RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-00913-RS
ADDRESS: 2215 MESA AVENUE

AUGUST 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION
P.O. Box 1569
Grand Junction, Colorado 81502

APPROVED BY M. K. Tucker for
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DOE PROJECT ENGINEER

DATE August 12, 1985

REA00913:REA-GE007

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-00913-RS, is a single-family residence located at 2215 Mesa Avenue, Grand Junction, Colorado.

The purpose of this assessment is to evaluate the extent of uranium millsite contamination at this property. This assessment includes recommended remedial action, estimated volume of material to be removed, and estimated cost of the proposed action.

1.2 Evaluation and Recommendation

The action recommended is the removal of contaminated material and restoration of the property to its original condition. The identified residual radioactive material found on this property is tailings; the estimated volume is: exterior, 66 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is $6,384. Remedial action on this property will take approximately 10 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 2215 Mesa Avenue, Grand Junction, Colorado

Zoning: Residential (RSF-8)

Lot Size: Approximately 7,739 sf (0.18 acre)

Legal Description: Lot 10, Block 2, Wilcox and Bixby Subdivision, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 2 miles north of the State of Colorado Tailings Repository. Appendix Figure 2.1 shows the property location relative to its surroundings.

Utilities: Utility locations are shown in Appendix Figure 2.2.

Electrical:	Overhead
Gas:	Underground
Telephone:	Overhead
Sewer:	Underground
Water:	Underground
Cable TV:	Overhead

Bordering Properties:

North:	Mesa Avenue
South:	Alley
East:	Single-family residence
West:	Single-family residence

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-family residence
Size:	Approximately 1,050 sf
Construction Date:	1957
Construction:	Wood-frame with wood siding
Foundation:	Not determined
Footing Depth:	Not determined
Basement:	Yes
Crawl Space:	No
Condition:	Good

Other Structures:

Type:	Metal storage shed - 1
Size:	Approximately 88 sf
Construction:	Prefabricated metal roof and walls
Foundation:	4" concrete slab
Condition:	Good

Type:	Metal storage shed - 2
Size:	Approximately 27 sf
Construction:	Prefabricated metal roof and walls
Foundation:	2 x 4 wood-frame on grade
Condition:	Good

General Remarks:

Structures, utilities, landscaping, and other special features of this property are included in Appendix Figure 2.2.

Historical Data:

This structure is not over 50 years old. Therefore, it does not meet the eligibility criteria for consideration of inclusion on the National Register of Historic Places.

3.0 RADIOLOGIC SURVEY

3.1 Introduction

Radiologic data were collected by Bendix at DOE ID No. GJ-00913-RS on May 16, 1985. Data collection methods were performed in accordance with procedures fully described in the Radiologic Support Operations Procedures Manual GJ-07(84) (Bendix Field Engineering Corporation, 1984). These data were evaluated to determine the areal and vertical extent of uranium mill tailings contamination at this property as well as any other contaminated material that may have originated from the millsite.

A review of historical information from the files of the Colorado Department of Health (CDH) and the inclusion data from Oak Ridge National Laboratory (ORNL) was conducted. These records indicate contamination in the north and south yards and around the primary structure.

The Bendix radiologic survey was designed to investigate the entire property, with emphasis on previously identified areas of contamination. Conclusions based upon data analyses are discussed in Section 3.5, Extent of Contamination. Photocopies of the Official Survey Report, team leader notes, deconvolution graphs, and Exterior Gamma Scan map are included in the Appendix (Section 6.0).

3.2 Gamma Exposure-Rate Surveys

3.2.1 Exterior Findings

Background Readings: 14 to 15 uR/h
Highest Outside Gamma Reading (HOG): 80 uR/h

Exterior radium-concentration measurements are presented in Appendix Table 3.1. Grid-point survey results are shown in Appendix Figure 3.1.

3.2.2 Interior Findings

Background Readings: 13 to 14 uR/h
Highest Inside Gamma Reading (HIG): 17 uR/h

Interior gamma exposure-rate measurements are summarized in Appendix Table 3.2.

3.3 Boreholes, Soil Samples, and Other Measurements

Areas which displayed elevated gamma levels were further investigated; these areas are shown in Appendix Figure 3.2. Data from these investigations are included in Appendix Table 3.1.

3.4 Radon/Radon Daughter Concentration (RDC)

The working level was not assessed by CDH. No RDC measurements were taken by Bendix.

3.5 Extent of Contamination

Appendix Figure 3.3 shows identified areas and estimated depths of contamination on this property, based on assessments of all measurements taken. As noted in this figure, areas recommended for remedial action that contain identified residual radioactive materials are:

(AREA A) Contamination in the northeast corner of the property is 15 inches deep (approximately 84 sf).

(AREA B) Two deposits at the north side of the primary structure are 6 inches deep (approximately 56 sf).

(AREA C) A deposit at the east side of the primary structure extends to a depth of 6 inches (approximately 44 sf).

(AREA D) Contamination south of the primary structure is 6 inches deep (approximately 51 sf).

(AREA E) A deposit in the southeast yard, and along the east property line, extends to a depth of 12 inches (approximately 426 sf).

(AREA F) Contamination south of the south property line is 6 inches deep (approximately 168 sf).

(AREA G) Contamination in the center of the south yard extends to a depth of 15 inches (approximately 221 sf).

(AREA H) A deposit east of the sidewalk in the south yard is 12 inches deep (approximately 123 sf).

(AREA I) A small deposit south of the south property line in the alley right-of-way is 6 inches deep (approximately 36 sf).

(AREA J) A large deposit in the southwest corner of the property extends to a depth of 12 inches (approximately 450 sf).

(AREA K) Contamination west of the sidewalk in the south yard is 6 inches deep (approximately 105 sf).

(AREA L) A small deposit east of the west property line is 6 inches deep (approximately 24 sf).

(AREA M) Contamination immediately north of the primary structure is 15 inches deep (approximately 65 sf).

(AREA N) A deposit in the north yard, continuing into the street right-of-way, extends to a depth of 12 inches (approximately 60 sf).

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-00913-RS, includes removal of all areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figure 3.3) and transport of removed material to the disposal site.

After remedial action is completed, the areas involved will be restored to original condition in accordance with the Bendix drawings, Vicinity Properties General Construction Specification (Bendix Field Engineering Corporation, 1984), and Statement of Work for Construction Subcontractor.

Dislocation of the occupants will not be required for this remedial action.

4.2 Evaluation of Recommended Remedial Action

Volume calculations of the areas included for remedial action are presented in Appendix Table 4.1. Cost estimates are presented in Appendix Table 4.2.

