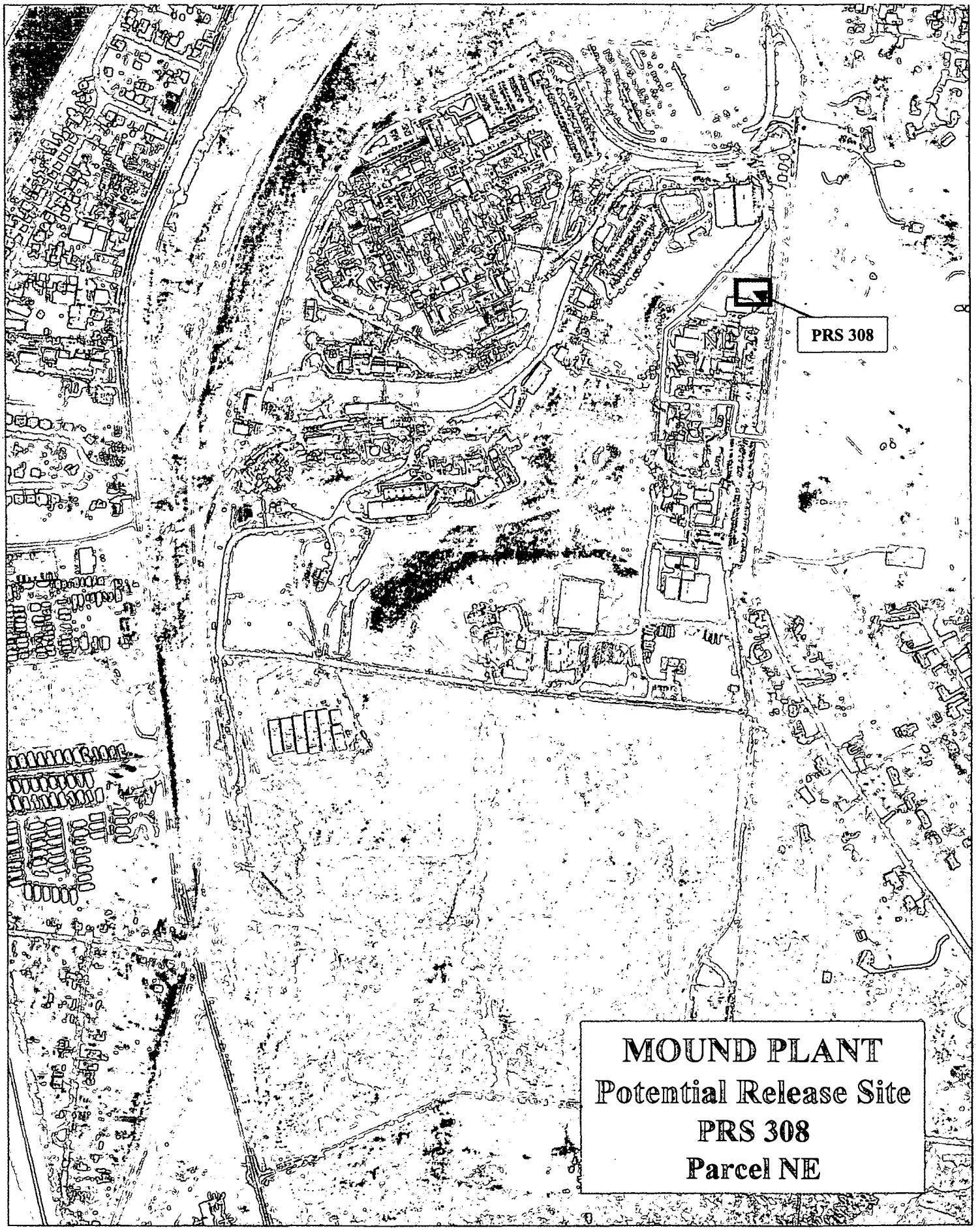
   From our review of previously released PRS Data Packages, we understand that the Core Team actually compared the 10^{-5} Guideline Values to the maximum detected concentrations of PRS 308 constituents in consideration of their binning recommendation. The PRS 308 maximum detected concentrations do not exceed the 10^{-5} Guideline Values. We suggest that this discrepancy between the data summary tables and the recommendation page text be corrected so that there is no confusion for the lay reader.

   Response
   Because the Core Team bases its decision for a PRS on all the information available in the PRS package, it would be better to remove from the recommendation the sentence "All September sample results were below guideline values." A revised recommendation will be published along with this comment/response in the final version of the PRS Package.

   One tool the Core Team uses to evaluate a PRS is the Risk–Based Guideline Value (RBGV). RBGVs are not used as Action Levels (i.e. an exceedance automatically triggers a removal action). A concentration that corresponds to greater than 10^{-6} risk (or even 10^{-5}) is not , in itself, unacceptable; but must be considered with all the other information available for that PRS (for example, accepted background concentration, possible pathway to construction worker/site employee, ...). After reviewing all of the information in the PRS 308 package, the Core Team concluded PRS 308 requires No Further Assessment.

Errata

1. No comments

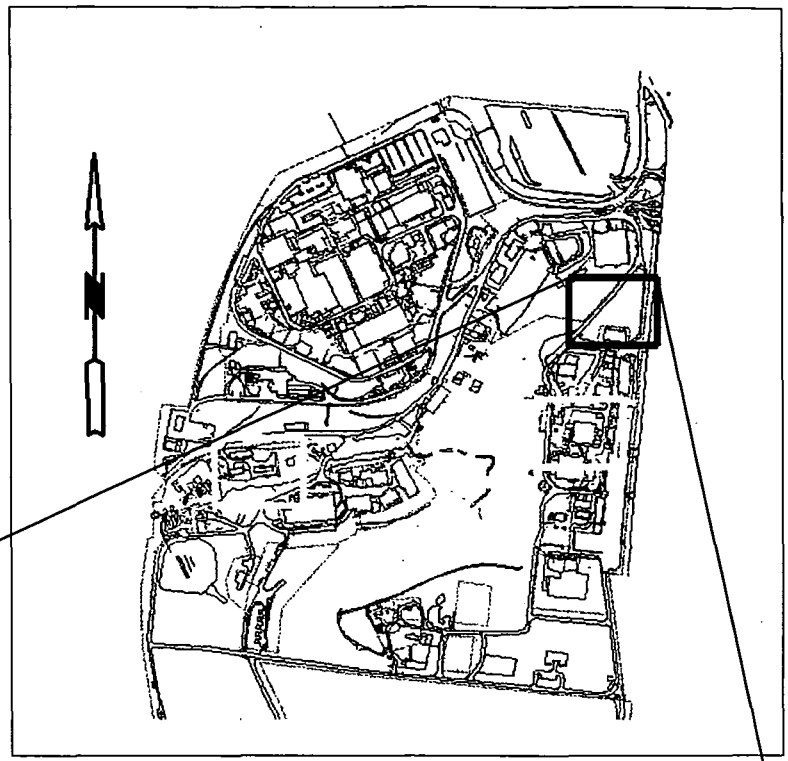

PRS 308
MOUND PLANT
Potential Release Site
PRS 308
Parcel NE

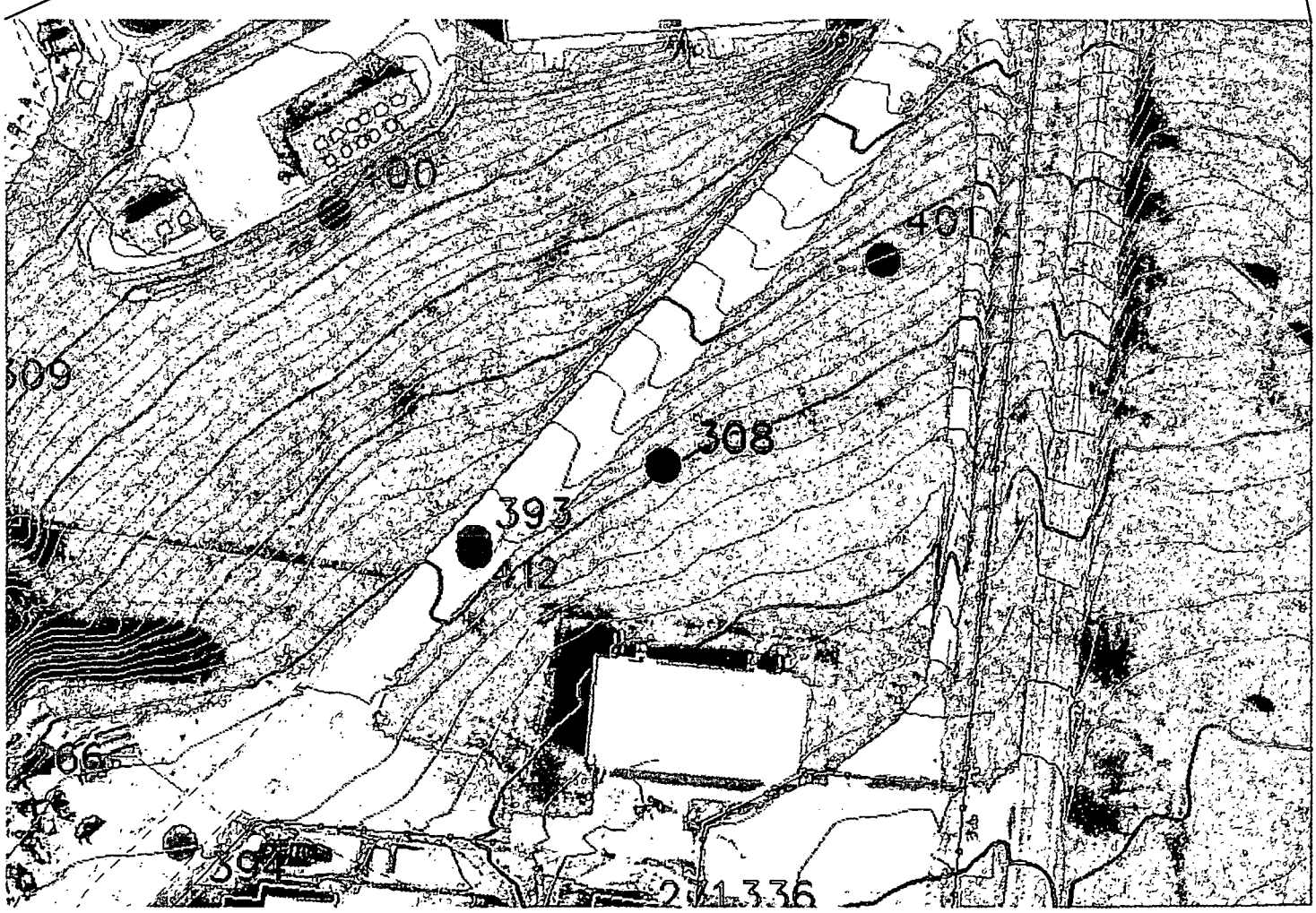
Mound Plant

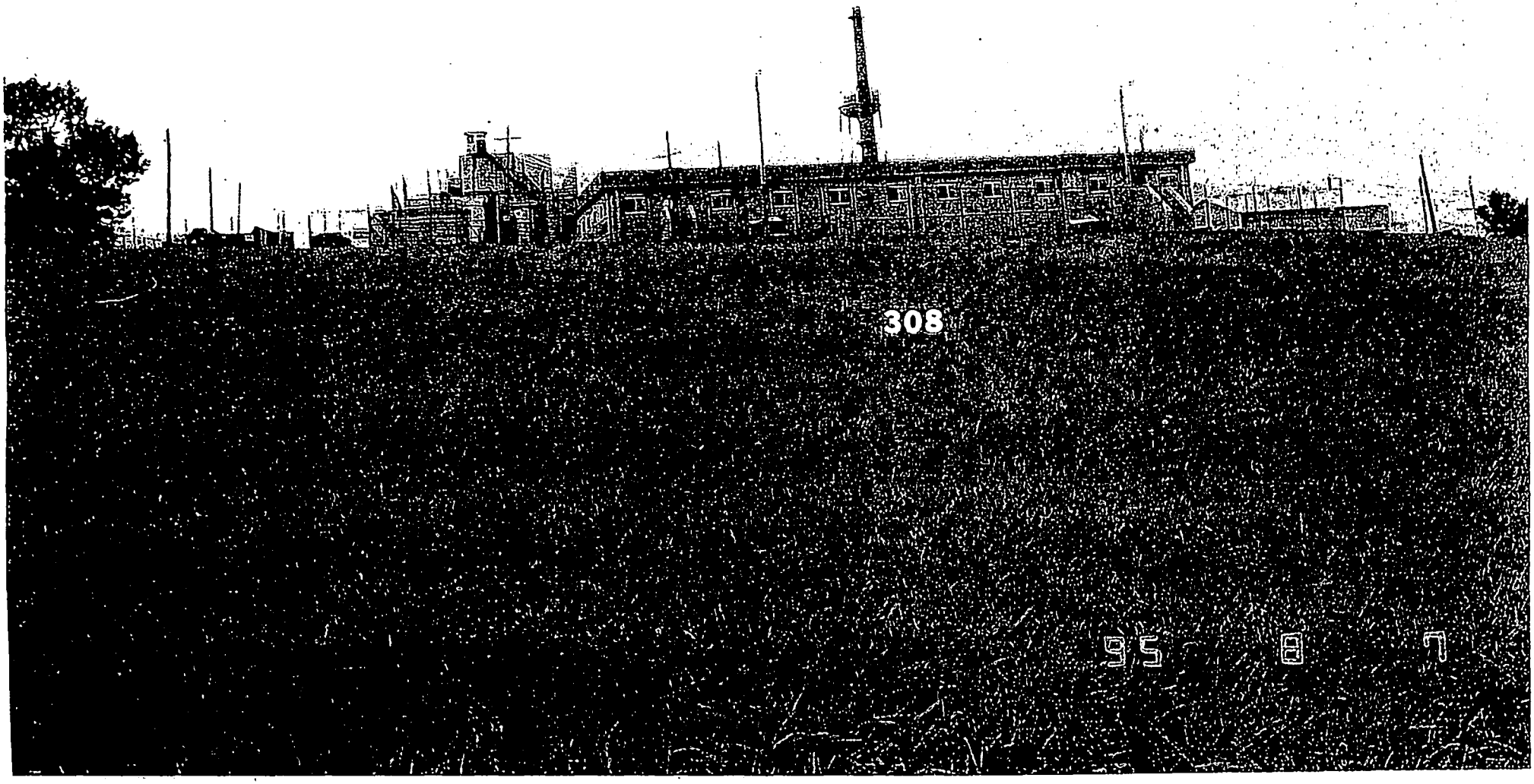
PRS 308

Isolated Thorium Hot Spot

On the map below:
- PRS number and location shown in black
- Fencing shown in red
- Elevation contours shown in brown
- Other PRS's shown in blue






308
95 8 7

PRS 308

PRS Description:

Potential Release Site (PRS) 308 was identified as an isolated Thorium-232 hot spot during the Site Survey Project (location C0028)[1]. No radioactive or hazardous waste generating processes are known to have occurred at this location.

PRS 308 Evaluation Chronological History:

Summary Events Leading to Core Team Evaluation of July 1995 (Binning Event #1)

The Core Team formally evaluated PRS 308 on July 19, 1995. The Core Team noted that based on the 1988 Site Survey Project, Thorium-232 contamination of 109 pCi/g was detected at location C0028.[1] Plutonium-238 at values less than 50 pCi/g were noted to the east of this location.[2] Additional sampling conducted in the summer of 1995 detected Plutonium-238 at 106 pCi/g approximately 20 feet south of the original Thorium detection.[3] The Core Team elected to bin PRS 308 as requiring Further Assessment (FA).

Summary Events Leading to Core Team Evaluation of December 1997 (Binning Event #2)

Further Assessment activities were planned and conducted.[4] An investigation was designed and implemented to determine soil concentrations of Plutonium-238 and Thorium-232 within a 50 foot radius of the PRS 308 location. The investigation found concentrations of Plutonium-238 and Thorium-232 at values of 15 pCi/g and 20 pCi/g, respectively. It was assumed that the Thorium-232 found was most probably due to runoff from PRS 267, a location of past Thorium storage and redrumming operations. The Core Team formally evaluated PRS 308 on December 17, 1997 and elected to bin it as Further Assessment.

Summary Events Leading to Core Team Evaluation of September 2000 (Binning Event #3)

Planned new building construction on the SM/PP Hill in an area to include PRS 308 allowed for opportune Further Assessment sampling activities. In July 2000, in conjunction with excavation for a retainer wall for the new structure, two trenches were dug and sampled approximately along the entire length of the wall to a depth of five feet. This is the depth of the retainer wall footer. Sampling results derived from this trench excavation are noted in Table 1.[5] The Core Team formally addressed PRS 308 on September 18, 2000 and elected to bin it as Further Assessment because trench depth did not reach seven feet – the depth of the elevated Plutonium-238 detection noted in "Field Data, Other Soil Characterization, May 1995."

Table 1: Sampling Information - PRS 308 Further Assessment (July 2000)

Contaminant	Maximum Concentration Detected (pCi/g)	Guideline * Criteria (10^{-6}) (pCi/g)	Background Value (pCi/g)
Cesium-137 (+D)	.08	.46	.42
Lead-210 (+D)	1.84	1.7	NA
Radium-226 (+D)	1.87	.14	2.0
Actinium-227 (+D)	.35	1.0	NA
Thorium-230 (+D)	1.38	.13	1.9
Thorium-232 (+D)	1.23	.11	1.4
Uranium-238 (+D)	1.84	.12	1.2
Plutonium-238	15.0	55 (10^{-5})	.13

*Construction Worker

Summary Events Leading to Core Team Evaluation Considerations (Binning Event #4)

A second trench sampling investigation was conducted in late September 2000 which encompassed the areas of past investigations to a depth of at least seven feet. The (above noted) building retainer wall was physically constructed in October 2000. PRS 308 and soils in the immediate area were removed to establish a solid substrate for the retainer wall footer. Sampling results derived prior to construction excavation, as presented at the Core Team meeting of January 17, 2001, are noted in Table 2 and Reference 6. Reference 6 includes the employed Sampling & Analysis Plan, as well as the Soil Analysis Reports.

Table 2: Sampling Information – PRS 308 Further Assessment (September 2000)

Contaminant	Maximum Concentration Detected (pCi/g)	Guideline * Criteria (10^{-6}) (pCi/g)	Background Value (pCi/g)
Thorium-228 (+D)	0.787	.11	1.5
Thorium-230 (+D)	2.25	.13	1.9
Thorium-232 (+D)	0.95	.11	1.4
Uranium-238 (+D)	0.79	.12	1.2
Plutonium-238	14.21	55 (10^{-5})	.13

*Construction Worker

READING ROOM REFERENCES:

1) OU-9 Site Scoping Report: Volume 3: Radiological Site Survey Report, June 1993
2) OU-5 Operational Area Phase I Investigation, Non-AOC Field Report, Draft, March 1995

OTHER REFERENCES:

3) Field Data, Other Soils Characterization, May 1995
4) Further Assessment Sampling at PRS 308, Revision 1, April 1997
5) Further Assessment Sampling Results/Information (Table 1, Sampling of July 2000)
6) Further Assessment Sampling Results/Information (Table 2, Sampling of September 2000)

PREPARED BY:

Dennis Gault, BWXTO Project Engineer
Joseph C. Geneczko, Member of BWXTO Technical Staff
George Liebson, Member of EG&G Technical Staff
Richard Neff, DOE Technical Support Staff

MOUND PLANT

PRS #308

Isolated Thorium Hot Spot

RECOMMENDATION (REVISED):

Potential Release Site (PRS) 308 was identified as a radiological hot spot (C0028) located near the eastern boundary of the Mound Plant SM/PP Hill. PRS 308 was initially binned in July 1995 as a Further Assessment. This was followed by additional sampling events in December 1997 and September 2000. The additional sampling events conducted in September did not identify levels of concern.

Therefore, PRS 308 requires NO FURTHER ASSESSMENT.

Concurrence:

DOE/MEMP: _____ 6/17/02
Robert S. Rothman, Remedial Project Manager (date)

USEPA: _____ 6/13/02
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: _____ 6/14/02
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from _____ to _____

☐ No comments were received during the comment period.

☐ Comment responses can be found on page _____ of this package.