Estimated cost of remedial action is $6,384.

This remedial action will result in removal of the identified residual radioactive materials.

There is no owner preference with respect to remedial action and no legal or other complications are foreseen at this time.

5.0 REFERENCES

ARIX, A Professional Corporation, Procedures Manual for the Grand Junction Remedial Action Program, for Colorado Department of Health, Radiation Control Division, and the U.S. Department of Energy, 1983.

Bendix Field Engineering Corporation, Procedures Manual Radiologic Support Operations Grand Junction Vicinity Properties, (GJ-07), for U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, 1984.

Bendix Field Engineering Corporation, Engineering, Construction, and Land Support Manual Grand Junction Vicinity Properties Project, (GJ-08), for U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, 1984.

Bendix Field Engineering Corporation, Grand Junction Vicinity Properties Operating Manual, (GJ-16) for U.S. Department of Energy, Nuclear Energy Programs, Division of Remedial Action Projects, UMTRA, 1984.

Bendix Field Engineering Corporation, Vicinity Properties General Construction Specification, for U.S. Department of Energy, Nuclear Energy Programs, Division of Remedial Action Projects, UMTRA, 1984.

Bendix Field Engineering Corporation, Environmental Assessment of Preliminary Cleanup Activities at Offsite Properties Contaminated by Tailings from the Grand Junction Inactive Uranium Millsite, (GJ-04), for U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations, Albuquerque, New Mexico, 1983.

U.S. Department of Energy, Programmatic Memorandum of Agreement (DOE No. DE-GM04-84AL28460) between the U.S. Department of Energy, the Advisory Council on Historic Preservation, and the Colorado State Historic Preservation Officer, for UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, 1984.

U.S. Department of Energy, Vicinity Properties Management and Implementation Manual, for UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, 1984.

U.S. Environmental Protection Agency, Standards for Remedial Action at Inactive Uranium Processing Sites (40 CFR Part 192), Washington, D.C., 1983.

6.0 APPENDIX

This Appendix contains the following:

Appendix Tables:
- Table 3.1 Radium Concentrations at Exterior Locations
- Table 3.2 Summary of Interior Gamma Exposure Rates
- Table 4.1 Area and Volume Calculations
- Table 4.2 Estimated Cost of Decontamination and Restoration

Appendix Figures:
- Figure 2.1 Vicinity Map
- Figure 2.2 Site Plan
- Figure 3.1 Exterior Grid-Point Exposure Rates
- Figure 3.2 Sample Locations
- Figure 3.3 Estimated Extent of Contamination

Official Survey Report
Team Leader Notes
Deconvolution Graphs (Apparent Radium-226 Concentration)
Exterior Gamma Scan Map

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
1	151250	00	DS	1.2		*	North sidewalk
2	160235	03	TC	10.7		*	North yard
		06	TC	12.1		*	DC = 12 inches
		09	TC	9.6		*	Based on the
		12	TC	6.8		*	deconvolution graph
		15	TC	5.1		*	
		18	TC	4.4		*	
		21	TC	4.0		*	
		24	TC	3.7		*	
		27	TC	3.5		*	
		30	TC	3.5		*	
		33	TC	3.6		*	
		36	TC	3.6		*	
		39	TC	3.6		*	
		42	TC	3.6		*	
		45	TC	3.5		*	
3	163267	03	TC	18.0		*	North yard
		06	TC	18.1		*	DC = 15 inches
		09	TC	18.6		*	Based on the
		12	TC	12.5		*	deconvolution graph
		15	TC	8.3		*	
		18	TC	6.1		*	
		21	TC	5.0		*	
		24	TC	4.3		*	
		27	TC	3.9		*	
		30	TC	3.8		*	
		33	TC	3.6		*	
		36	TC	3.4		*	
		39	TC	3.4		*	
		42	TC	3.4		*	
		45	TC	3.4		*	
		48	TC	3.3		*	
4	184240	00	DS	<1.0		*	On sidewalk
5	188238	00	DS	29.3		*	North side of
		06	DS	17.1		*	primary structure
		03	TC	16.7		*	DC = 15 inches
		06	TC	18.6		*	Based on the
		09	TC	17.0		*	deconvolution graph
		12	TC	12.6		*	
		15	TC	8.2		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
5	188238	18	TC	6.0		*	
		21	TC	4.8		*	
		24	TC	4.3		*	
		27	TC	3.9		*	
		30	TC	3.8		*	
		33	TC	3.7		*	
		36	TC	3.7		*	
		39	TC	3.6		*	
		42	TC	3.6		*	
		45	TC	3.5		*	
		48	TC	3.6		*	
		51	TC	3.6		*	
		54	TC	3.6		*	
		57	TC	3.6		*	
		60	TC	3.5		*	
		63	TC	3.6		*	
		66	TC	3.5		*	
		69	TC	3.5		*	
		72	TC	3.4		*	
		75	TC	3.5		*	
		78	TC	3.5		*	
		81	TC	3.6		*	
		84	TC	3.5		*	
		87	TC	3.4		*	
		90	TC	3.3		*	
		93	TC	3.3		*	
		96	TC	3.3		*	
		99	TC	3.4		*	
		102	TC	3.6		*	
6	188250	00	DS	2.8		*	North property
		06	DS	1.1		*	DC = 6 inches
7	188258	00	DS	1.8		*	North of primary
		06	DS	1.4		*	structure
8	194272	00	DS	<1.0		*	Gas line
		06	DS	<1.0		*	DC = 0 inches
		03	TC	3.8		*	
		06	TC	3.9		*	
		09	TC	3.9		*	
		12	TC	3.9		*	
		15	TC	3.7		*	
		18	TC	3.5		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
8	194272	21	TC	3.5		*	
		24	TC	3.5		*	
		27	TC	3.5		*	
		30	TC	3.6		*	
		33	TC	3.6		*	
		36	TC	3.6		*	
		39	TC	3.7		*	
		42	TC	3.7		*	
		45	TC	3.7		*	
		48	TC	3.7		*	
		51	TC	3.7		*	
		54	TC	3.7		*	
		57	TC	3.7		*	
		60	TC	3.7		*	
		63	TC	3.7		*	
		66	TC	3.7		*	
9	200271	00	DS	9.6		*	East property
		06	DS	<1.0		*	DC = 6 inches
10	204270	00	DS	43.8		*	East property
		06	DS	2.5		*	DC = 6 inches
		12	DS	<1.0		*	
11	205270	[12]	DS	<1.0		*	East side of
		[12]	GS		12.6	*	primary structure
		00	GS		30.2	*	
12	210271	00	DS	8.0		*	East property
		06	DS	<1.0		*	DC = 6 inches
13	217272	03	TC	8.4		*	Southeast corner
		06	TC	8.0		*	of primary structure
		09	TC	6.3		*	DC = 12 inches
		12	TC	5.1		*	Based on the
		15	TC	4.2		*	deconvolution graph
		18	TC	3.9		*	
		21	TC	3.7		*	
		24	TC	3.7		*	
		27	TC	3.6		*	
		30	TC	3.6		*	
		33	TC	3.6		*	
		36	TC	3.6		*	

Table 3.1
Radium Concentrations at Exterior Locations
2215 Mesa Avenue

DOE ID #GJ-00913-RS

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	In Situ Ra-226 (pCi/g) Spectr.	Chem Ra-226 (pCi/g)	Comments
13	217272	39	TC	3.6		*	
		42	TC	3.6		*	
14	220253	00	DS	3.9		*	Sewer line
		06	DS	<1.0		*	DC = 6 inches
		00	GS		5.0	*	Based on the delta readings
		03	TC	3.6		*	
		06	TC	3.7		*	
		09	TC	3.7		*	
		12	TC	3.8		*	
		15	TC	3.7		*	
		18	TC	3.7		*	
		21	TC	3.6		*	
		24	TC	3.7		*	
		27	TC	3.8		*	
		30	TC	3.9		*	
		33	TC	3.8		*	
		36	TC	3.7		*	
		39	TC	3.6		*	
		42	TC	3.6		*	
		45	TC	3.5		*	
		48	TC	3.5		*	
		51	TC	3.5		*	
		54	TC	3.5		*	
		57	TC	3.4		*	
		60	TC	3.5		*	
		63	TC	3.5		*	
		66	TC	3.3		*	
		69	TC	3.3		*	
		72	TC	3.3		*	
		75	TC	3.2		*	
		78	TC	3.4		*	
		81	TC	3.4		*	
		84	TC	3.4		*	
		87	TC	3.4		*	
		90	TC	3.4		*	
15	230273	00	DS	12.7		*	East property
		06	DS	2.9		*	DC = 12 inches
		12	DS	<1.0		*	
16	245215	00	DS	4.1		*	South yard
		06	DS	1.4		*	DC = 6 inches

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
17	250220	03	TC	5.7		*	South yard
		06	TC	6.0		*	DC = 12 inches
		09	TC	5.5		*	Based on the
		12	TC	4.7		*	deconvolution graph
		15	TC	4.3		*	
		18	TC	4.0		*	
		21	TC	3.8		*	
		24	TC	3.9		*	
		27	TC	3.9		*	
		30	TC	3.9		*	
		33	TC	3.8		*	
		36	TC	3.8		*	
		39	TC	3.7		*	
		42	TC	3.8		*	
		45	TC	3.8		*	
		48	TC	3.6		*	
18	250273	00	DS	15.1		*	East property
		06	DS	5.2		*	DC = 12 inches
		12	DS	1.9		*	
19	260226	00	DS	3.8		*	South yard
		06	DS	1.3		*	DC = 6 inches
20	265273	00	DS	14.4		*	East property
		06	DS	2.6		*	side
		12	DS	1.3		*	DC = 12 inches
21	271265	00	DS	<1.0		*	South yard
		06	DS	<1.0		*	
22	273235	00	DS	1.2		*	South yard
		06	DS	1.5		*	
23	274245	00	DS	1.7		*	South yard
		06	DS	1.3		*	
24	275220	03	TC	9.6		*	South yard
		06	TC	10.8		*	DC = 12 inches
		09	TC	8.6		*	Based on the
		12	TC	6.3		*	deconvolution graph
		15	TC	5.1		*	
		18	TC	4.6		*	
		21	TC	4.3		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
24	275220	24	TC	4.2		*	
		27	TC	4.2		*	
		30	TC	4.2		*	
		33	TC	4.2		*	
		36	TC	4.1		*	
		39	TC	4.0		*	
		42	TC	4.0		*	
		45	TC	4.0		*	
		48	TC	3.9		*	
		51	TC	3.8		*	
25	280228	00	DS	<1.0		*	South yard
26	280235	03	TC	15.3		*	South yard
		06	TC	15.6		*	DC = 12 inches
		09	TC	11.9		*	Based on the
		12	TC	7.9		*	deconvolution graph
		15	TC	5.7		*	
		18	TC	4.7		*	
		21	TC	4.2		*	
		24	TC	3.8		*	
		27	TC	3.7		*	
		30	TC	3.6		*	
		33	TC	3.6		*	
		36	TC	3.7		*	
		39	TC	3.7		*	
		42	TC	3.6		*	
		45	TC	3.6		*	
		48	TC	3.5		*	
		51	TC	3.5		*	
27	280245	03	TC	15.1		*	South yard
		06	TC	15.3		*	DC = 15 inches
		09	TC	12.3		*	Based on the
		12	TC	8.7		*	deconvolution graph
		15	TC	6.0		*	
		18	TC	4.9		*	
		21	TC	4.5		*	
		24	TC	4.1		*	
		27	TC	4.0		*	
		30	TC	3.9		*	
		33	TC	3.9		*	
		36	TC	3.9		*	
		39	TC	3.9		*	

RADRPT V85.1<850513.1530> Table 3.1

Radium Concentrations at Exterior Locations

DOE ID #GJ-00913-RS 2215 Mesa Avenue

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
27	280245	42	TC	3.8		*	
		45	TC	3.7		*	
		48	TC	3.8		*	
28	280265	03	TC	20.3		*	South yard
		06	TC	17.0		*	DC = 12 inches
		09	TC	11.5		*	Based on the
		12	TC	7.4		*	deconvolution graph
		15	TC	5.4		*	
		18	TC	4.6		*	
		21	TC	4.1		*	
		24	TC	4.0		*	
		27	TC	3.8		*	
		30	TC	3.8		*	
		33	TC	3.8		*	
		36	TC	3.7		*	
		39	TC	3.7		*	
		42	TC	3.6		*	
		45	TC	3.7		*	
		48	TC	3.7		*	
29	286220	00	DS	3.0		*	South alley
		06	DS	<1.0		*	DC = 6 inches
30	288245	00	DS	4.6		*	South alley
		06	DS	<1.0		*	DC = 6 inches
31	290265	00	DS	4.0		*	South alley
		06	DS	1.1		*	DC = 6 inches
32	290272	00	DS	3.0		*	South alley
		06	DS	1.2		*	DC = 6 inches