REFERENCE MATERIAL

PRS 308

Reference 1

ENVIRONMENTAL RESTORATION PROGRAM

OPERABLE UNIT 9, SITE SCOPING REPORT: VOLUME 3 - RADIOLOGICAL SITE SURVEY

MOUND PLANT
MIAMISBURG, OHIO

June 1993

DEPARTMENT OF ENERGY
ALBUQUERQUE FIELD OFFICE

ENVIRONMENTAL RESTORATION PROGRAM
EG&G MOUND APPLIED TECHNOLOGIES

FINAL

RADIOCHEMICAL ANALYSIS

Map Location[a]	Coordinates South	Coordinates West	MRC ID No.	Mo-Yr	Depth (inch)	Pu-238 (pCi/g)	Thorium[b] (pCi/g)	Tritium (pCi/mL)	Co-60 (pCi/g)	Cs-137 (pCi/g)	Ra-226 (pCi/g)	Am-241 (pCi/g)
			None[d]	07-84	72	NR	18					
			None[d]	07-84	84	NR	12					
			None[d]	07-84	96	NR	12					
			None[d]	07-84	108	NR	10					
			None[d]	07-84	120	NR	5.3					
C0028	2375	1755	1245	12-82	18	11.40	5.61					
			1246	12-82	48	NR	109.00					
			1247	12-82	66	NR	109.00					
			1248	12-82	102	NR	58.00					
			1250	12-82	156	NR	97.00					
			1251	12-82	216	0.29[c]	29.45[c]					
			1252	12-82	234	0.06	b					
			1253	12-82	252	0.03	b					
S0314	2375	1910	2820	10-83	0	0.78	b					
C0029	2374.1	2184.3	None[d]	07-84	0	NR	12					
			None[d]	07-84	12	NR	17					
			None[d]	07-84	24	NR	17					
			None[d]	07-84	36	NR	38					
			None[d]	07-84	48	NR	53					
			None[d]	07-84	60	NR	42					
			None[d]	07-84	72	NR	36					
			None[d]	07-84	84	NR	38					
			None[d]	07-84	96	NR	55					
			None[d]	07-84	108	NR	48					
			None[d]	07-84	120	NR	36					
			None[d]	07-84	132	NR	21					
			None[d]	07-84	144	NR	17					

Reference 2

Environmental Restoration Program

OPERABLE UNIT 5
OPERATIONAL AREA PHASE I INVESTIGATION
NON-AOC FIELD REPORT

MOUND PLANT
MIAMISBURG, OHIO

VOLUME II - APPENDICES A-G

March 1995

Draft

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies

MOUND SOIL SCREEN DATA

APPENDIX D

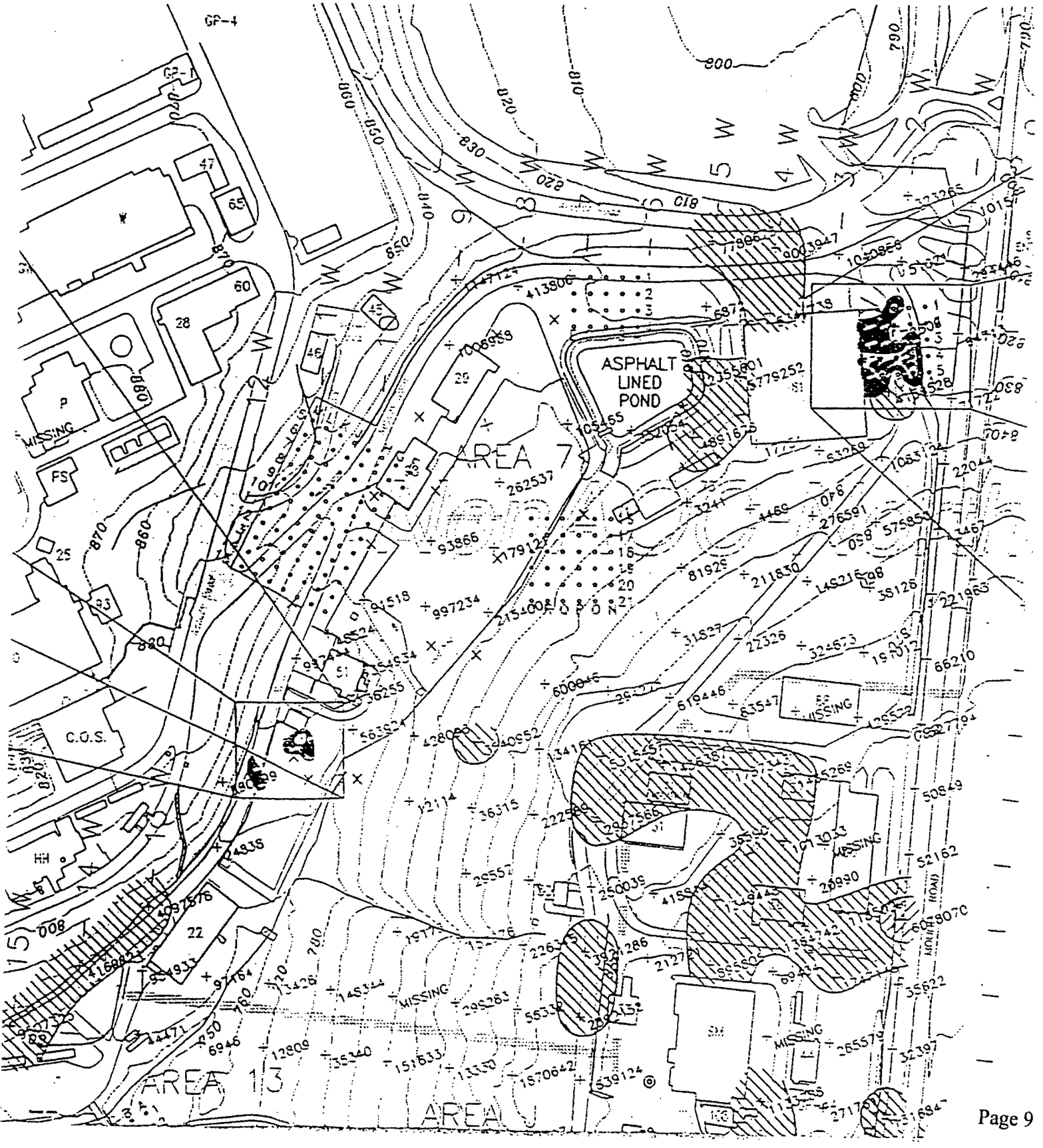
RADIOLOGICAL DATA (FIDLER SURVEY MOUND SOIL SCREENING FACILITY DATA) FOR NON-AOC POINTS

	FIDLER SURVEY DATA					MOUND SOIL SCREENING FACILITY DATA			
SMPID	Contamination Criteria CH1	FIDLER Readings CH1	Contamination Criteria CH2	FIDLER Readings CH2	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:
20N03	130	100	6.5	6.5	NC	0	a	0.3	a
20N04	176.8	110	8.97	7.5	NC	0	a	1.1	a
20N05	176.8	85	8.97	4.5	NC	WIPE	c	WIPE	c
20N06	176.8	375	8.97	22.0	30	27	b	2.6	b
20N07	176.8	325	8.97	22.5	45	37	b	14.7	b
20N10	157.3	95	8.45	4.5	NC	0	a	0.6	a
20N11	157.3	80	8.45	4.0	NC	WIPE	c	WIPE	c
21N01	253.5	140	12.48	9.5	NC	15	a	1	a
						3	a	0.8	a
21N02	176.8	140	8.97	6.5	NC	7	a	1	a
						19	a	0.7	a
21N03	176.8	160	8.97	8.0	NC	20	a	1.2	a
21N04	176.8	100	8.97	5.0	NC	9	a	0.5	a
21N05	152.1	110	8.45	10.0	NC	11	a	1.8	a
21N08	176.8	85	8.97	4.5	NC	WIPE	c	WIPE	c
21N09	176.8	75	8.97	4.5	NC	WIPE	c	WIPE	c
21N10	157.3	90	8.45	6.5	NC	19	a	0.9	a
22N01	253.5	145	12.48	8.5	NC	24	a	1.3	a
22N02	176.8	135	8.97	5.5	NC	3	a	0.6	a
22N03	176.8	115	8.97	6.0	NC	18	a	1.1	a
22N04	152.1	100	8.45	9.5	NC	19	a	2	b
22N05	152.1	105	8.45	8.0	NC	10	a	1.4	a
22N08	176.8	115	8.97	4.5	NC	WIPE	c	WIPE	c
22N09	176.8	95	8.97	6.0	NC	WIPE	c	WIPE	c
23N01	253.5	170	12.48	10.5	NC	25	b	0.8	a
23N02	176.8	160	8.97	5.0	NC	16	a	0.8	a
						26	b	1.0	a
23N03	152.1	115	8.45	5.5	NC	3	a	1.1	a
23N04	152.1	95	8.45	6.0	NC	12	a	0.7	a

LON Counts

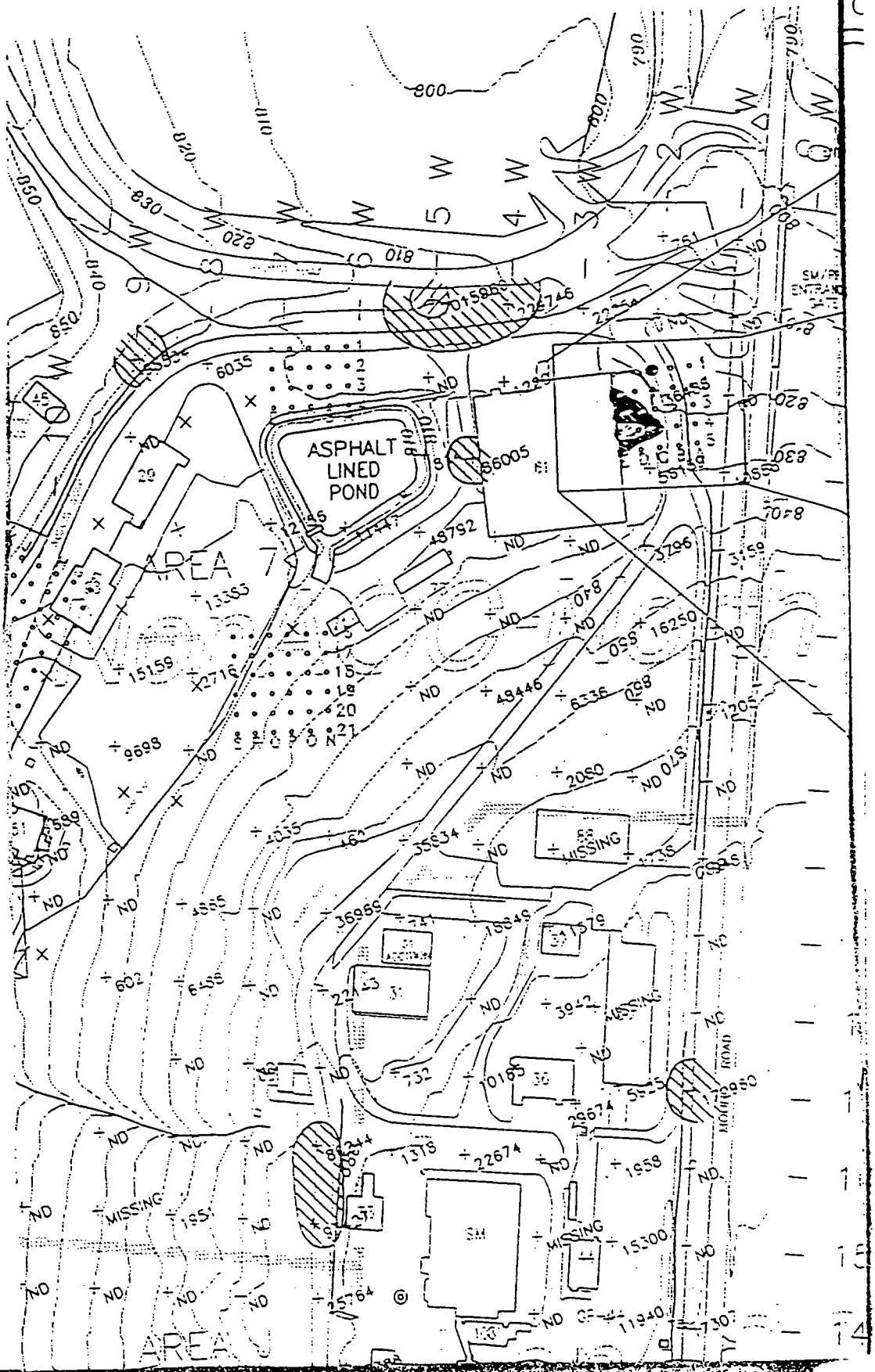
Plate 2: Total Aromatic Hydrocarbons

PETREX DATA (RELATIVE)



Low Counts

Plate 3: Total Semivolatile Hydrocarbons

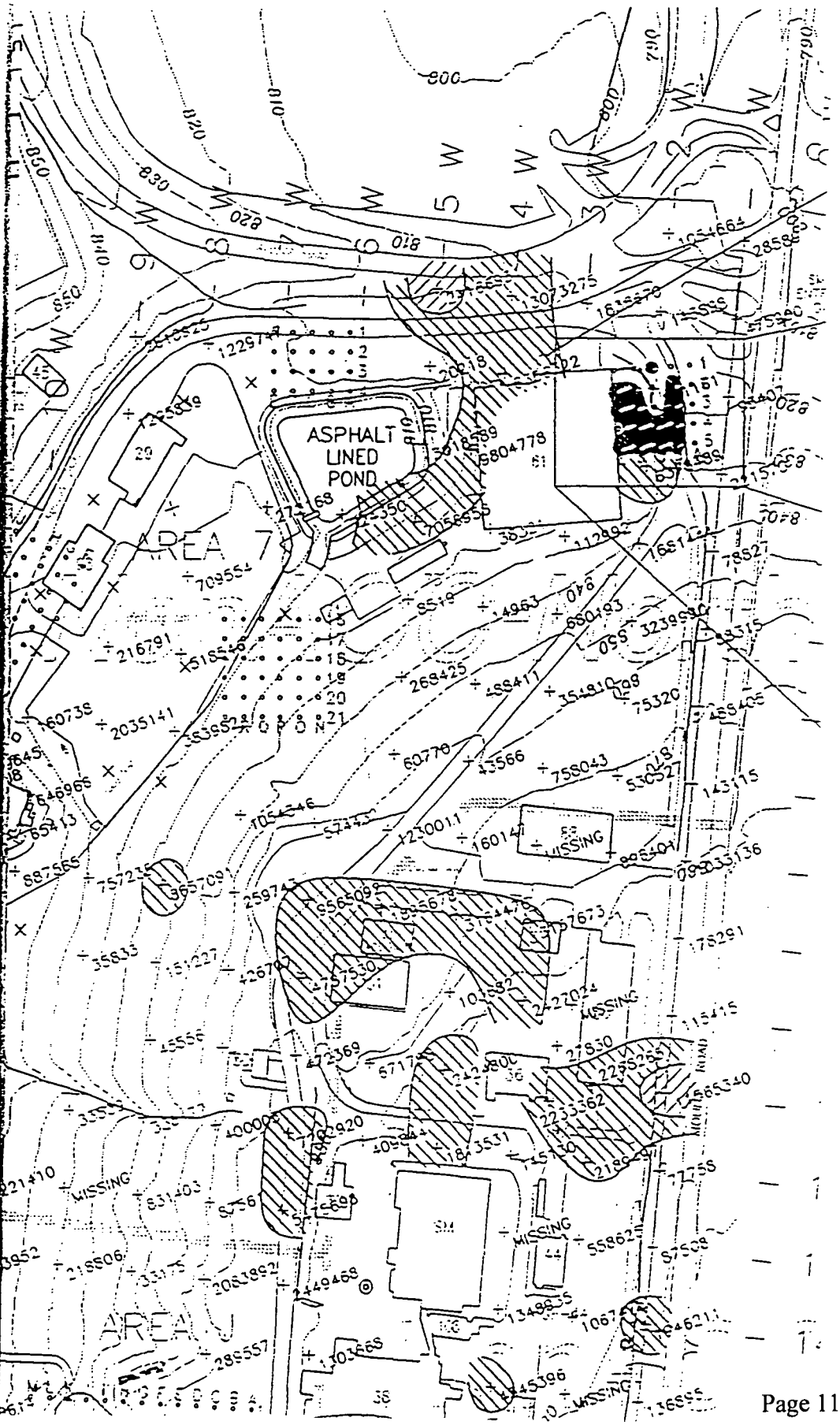


PETREX DATA (RELATIVE)

Low Levels

Plate 4: Total C5-C11 Petroleum Hydrocarbons

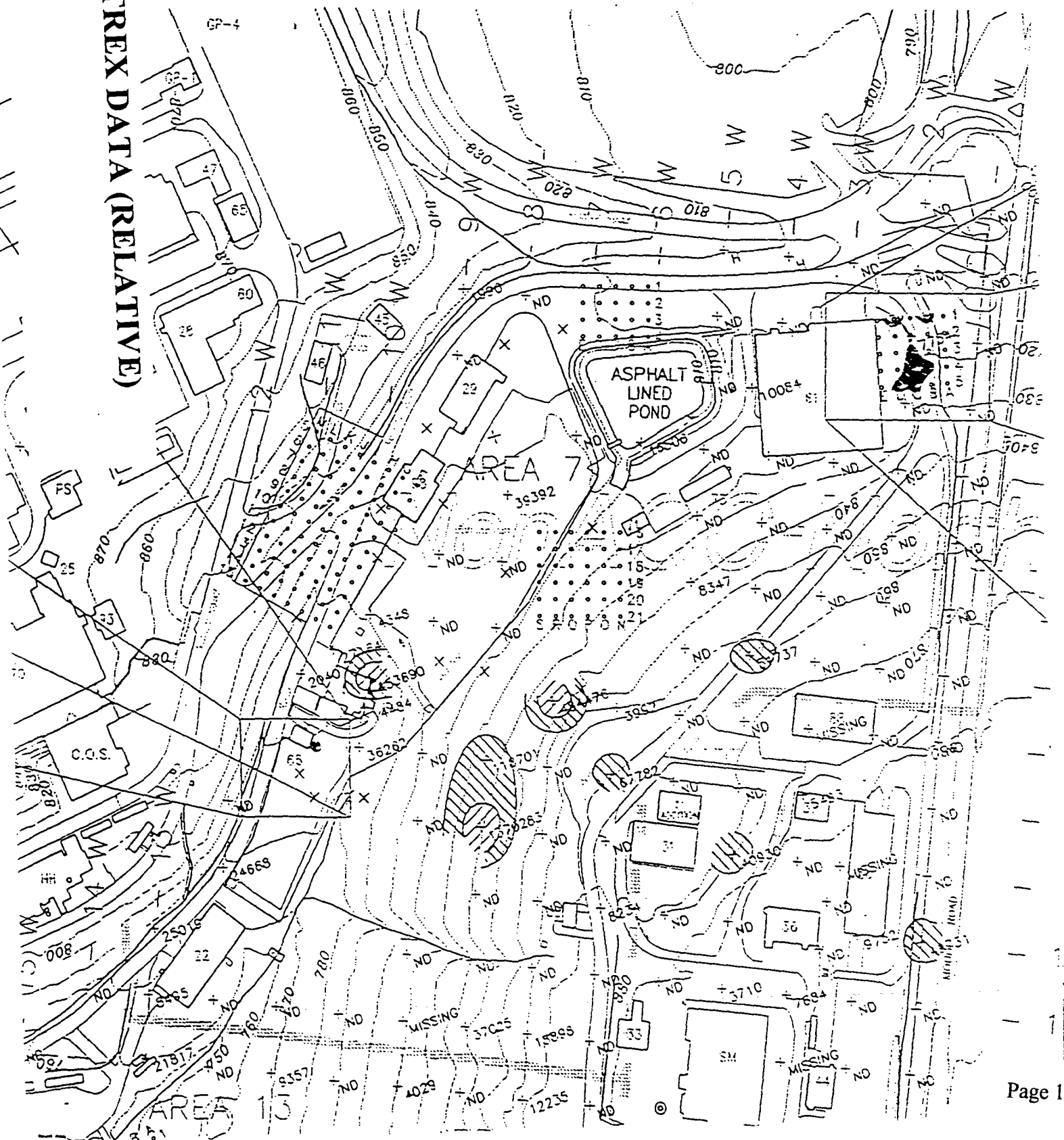
PETREX DATA (RELATIVE)



Low Counts

Plate 5: Total Halogenated Hydrocarbons

PETREX DATA (RELATIVE)



Reference 3

FIELD DATA
OTHER SOILS CHARACTERIZATION
PRS 308 (ALSO KNOWN AS HOT SPOT C0028)

Key to interpreting sample data:

Sample nomenclature is of the form **XXYY-ZZ00**

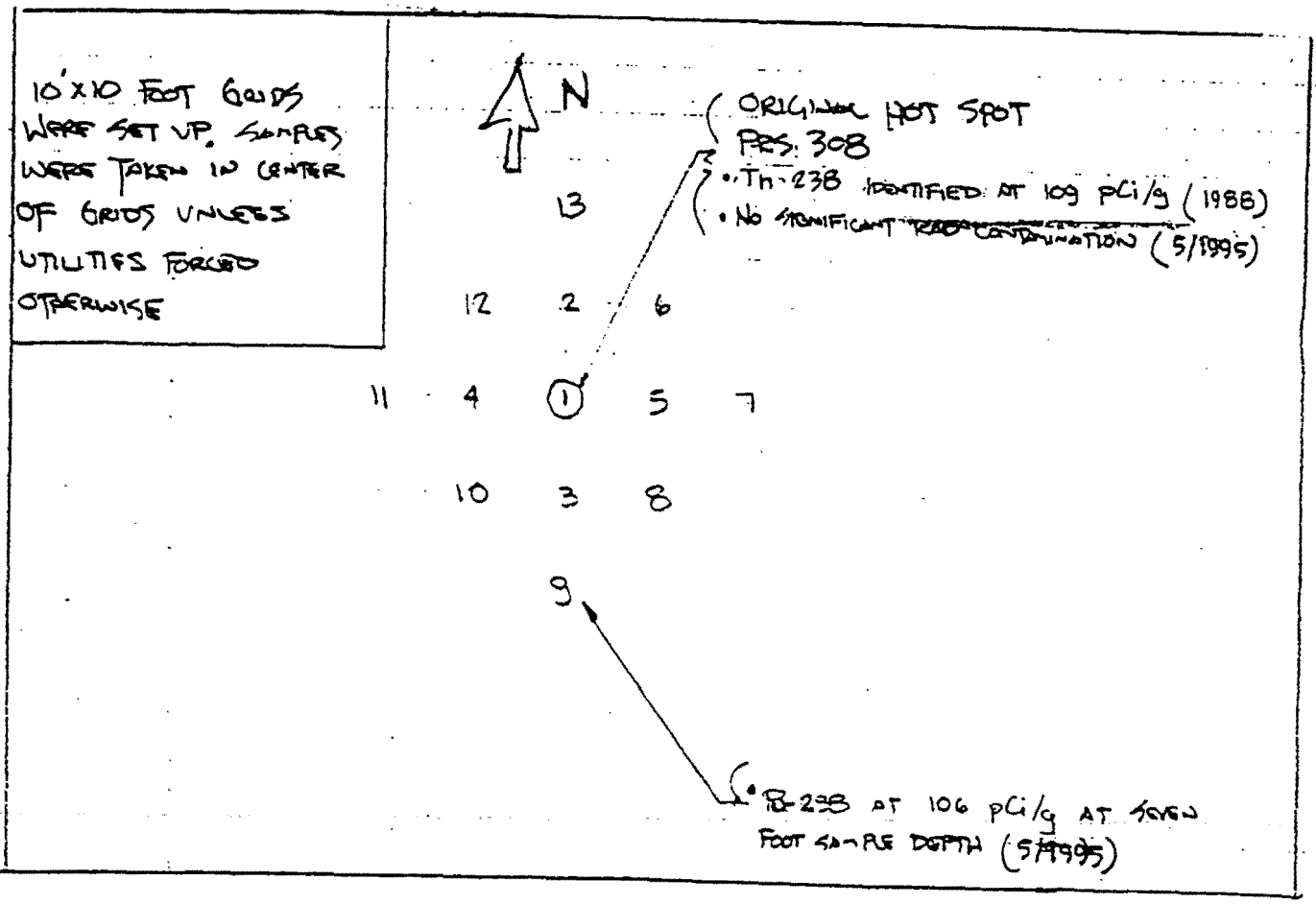
Where:

XX = Area designation
- 87 = PRS 308
- 86 = PRS 310/382
- 83 = prs 312

YY = Sample Location
- 01 = Historical Hot Spot Location
- 02 = Approx 10 feet north of historical location
- 03 = Approx 10 feet south of historical location
- 04 = Approx 10 feet west of historical location
- 05 = Approx 10 feet east of historical location

ZZ = Sample Type
- 50 = Soil

00 = Sample Depth
- 01 = Surface
- 04 = 0-4 feet
- 08 = 4-8 feet
- 12 = 8-12 feet



FIDLER DATA

Health Physics Counti
Request for Analysis and Hea
G Area Spe

To be filled out by Submitter

Name [redacted]	HP #: 8732	RWP #: NA
Isotop[redacted] All	Analysis Required: ☑ Alpha ☑ Beta ☐ H^3	

Type of Sample: ☐ Paper Wipe ☐ Q-tip ☐ Millipore Filter ☐ Glass Fiber Filter ☐ Oil ☐ Water ☑ Other: Explain Soil (i.e. Hazardous Waste)

Description: ☐ Air Sample ☐ Personnel Sample (HP#) ____ ☐ Structural Sample ☑ Other: Explain Soil ☐ Equipment Sample

Time and Date Sample Was Taken: 6-26-95 1330 - 1430 | Pre-screened: ☑ Yes ☐ No | No. of Samples: 6

Remarks: Weston Soil Characterization: Area 87
Electra 5262/5277 Cal Due Date: 7-12-95

WIPE AREA: ☐ 100 cm² ☐

Fidler Check # 3041 / 3434
Next Cal. Due 8-3-95

CHANNEL		One	Out	Two
	Bkg	150	5K	4K
	Pu	17K	22K	5K
Field Inst. Res.	Th	2K	30K	23K

Sample ID #	Sample Description	Alpha/Beta DPM/CPM Results	Alpha/Beta Inst. ID	Fidler/CPM One	Fidler/CPM Out	Fidler/CPM Two	PAC DPM/100 CM² # NA	Electra α dpm	Electra β dpm
Background	Background	NA	NA	NA	NA	NA		10	2046
	Check Standard			NA	NA	NA		787	292K
NA	Pre-Scan A. # 8709			ND	ND	ND		NA	NA
	Soil Sample # 8709-5001							ND	ND
	# 8709-5004								
	# 8709-5007								
	Pre-Scan # 8708							NA	NA
	Soil Sample # 8708-5001							ND	ND
	# 8708-5004								
	# 8708-5007								
	NA			NA	NA	NA		NA	NA

Counting Facility Technician's Signature: [redacted] HP # ____

Radiological Control Technician's Signature: [redacted] HP # 8732

Date Submitted: ____ Date Completed: ____

Reviewed By: [redacted] HP # 4959 Date: 8-2-95

ML-9380 (6-94) G AREA SPECIFIC

SOIL ANALYSIS REPORT

SAMPLE ID: SS500548
FILE ID: SS_00403.S0

Isotope	Activity (pCi/g)	Resp. Limit (pCi/g)	Spoils Limit (pCi/g)
Co-60	< 0.12	1,390,000	1.4
Cs-137	0.22	6,500,000	5.3
Pb-210	2.63	1,300,000	2.9
Ra-226	3.99	26,300	5.0
Ac-227 (D)	< 0.63	31	1.8
Th-228	< 24.26	671	2.8
Th-229	< 1.85	104	5.4
Th-230	< 18.29	650	1.7
Th-232 (D)	0.94	130	0.9
Pa-231	< 5.28	160	0.1
U-235	< 1.42	1,730	4.1
U-238 (D)	< 24.3	1,730	20.4
Pu-238	< 151	452	25.0
Am-241	< 0.22	400	0.8

Other Nuclides:

Isotope	Activity (pCi/g)	Resp. Limit (pCi/g)	Spoils Limit (pCi/g)
Th-234	2.9		

Σ DOT 0.23805 nCi/g Σ Respirator 0.49227696 Σ Spoils 82.8467844

Description:

8709-5001 Area 87

Collector: [redacted] 8732

Comments:

Σ Respirator or Σ Spoils <1 indicates soil levels below limits. Values > or = 1 indicate the soil levels exceed alarm limits for that operation. Respirator limits provided by Health

Σ DOT 2 nCi/g limit, total activity.

(D) denotes identification by daughter emissions. Sample is assumed to be in secular equilibrium.

< by activity means it is less than the MDA. MDA value is used in calculation of respirator, spoils, and DOT

DATE: 7/10/95 HP: 4535 INITIALS: [redacted]

SOIL ANALYSIS REPORT

SAMPLE ID: SS500549
FILE ID: SS_00404.S0

Isotope	Activity (pCi/g)	Resp. Limit (pCi/g)	Spoils Limit (pCi/g)
Co-60	< 0.11	1,390,000	1.4
Cs-137	< 0.08	6,500,000	5.3
Pb-210	3.21	1,300,000	2.9
Ra-226	< 2.21	26,300	5.0
Ac-227 (D)	< 0.81	31	1.8
Th-228	19.74	671	2.8
Th-229	1.27	104	5.4
Th-230	< 7.02	650	1.7
Th-232 (D)	0.6	130	0.9
Pa-231	< 3.3	160	0.1
U-235	< 1.22	1,730	4.1
U-238 (D)	< 13.71	1,730	20.4
Pu-238	< 165.7	452	25.0
Am-241	< 0.15	400	0.8

Other Nuclides:

Isotope	Activity (pCi/g)	Resp. Limit (pCi/g)	Spoils Limit (pCi/g)

Σ DOT 0.21913 nCi/g Σ Respirator 0.47948430 Σ Spoils 54.5169457

Description:
8709-5004 AREA 87

Collector: [redacted], 8732

Comments:

Σ Respirator or Σ Spoils <1 indicates soil levels below limits. Values > or = 1 indicate the soil levels exceed alarm limits for that operation. Respirator limits provided by Health

Σ DOT 2 nCi/g limit, total activity.

(D) denotes identification by daughter emissions. Sample is assumed to be in secular equilibrium.

< by activity means it is less than the MDA. MDA value is used in calculation of respirator, spoils, and DOT

DATE: 7/10/95 HP: 4535 INITIALS: [redacted]

SOIL ANALYSIS REPORT

SAMPLE ID: SS500550
FILE ID: SS_00405.S0

Isotope		Activity (pCi/g)	Resp. Limit (pCi/g)	Spoils Limit (pCi/g)
Co-60		0.08	1,390,000	1.4
Cs-137	<	0.09	6,500,000	5.3
Pb-210	<	0.83	1,300,000	2.9
Ra-226		2.78	26,300	5.0
Ac-227 (D)	<	0.48	31	1.8
Th-228	<	20.46	671	2.8
Th-229	<	1.29	104	5.4
Th-230	<	13.69	650	1.7
Th-232 (D)		0.71	130	0.9
Pa-231	<	3.08	160	0.1
U-235	<	1.02	1,730	4.1
U-238 (D)		9.82	1,730	20.4
Pu-238		106.3	452	25.0
Am-241	<	0.12	400	0.8

Other Nuclides:

Isotope	Activity (pCi/g)	Resp. Limit (pCi/g)	Spoils Limit (pCi/g)

Σ DOT 0.16075 nCi/g Σ Respirator 0.34600189 Σ Spoils 52.9470124

Description:
8709-5007 AREA 87

Collector:

Comments:

Σ Respirator or Σ Spoils <1 indicates soil levels below limits. Values > or = 1 indicate the soil levels exceed alarm limits for that operation. Respirator limits provided by Health

Σ DOT 2 nCi/g limit, total activity.

(D) denotes identification by daughter emissions. Sample is assumed to be in secular equilibrium.

< by activity means it is less than the MDA. MDA value is used in calculation of respirator, spoils, and DOT

DATE: 7/10/95 HP: 4535 INITIALS: [redacted]

SCREEN DATA

SOIL ANALYSIS REPORT

SAMPLE ID: SS500551
FILE ID: SS_00406.S0

Isotope		Activity (pCi/g)	Resp. Limit (pCi/g)	Spoils Limit (pCi/g)
Co-60		0.05	1,390,000	1.4
Cs-137	<	0.12	6,500,000	5.3
Pb-210	<	1.52	1,300,000	2.9
Ra-226		4.29	26,300	5.0
Ac-227 (D)	<	0.84	31	1.8
Th-228	<	18	671	2.8
Th-229	<	1.5	104	5.4
Th-230	<	0.37	650	1.7
Th-232 (D)		0.84	130	0.9
Pa-231	<	4.46	160	0.1
U-235	<	1.32	1,730	4.1
U-238 (D)	<	15.78	1,730	20.4
Pu-238	<	206.2	452	25.0
Am-241	<	0.19	400	0.8

Other Nuclides:

Isotope	Activity (pCi/g)	Resp. Limit (pCi/g)	Spoils Limit (pCi/g)

Σ DOT 0.25548 nCi/g Σ Respirator 0.56996967 Σ Spoils 63.0874706

Description:
8708-5001 AREA 87

Collector: [redacted] 8732

Comments:

Σ Respirator or Σ Spoils <1 indicates soil levels below limits. Values > or = 1 indicate the soil levels exceed alarm limits for that operation. Respirator limits provided by Health

Σ DOT 2 nCi/g limit, total activity.

(D) denotes identification by daughter emissions. Sample is assumed to be in secular equilibrium.

< by activity means it is less than the MDA. MDA value is used in calculation of respirator, spoils, and DOT

DATE: 7/10/95 HP: 4535 INITIALS: [redacted]

SCREEN DATA

SOIL ANALYSIS REPORT

SAMPLE ID: SS500552
FILE ID: SS_00407.S0

Isotope		Activity (pCi/g)	Resp. Limit (pCi/g)	Spoils Limit (pCi/g)
Co-60	<	0.05	1,390,000	1.4
Cs-137		0.08	6,500,000	5.3
Pb-210	<	1.21	1,300,000	2.9
Ra-226	<	1.5	26,300	5.0
Ac-227 (D)	<	0.44	31	1.8
Th-228	<	21.06	671	2.8
Th-229	<	1.2	104	5.4
Th-230	<	11.1	650	1.7
Th-232 (D)		0.48	130	0.9
Pa-231	<	3.61	160	0.1
U-235	<	1.05	1,730	4.1
U-238 (D)	<	10.66	1,730	20.4
Pu-238	<	128.7	452	25.0
Am-241	<	0.13	400	0.8

Other Nuclides:

Isotope	Activity (pCi/g)	Resp. Limit (pCi/g)	Spoils Limit (pCi/g)
Th-234	1.59		

Σ DOT 0.18286 nCi/g Σ Respirator 0.39233604 Σ Spoils 57.7080369

Description:
8708-5004 AREA 87

Collector: [redacted] 8732

Comments:

Σ Respirator or Σ Spoils <1 indicates soil levels below limits. Values > or = 1 indicate the soil levels exceed alarm limits for that operation. Respirator limits provided by Health

Σ DOT 2 nCi/g limit, total activity.

(D) denotes identification by daughter emissions. Sample is assumed to be in secular equilibrium.

< by activity means it is less than the MDA. MDA value is used in calculation of respirator, spoils, and DOT

DATE: 7/10/95 HP: 4535 INITIALS: [redacted]

SOIL ANALYSIS REPORT

SAMPLE ID: SS500547
FILE ID: SS_00402.S0

Isotope	Activity (pCi/g)	Resp. Limit (pCi/g)	Spoils Limit (pCi/g)
Co-60	< 0.06	1,390,000	1.4
Cs-137	< 0.09	6,500,000	5.3
Pb-210	< 1.46	1,300,000	2.9
Ra-226	2.09	26,300	5.0
Ac-227 (D)	< 0.62	31	1.8
Th-228	< 18.55	671	2.8
Th-229	< 1.31	104	5.4
Th-230	< 12.74	650	1.7
Th-232 (D)	0.42	130	0.9
Pa-231	< 3.91	160	0.1
U-235	< 1.14	1,730	4.1
U-238 (D)	5.67	1,730	20.4
Pu-238	< 130	452	25.0
Am-241	< 0.11	400	0.8

Other Nuclides:

Isotope	Activity (pCi/g)	Resp. Limit (pCi/g)	Spoils Limit (pCi/g)

Σ DOT 0.17817 nCi/g Σ Respirator 0.39941241 Σ Spoils 60.7295978

Description:
8708-5007 Area 87

Collector: [redacted], 8732

Comments:

Σ Respirator or Σ Spoils <1 indicates soil levels below limits. Values > or = 1 indicate the soil levels exceed alarm limits for that operation. Respirator limits provided by Health

Σ DOT 2 nCi/g limit, total activity.

(D) denotes identification by daughter emissions. Sample is assumed to be in secular equilibrium.

< by activity means it is less than the MDA. MDA value is used in calculation of respirator, spoils, and DOT

DATE: 7/10/95 HP: 4535 INITIALS: [redacted]

HEALTH PHYSICS

NAME [redacted]

HP NO. 5983 RWP # 95-00367 PAGE 1 OF 2

	INST./PROBE ID #	NEXT CAL.DUE DATE	INST. OPERATOR NAME AND HP NO.
OVERHOFF			
PAC			
SRM 200	2863/2186	4-12-95	[redacted] 5983
PUG			
BETA/GAMMA			
FIDLER	3664/3665	4-19-95	[redacted] 5983
ELECTRA α/β	5336/5339	4-6-95	[redacted] 5983

DATE	DESCRIPTION	AREA	COUNT RESULTS							
			ELECTRA	PAC	SRM 200	PUG	BETA GAMMA	FIDLER		
			DPM	DPM	DPM	CPM	MR/HR	CPM		
			100 cm²	100 cm²	100 cm²	100 cm²		CH-1	OUT	CH-2
			α / β							
							Bx	140	5K	4K
							Px	22K	29K	4.5K
3-6-95	OTHER SOILS SAMPLING & ANALYSIS HOT SPOT C0028- BLD 88 WESTON						Th	3K	25K	31K
3-6-95	INSTRUMENT CHECK	BLD 88	806 / 808K							
	BACKGROUND CHECK	NEAR BLD 88						250	11K	10K
	PRE-SCAN 8700 1							ND		ND
	SS# 8701 - 5001		ND					ND		ND
	SS# 8701 - 5004		ND					ND		ND
	SS# 8701 - 5008		ND					ND		ND
	PRE-SCAN 8702							ND		ND
	SS# 8702 - 5001		ND					ND		ND
	SS# 8702 - 5004		38 / 2.4K					ND		ND
	SS# 8702 - 5008		ND					ND		ND
	SS# 8702 - 5011		ND					ND		ND
	PRE-SCAN 8703							350		ND
	SS# 8703 - 5001		ND					ND		ND
	SS# 8703 - 5004		ND / 2.5K					ND		ND
	SS# 8703 - 5007		ND					ND		ND
	PRESCAN 8704							ND		ND
	SS# 8704 - 5001		ND					ND		ND
	SS# 8704 - 5004		ND					ND		ND
	SS# 8704 - 5005		ND / 1K					ND		ND
	(NEXT PAGE)									

Reviewed by: [redacted] 4959 DATE 3/16/95

COMMENTS: ND = NONE Detectable (≤ BACKGROUND) SS = SOIL SAMPLE

(α/β check source = Am 1 - α. 300 K dpm ± 20%. ALL RESULTS ARE RECORDED MINUS

DATE	DESCRIPTION	AREA	COUNT RESULTS								
	OTHER SOILS HS C0028		ELECTRA		PAC	SRM 200	PUG	BETA GAMMA	FIDLER		
			DPM		DPM	DPM	CPM	MR/HR	CPM		
			100 cm²		100 cm²	100 cm²	100 cm²		CH-1	OUT	CH-2
			α	β					BG 140	5K	4K
									P. 22K	29K	4.5
3-6-95	INSTRUMENT CHECK	BLD 88	806	308K					Th 3K	35K	31
	PRE-SCAN 8705	NEAR ~~BLD 88~~							ND		ND
	SS# 8705-5001		ND	1K					ND		ND
	SS# 8705-5004		ND						ND		ND
	SS# 8705-5007		ND						ND		ND
	PERSONNEL:		ND								
	SCOTT PETNER		ND								
	STEVE BERRY		ND								
	BOB BRYCE		ND								
	JEFF TACKETT		ND								
	WIPE #1 SOIL SAMPLES	BLD. 30	ND			0					
	WIPE #2 SOIL SAMPLES	BLD. 30	ND			0					

FIDLER DATA

* SAMPLE RESULTS ATTATCHED

Reviewed by: [redacted] HP# 495 DATE 3/16/95

COMMENTS: ND = NON-DETECTABLE (≤ BACKGROUND) SS = SOIL SAMPLES

(α/β CHECK SOURCE = 800 dpm α; 300K dpm β ± 20%. ALL RESULTS ARE RECORDED MENUS

SCREEN DATA

TEST RESULTS - SODIUM IODIDE SOIL SCREEN
(MD-80030, OP. 1355)
400 SECOND COUNT
PREPARED BY BETTY PETERS -EXT. 4408

SAMPLE NO.	DATE COLLECTED	DATE SCREENED	SAMPLER	SAMP TYPE	88 KEV WINDOW pCi/g	17 KEV WINDOW pCi/g	MORE ISO-TOPES	GRID LOCATION	WELL
9501895	03/06/95	03/07/95	[redacted]5983	CONT	1.2	24	N	WESTON HS C0028 8701-5001	C
9501893	03/06/95	03/07/95	[redacted]5983	CONT	1.2	3	N	WESTON HS C0028 8701-5004	B
9501892	03/06/95	03/07/95	[redacted]5983	CONT	0.9	9	N	WESTON HS C0028 8701-5008	A
9501891	03/06/95	03/07/95	[redacted]5983	CONT	1.1	3	N	WESTON HS C0028 8702-5001	A
9501894	03/06/95	03/07/95	[redacted]5983	CONT	0.9	14	N	WESTON HS C0028 8702-5004	C
9501887	03/06/95	03/07/95	[redacted]5983	CONT	1.2	0	N	WESTON HS C0028 8702-5008	B
9501883	03/06/95	03/07/95	[redacted]5983	CONT	1.0	1	N	WESTON HS C0028 8702-5011	A
9501881	03/06/95	03/07/95	[redacted]5983	CONT	1.5	24	N	WESTON HS C0028 8703-5001	B
9501886	03/06/95	03/07/95	[redacted]5983	CONT	1.5	16	N	WESTON HS C0028 8703-5004	C
9501890	03/06/95	03/07/95	[redacted]5983	CONT	1.2	4	N	WESTON HS C0028 8703-5007	B
9501882	03/06/95	03/07/95	[redacted]5983	CONT	1.2	35	N	WESTON HS C0028 8704-5001	C
9501889	03/06/95	03/07/95	[redacted]5983	CONT	0.7	7	N	WESTON HS C0028 8704-5004	C
9501885	03/06/95	03/07/95	[redacted]5983	CONT	1.1	12	N	WESTON HS C0028 8704-5005	C
9501888	03/06/95	03/07/95	[redacted]5983	CONT	1.4	13	N	WESTON HS C0028 8705-5001	A
9501884	03/06/95	03/07/95	[redacted]5983	CONT	1.3	1	N	WESTON HS C0028 8705-5004	B