Measurement Types:
- GB = GAD-6 Borehole
- GS = GAD-6 Surface
- DS = Delta Scintillometer
- TC = Total Count Borehole
- SS = Soil Sample
- BH = Combined GAD-6 and Total Count Borehole

Notes:
- DC = Depth of Contamination
- * = No Soil Sample Taken
- [n] = Reading Taken n-Inches Above Floor or Ground
- Date of Survey = 05-16-85
- Team Leader = MJH

Table 3.2
Summary of Interior Gamma Exposure Rates

DOE ID #GJ-00913-RS 2215 Mesa Avenue

Location *	Number of Readings Taken at Waist Level	Range at Waist Level (uR/h)	Mean at Waist Level (uR/h)	Number of Readings Taken at Surface	Range at Surface (uR/h)	Mean Surface (uR/h)
BASEMENT	*	*	*	*	16-17	*
GROUND FLOOR	*	*	*	*	13-15	*
METAL SHED 1	*	*	*	*	14-15	*

* The CDH and ORNL data indicate the absence of interior contamination at this property. This information was investigated by performing walking gamma scans.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-00913-RS

AREA	CALCULATIONS(ft)		SF		DEPTH(ft)		CF	CUBIC YARDS
EXTERIOR								
	Contaminated Fill							
A	12 x 7	=	84	x	1.3	=	109	
B	2 x 12	=	24					
	4 x 8	=	32					
			56	x	0.5	=	28	
C	22 x 2	=	44	x	0.5	=	22	
D	3 x 17	=	51	x	0.5	=	26	
E	57 x 3	=	171					
	15 x 17	=	255					
			426	x	1.0	=	426	
F	4 x 42	=	168	x	0.5	=	84	
G	13 x 17	=	221	x	1.3	=	287	
H	13 x 6	=	78					
	9 x 5	=	45					
			123	x	1.0	=	123	
I	3 x 12	=	36	x	0.5	=	18	
J	45 x 10	=	450	x	1.0	=	450	
K	35 x 3	=	105	x	0.5	=	53	

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-00913-RS

AREA	CALCULATIONS(ft)		SF		DEPTH(ft)		CF				CUBIC YARDS
L	8 x 3	=	24	x	0.5	=	12				
M	5 x 13	=	65	x	1.3	=	85				
N	10 x 6	=	60	x	1.0	=	60				
	Volume of Contaminated Fill					=	1,783	=	1,783/27	=	66
	TOTAL VOLUME - EXTERIOR									=	66

See Appendix Figure 3.3 For Areas

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-00913-RS

EXTERIOR		
Remove and replace chain link fence		
215 lf @ $2.60/lf	$	559
Remove and replace clothesline		
Lump Sum		50
Remove and replace metal storage shed - 2		
Lump Sum		250
Remove and replace one green ash tree		
Lump Sum		150
Remove and replace shrubs and rose bushes		
Lump Sum		240
Remove identified residual radioactive material		
53 cy @ $14.50/cy (machine-open)		769
13 cy @ $44/cy (manual-open)		572
Replace roadbase		
4 cy @ $11.50/cy		46
Place topsoil		
62 cy @ $9.50/cy		589
Place sod		
1,589 sf @ $.50/sf		795
SUBTOTAL EXTERIOR	$	4,020

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-00913-RS

TOTAL EXTERIOR	$ 4,020
TOTAL INTERIOR	0
ACCESS CONTROL	250
SUBTOTAL	$ 4,270
CONTINGENCY @ 15%	641
SUBTOTAL	$ 4,911
CONTRACTOR OVERHEAD & PROFIT @ 30%	1,473
GRAND TOTAL	$ 6,384

RDJ/080885
REA00913/REA-GE007/LMR

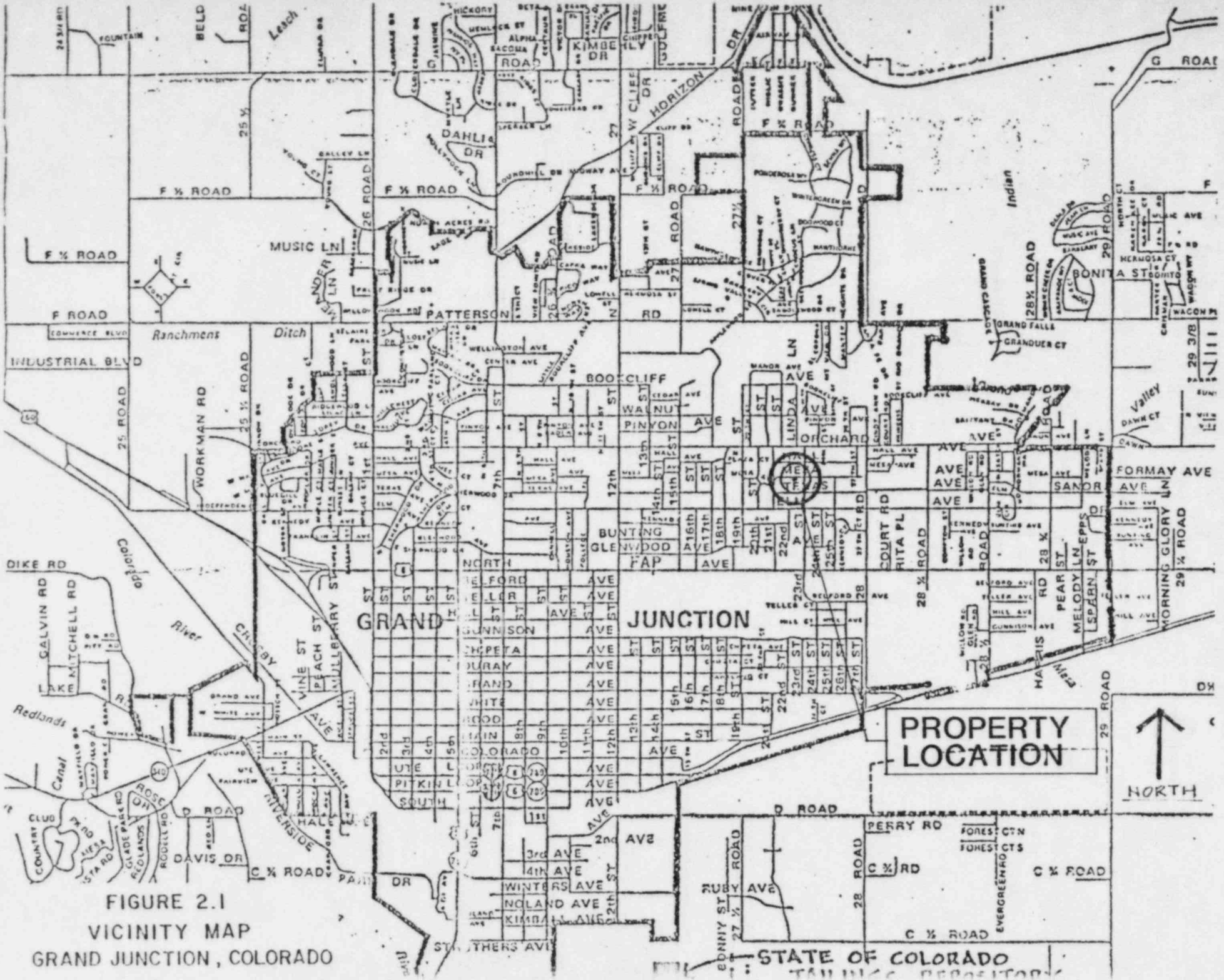
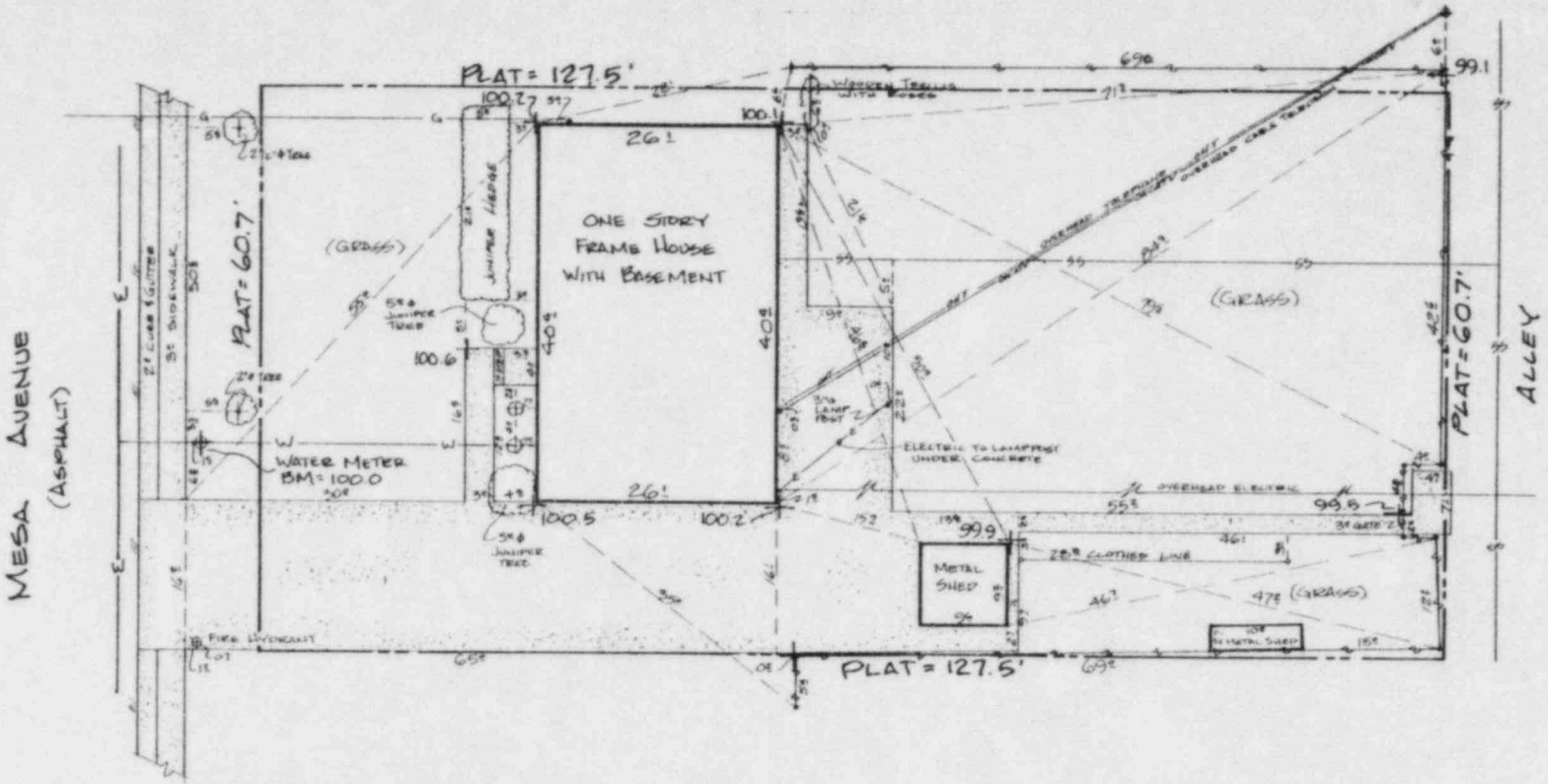


FIGURE 2.1
VICINITY MAP
GRAND JUNCTION, COLORADO

LOT 10 BLOCK 2 WILCOX AND BIXBY SUBDIVISION,
GRAND JUNCTION, COLORADO.



10 5 0 10 20
SCALE IN FEET

This drawing, prepared for the Uranium Mill Tailings Remedial Action Project, is for the sole use of the U.S. Department of Energy and its contractors. It is not a land survey plat or an improvement survey plat and is not to be relied upon for the establishment of fence, building, or other future improvement lines.

FIGURE 2.2 SITE PLAN

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECT OFFICE, COLORADO					DOE I.D. NO. GJ00913RS
ADDRESS 2215 MESA AVENUE GRAND JUNCTION, COLORADO					ALLIED
SURV RLB	5-1-85	DRAFT RSK	5-3-85	CK	
DRAWING NO 3-C650-F1				SHEET 1 OF 1	