Health Physics Counti
Request for Analysis and Hea
G Area Spe

1 of 1

To be filled out by Submitter

Name: [redacted]	**HP #:** 6031	**RWP #:** NA
Isotope:	**Analysis Required:** ☐ Alpha ☐ Beta ☐ H^3	

Type of Sample: ☐ Paper Wipe ☐ Q-tip ☐ Millipore Filter ☐ Glass Fiber Filter ☐ Oil ☐ Water ☑ Other: Explain Soil (i.e. Hazardous Waste)

Description: ☐ Air Sample ☐ Personnel Sample (HP#) ____ ☐ Structural Sample ☑ Other: Explain Soil ☐ Equipment Sample

Time and Date Sample Was Taken: 8:15 7-11-95 **Pre-screened:** ☑ Yes ☐ No **No. of Samples:**

Remarks: WESTON OTHER SOILS SAMPLING & ANALYSIS

WIPE AREA: ☐ 100 cm² ☐

Fidler Check #3672/3674

Next Cal. Due 7-19-95

CHANNEL		One	Out	Two
	Bkg	100	4K	4.0K
	Pu	20K	29K	4.5K
Field Inst. Res.	Tb	2.3K	3.5K	50K

Sample ID #	Sample Description	Alpha/Beta DPM/CPM Results	Alpha/Beta Inst. ID	Fidler/CPM One	Fidler/CPM Out	Fidler/CPM Two	PAC DPM/100 CM² #5364	PAC DPM/100 CM² #5365		
Background	Background			NA	NA	NA	12-1-95			
[redacted]	Check Standard			NA	NA	NA	872	983K.		
	Background check area 38			140	8K	7K.	N/A	N/A		
	PRE Scan Field # 8703			ND	ND	ND	ND	ND		

Counting Facility Technician's Signature: ____ **HP #** ____

Radiological Control Technician's Signature: [redacted] **HP #** 6031

Date Submitted: ____ **Date Completed:** ____

Reviewed By: ____ **HP #** ____ **Date:** ____

ML-9380 (6-94) G AREA SPECIFIC

Reference 4

FURTHER ASSESSMENT

Sampling at PRS No. 308

Revision 1

April 1997

Department of Energy
EG&G Mound Applied Technologies
Mound Plant
Miamisburg, Ohio

1.0 INTRODUCTION

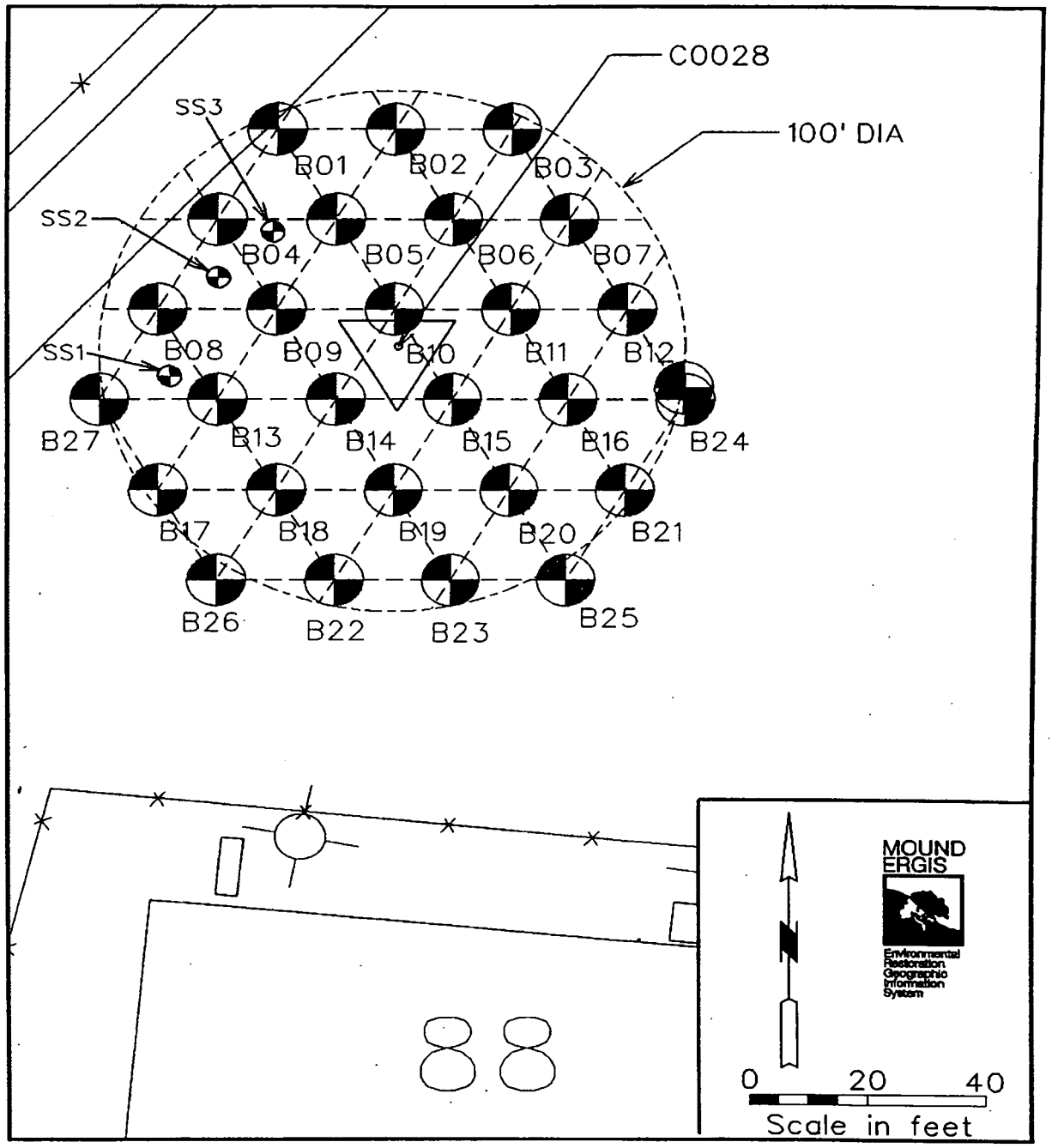
In 1988, the Site Survey Project discovered thorium^{232} at location C0028 on the SM/PP Hill north of Building 88 (Figure 1-1). The thorium^{232} concentration at C0028 was 109 pCi/g approximately 5 feet below ground surface (bgs). The location of C0028 was not surveyed or accurately recorded at that time.

In 1995, an attempt was made to find the location based on concentrations of thorium in the soil. This effort, part of the Other Soils Study, involved sample collection and analysis from 16 boreholes surrounding the approximate location of C0028. Although thorium was not detected, plutonium^{238} was found in concentrations up to 106 pCi/g. As a result, Mound decided to conduct additional investigation in the area. This site has been identified as Potential Release Site 308 (PRS 308).

The objective of the PRS 308 soil sampling effort described in this report is to supplement the existing data package for the potential release site, and to provide the information necessary to allow the Mound Core Team to determine if remediation should be considered for the soils. To address these objectives, a Sampling and Analysis Plan (SAP) was prepared and executed.

Figure 1-1

Sample Locations at PRS 308



2.0 INVESTIGATIVE ACTIVITIES

From 30 September through 3 October 1996, the Mound ER Program conducted subsurface sampling at PRS 308. The sampling activities were performed in accordance with the approved SAP except as noted below.

2.1 BORING LOCATIONS AND SAMPLE COLLECTION

Twenty-seven borings, B01 through B27, were located around the former C0028 site for sampling using a hollow stem auger drill rig. The coordinates for each boring location are listed on Table 2-1. The boring locations were scanned prior to drilling to insure clearance of underground utilities. Location B08 was eliminated based on its proximity to underground utilities. Relocating the point would have resulted in it lying outside the area of interest or too close to other sample locations. Thus only 26 boring locations were sampled.

At most of the borings, refusal (i.e., bedrock) was encountered at 2-feet or less bgs. One soil sample was collected at each of these locations. At other locations, soil samples were collected from the borings at 2-foot intervals with total depths of up to 4 feet before bedrock was encountered. A total of 31 discrete soil samples were collected. In addition, six duplicates and two equipment rinsate samples were also collected.

Three surface soil sample locations were added to the project at the request of Mound. These locations were selected due to reports of elevated thorium in the drainage swale along the road near the site. FIDLER readings were used to identify these sampling locations. The three surface locations exhibited high FIDLER readings in the ditch adjacent to PRS 308, as shown on Figure 1-1. These locations are probably the result of transport from PRS 267, which is just south and uphill from the swale.

Soil samples were collected according to procedures described in the SAP. Deviations to the SAP with respect to the collection of soil samples did not impact the data quality that supports the DQO and are summarized as follows:

- CAR003: Boring B08 was eliminated due to the potential presence of underground utilities.
- CAR004: Three additional surface soil samples were collected from the drainage ditch adjacent to PRS 308.

2.2 SAMPLE ANALYSIS

All of the soil samples were submitted to the EG&G Mound Laboratory for on-site screening by Method F-002: Gamma Spectrometry for thorium^{232}, and by Method F-003: Sodium Iodide Detector Analysis for plutonium^{238}. Upon review of the screening results, Mound identified eleven samples for off-site analysis as follows:

- all five samples with plutonium screening results above Minimum Detectable Activity (MDA) values,
- the four samples with the highest thorium screening results,
- two of the three samples from the drainage swale because of elevated thorium screening values.

In addition to the eleven soil samples, one field rinsate was also submitted.

The SAP specified that 10 percent of the soil samples would be sent for off-site analysis. Mound's decision to analyze a higher percentage of the samples was based on the desire to confirm sufficient number of both plutonium and thorium radionuclide detections and to include at least two of the added surface samples.

3.0 RESULTS OF ANALYSES

The investigation obtained geological information and soil analytical results from PRS 308. This section summarizes the analytical results. Copies of the data validation summaries and analytical Form 1s are presented in Appendices C and D, respectively.

3.1 ANALYTICAL RESULTS

Forty-two soil samples plus quality assurance samples were collected. Based on the selection criteria, 10 soil samples, 1 field duplicate, and 1 field rinsate were submitted for laboratory analysis. The soil target radionuclides were thorium^{232} and plutonium^{238}. The sample results for these analyses are listed in Table 3-1.

Plutonium^{238} Analytical Results

Results from the on-site screening facility for plutonium^{238} are presented in the Field Entry Form (Appendix B). Five samples indicated results above the minimum detectable activity (MDA) and ranged from less than 28 to 47 pCi/g. All five samples were selected for confirmation at an off-site laboratory by alpha spectroscopy using Method A-012.

Plutonium results from all 11 soil samples sent for off-site analysis are reported in Table 3-1. Concentrations ranged from 0.01 to 15.1 pCi/g. The sample with the maximum plutonium^{238} activity of 15.1 pCi/g was found in soil collected at boring location B09, interval 0 to 2 feet. The next highest results for plutonium^{238} were 2.04 and 1.98 pCi/g, which correspond to the surface soil locations SS1 and SS2 collected from the drainage swale.

Table 3-1 Analytical Results from Off-site Confirmation Samples

Borehole Identification	B23 02	B23* 02	B22 02	B17 02	B10 02	B10 04	B06 02	B05 02	B09 02	SS1 01	SS2 01	B01 02	B01* 02	B24 02
Sequential Sample Id	000001	000001	000003	000012	000020	000021	000024	000026	000027	000033	000034	000040	000040	000042
Depth (ft, bgs)	0 to 2	0 to 2	0 to 2	0 to 2	0 to 2	2 to 4	0 to 2	0 to 2	0 to 2	0 to 1	0 to 1	NA	0 to 2	0 to 2
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Water	Water	Soil
Units	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g
TH-228	*1.01*	*1.12*	*1.03*	0.800	*1.16*	*0.884*	*1.03*	*1.12*	***1.74***	***8.63***	***20.9***	< 0.323	< 0.209	*1.05*
TH-230	0.902	1.02	1.04	0.705	1.12	0.820	0.943	0.629	0.897	1.65	**2.98**	< 0.172	< 0.227	0.931
TH-232	1.08	1.06	0.961	0.685	1.17	0.837	1.01	1.07	**1.71**	**8.47**	**19.8**	< 0.172	< 0.227	0.986
PU-238	0.0441	0.0310	**0.576**	**1.36**	0.0769	< 0.0101	**0.811**	**0.301**	**15.1**	**2.04**	**1.98**	**< 0.153**	**< 0.170**	**0.154**
PU-239/40	< 0.0114	< 0.00517	< 0.0419	< 0.0126	< 0.00679	< 0.0101	< 0.0117	< 0.0135	0.0646	0.0264	0.0364	< 0.152	< 0.101	< 0.0171

Notes:
* - Laboratory duplicate sample
Bold - results greater than background
Italic - results greater than guideline criteria

The on-site soil screening results for plutonium were conservative when compared to the corresponding off-site isotopic results for plutonium^{238}. Table 3-2 presents a listing of the plutonium results for the five samples with screening results above MDA.

Table 3-2 Comparison of On-Site and Off-Site Analytical Results for Plutonium

Location Code	On-Site (pCi/g)	Off-Site (pCi/g)
SS1-01	47	2.04
B10-04	46	0.01
B23-02	40	0.04
B17-02	29	1.36
B09-02	28	15.10

Thorium^{232}Analytical Results

Results from the on-site screening facility for thorium are presented in the Field Entry Form (Appendix B). Twenty-two samples indicated results above the minimum detectable activity (MDA) and ranged from 0.6 to 15.9 pCi/g. Seven samples with the highest thorium concentrations were chosen to be sent to the off-site laboratory for isotopic analyses and ranged from 1.1 to 15.9 pCi/g. Isotopic thorium analyses were performed following Method A-012 as defined in the SAP.

Thorium results from all seven soil samples sent for off-site analysis are reported in Table 3-1. An eighth sample is reported in Table 3-1. This sample location, B09-02, was sent off-site based on the on-site plutonium result. The on-site thorium result was above MDA and thus included in the report.

Off-site analytical results above MDA for thorium^{232} ranged from 1.17 to 1.71 pCi/g for the core samples collected from PRS 308. The samples with the maximum thorium^{232} activities of 8.47 and 19.8 pCi/g were found in surface soil sample locations SS1 and SS2, respectively. These samples were collected from the drainage swale.

There was good correlation between the on-site thorium results and the off-site results. A comparison of the thorium results, sorted from highest to lowest on-site reading, is shown in Table 3-3.

Table 3-3 Comparison of On-Site and Off-Site Analytical Results for Thorium-232

Location Code	On-Site (pCi/g)	Off-Site (pCi/g)
SS2-01	15.9	19.80
SS1-01	7.2	8.47
B06-02	1.7	1.01
B05-02	1.4	1.07
B22-02	1.2	0.96
B24-02	1.2	0.99
B10-02	1.1	1.17
B09-02	0.9	1.71

3.2 DATA VALIDATION

After receiving the analytical results, two samples (000020 and 000042) were selected for data validation. QuantaLex, Inc. performed the data validation. The data validation report indicated that the data were acceptable without qualification.

In addition to the data validation, a review was performed of the blank, matrix spike, and laboratory control sample data associated with the sample results. Based on this review of the quality control data associated with the plutonium and thorium results, the data are usable without qualification.

4.0 CONCLUSIONS

The data collected during the subsurface investigation was evaluated first to determine the completeness and usability, and second to determine if the DQO was met. Conclusions regarding this evaluation are discussed as follows:

- Top of bedrock in the area around PRS 308 is within four feet of the surface.

- Off-site analyses establish that soil samples from PRS 308 exhibited elevated concentrations of plutonium^{238} of up to 15.1 pCi/g (found at B09 in the 0 to 2 foot interval) versus background values of 0.13 pCi/g for plutonium.

- Soil samples from PRS 308 (excluding the swale) exhibited concentrations of thorium^{232} of up to 1.71 pCi/g (found at B09 in the 0 to 2 foot interval) from off-site analysis.

- The nearby ditch exhibited surface concentrations of thorium^{232} of up to 19.8 pCi/g (surface soil location SS2) from off-site analysis. These are probably related to PRS 267 which is known to be a historical thorium redrumming site.

- There was general agreement between on-site gamma spectrometry results for thorium and off-site alpha spectroscopy results.

- On-site soil screening using Method F-003 provided consistently higher results for plutonium^{238} as compared to off-site analysis per method A-012. This bias is expected based on historical comparison.

- Leaching to ground water is not a concern at this site due to the high K_d factor for plutonium and thorium and the relatively low soil concentrations. A high K_d factor means that the contaminants will remain relatively immobile in the soil and thus not leach into the aquifer.

Reference 5

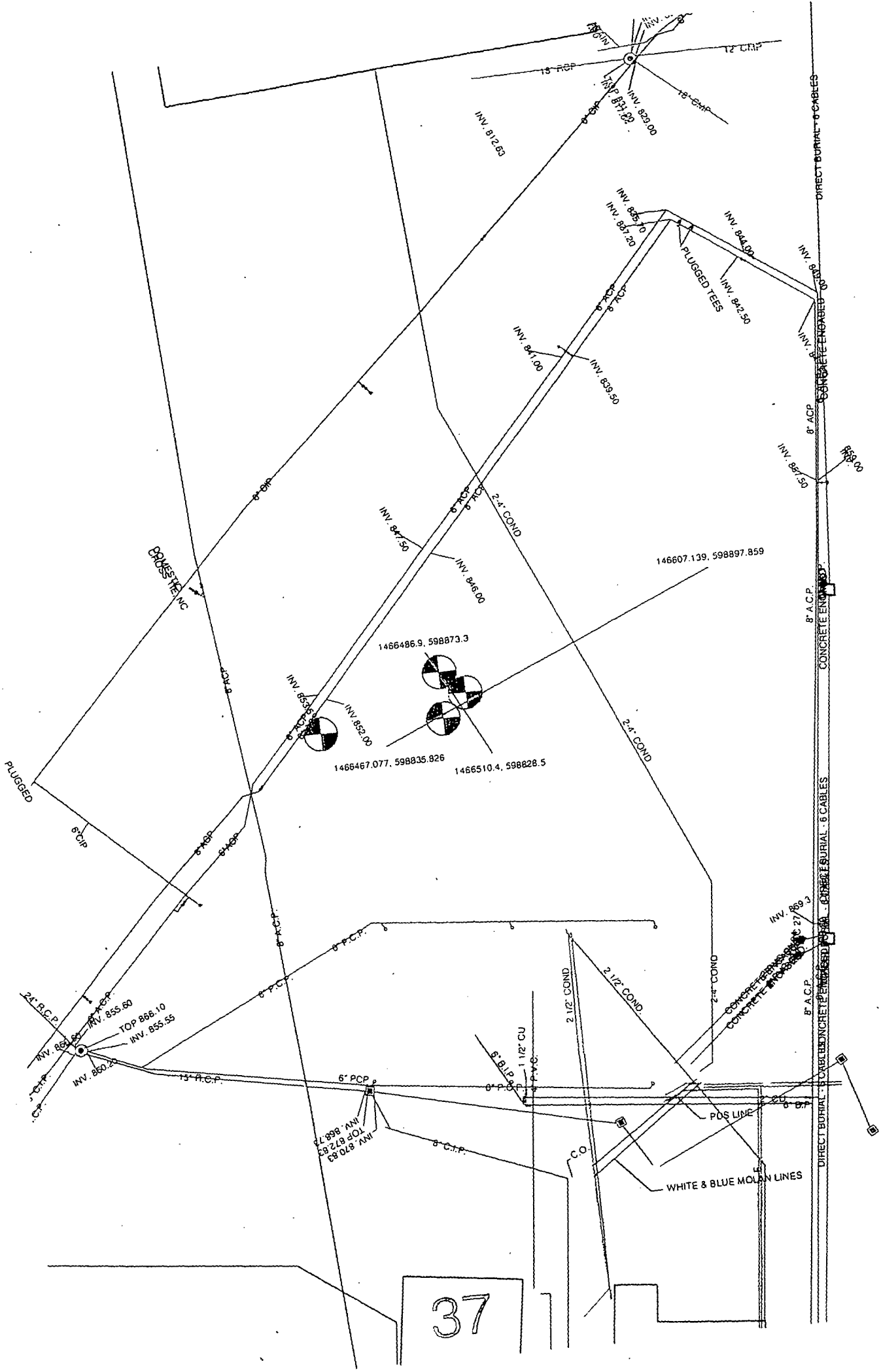
PRS 308 Trench Sampling Results

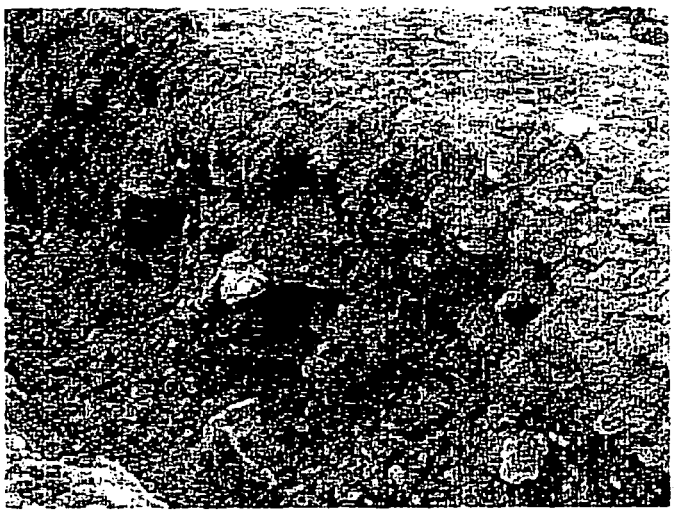
(Above the Minimum Detection Activity)

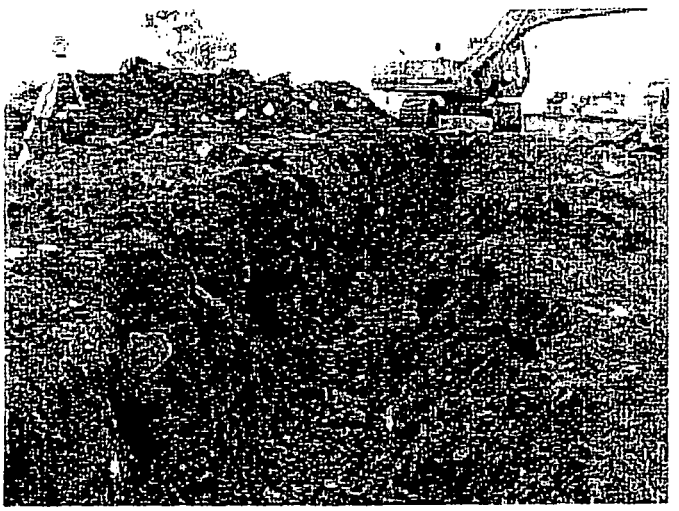
Samle ID	Sample Depth	Co-60 (pCi/g)	Cs-137 (pCi/g)	Pb-210 (pCi/g)	Ra-226 (pCi/g)	Ac-227(D) (pCi/g)	Th-230 (pCi/g)	Th-232(D) (pCi/g)	Pu-238 (pCi/g)	Am-241 (pCi/g)	U-238 (pCi/g)
CV	[illegible]	0.1	0.88	1.7	[illegible]	[illegible]	[illegible]	1.61	[illegible]	[illegible]	[illegible]
004587	0' - 2'	-	-	1.14	1.85	-	-	1.23	-	-	1.01
004588	2' - 4'	-	-	0.94	1.3	0.15	-	-	-	-	1.48
004589	4' - 5.5'	-	-	0.76	1.42	-	-	0.92	-	-	0.95
004590	0' -3'	-	0.06	0.91	1.07	-	-	-	-	-	0.99
004591	0' - 2'	-	-	1.48	1.18	-	-	1.02	-	-	1.68
004592	3' - 5'	-	-	1.68	-	-	-	0.73	-	-	1.79
004593	0' - 2'	-	-	-	1.33	-	-	1.2	-	-	1.23
004594	0' - 3'	-	-	-	1.79	0.35		0.86	-	-	1.18
004595	3' - 5'	-	-	1.84	-	-	-	0.95	-	-	-
004596	0' - 2'	-	-	0.75	1.86	-	-	1.02	-	-	0.81
004597	2' - 5'	-	-	1.17	-	-	-	1.08	-	-	1.51
004598	0' - 2'	-	-	1.3	-	-	-	0.98	-	-	-
004599	2' - 5'	-	-	-	0.95	-	-	0.84	-	-	1.51
004600	0' - 5'	-	-	-	1.14	-	-	-	-	-	1.39
004601	0' - 3'	-	-	-	-	-	-	0.95	-	-	1.36
004602	0' - 2'	-	-	1.26	-	-	-	0.99	-	-	1.73
004603	2' - 5'	-	-	-	-	-	1.38	0.6	-	-	1.31
004604	0' - 5'	-	-	-	-	-	-	0.64	-	-	-
004605	0' - 5'	-	0.04	0.82	0.57	-	-	0.93	-	-	1.84
004606	0' - 1'	-	0.06	0.8	0.59	0.29	-	0.73	-	-	0.79
004607	0' - 2'	-	-	-	1.08	-	-	0.86	-	-	1.56
004608	2' - 5'	-	-	-	-	-	-	0.88	-	-	1.19
004609	0' - 5'	-	0.08	0.64	1.23	-	-	0.98	-	-	0.7
004610	0' - 5'	-	-	-	1.54	-	-	0.26	-	-	0.78
004611	0' - 5'	-	-	-	1.23	-	-	0.2	-	-	1.01
004612	0' - 5'	-	-	0.68	1.87	-	-	0.79	-	-	0.74
004613	0' - 5'	-	-	0.94	1.04	-	-	0.92	-	-	1.58
004614	0' - 5'	-	-	-	1.46	-	-	0.87	-	-	1.47
004615	0' - 5'	-	-	-	-	-	-	1.17	-	-	1.07
004616	0' - 5'	-	-	0.78	1.5	-	-	1.14	-	-	-
004617	0' - 5'	-	-	-	-	-	-	0.95	-	-	-

CV - Comparison Value

Note: Results in bold exceeds Comparison Value


12" CMP
15" RCP
18" CMP
INV. 829.00
INV. 812.63
INV. 835.70
INV. 837.20
INV. 844.00
PLUGGED TEES
INV. 842.50
INV. 841.00
INV. 839.50
8" ACP
INV. 847.50
2.4" COND
INV. 847.50
INV. 846.00
146607.139, 598897.859
1466486.9, 598873.3
INV. 852.00
1466467.077, 598835.826
1466510.4, 598828.5
PLUGGED
6" CIP
8" ACP
8" A.C.P.
6" P.C.P.
24" R.C.P.
INV. 855.60
TOP 866.10
INV. 855.55
INV. 860.20
15" R.C.P.
6" PCP
6" B.I.P.
1 1/2" CU
P.V.C.
2 1/2" COND
2.4" COND
INV. 869.3
8" A.C.P.
CONCRETE ENCASED
DIRECT BURIAL - 6 CABLES
POS LINE
WHITE & BLUE MOLAN LINES
C.O.
8" C.I.P.
37



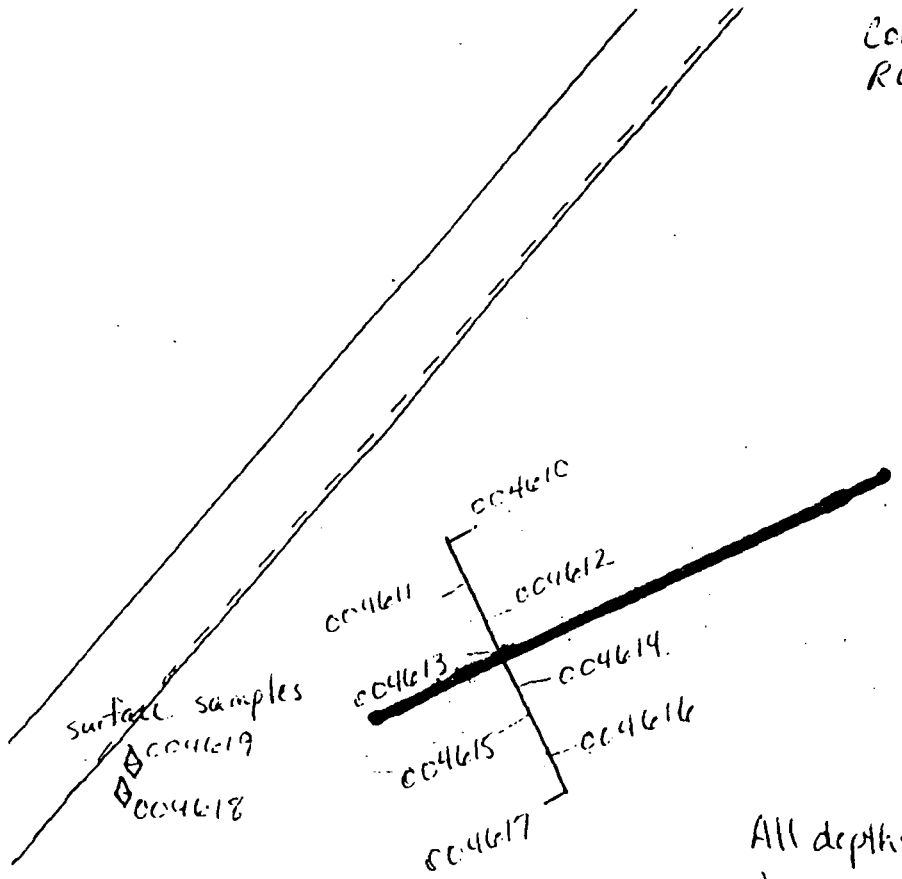


RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) Hillside near PRS 308	SURVEY NO. 00-LS-186
PURPOSE: Dig trench to characterize area	RWP NO. LS-008-00
	DATE: 7-18-00
	TIME: 1500

MAP/DRAWING

Area posted: Controlled Area
SCA, RMMA
Contact RCT prior to digging
RWP required



All depths 0-5'
Approx sample locations.
See GPS coordinates on page 3.

All area dose rates <0.015 mr/hr

FIDLER used for indication only

LEGEND: # = mrem/hr (γ) whole body
E = mrem/hr (β+η+γ) extremity on contact
= mrem/hr neutron
= air sample number
= swipe number
#/α or /β = direct cont. measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
NE Hydra	5306/5318	12-14-00
FIDLER	3714/3824	11-13-00
BICRON	3929	11-13-00
	"	
	"	

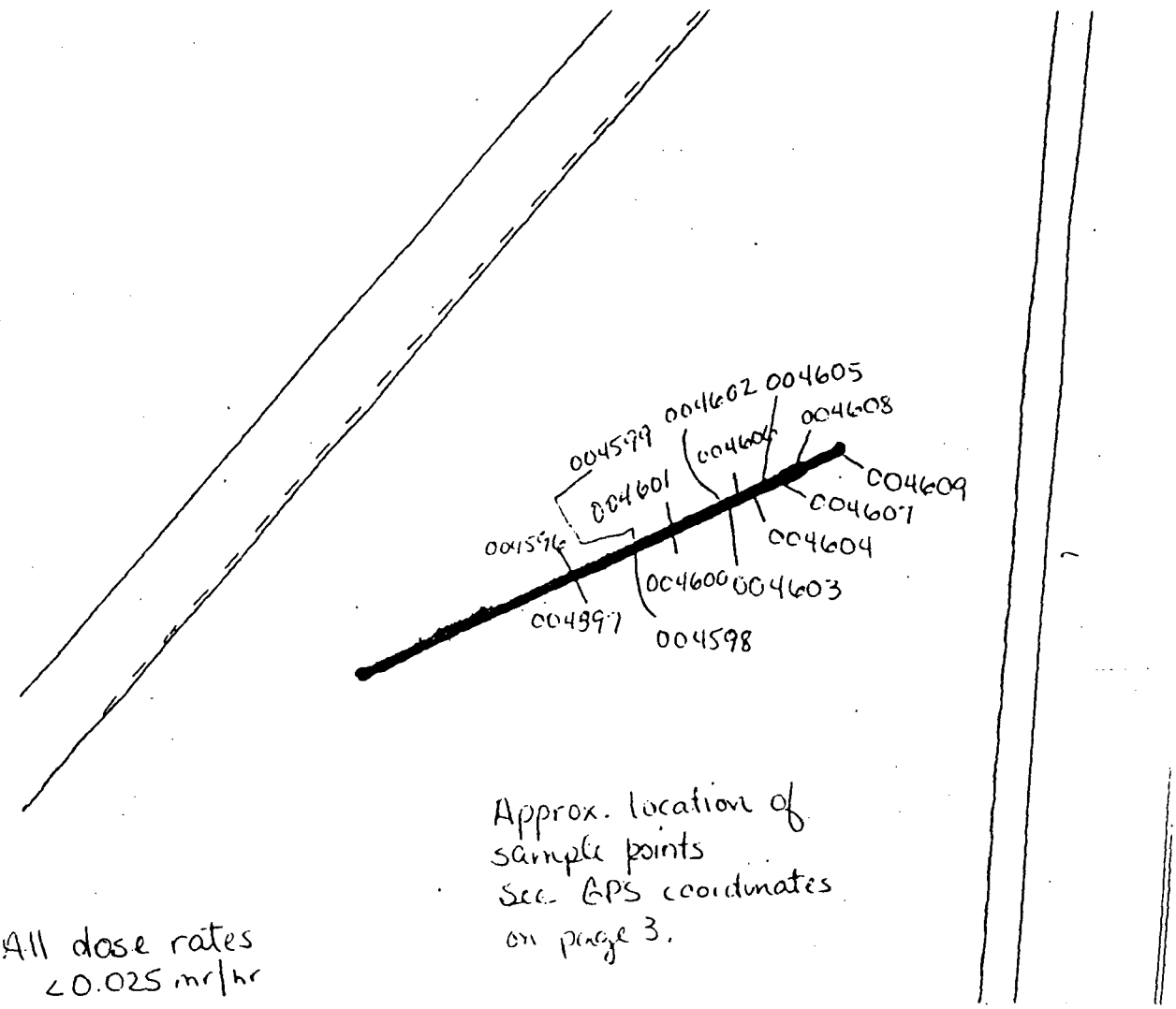
Completed by/Signature: [redacted]	HP# 7725 7730	Date: 7-18-00
Completed by/(Print Name): [redacted]		
Counted by/(Signature): [redacted]	HP# 7725 7730	Date: 7-18-00
[redacted]	HP# [illegible]	Date: [illegible]
Reviewed/ [redacted]		

ML-9620 (2-98)

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) Hillside near PRS 308	SURVEY NO. 00-LS-177
PURPOSE: Dig trench to characterize area	RWP NO. LS-008-00
	DATE: 7-11-00
	TIME: 1530

MAP/DRAWING



Approx. location of sample points See GPS coordinates on page 3.

All dose rates <0.025 mr/hr

FIDLER used for indication only

LEGEND: # = mrem/hr (γ) whole body
E = mrem/hr (β+η+γ) extremity on contact
△# = mrem/hr neutron
[#] = air sample number
(#) = swipe number
(#/α) or /β = direct cont. measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
Bicron	3929	11-13-00
NE Electra	5306/5318	12-14-00
FIDLER	3824/3714	11-13-00
	N	
	A	

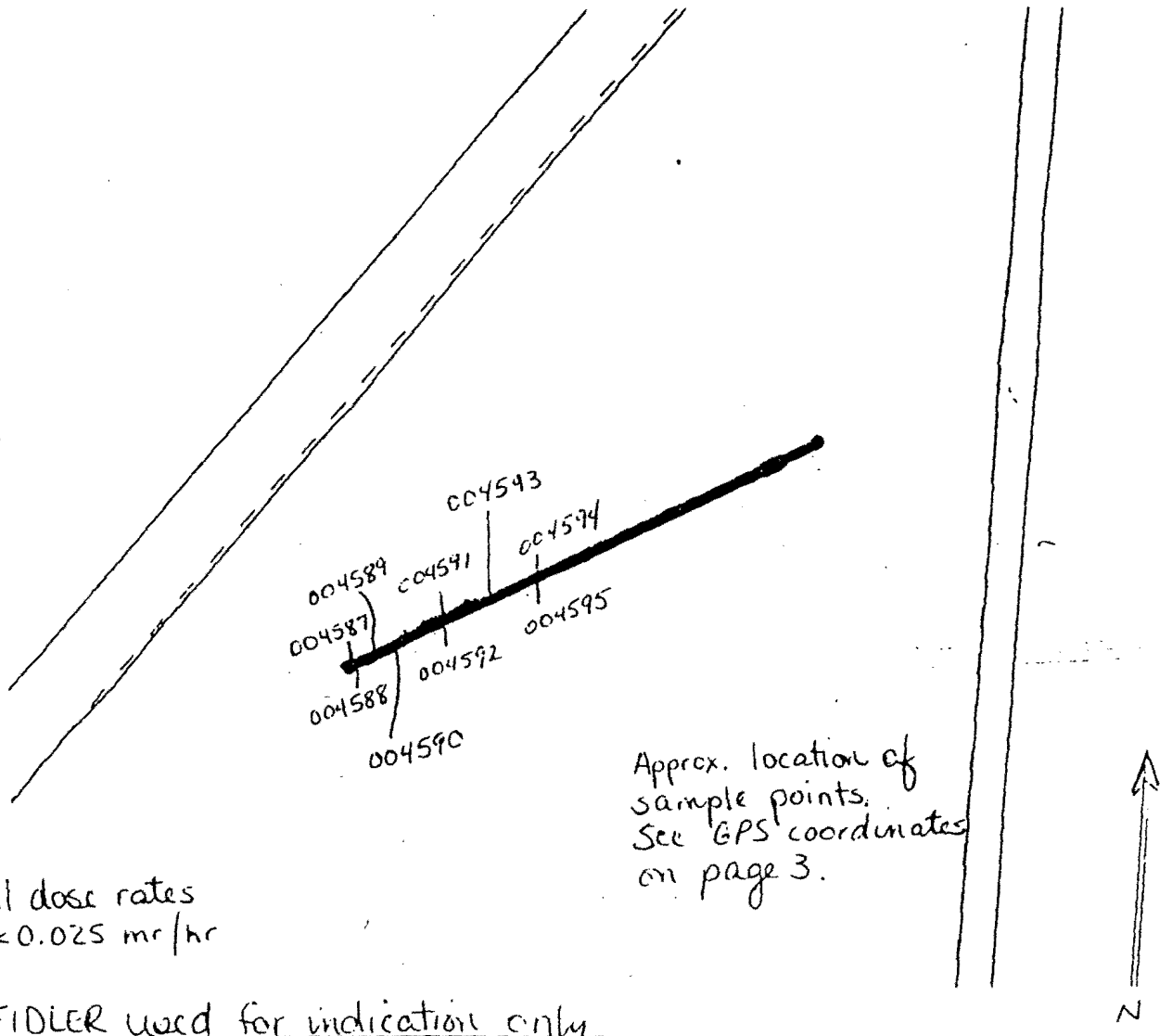
[redacted]	HP# 7725 2230	Date: 7-11-00
[redacted]		
[redacted]	HP# 7725 2230	Date: 7-11-00
[redacted]		
Revie[redacted]	HP# 6144	Date: 7/18/
Reviewed/Approved [redacted]		

ML-9620 (2-98)

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) Hillside near PRS 308	SURVEY NO. 00-LS-174
PURPOSE: Dig trench to characterize area	RWP NO. LS-008-00
	DATE: 7-10-00
	TIME: 1500

MAP/DRAWING



All dose rates <0.025 mr/hr

FIDLER used for indication only

LEGEND: # = mrem/hr (γ) whole body
E = mrem/hr (β+η+γ) extremity on contact
= mrem/hr neutron
= air sample number
= swipe number
#/α or /β = direct cont. measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
Bicron	3929	11-13-00
NE Electra	5314/5468	9-10-00
Fidler	3827/3672	11-12-00
	N	
	A	

Completed by: (Signature) [redacted]	HP# 7730 7725	Date: 7-10-00
[redacted]		
[redacted]	HP# 7730 7725	Date: 7-10-00
[redacted]		
Rev[redacted]	HP# 6144	Date: 7/18/00
Reviewed/App[redacted]		

ML-9620 (2-98)

Yellow locations area a part of this survey.