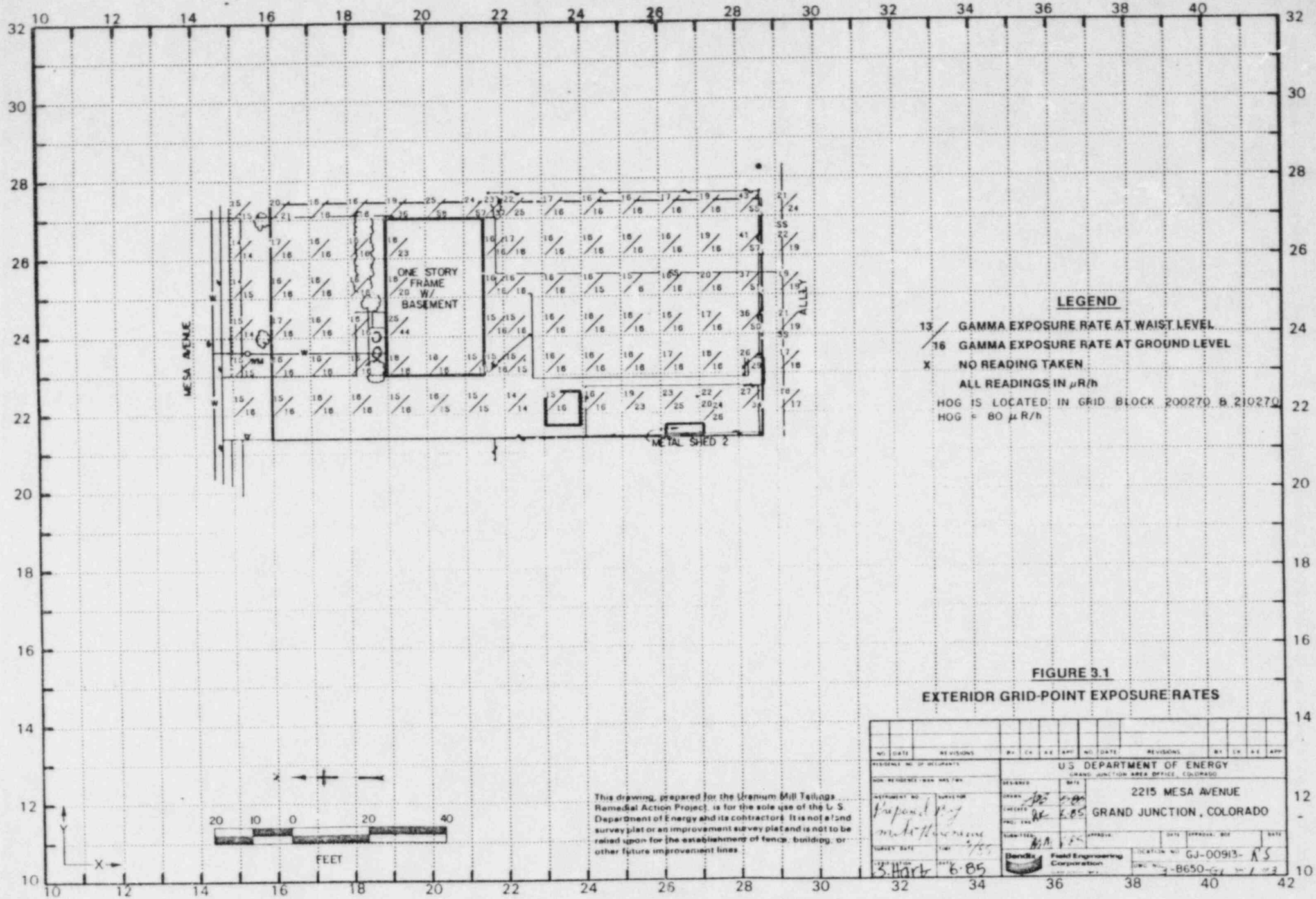


FIGURE 3.1

EXTERIOR GRID-POINT EXPOSURE RATES

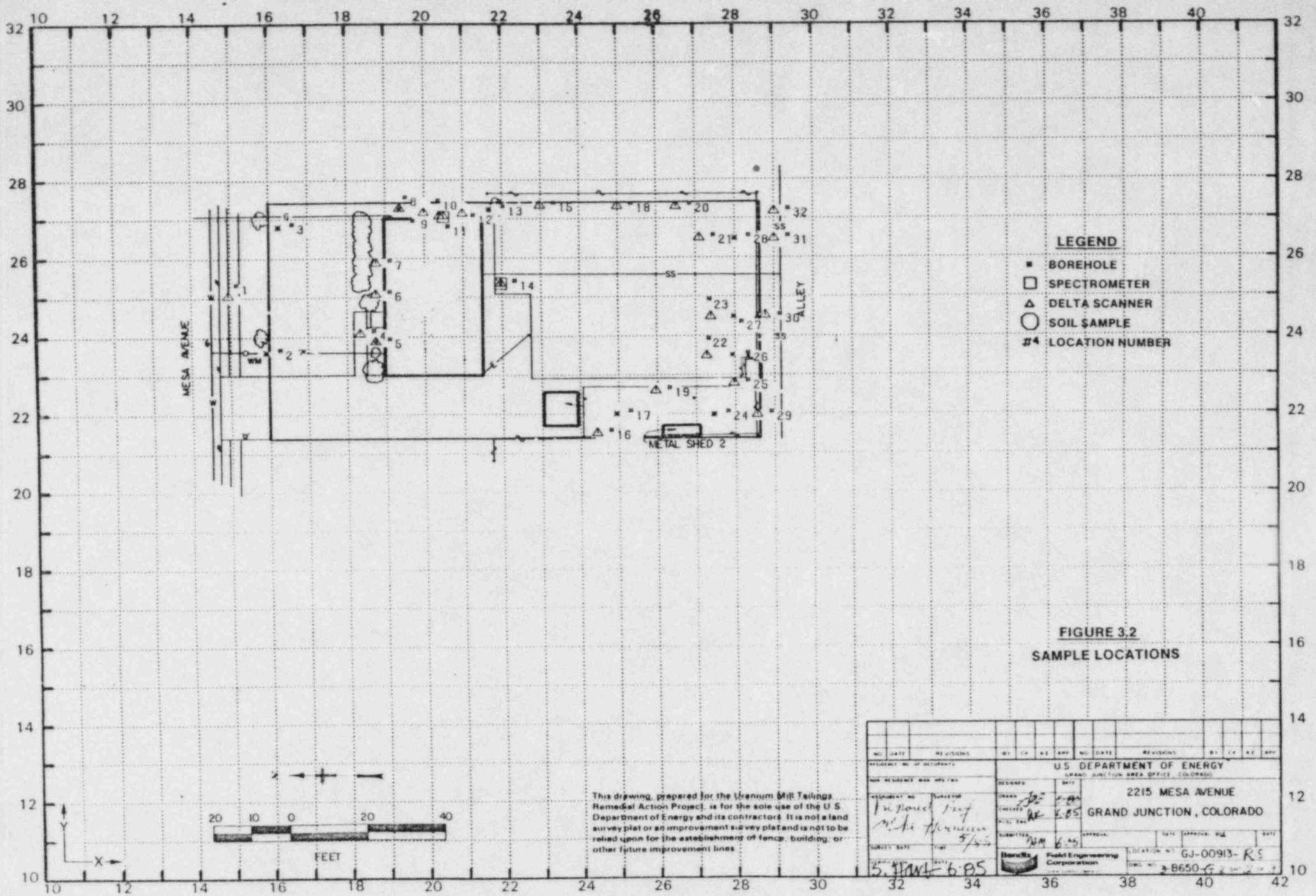


FIGURE 3.2

SAMPLE LOCATIONS

This drawing, prepared for the Uranium Mill Tailings Remedial Action Project, is for the sole use of the U.S. Department of Energy and its contractors. It is not a land survey plat or an improvement survey plat and is not to be relied upon for the establishment of fence, building, or other future improvement lines.