00-LS-186

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000361
FILE ID: MG100744.S0
PRIORITY: Y

Description\Location: PRS 308 #004587

Collector: 7725

Date Received: 7/10/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.03	45,000
Cs-137	*	0.02	0.02	45,000
Pb-210		1.14	0.31 ✓	45,000
Ra-226		1.85	0.38 ✓	800
Ac-227 (D)	*	0.00	0.11	40
Th-230	*	0.00	2.93	800
Th-232 (D)		1.23	0.09 ✓	130
Pu-238	*	0.00	6.45	500
Am-241	*	0.00	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.01	0.29 ✓	

Σ DOT 0.01 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/11/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

00-LS-174

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000362
FILE ID: MG200359.S0
PRIORITY: Y

Description\Location: PRS 308 #004588

Collector: 7725

Date Received: 7/10/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	•	0.02	0.02	45,000
Cs-137	•	0.01	0.02	45,000
Pb-210		0.94	0.35 ✓	45,000
Ra-226		1.30	0.43 ✓	800
Ac-227 (D)		0.15	0.11 ✓	40
Th-230	*	2.29	3.86	800
Th-232 (D)		1.14	0.06	130
Pu-238	*	0.00	9.97	500
Am-241	*	0.00	0.04	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.48	0.40 ✓	

Σ DOT 0.02 nCi/g

Σ Respirator 0.04

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/11/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

Page 14 of 15
00-LS-174

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004589
LAB SAMPLE ID: ML000363
FILE ID: MG300321.S0
PRIORITY: Y

Description\Location:
PRS 308, #004589
ML000584, MG100816.S0 FOR CO-60

Collector: 7725

Date Received: 7/10/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.02	0.09	45,000
Cs-137		0.03	0.02	45,000
Pb-210		0.76	0.40 ✓	45,000
Ra-226		1.42	0.45 ✓	800
Ac-227 (D)	*	0.06	0.14	40
Th-230	*	0.00	4.33	800
Th-232 (D)		0.92	0.08 ✓	130
Pu-238	*	0.00	11.96	500
Am-241	*	0.02	0.04	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.95	0.39 ✓	

Σ DOT 0.02 nCi/g

Σ Respirator 0.04

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/11/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

00-LS-174

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000364
FILE ID: MG100745.S0
PRIORITY: Y

Description\Location: PRS 308, #004590

Collector: 7725

Date Received: 7/10/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	•	0.03	0.06	45,000
Cs-137		0.06	0.04 ✓	45,000
Pb-210		0.91	0.59 ✓	45,000
Ra-226		1.07	0.85 ✓	800
Ac-227 (D)	*	0.00	0.30	40
Th-230	*	3.41	7.34	800
Th-232 (D)		1.02	0.19	130
Pu-238	*	7.67	16.38	500
Am-241	*	0.00	0.08	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.99	0.69 ✓	

Σ DOT 0.03 nCi/g

Σ Respirator 0.06

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/11/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

00-LS-174

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000365
FILE ID: MG200360.S0
PRIORITY: Y

Description\Location:
PRS 308, #004591

Collector: 7725

Date Received: 7/10/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.06	45,000
Cs-137	*	0.01	0.05	45,000
Pb-210		1.48	0.87 ✓	45,000
Ra-226		1.18	0.96 ✓	800
Ac-227 (D)	*	0.00	0.33	40
Th-230	*	0.00	11.14	800
Th-232 (D)		1.02	0.16 ✓	130
Pu-238	*	13.57	20.50	500
Am-241	*	0.00	0.11	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.68	0.93 ✓	

Σ DOT 0.04 nCi/g

Σ Respirator 0.07

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/11/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

00-LS-174

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004592
LAB SAMPLE ID: ML000366
FILE ID: MG300322.S0
PRIORITY: Y

Description\Location:
PRS 308, #004592
ML000583, MG300392.S0 FOR CO-60

Collector: 7725

Date Received: 7/10/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.04	0.07	45,000
Cs-137	*	0.04	0.07	45,000
Pb-210		1.68	1.27 ✓	45,000
Ra-226	*	1.27	1.30	800
Ac-227 (D)	*	0.00	0.51	40
Th-230	*	6.30	13.64	800
Th-232 (D)		0.73	0.29 ✓	130
Pu-238	*	0.00	38.70	500
Am-241	*	0.00	0.15	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.79	1.19 ✓	

Σ DOT 0.06 nCi/g

Σ Respirator 0.11

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/11/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

00-LS-174

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000367
FILE ID: MG100746.S0
PRIORITY: Y

Description\Location: PRS 308, #004593

Collector: 7725

Date Received: 7/11/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.07	45,000
Cs-137	*	0.04	0.06	45,000
Pb-210	•	0.29	0.74	45,000
Ra-226		1.33	0.78 ✓	800
Ac-227 (D)	*	0.01	0.28	40
Th-230	•	0.00	8.50	800
Th-232 (D)		1.20	0.17 ✓	130
Pu-238	•	6.02	15.16	500
Am-241	*	0.02	0.08	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.23	0.68 ✓	

Σ DOT 0.03 nCi/g

Σ Respirator 0.06

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/11/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

00-LS-174

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000368
FILE ID: MG200361.S0
PRIORITY: Y

Description\Location:
PRS 308, #004594

Collector: 7725

Date Received: 7/10/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.04	0.04	45,000
Cs-137	*	0.02	0.05	45,000
Pb-210	*	0.00	1.15	45,000
Ra-226		1.79	1.07 ✓	800
Ac-227 (D)		0.35	0.29 ✓	40
Th-230	*	2.69	10.45	800
Th-232 (D)		0.86	0.23 ✓	130
Pu-238	*	0.00	28.86	500
Am-241	*	0.00	0.13	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.18	1.08 ✓	

Σ DOT 0.04 nCi/g

Σ Respirator 0.09

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/11/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004595
LAB SAMPLE ID: ML000369
FILE ID: MG300323.S0
PRIORITY: Y

Description\Location:
PRS 308, #004595
ML00547, MG100806.S0 FOR CO-60

Collector: 7725

Date Received: 7/10/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.02	0.08	45,000
Cs-137	*	0.04	0.06	45,000
Pb-210		1.84	1.10 ✓	45,000
Ra-226	*	1.11	1.35	800
Ac-227 (D)	*	0.29	0.42	40
Th-230	*	4.32	12.84	800
Th-232 (D)		0.95	0.23 ✓	130
Pu-238	*	0.00	21.07	500
Am-241	*	0.00	0.16	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.97	1.08	

Σ DOT 0.04 nCi/g

Σ Respirator 0.08

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/11/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000370
FILE ID: MG100747.S0
PRIORITY: Y

Description\Location: PRS 308, #004596

Collector: 7725

Date Received: 7/11/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.03	0.06	45,000
Cs-137	*	0.05	0.05	45,000
Pb-210		0.75	0.72 ✓	45,000
Ra-226		1.86	0.81 ✓	800
Ac-227 (D)	*	0.00	0.29	40
Th-230	*	0.00	7.71	800
Th-232 (D)		1.02	0.22 ✓	130
Pu-238	*	0.00	19.40	500
Am-241	*	0.00	0.09	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.81	0.71 ✓	

Σ DOT 0.03 nCi/g

Σ Respirator 0.07

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/11/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

00-LS-177

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000371
FILE ID: MG200362.S0
PRIORITY: Y

Description\Location: PRS 308, #004597

Collector: 7725

Date Received: 7/11/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.06	45,000
Cs-137	*	0.00	0.06	45,000
Pb-210		1.17	0.98 ✓	45,000
Ra-226	*	1.13	1.14	800
Ac-227 (D)	*	0.09	0.35	40
Th-230	*	0.12	11.19	800
Th-232 (D)		1.08	0.15 ✓	130
Pu-238	*	13.69	26.09	500
Am-241	*	0.10	0.11	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.51	1.09 ✓	

Σ DOT 0.04 nCi/g

Σ Respirator 0.08

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/11/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004598
LAB SAMPLE ID: ML000372
FILE ID: MG300324.S0
PRIORITY: Y

Description\Location:
PRS 308, #004598
ML000582, MG200437.S0 FOR CO-60

Collector: 7725

Date Received: 7/11/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.06	45,000
Cs-137	*	0.04	0.07	45,000
Pb-210		1.30	1.15 ✓	45,000
Ra-226	•	0.84	1.40	800
Ac-227 (D)	*	0.07	0.43	40
Th-230	*	2.28	12.63	800
Th-232 (D)		0.98	0.22 ✓	130
Pu-238	•	0.00	24.20	500
Am-241	*	0.00	0.14	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.91	1.27	

Σ DOT 0.04 nCi/g

Σ Respirator 0.08

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Uranium and Radium results both below detection levels. No corrections applied.

Date: 7/11/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000376
FILE ID: MG100749.S0
PRIORITY: Y

Description\Location: PRS 308, #004599

Collector: 7725

Date Received: 7/11/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.02	0.06	45,000
Cs-137	*	0.00	0.07	45,000
Pb-210	*	0.60	0.64	45,000
Ra-226		0.95	0.82 ✓	800
Ac-227 (D)	*	0.00	0.26	40
Th-230	*	4.29	6.65	800
Th-232 (D)		0.84	0.19 ✓	130
Pu-238	*	3.24	13.57	500
Am-241	*	0.00	0.07	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.51	1.09 ✓	

Σ DOT 0.02 nCi/g

Σ Respirator 0.05

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/11/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000380
FILE ID: MG200365.S0
PRIORITY: Y

Description\Location: PRS 308, #004600

Collector: 7725

Date Received: 7/11/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	•	0.00	0.04	45,000
Cs-137	*	0.00	0.04	45,000
Pb-210	*	1.52	72.00	45,000
Ra-226		1.14	0.91 ✓	800
Ac-227 (D)	*	0.00	0.36	40
Th-230	*	0.00	8.91	800
Th-232 (D)		0.80	0.15	130
Pu-238	•	0.00	23.05	500
Am-241	*	0.00	0.10	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.39	0.75 ✓	

Σ DOT 0.11 nCi/g

Σ Respirator 0.08

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/11/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004601
LAB SAMPLE ID: ML000381
FILE ID: MG300327.S0
PRIORITY: Y

Description\Location:
PRS 308, #004601
ML000548, MG200424.S0 FOR CO-60

Collector: 7725

Date Received: 7/11/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	•	0.00	0.05	45,000
Cs-137	•	0.00	0.07	45,000
Pb-210	•	0.78	1.05	45,000
Ra-226	•	0.79	1.08	800
Ac-227 (D)	•	0.00	0.41	40
Th-230	*	0.00	12.11	800
Th-232 (D)		0.95	0.20 ✓	130
Pu-238	•	0.00	17.18	500
Am-241	•	0.00	0.14	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.36	1.10 ✓	

Σ DOT 0.03 nCi/g

Σ Respirator 0.07

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/11/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000379
FILE ID: MG200364.S0
PRIORITY: Y

Description\Location:
PRS 308, #004602

Collector: 7725

Date Received: 7/11/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.06	45,000
Cs-137	*	0.00	0.06	45,000
Pb-210		1.26	1.08 ✓	45,000
Ra-226	*	0.45	1.32	800
Ac-227 (D)	*	0.00	0.40	40
Th-230	*	0.00	11.30	800
Th-232 (D)		0.99	0.20 ✓	130
Pu-238	*	3.00	29.34	500
Am-241	*	0.00	0.13	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.73	1.15 ✓	

Σ DOT 0.05 nCi/g

Σ Respirator 0.09

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/11/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

CC-LS-177

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000386
FILE ID: MG200367.S0
PRIORITY: Y

Description\Location:
PRS 308, #004603

Collector: 7725

Date Received: 7/11/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.06	45,000
Cs-137	*	0.00	0.05	45,000
Pb-210	*	0.78	0.86	45,000
Ra-226	*	0.93	1.04	800
Ac-227 (D)	*	0.00	0.33	40
Th-230	*	1.38	9.38 ✓	800
Th-232 (D)		0.60	0.21 ✓	130
Pu-238	*	0.00	23.93	500
Am-241	*	0.01	0.10	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.31	0.96 ✓	

Σ DOT 0.04 nCi/g

Σ Respirator 0.07

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Radium results below detection level. No correction applied.

Date: 7/12/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004604
LAB SAMPLE ID: ML000387
FILE ID: MG300329.S0
PRIORITY: Y

Description\Location:
PRS 308, #004604
ML000596, MG300396 FOR CO-60

Collector: 7725

Date Received: 7/11/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	•	0.02	0.07	45,000
Cs-137	•	0.00	0.08	45,000
Pb-210	•	0.00	1.42	45,000
Ra-226	*	1.21	1.47	800
Ac-227 (D)	•	0.15	0.45	40
Th-230	•	0.00	14.13	800
Th-232 (D)		0.64	0.27	130
Pu-238	*	0.00	40.87	500
Am-241	•	0.00	0.16	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.11	1.33	

Σ DOT 0.06 nCi/g

Σ Respirator 0.12

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Radium and Uranium results below detection level. No correction applied.

Date: 7/12/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

OC-LS-177

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000388
FILE ID: MG200368.S0
PRIORITY: Y

Description\Location: PRS 308, #004605

Collector: 7725

Date Received: 7/11/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.02	45,000
Cs-137		0.04	0.01 ✓	45,000
Pb-210		0.82	0.34 ✓	45,000
Ra-226		0.57	0.40 ✓	800
Ac-227 (D)	*	0.10	0.11	40
Th-230	*	0.36	3.45	800
Th-232 (D)		0.93	0.05 ✓	130
Pu-238	*	0.00	8.85	500
Am-241	*	0.04	0.04	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.84	0.35 ✓	

Σ DOT 0.02 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/12/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

00-LS-177

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004606
LAB SAMPLE ID: ML000390
FILE ID: MG300330.S0
PRIORITY: Y

Description\Location:
PRS 308, #004606
ML000551, MG300383.S0 FOR CO-60

Collector: 7725

Date Received: 7/11/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.03	0.06	45,000
Cs-137		0.06	0.02 ✓	45,000
Pb-210		0.80	0.34 ✓	45,000
Ra-226		0.59	0.37 ✓	800
Ac-227 (D)		0.29	0.11 ✓	40
Th-230	*	0.00	3.67	800
Th-232 (D)		0.73	0.06 ✓	130
Pu-238	*	0.00	10.14	500
Am-241	*	0.00	0.04	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.79	0.36 ✓	

Σ DOT 0.02 nCi/g

Σ Respirator 0.04

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/12/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

OO-LS 177

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000391
FILE ID: MG200369.S0
PRIORITY: Y

Description\Location: PRS 308, #004607

Collector: 7725

Date Received: 7/11/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.04	45,000
Cs-137	*	0.05	0.05	45,000
Pb-210	*	0.90	0.90	45,000
Ra-226		1.08	1.02 ✓	800
Ac-227 (D)	*	0.07	0.32	40
Th-230	*	0.00	10.29	800
Th-232 (D)		0.86	0.17 ✓	130
Pu-238	*	0.00	25.73	500
Am-241	*	0.00	0.11	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.56	0.89 ✓	

Σ DOT 0.04 nCi/g

Σ Respirator 0.08

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/12/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004608
LAB SAMPLE ID: ML000392
FILE ID: MG300331.S0
PRIORITY: Y

Description\Location:
PRS 308, #004608
ML000606, MG100823 FOR CO-60

Collector: 7725

Date Received: 7/11/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	•	0.02	0.06	45,000
Cs-137	•	0.03	0.07	45,000
Pb-210	•	0.60	1.16	45,000
Ra-226	*	0.86	1.24	800
Ac-227 (D)	*	0.00	0.42	40
Th-230	•	0.00	13.21	800
Th-232 (D)		0.88	0.19	130
Pu-238	•	0.00	22.15	500
Am-241	•	0.04	0.13	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.19	1.06	

Σ DOT **0.04** nCi/g

Σ Respirator **0.08**

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/12/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

00-LS-177

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000393
FILE ID: MG100754.S0
PRIORITY: Y

Description\Location: PRS 308, #004609

Collector: 7725

Date Received: 7/11/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.07	45,000
Cs-137		0.08	0.06 ✓	45,000
Pb-210		0.64	0.61 ✓	45,000
Ra-226		1.23	0.80 ✓	800
Ac-227 (D)	*	0.14	0.24	40
Th-230	*	0.00	7.17	800
Th-232 (D)		0.98	0.21 ✓	130
Pu-238	*	0.00	17.58	500
Am-241	*	0.01	0.07	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.70	0.66 ✓	

Σ DOT 0.03 nCi/g

Σ Respirator 0.06

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 HAS BEEN CORRECTED FOR U-235 CONTRIBUTION

Date: 7/12/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000484
FILE ID: MG100785.S0
PRIORITY: Y

Description\Location:
PRS 308
004610

Collector: 7730

Date Received: 7/18/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.08	45,000
Cs-137	•	0.03	0.04	45,000
Pb-210	•	0.38	0.70	45,000
Ra-226		1.54	0.80 ✓	800
Ac-227 (D)	•	0.13	0.27	40
Th-230	•	1.40	7.24	800
Th-232 (D)		0.74	0.26 ✓	130
Pu-238	*	0.00	16.68	500
Am-241	•	0.00	0.08	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238(D)	0.78	0.70 ✓	

Σ DOT 0.03 nCi/g

Σ Respirator 0.06

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

COPY

Comments: Ra-226 has been corrected for contribution from U-235

Date: 7/18/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000485
FILE ID: MG200401.S0
PRIORITY: Y

Description\Location:
PRS 308
004611

Collector: 7730

Date Received: 7/18/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.03	0.04	45,000
Cs-137	*	0.01	0.05	45,000
Pb-210	*	0.17	1.00	45,000
Ra-226		1.23	0.99 ✓	800
Ac-227 (D)	*	0.23	0.30	40
Th-230	*	8.67	9.29	800
Th-232 (D)		0.71	0.20 ✓	130
Pu-238	*	3.72	26.89	500
Am-241	*	0.09	0.09	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238(D)	1.01	0.98 ✓	

Σ DOT 0.04 nCi/g

Σ Respirator 0.08

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

COPY

Comments: Ra-226 has been corrected for contribution from U-235

Date: 7/18/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000493
FILE ID: MG100788.S0
PRIORITY: Y

Description\Location:
PRS 308
004612

Collector: 7730

Date Received: 7/18/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.03	0.08	45,000
Cs-137	*	0.02	0.05	45,000
Pb-210		0.68	0.65 ✓	45,000
Ra-226		1.87	0.73 ✓	800
Ac-227 (D)	*	0.06	0.27	40
Th-230	*	5.66	6.48	800
Th-232 (D)		0.79	0.26 ✓	130
Pu-238	*	0.00	17.25	500
Am-241	*	0.06	0.07	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238(D)	0.74	0.71 ✓	

Σ DOT 0.03 nCi/g

Σ Respirator 0.06

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

COPY

Comments: Ra-226 has been corrected for contribution from U-235

Date: 7/18/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000494
FILE ID: MG200404.S0
PRIORITY: Y

Description\Location:
PRS 308
004613

Collector: 7725

Date Received: 7/18/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	•	0.01	0.05	45,000
Cs-137	•	0.00	0.06	45,000
Pb-210		0.94	0.92 ✓	45,000
Ra-226		1.42	1.04 ✓	800
Ac-227 (D)	*	0.00	0.37	40
Th-230	•	7.98	10.33	800
Th-232 (D)		0.92	0.22 ✓	130
Pu-238	•	13.61	23.39	500
Am-241	•	0.00	0.13	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238(D)	1.58	1.09 ✓	

Σ DOT 0.04 nCi/g

Σ Respirator 0.08

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

COPY

Comments: Ra-226 has been corrected for contribution from U-235

Date: 7/18/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000495
FILE ID: MG300364.S0
PRIORITY: Y

Description\Location:
PRS 308
004614

Collector: 7730

Date Received: 7/18/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.08	45,000
Cs-137	*	0.01	0.07	45,000
Pb-210	*	0.00	1.35	45,000
Ra-226		1.46	1.18 ✓	800
Ac-227 (D)	*	0.13	0.38	40
Th-230	*	4.91	12.54	800
Th-232 (D)		0.87	0.26 ✓	130
Pu-238	*	13.89	31.65	500
Am-241	*	0.02	0.14	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238(D)	1.47	1.16 ✓	

Σ DOT 0.05 nCi/g

Σ Respirator 0.10

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

COPY

Comments: Ra-226 has been corrected for contribution from U-235

Date: 7/18/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000496
FILE ID: MG100789.S0
PRIORITY: Y

Description\Location:
PRS 308
004615

Collector: 7730

Date Received: 7/18/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	•	0.00	0.07	45,000
Cs-137	•	0.00	0.07	45,000
Pb-210	•	0.23	0.78	45,000
Ra-226	*	0.78	0.83	800
Ac-227 (D)	•	0.00	0.27	40
Th-230	•	0.00	7.64	800
Th-232 (D)		1.17	0.19 ✓	130
Pu-238	•	8.46	12.83	500
Am-241	•	0.00	0.08	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238(D)	1.07	0.67 ✓	

Σ DOT 0.02 nCi/g

Σ Respirator 0.05

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

COPY

Comments: Ra-226 has been corrected for contribution from U-235

Date: 7/18/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000490
FILE ID: MG100787.S0
PRIORITY: Y

Description\Location:
PRS 308
004616

Collector: 7725

Date Received: 7/18/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	•	0.00	0.09	45,000
Cs-137	*	0.00	0.07	45,000
Pb-210		0.78	0.68 ✓	45,000
Ra-226		1.50	0.86 ✓	800
Ac-227 (D)	*	0.01	0.27	40
Th-230	•	0.00	7.16	800
Th-232 (D)		1.14	0.20 ✓	130
Pu-238	•	1.49	14.79	500
Am-241	*	0.03	0.07	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.03 nCi/g

Σ Respirator 0.06

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

COPY

Comments: U-238(D) less than MDA. No corrections applied to Ra-226.

Date: 7/18/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000491
FILE ID: MG200403.S0
PRIORITY: Y

Description\Location:
PRS 308
004617

Collector: 7725

Date Received: 7/18/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.02	0.05	45,000
Cs-137	*	0.01	0.05	45,000
Pb-210	*	0.12	1.07	45,000
Ra-226	*	0.99	1.11	800
Ac-227 (D)	*	0.00	0.39	40
Th-230	*	0.00	10.88	800
Th-232 (D)		0.95	0.16	130
Pu-238	*	0.00	25.33	500
Am-241	*	0.00	0.11	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.04 nCi/g

Σ Respirator 0.08

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

COPY

Comments: Ra-226 less than MDA. No corrections applied to Ra-226.

Date: 7/18/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: ML000486
FILE ID: MG300361.S0
PRIORITY: Y

Description\Location:
PRS 308
004618

Collector: 7725

Date Received: 7/18/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.12	45,000
Cs-137		0.21	0.09	45,000
Pb-210	*	1.52	1.98	45,000
Ra-226	*	1.83	2.16	800
Ac-227 (D)	*	0.60	0.67	40
Th-230	*	13.93	21.96	800
Th-232 (D)		4.43	0.36	130
Pu-238	*	0.00	64.60	500
Am-241	*	0.00	0.26	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.10 nCi/g

Σ Respirator 0.21

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

COPY

Comments: U-238(D) less than MDA. No corrections applied to Ra-226.