U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION AREA OFFICE, COLORADO

2215 MESA AVENUE
GRAND JUNCTION, COLORADO

Bendix Field Engineering Corporation

GJ-00913-KS
B650-G

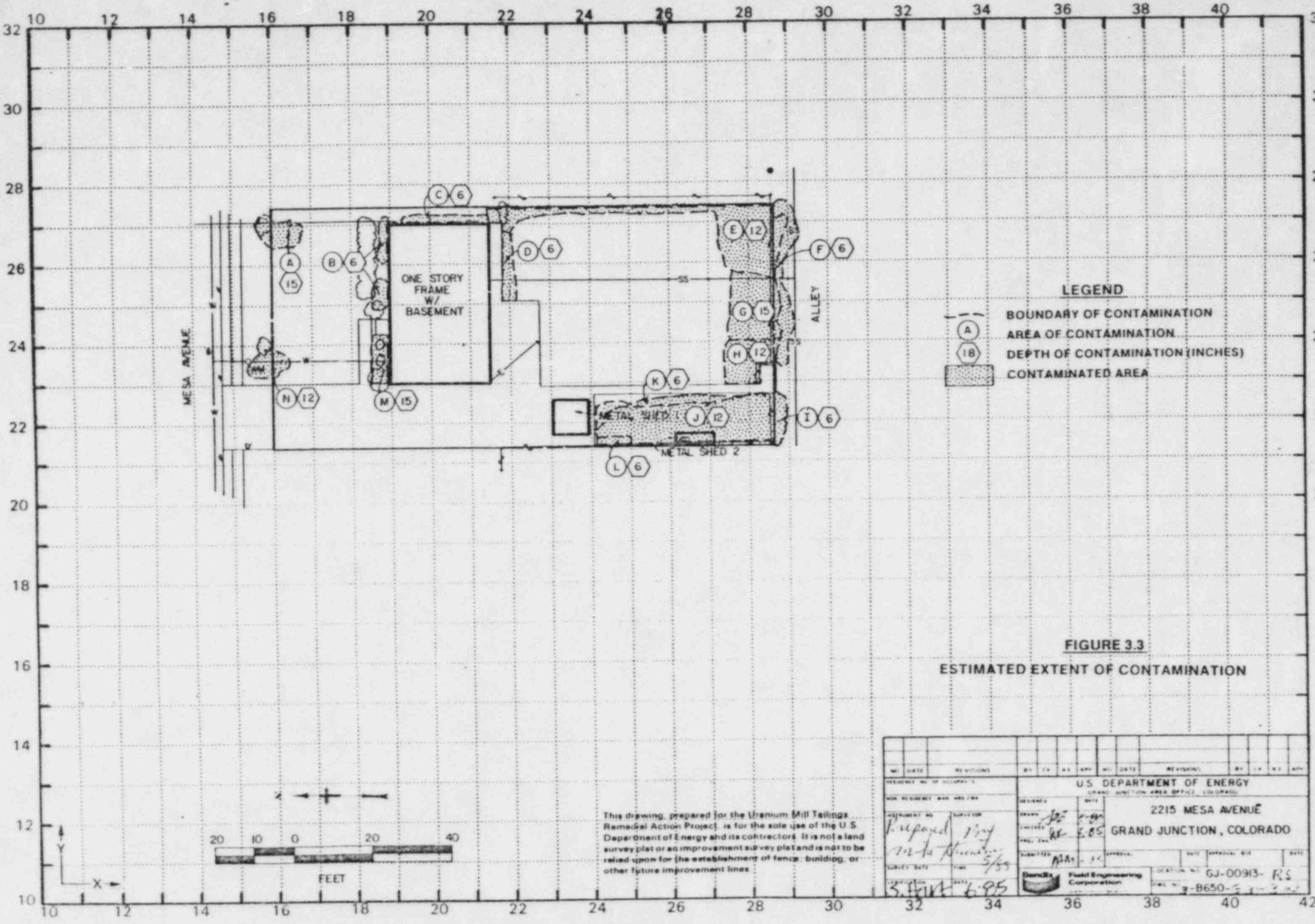


FIGURE 3.3

ESTIMATED EXTENT OF CONTAMINATION

3/85

DOE ID NO. GJ-00913 Date 5-29-85

U.S. DEPARTMENT OF ENERGY
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT
GRAND JUNCTION VICINITY PROPERTIES

Official Survey Report

Property Address 2215 Mesa Avenue

Property Owner Mr. and Mrs. Charles E. Kirkhart

Address of Owner (if different from above) NA.

Report Prepared By Mike Heronema

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

1 1 No evidence of residual radioactive material on surveyed property.

1 X 1 Residual ractioactive materials found at the following locations:

1 X 1 In open areas.

1 X 1 Under or around exterior improvements.

1 X 1 Under or around a typically nonoccupied structure.

1 X 1 Under or around a typically occupied structure.

II. RESULTS OF RADIOLOGIC ASSESSMENT

1 1 Levels of radiation from residual radioactive materials, if any, do not exceed EPA Standards and no action is required under the Uranium Mill Tailings Remedial Action Project.

1 X 1 Levels of radiation from residual radioactive materials exceed EPA Standards such that Remedial Action is recommended and will be accomplished, with your consent, as soon as budget and schedule permit.

cc:
G. A. Franz, III, GJ/CDH
J. Themelis, Mgr. UMTRA Proj. Off.

HIG = 17 uR/h
HOG = 80 uR/h

MEMORANDUM

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado

Date: May 23, 1985

To: Files

From: Mike Heronema

Subject: Team Leader Notes - GJ-00913-RS

Address: 2215 Mesa Avenue

Owner: Mr. and Mrs. Charles E. Kirkhart

Team Members

M. Heronema (Team Leader)
M. Dexter
C. Adams
D. Dow
M. Gilfillan
R. Schouten

Instruments

Total Count - C-3573
Crutch Scintillometer - C-1166, C-1127, C-1182, C-3502, C-1036, C-1239
Delta Scintillometer - C-3940, C-3942
Surface Spectrometer - C-3431

Date: May 16, 1985

All utilities were investigated with no apparent contamination.