Date: 7/18/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004619
LAB SAMPLE ID: ML000492
FILE ID: MG300363.S0
PRIORITY: Y

Description\Location:
PRS 308
004619, ML00549, MG300381.S0 FOR CO-60

Collector: 7725

Date Received: 7/18/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	•	0.06	0.08	45,000
Cs-137		0.21	0.18	45,000
Pb-210	•	0.95	3.45	45,000
Ra-226	•	3.74	4.28	800
Ac-227 (D)	*	0.56	1.13	40
Th-230	*	20.24	40.69	800
Th-232 (D)		20.21	0.56	130
Pu-238	•	0.00	98.92	500
Am-241	*	0.31	0.42	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.17 nCi/g

Σ Respirator 0.44

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: Ra-226 leass than MDA. No corrections applied to Ra-226

Date: 7/18/00 Counted By: 6024 Analyzed By: 6086 INITIALS [redacted]

Reference 6

9/21/00

PRS 308
Further Assessment
Sampling and Analysis Plan

By
Dennis Gault, BWXTO Project Engineer

Purpose:
The purpose of this sampling investigation is to confirm the presence/absence of Plutonium-238 (Pu-238) and Uranium-238 (U-238) (uranium daughters for equilibrium) contamination at and around the previous sampling location MND17-8709-5007. The samples will also be analyzed for Thorium-230 (Th-230), Thorium-228 (Th-228), and Thorium-232 (Th-232). If contamination is confirmed, this investigation will determine its extent via additional sampling.

The information gained from this investigation will be used by the Mound 2000 Core Team to determine the final disposition of PRS 308.

Number and Location of Samples:
Per the Core Team recommendation, five sample locations will be investigated. One will be at the MND17-8709-5007 location of concern. The other four locations will be located in a diamond shaped "box" pattern a distance of ten feet away from the original location.

Samples will be taken to a depth of seven feet or to refusal (verify the acceptability of the rig with the Core Team).

Locating four sampling locations in a ten-foot pattern north, south, east, and west of the MND17-8709 location would place the five sample locations at MND17-8709, MND17-8703, MND17-8714, MND17-8715, and MND17-8716. Two of these locations are located within the resent trenches that were dug and sampled to a depth of about five feet (MND17-8709 & MND17-8716).

Purposed Method of Field Sampling:
It is purposed that two sampling trenches be dug and sampled to a depth of seven feet. A track hoe would be used to dig the trenches. These trenches would start at the sample locations on the outside of the "diamond" and run through the center location to the location on the opposite side. Samples would be taken at the beginning of the trench and at five-foot interval along the trench. Samples at depth would then be taken at two-foot intervals starting at the surface and ending with a sample at the bottom of the trench. All samples will be taken from the bucket of the track hoe.

Sample Analysis:
Field analysis of the material removed from the trench will consist of real time monitoring using the Fiddler and NE Electra.

The samples will be taken to the Mound on-site laboratory for gamma-spec analysis of Plutonium-238 and Uranium-238 (uranium daughters for equilibrium). The detection limit for the contaminants of concern will be 25 pCi/g for Pu-238 and 1 pCi/g for U-238.

The samples will also be analyzed for Thorium. The detection limits for the isotopes of Thorium are 1 pCi/g for Th-228 and Th-232, and 3 pCi/g for Th-230.

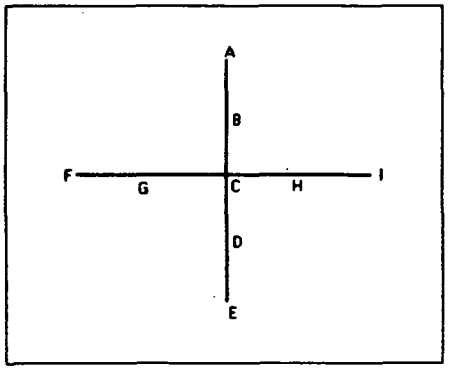
PRS 308 Week of 9/25/00 Sampling Results

Gamma Spec

ID		PU239 pCi/g	PU239MDA pCi/g	TH230 pCi/g	TH230MDA pCi/g	TH232 pCi/g	TH232MDA pCi/g	U-238 pCi/g	U-238_MDA pCi/g
Hole A									
004618	surface	0	5.37	0	2.52	0.71	0.07	0.68	0.24
004627	0-2	0	16.79	1.15	2.37	0.81	0.03	0.48	0.23
004629	2-4	0	20.75	0	3	0.66	0.05	0.52	0.29
004631	4-6	0	8.98	0.99	2.48	0.74	0.03	0.7	0.24
004636	6-7	0	11.21	0.99	2.75	0.71	0.04	0.79	0.26
Hole B									
004619	surface	0	7.62	1.51	2.87	0.81	0.05	0.76	0.27
004628	0-2	0.02	6.56	0	2.49	0.95	0.1	0.53	0.3
004632	2-4	1.1	16.29	0.54	2.42	0.83	0.03	0.62	0.21
004634	4-6	0	18.26	0.23	2.52	0.7	0.04	0.52	0.25
004637	6-7	14.21	17.35	1.02	2.67	0.69	0.04	0.64	0.27
Hole C									
004620	surface	0	7.2	0	2.63	0.7	0.05	0.6	0.28
004630	0-2	3.16	5.7	0.98	2.7	0.86	0.08	0.48	0.34
004633	2-4	0	7.22	2.25	2.91	0.8	0.05	0.34	0.3
004635	4-6	1.51	7.38	0.93	2.57	0.77	0.05	0.53	0.25
004638	6-7	0	4.94	0	2.36	0.65	0.08	0.35	0.22
Hole D									
004621	surface	0	6.28	0.89	2.72	0.83	0.07	0.53	0.27
004639	0-2	0	5.85	0.85	2.67	0.86	0.08	0.57	0.26
004741	2-4	0	4.56	0.31	1.87	0.72	0.03	0.59	0.19
004743	4-6	0	5.75	0.74	2.1	0.74	0.04	0.5	0.23
004745	6-7	0.49	4.07	0	1.86	0.52	0.06	0.26	0.18
Hole F									
004623	surface	1.88	4.93	0	2.23	0.89	0.06	0.42	0.22
004748	0-2	0	5.67	1.07	2.58	0.76	0.06	0.53	0.25
004750	2-4	3.34	5.49	0.47	2.65	0.73	0.04	0.51	0.24
004752	4-6	0	4.96	0.07	2.33	0.7	0.06	0.66	0.22
004754	6-7	0	5.61	0	2.46	0.66	0.07	0.36	0.24

Alpha Spec

ID		PU239 pCi/g	PU239LDL pCi/g	TH230 pCi/g	TH230LDL pCi/g	TH232 pCi/g	TH232LDL pCi/g	TH228 pCi/g	TH228LDL pCi/g	U-238 pCi/g	U-238LDL pCi/g
Composite	**Hole E**	0.198	0.015	0.562	0.06	0.793	0.041	0.787	0.06	0.585	0.003
004622	surface										
004640	0-2										
004742	2-4										
004744	4-6										
004746	6-7										
Composite	**Hole G**	0.056	0.018	0.772	0.025	0.63	0.025	0.74	0.05	0.587	0.003
004624	surface										
004747	0-2										
004749	2-4										
004751	4-6										
004753	6-7										
Composite	**Hole H**	0.07	0.021	0.682	0.047	0.682	0.047	0.766	0.047	0.611	0.003
004625	surface										
004755	0-2										
004757	2-4										
004759	4-6										
004761	6-7										
Composite	**Hole I**	0.034	0.003	1.278	0.192	0.568	0.192	0.748	0.384	0.614	0.003
004626	surface										
004756	0-2										
004758	2-4										
004760	4-6										
004762	6-7										



00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004618
LAB SAMPLE ID: ML000804
FILE ID: MG100864.S0
PRIORITY: Y

Description\Location:
PRS 308 A surface

Collector: 5520

Date Received: 9/25/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.02	0.02	45,000
Cs-137	*	0.02	0.02	45,000
Pb-210		0.60	0.22	45,000
Ra-226		1.39	0.31	800
Ac-227 (D)	*	0.02	0.10	40
Th-230	*	0.00	2.52	800
Th-232 (D)		0.71	0.07	130
Pu-238	*	0.00	5.37	500
Am-241	*	0.00	0.02	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.68	0.24	

Σ DOT 0.01 nCi/g

Σ Respirator 0.02

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 9/27/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004619
LAB SAMPLE ID: ML000805
FILE ID: MG200486.S0
PRIORITY: Y

Description\Location:
PRS 308 B ~~0-2'~~ Surface cgk 10-2-00

Collector: 5520

Date Received: 9/25/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.01	45,000
Cs-137		0.02	0.01	45,000
Pb-210	*	0.28	0.28	45,000
Ra-226		1.57	0.30	800
Ac-227 (D)	*	0.05	0.09	40
Th-230	*	1.51	2.87	800
Th-232 (D)		0.81	0.05	130
Pu-238	*	0.00	7.62	500
Am-241	*	0.00	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.76	0.27	

Σ DOT 0.01 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 9/27/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004620
LAB SAMPLE ID: ML000806
FILE ID: MG300433.S0
PRIORITY: Y

Description\Location:
PRS 308 C surface

Collector: 5520

Date Received: 9/25/00 **Date Collected:**

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	0.02	0.01	45,000
Cs-137	0.02	0.01	45,000
Pb-210	0.49	0.24	45,000
Ra-226	1.69	0.27	800
Ac-227 (D) *	0.10	0.11	40
Th-230 *	0.00	2.63	800
Th-232 (D)	0.70	0.05	130
Pu-238 *	0.00	7.20	500
Am-241 *	0.02	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.60	0.26	

Σ DOT 0.01 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 9/27/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004621
LAB SAMPLE ID: ML000807
FILE ID: 20800001.S0
PRIORITY: Y

Description\Location:
PRS 308 D surface

Collector: 5520

Date Received: 9/25/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.03	45,000
Cs-137	*	0.02	0.02	45,000
Pb-210		0.73	0.25	45,000
Ra-226		1.46	0.35	800
Ac-227 (D)	*	0.06	0.10	40
Th-230	*	0.89	2.72	800
Th-232 (D)		0.83	0.07	130
Pu-238	*	0.00	6.28	500
Am-241	*	0.00	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.53	0.27	

Σ DOT 0.01 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 9/27/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004622
LAB SAMPLE ID: ML000808
FILE ID: 20800001.S0
PRIORITY: Y

Description\Location:
PRS 308

Collector: 5520

Date Received: 9/25/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.01	45,000
Cs-137		0.02	0.01	45,000
Pb-210		1.50	0.29	45,000
Ra-226		2.01	0.32	800
Ac-227 (D)	*	0.03	0.10	40
Th-230	*	0.00	3.00	800
Th-232 (D)		0.96	0.04	130
Pu-238	*	0.00	7.50	500
Am-241	*	0.00	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.71	0.28	

Σ DOT 0.02 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004623
LAB SAMPLE ID: ML000809
FILE ID: 10800001.S0
PRIORITY: Y

Description\Location:
PRS 308 F surface

Collector: 5520

Date Received: 9/25/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.02	45,000
Cs-137		0.04	0.02	45,000
Pb-210		0.74	0.20	45,000
Ra-226		1.64	0.31	800
Ac-227 (D)	*	0.04	0.08	40
Th-230	*	0.00	2.23	800
Th-232 (D)		0.89	0.06	130
Pu-238	*	1.88	4.93	500
Am-241	*	0.01	0.02	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.42	0.22	

Σ DOT 0.01 nCi/g

Σ Respirator 0.02

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 9/27/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004624
LAB SAMPLE ID: ML000810
FILE ID: 10800003.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.05	45,000
Cs-137	*	0.02	0.04	45,000
Pb-210		0.53	0.49	45,000
Ra-226		1.94	0.57	800
Ac-227 (D)	*	0.04	0.22	40
Th-230	*	0.00	5.34	800
Th-232 (D)		0.93	0.14	130
Pu-238	*	3.31	11.19	500
Am-241	*	0.00	0.06	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.34	0.47	

Σ DOT 0.02 nCi/g

Σ Respirator 0.04

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/3/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004625
LAB SAMPLE ID: ML000811
FILE ID: MG300435.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/25/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	•	0.03	0.13	45,000
Cs-137	*	0.02	0.12	45,000
Pb-210	*	0.00	2.39	45,000
Ra-226	•	1.25	2.44	800
Ac-227 (D)	*	0.00	0.97	40
Th-230	*	0.00	25.97	800
Th-232 (D)	•	0.50	0.51	130
Pu-238	*	26.02	28.93	500
Am-241	*	0.02	0.24	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.76	2.41	

Σ DOT 0.06 nCi/g

Σ Respirator 0.12

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004626
LAB SAMPLE ID: ML000812
FILE ID: MG100866.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.02	0.15	45,000
Cs-137	*	0.01	0.11	45,000
Pb-210		1.64	1.18	45,000
Ra-226		2.93	1.39	800
Ac-227 (D)	*	0.00	0.57	40
Th-230	*	0.00	16.06	800
Th-232 (D)		1.01	0.26	130
Pu-238	*	0.00	30.99	500
Am-241	*	0.00	0.15	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.90	1.25	

Σ DOT 0.05 nCi/g

Σ Respirator 0.11

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004627
LAB SAMPLE ID: ML000829
FILE ID: A0000187.S0
PRIORITY: Y

Description\Location:
PRS 308

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.01	45,000
Cs-137	*	0.01	0.01	45,000
Pb-210		0.47	0.25	45,000
Ra-226		1.41	0.22	800
Ac-227 (D)	*	0.03	0.11	40
Th-230	*	1.15	2.37	800
Th-232 (D)		0.81	0.03	130
Pu-238	*	0.00	16.79	500
Am-241	*	0.00	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.48	0.23	

Σ DOT 0.02 nCi/g

Σ Respirator 0.05

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004628
LAB SAMPLE ID: ML000830
FILE ID: F0000252.S0
PRIORITY: Y

Description\Location:
PRS 308 B 0-2'

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.01	45,000
Cs-137	*	0.01	0.01	45,000
Pb-210		0.46	0.28	45,000
Ra-226		1.87	0.32	800
Ac-227 (D)	*	0.00	0.13	40
Th-230	*	1.86	3.00	800
Th-232 (D)		0.95	0.04	130
Pu-238	*	0.00	30.56	500
Am-241	*	0.00	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.59	0.30	

Σ DOT 0.04 nCi/g

Σ Respirator 0.08

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

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00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004629
LAB SAMPLE ID: ML000831
FILE ID: A0000188.S0
PRIORITY: Y

Description\Location:
PRS 308 A 2-4

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.02	45,000
Cs-137	*	0.01	0.01	45,000
Pb-210		0.39	0.29	45,000
Ra-226		1.17	0.29	800
Ac-227 (D)	*	0.04	0.09	40
Th-230	*	0.00	3.00	800
Th-232 (D)		0.66	0.05	130
Pu-238	*	0.00	20.75	500
Am-241	*	0.00	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.52	0.29	

Σ DOT 0.03 nCi/g

Σ Respirator 0.05

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

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00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004630
LAB SAMPLE ID: ML000837
FILE ID: 10800004.S0
PRIORITY: Y

Description\Location:
PRS 308 C 0-2

Collector: 5520

Date Received: 9/25/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.03	45,000
Cs-137	*	0.00	0.02	45,000
Pb-210		0.48	0.23	45,000
Ra-226		1.82	0.34	800
Ac-227 (D)	*	0.00	0.10	40
Th-230	*	0.96	2.70	800
Th-232 (D)		0.86	0.08	130
Pu-238	*	3.16	5.70	500
Am-241	*	0.00	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.48	0.34	

Σ DOT 0.01 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 9/27/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004631
LAB SAMPLE ID: ML000832
FILE ID: F0000253.S0
PRIORITY: Y

Description\Location:
PRS 308 A 4-6'

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.01	45,000
Cs-137	*	0.00	0.01	45,000
Pb-210		0.48	0.21	45,000
Ra-226		1.38	0.28	800
Ac-227 (D)	*	0.00	0.11	40
Th-230	*	0.99	2.48	800
Th-232 (D)		0.74	0.03	130
Pu-238	*	0.00	8.98	500
Am-241	*	0.00	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.70	0.24	

Σ DOT 0.01 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004632
LAB SAMPLE ID: ML000833
FILE ID: A0000189.S0
PRIORITY: Y

Description\Location:
PRS 308 B 2-4

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.01	45,000
Cs-137	*	0.01	0.01	45,000
Pb-210		0.64	0.22	45,000
Ra-226		1.55	0.23	800
Ac-227 (D)	*	0.00	0.07	40
Th-230	*	0.54	2.42	800
Th-232 (D)		0.83	0.03	130
Pu-238	*	1.10	16.29	500
Am-241	*	0.02	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.62	0.21	

Σ DOT 0.02 nCi/g

Σ Respirator 0.05

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004633
LAB SAMPLE ID: ML000838
FILE ID: 20800002.S0
PRIORITY: Y

Description\Location:
PRS 308 C 2-4'

Collector: 5520

Date Received: 9/25/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.02	45,000
Cs-137	*	0.01	0.01	45,000
Pb-210		0.81	0.29	45,000
Ra-226		1.68	0.29	800
Ac-227 (D)	*	0.08	0.10	40
Th-230	*	2.25	2.91	800
Th-232 (D)		0.80	0.05	130
Pu-238	*	0.00	7.22	500
Am-241	*	0.02	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.34	0.30	

Σ DOT 0.01 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004634
LAB SAMPLE ID: ML000834
FILE ID: A0000190.S0
PRIORITY: Y

Description\Location:
PRS 308 B 4-6'

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.01	45,000
Cs-137	*	0.00	0.01	45,000
Pb-210		0.28	0.26	45,000
Ra-226		1.16	0.23	800
Ac-227 (D)	*	0.03	0.07	40
Th-230	*	0.23	2.52	800
Th-232 (D)		0.70	0.04	130
Pu-238	*	0.00	18.26	500
Am-241	*	0.02	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.52	0.25	

Σ DOT 0.02 nCi/g

Σ Respirator 0.05

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004635
LAB SAMPLE ID: ML000839
FILE ID: 30800004.S0
PRIORITY: Y

Description\Location:
PRS 308 C 4-6'

Collector: 5520

Date Received: 9/25/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.02	45,000
Cs-137	*	0.00	0.01	45,000
Pb-210		0.49	0.24	45,000
Ra-226		1.68	0.25	800
Ac-227 (D)	*	0.00	0.12	40
Th-230	*	0.93	2.57	800
Th-232 (D)		0.77	0.05	130
Pu-238	*	1.51	7.38	500
Am-241	*	0.00	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.53	0.25	

Σ DOT 0.01 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004636
LAB SAMPLE ID: ML000835
FILE ID: F0000254.S0
PRIORITY: Y

Description\Location:
PRS 308 A 6-7'

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.01	45,000
Cs-137	*	0.00	0.01	45,000
Pb-210		0.32	0.25	45,000
Ra-226		1.25	0.29	800
Ac-227 (D)	*	0.04	0.09	40
Th-230	*	0.99	2.75	800
Th-232 (D)		0.71	0.04	130
Pu-238	*	0.00	11.21	500
Am-241	*	0.00	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.79	0.26	

Σ DOT 0.02 nCi/g

Σ Respirator 0.04

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004637
LAB SAMPLE ID: ML000836
FILE ID: A0000191.S0
PRIORITY: Y

Description\Location:
PRS 308 B 6-7

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.01	45,000
Cs-137	*	0.01	0.01	45,000
Pb-210		0.72	0.29	45,000
Ra-226		1.23	0.26	800
Ac-227 (D)	*	0.00	0.12	40
Th-230	*	1.02	2.67	800
Th-232 (D)		0.69	0.04	130
Pu-238	*	14.21	17.35	500
Am-241	*	0.02	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.64	0.27	

Σ DOT 0.02 nCi/g

Σ Respirator 0.05

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004638
LAB SAMPLE ID: ML000840
FILE ID: 10800005.S0
PRIORITY: Y

Description\Location:
PRS 308 C 6-7'

Collector: 5520

Date Received: 9/25/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.03	45,000
Cs-137	*	0.00	0.02	45,000
Pb-210		0.39	0.21	45,000
Ra-226		1.32	0.28	800
Ac-227 (D)	*	0.03	0.08	40
Th-230	*	0.00	2.36	800
Th-232 (D)		0.65	0.08	130
Pu-238	*	0.00	4.94	500
Am-241	*	0.02	0.02	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.35	0.22	

Σ DOT 0.01 nCi/g

Σ Respirator 0.02

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 9/27/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004639
LAB SAMPLE ID: ML000842
FILE ID: 10800007.S0
PRIORITY: Y

Description\Location:
PRS 308 D 0-2'

Collector: 5520

Date Received: 9/25/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.03	45,000
Cs-137	*	0.01	0.02	45,000
Pb-210		0.82	0.22	45,000
Ra-226		1.88	0.34	800
Ac-227 (D)	*	0.09	0.10	40
Th-230	*	0.85	2.67	800
Th-232 (D)		0.86	0.08	130
Pu-238	*	0.00	5.85	500
Am-241	*	0.00	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.57	0.26	

Σ DOT 0.01 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: ~~004740~~ 004640 cgr 10-31-00
LAB SAMPLE ID: ML000821
FILE ID: MG200488.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.03	0.08	45,000
Cs-137	*	0.05	0.08	45,000
Pb-210	*	0.23	1.74	45,000
Ra-226		1.86	1.71	800
Ac-227 (D)	*	0.00	0.70	40
Th-230	*	4.17	17.61	800
Th-232 (D)		0.81	0.36	130
Pu-238	*	23.01	36.72	500
Am-241	*	0.02	0.20	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.73	1.62	

Σ DOT 0.06 nCi/g

Σ Respirator 0.12

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

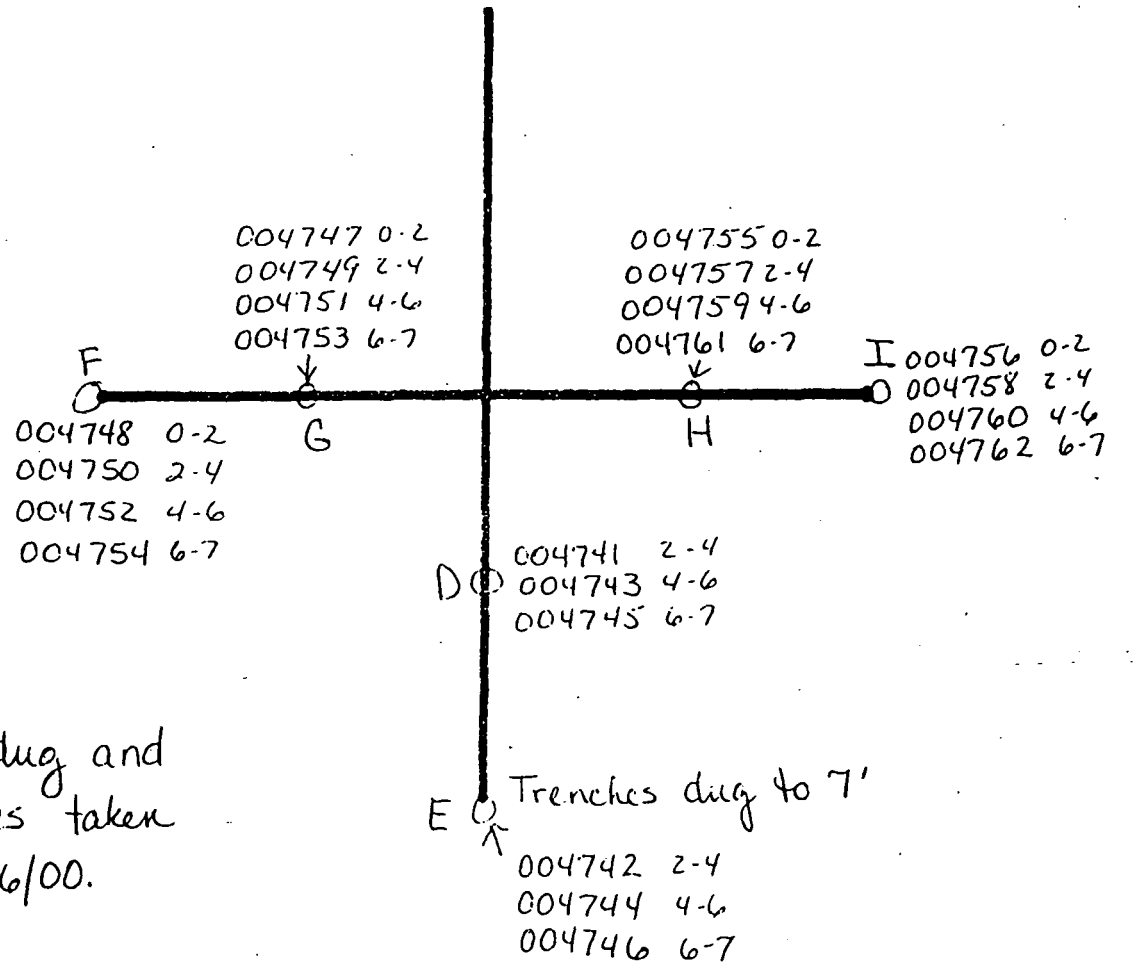
Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

RADIOLOGICAL SURVEY DATA SHEET

MAP/DRAWING Continuation Page

Survey No. 00-LS-282

MAP/DRAWING



Area dug and samples taken on 9/26/00.

Spoils pile was scanned with the FIDLER using out channel & channel 1 N/D

spoils pile was covered with a tarp at end of day.

N↑

LEGEND: # = mrem/hr (γ) whole body
E = mrem/hr (β+η+γ) extremity on contact
△# = mrem/hr neutron
[#] = air sample number
(#) = swipe number
(#/α) or /β = direct cont. measurement in dpm/100cm²

ML-9620B (2-98)

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004741
LAB SAMPLE ID: ML000846
FILE ID: 20800004.S0
PRIORITY: Y

Description\Location:
PRS 308 D 2-4'

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.01	45,000
Cs-137	*	0.00	0.01	45,000
Pb-210		0.87	0.17	45,000
Ra-226		1.70	0.21	800
Ac-227 (D)	*	0.00	0.80	40
Th-230	*	0.31	1.87	800
Th-232 (D)		0.72	0.03	130
Pu-238	*	0.00	4.56	500
Am-241		0.03	0.02	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.59	0.19	

Σ DOT 0.01 nCi/g

Σ Respirator 0.04

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004742
LAB SAMPLE ID: ML000822
FILE ID: MG300439.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.02	0.12	45,000
Cs-137	*	0.00	0.10	45,000
Pb-210	*	0.02	1.74	45,000
Ra-226	*	0.46	2.07	800
Ac-227 (D)	*	0.00	0.89	40
Th-230		1.16	0.41	800
Th-232 (D)		0.64	0.41	130
Pu-238	*	0.00	52.47	500
Am-241	*	0.00	0.22	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.27	1.93	

Σ DOT 0.06 nCi/g

Σ Respirator 0.14

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004743
LAB SAMPLE ID: ML000847
FILE ID: 30800005.S0
PRIORITY: Y

Description\Location:
PRS 308 D 4-6

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.01	45,000
Cs-137	*	0.00	0.01	45,000
Pb-210		0.45	0.20	45,000
Ra-226		1.64	0.25	800
Ac-227 (D)	*	0.04	0.09	40
Th-230	•	0.74	2.10	800
Th-232 (D)		0.74	0.04	130
Pu-238	*	0.00	5.75	500
Am-241	*	0.00	0.02	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.50	0.23	

Σ DOT 0.01 nCi/g

Σ Respirator 0.02

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004744
LAB SAMPLE ID: ML000823
FILE ID: MG100871.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.05	0.10	45,000
Cs-137	*	0.00	0.12	45,000
Pb-210		1.33	0.95	45,000
Ra-226	*	1.40	1.42	800
Ac-227 (D)	*	0.02	0.52	40
Th-230	*	2.56	11.21	800
Th-232 (D)		0.67	0.41	130
Pu-238	*	0.00	28.45	500
Am-241		0.11	0.09	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.12	1.25	

Σ DOT 0.04 nCi/g

Σ Respirator 0.09

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004745
LAB SAMPLE ID: ML000848
FILE ID: 10800010.S0
PRIORITY: Y

Description\Location:
PRS 308 D 6-7'

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.02	45,000
Cs-137	*	0.00	0.02	45,000
Pb-210		0.30	0.17	45,000
Ra-226		0.90	0.26	800
Ac-227 (D)	*	0.02	0.07	40
Th-230	•	0.00	1.86	800
Th-232 (D)		0.52	0.06	130
Pu-238	*	0.49	4.07	500
Am-241	*	0.00	0.02	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.26	0.18	

Σ DOT 0.01 nCi/g

Σ Respirator 0.02

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004746
LAB SAMPLE ID: ML000824
FILE ID: MG200489.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.09	45,000
Cs-137	*	0.00	0.07	45,000
Pb-210	*	0.00	1.86	45,000
Ra-226	*	0.70	1.71	800
Ac-227 (D)	*	0.00	0.55	40
Th-230	*	0.00	15.39	800
Th-232 (D)		0.52	0.35	130
Pu-238	*	0.00	44.09	500
Am-241	*	0.00	0.18	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.07	1.75	

Σ DOT 0.06 nCi/g

Σ Respirator 0.13

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004747
LAB SAMPLE ID: ML000825
FILE ID: MG300440.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.10	45,000
Cs-137	*	0.05	0.05	45,000
Pb-210	*	0.59	1.73	45,000
Ra-226	*	1.66	1.98	800
Ac-227 (D)	*	0.00	0.97	40
Th-230	*	0.01	19.76	800
Th-232 (D)		1.14	0.25	130
Pu-238	*	0.00	60.40	500
Am-241	*	0.20	0.20	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.00	2.26	

Σ DOT 0.09 nCi/g

Σ Respirator 0.18

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004748
LAB SAMPLE ID: ML000841
FILE ID: 10800006.S0
PRIORITY: Y

Description\Location:
PRS 308 F 0-2'

Collector: 5520

Date Received: 9/25/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.02	45,000
Cs-137	*	0.00	0.02	45,000
Pb-210		0.52	0.22	45,000
Ra-226		1.57	0.36	800
Ac-227 (D)	*	0.02	0.09	40
Th-230	*	1.07	2.58	800
Th-232 (D)		0.76	0.08	130
Pu-238	*	0.00	5.67	500
Am-241	*	0.00	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.53	0.25	

Σ DOT 0.01 nCi/g

Σ Respirator 0.02

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 9/28/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004749
LAB SAMPLE ID: ML000826
FILE ID: MG100872.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.14	45,000
Cs-137	*	0.01	0.08	45,000
Pb-210	*	0.50	1.11	45,000
Ra-226		2.41	1.40	800
Ac-227 (D)	*	0.00	0.60	40
Th-230	*	4.04	11.75	800
Th-232 (D)		0.94	0.31	130
Pu-238	*	8.04	21.89	500
Am-241	*	0.00	0.14	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.04	1.36	

Σ DOT 0.04 nCi/g

Σ Respirator 0.08

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004750
LAB SAMPLE ID: ML000844
FILE ID: 20800003.S0
PRIORITY: Y

Description\Location:
PRS 308 F 2-4'

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.01	45,000
Cs-137		0.02	0.01	45,000
Pb-210		1.03	0.24	45,000
Ra-226		2.08	0.29	800
Ac-227 (D)	*	0.03	0.11	40
Th-230	•	0.47	2.65	800
Th-232 (D)		0.73	0.04	130
Pu-238	*	3.34	5.49	500
Am-241	*	0.00	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.51	0.24	

Σ DOT 0.01 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004751
LAB SAMPLE ID: ML000827
FILE ID: MG200490.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.04	0.05	45,000
Cs-137	*	0.02	0.07	45,000
Pb-210	*	0.79	1.33	45,000
Ra-226	*	0.77	1.68	800
Ac-227 (D)	*	0.00	0.57	40
Th-230	*	0.96	14.93	800
Th-232 (D)		0.55	0.30	130
Pu-238	*	16.81	26.98	500
Am-241	*	0.06	0.15	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.00	1.68	

Σ DOT 0.05 nCi/g

Σ Respirator 0.09

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004752
LAB SAMPLE ID: ML000843
FILE ID: 10800008.S0
PRIORITY: Y

Description\Location:
PRS 308 F 4-6'

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.02	45,000
Cs-137	*	0.00	0.02	45,000
Pb-210		0.54	0.20	45,000
Ra-226		1.41	0.29	800
Ac-227 (D)	*	0.01	0.09	40
Th-230	*	0.07	2.33	800
Th-232 (D)		0.70	0.06	130
Pu-238	*	0.00	4.96	500
Am-241	*	0.00	0.02	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.66	0.22	

Σ DOT 0.01 nCi/g

Σ Respirator 0.02

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004753
LAB SAMPLE ID: ML000828
FILE ID: MG300441.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.02	0.10	45,000
Cs-137	*	0.06	0.09	45,000
Pb-210	*	0.00	2.73	45,000
Ra-226	*	0.82	2.50	800
Ac-227 (D)	*	0.24	0.71	40
Th-230	•	0.00	26.89	800
Th-232 (D)		0.70	0.50	130
Pu-238	*	27.24	52.00	500
Am-241	*	0.12	0.22	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.09	2.32	

Σ DOT 0.09 nCi/g

Σ Respirator 0.16

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004754
LAB SAMPLE ID: ML000845
FILE ID: 10800009.S0
PRIORITY: Y

Description\Location:
PRS 308 F 6-7'

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.03	45,000
Cs-137	*	0.00	0.01	45,000
Pb-210		0.50	0.21	45,000
Ra-226		1.23	0.32	800
Ac-227 (D)	*	0.00	0.10	40
Th-230	*	0.00	2.46	800
Th-232 (D)		0.66	0.07	130
Pu-238	*	0.00	5.61	500
Am-241	*	0.00	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238D	0.36	0.24	

Σ DOT 0.01 nCi/g

Σ Respirator 0.02

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004755
LAB SAMPLE ID: ML000817
FILE ID: MG100869.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.07	0.70	45,000
Cs-137	*	0.00	0.08	45,000
Pb-210	*	0.21	1.12	45,000
Ra-226	*	1.17	1.31	800
Ac-227 (D)	*	0.21	0.39	40
Th-230	*	0.00	12.82	800
Th-232 (D)		0.93	0.25	130
Pu-238	*	7.29	21.29	500
Am-241	*	0.00	0.14	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.00	1.19	

Σ DOT 0.04 nCi/g

Σ Respirator 0.08

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004756
LAB SAMPLE ID: ML000813
FILE ID: MG300436.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.14	45,000
Cs-137	*	0.00	0.15	45,000
Pb-210	*	0.44	2.04	45,000
Ra-226		3.19	1.90	800
Ac-227 (D)	*	0.37	0.61	40
Th-230	*	0.00	24.35	800
Th-232 (D)		0.82	0.41	130
Pu-238	*	0.00	71.09	500
Am-241	*	0.00	0.24	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.41	2.41	

Σ DOT 0.10 nCi/g

Σ Respirator 0.20

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004757
LAB SAMPLE ID: ML000818
FILE ID: MG200487.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.09	45,000
Cs-137	*	0.02	0.08	45,000
Pb-210	*	0.71	1.75	45,000
Ra-226		3.25	1.71	800
Ac-227 (D)	*	0.00	0.82	40
Th-230	*	0.00	21.56	800
Th-232 (D)		0.58	0.36	130
Pu-238	*	26.64	38.06	500
Am-241	*	0.00	0.21	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.98	1.80	

Σ DOT 0.07 nCi/g

Σ Respirator 0.13

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004758
LAB SAMPLE ID: ML000814
FILE ID: MG100867.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.04	0.10	45,000
Cs-137	*	0.00	0.11	45,000
Pb-210	*	0.49	0.92	45,000
Ra-226		1.35	1.29	800
Ac-227 (D)	*	0.00	0.52	40
Th-230	*	0.00	10.83	800
Th-232 (D)		0.83	0.32	130
Pu-238	*	13.95	16.36	500
Am-241	*	0.00	0.11	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.01	1.01	

Σ DOT 0.03 nCi/g

Σ Respirator 0.07

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004759
LAB SAMPLE ID: ML000819
FILE ID: MG300438.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.04	0.10	45,000
Cs-137	*	0.05	0.09	45,000
Pb-210	*	0.59	1.73	45,000
Ra-226		2.42	1.54	800
Ac-227 (D)	*	0.06	0.63	40
Th-230	*	1.78	18.31	800
Th-232 (D)		0.65	0.33	130
Pu-238	*	0.00	59.52	500
Am-241	*	0.00	0.22	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.00	1.98	

Σ DOT 0.08 nCi/g

Σ Respirator 0.17

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004760
LAB SAMPLE ID: ML000815
FILE ID: MG100868.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.16	45,000
Cs-137	*	0.00	0.10	45,000
Pb-210		1.11	0.94	45,000
Ra-226		2.04	1.17	800
Ac-227 (D)	*	0.00	0.57	40
Th-230	*	8.44	9.54	800
Th-232 (D)		0.85	0.43	130
Pu-238	*	0.00	24.43	500
Am-241	*	0.00	0.13	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	1.18	1.09	

Σ DOT 0.04 nCi/g

Σ Respirator 0.08

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004761
LAB SAMPLE ID: ML000820
FILE ID: MG100870.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.20	45,000
Cs-137	*	0.02	0.10	45,000
Pb-210	*	0.04	1.35	45,000
Ra-226	*	1.14	1.48	800
Ac-227 (D)	*	0.11	0.44	40
Th-230	*	2.54	12.67	800
Th-232 (D)		0.96	0.52	130
Pu-238	*	7.49	29.31	500
Am-241	*	0.00	0.15	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	0.00	1.55	

Σ DOT 0.05 nCi/g

Σ Respirator 0.10

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

00-LS-282

SOIL ANALYSIS REPORT

FIELD SAMPLE ID: 004762
LAB SAMPLE ID: ML000816
FILE ID: MG300437.S0
PRIORITY: Y

Description\Location:
PRS 308
20 MINUTE COUNT

Collector: 5520

Date Received: 9/26/00 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.21	45,000
Cs-137	*	0.07	0.13	45,000
Pb-210	*	0.00	2.45	45,000
Ra-226	*	0.62	2.69	800
Ac-227 (D)	*	0.35	1.02	40
Th-230	*	0.00	26.40	800
Th-232 (D)		0.73	0.43	130
Pu-238	*	30.29	61.45	500
Am-241	*	0.01	0.28	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U-238	2.78	1.84	

Σ DOT 0.10 nCi/g

Σ Respirator 0.19

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 10/2/00 Counted By: 6024 Analyzed By: 5613 INITIALS [redacted]

BWXT of Ohio, Inc.

ENVIRONMENTAL/ANALYTICAL SERVICES REQUEST FOR ANALYSIS

DATE: 9-27-00	SAMPLE MATRIX: Soil	NUMBER OF SAMPLES: 4 composites	COLLECTED BY:
PROJECT/FUNCTION:	PRIMARY CONTACT/PHONE NO.:	MAIL STOP:	CHARGE NUMBER: K01818
~~CHARGE NUMBER~~:	SEND DATA TO:	EXTENSION:	GAMMA SPEC. PERFORMED (YES/NO): yes

ANALYSES REQUESTED (check):
- ☐ Qualitative (identify)
- ☐ Qualitative (identify + proportionality of isotopes)
- ☐ Quantitative (concentration)
- ☐ ^3H
- ☐ Gross α
- ☐ Characterize and Approve Water for Release
- ☐ Other _____

SUSPECTED CONTAMINANTS:
- ☐ ^3H
- ☒ Pu
- ☒ U
- ☒ Th
- ☐ Other _____

NOTE: Attach additional information (e.g. RSDS, collection data, and gamma spec. results) if applicable

LAB IDENTIFICATION	SAMPLE LOCATION	SAMPLE #	SAMPLE VOLUME/AREA	RESULTS
0020784	Prs 308	1		
0020785		2		
0020786		3		
0020787		4		

COMMENTS:

00-LS-282

50 of 53

ANALYZED BY: Bradley O Yates	DATE: 10-2-00

ML-5222 (11-99)

Composite Information

Laboratory ID#	Soil Samples
0020784	004626
	004756
	004758
	004760
	004762

Laboratory ID#	Soil Samples
0020785	004625
	004755
	004757
	004759
	004761

Laboratory ID#	Soil Samples
0020786	004622
	004640
	004742
	004744
	004744

Laboratory ID#	Soil Samples
0020787	004624
	004747
	004749
	004751
	004753

PRS 308 Soils

Submitted: September 27, 2000

0020784

Isotope	pCi/g	Uncertainty pCi/g	LDL pCi/g
Th-232	0.568	0.236	0.192
Th-230	1.278	0.410	0.192
Th-228	0.748	0.288	0.384
Th-227	0.284	0.155	0.192

0020785

Isotope	pCi/g	Uncertainty pCi/g	LDL pCi/g
Th-232	0.682	0.100	0.047
Th-230	0.682	0.100	0.047
Th-228	0.768	0.108	0.047
Th-227	0.043	0.020	0.023

0020786

Isotope	pCi/g	Uncertainty pCi/g	LDL pCi/g
Th-232	0.793	0.142	0.041
Th-230	0.562	0.113	0.080
Th-228	0.787	0.142	0.080
Th-227	0.181	0.059	0.096

0020787

Isotope	pCi/g	Uncertainty pCi/g	LDL pCi/g
Th-232	0.630	0.099	0.025
Th-230	0.772	0.114	0.025
Th-228	0.740	0.111	0.050
Th-227	0.057	0.026	0.060

L C Hopkins — 10-3-00
Analyst — Date

[redacted] — 6195 — 10-2-00
HP# — Date

PRS 308 Soils

Submitted: September 27, 2000

0020784

Isotope	pCi/g	Uncertainty pCi/g	LDL pCi/g
Pu-238	0.034	0.006	0.003
Pu-239	-0.001	0.001	0.007
U-233/234	0.580	0.047	0.009
U-235	0.040	0.007	0.003
U-238	0.614	0.049	0.003

0020785

Isotope	pCi/g	Uncertainty pCi/g	LDL pCi/g
Pu-238	0.070	0.014	0.021
Pu-239	0.007	0.004	0.006
U-233/234	0.600	0.049	0.010
U-235	0.044	0.008	0.003
U-238	0.611	0.050	0.003

0020786

Isotope	pCi/g	Uncertainty pCi/g	LDL pCi/g
Pu-238	0.198	0.024	0.015
Pu-239	0.004	0.004	0.015
U-233/234	0.547	0.045	0.009
U-235	0.047	0.008	0.003
U-238	0.585	0.047	0.003

0020787

Isotope	pCi/g	Uncertainty pCi/g	LDL pCi/g
Pu-238	0.056	0.012	0.018
Pu-239	0.004	0.003	0.005
U-233/234	0.544	0.044	0.003
U-235	0.034	0.007	0.003
U-238	0.587	0.047	0.003

Bradley D Jones — 10-02-00
Analyst — Date

[redacted]

1585 — 10-2-00
Data Verification — HP# — Date