Elevated readings in Shed 2 were investigated. Shine from the contaminated soil beneath the shed is suspected. Shed 2 is located incorrectly on the map; the location should be 260210 and not 250210. The maps will be returned to drafting for correction.

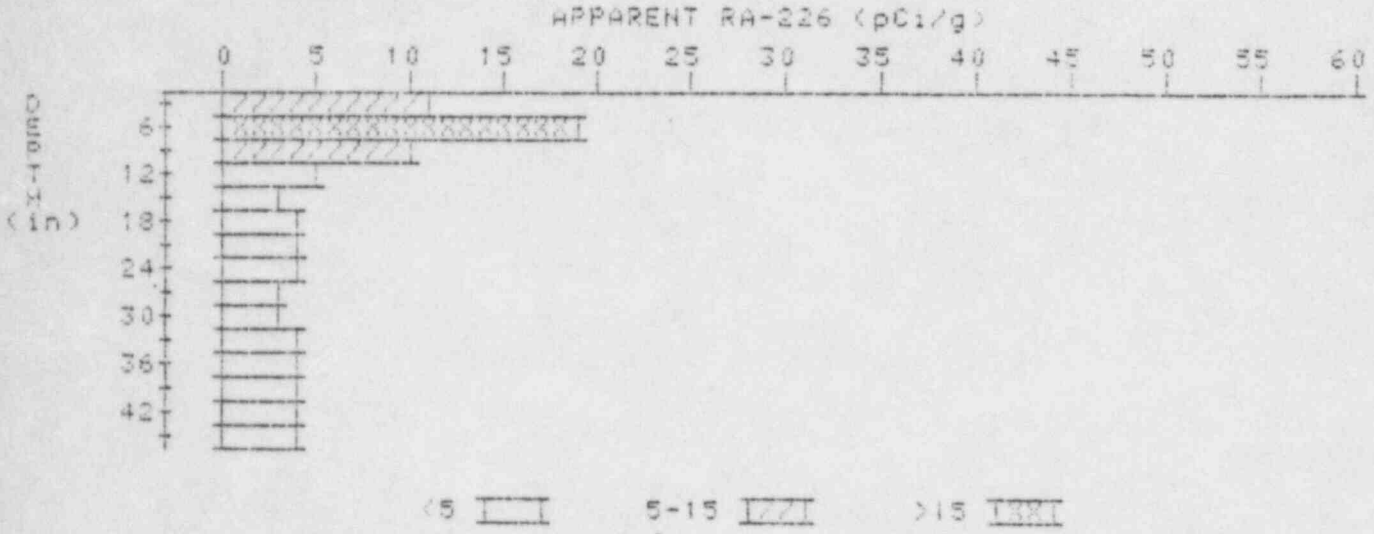
Date: May 23, 19885

Contamination in Shed 2 will be considered as exterior contamination per D. Mackler.

DECON V05.1(850524.0923)

APPARENT RADIUM-226 CONCENTRATION 2
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00913-RS
HOLE NUMBER: 2
LOCATION: 160233

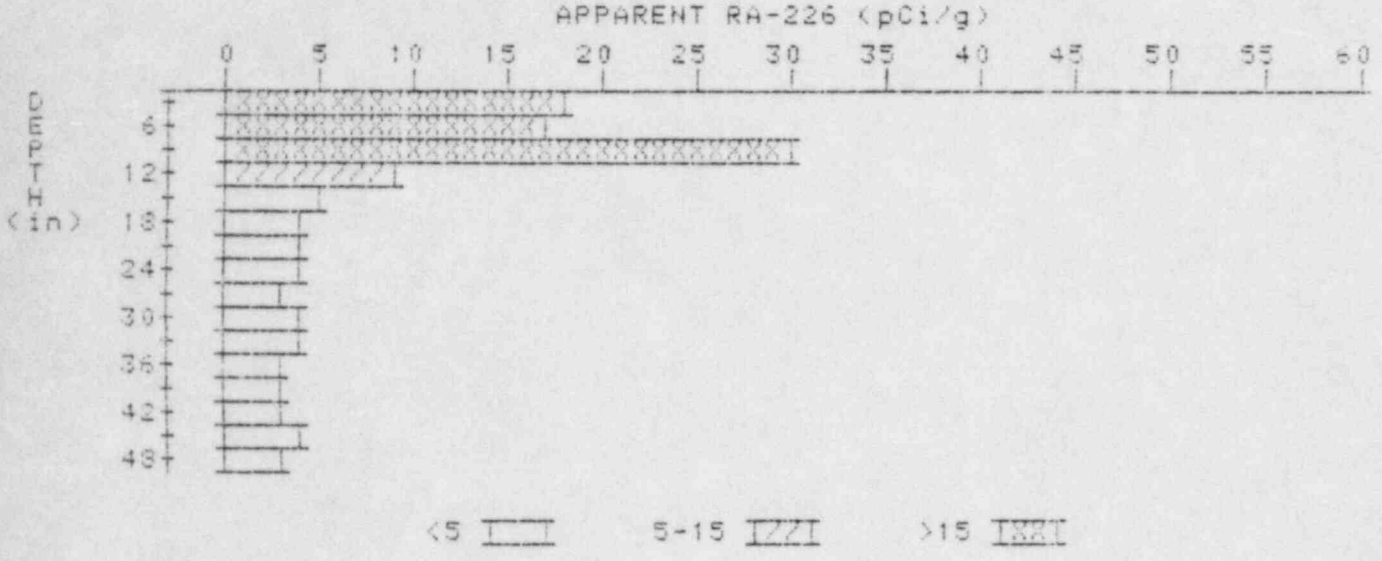


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	10.7	10.7
6	12.1	19.0
9	9.6	10.1
12	6.8	4.8
15	5.1	3.3
18	4.4	3.9
21	4.0	3.8
24	3.7	3.5
27	3.5	3.1
30	3.5	3.3
33	3.6	3.6
36	3.6	3.6
39	3.6	3.6
42	3.6	3.9
45	3.5	3.5

DECON V85.1(850524.0823)

APPARENT RADIUM-226 CONCENTRATION 3
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00913-RS
HOLE NUMBER: 3-
LOCATION: 163267

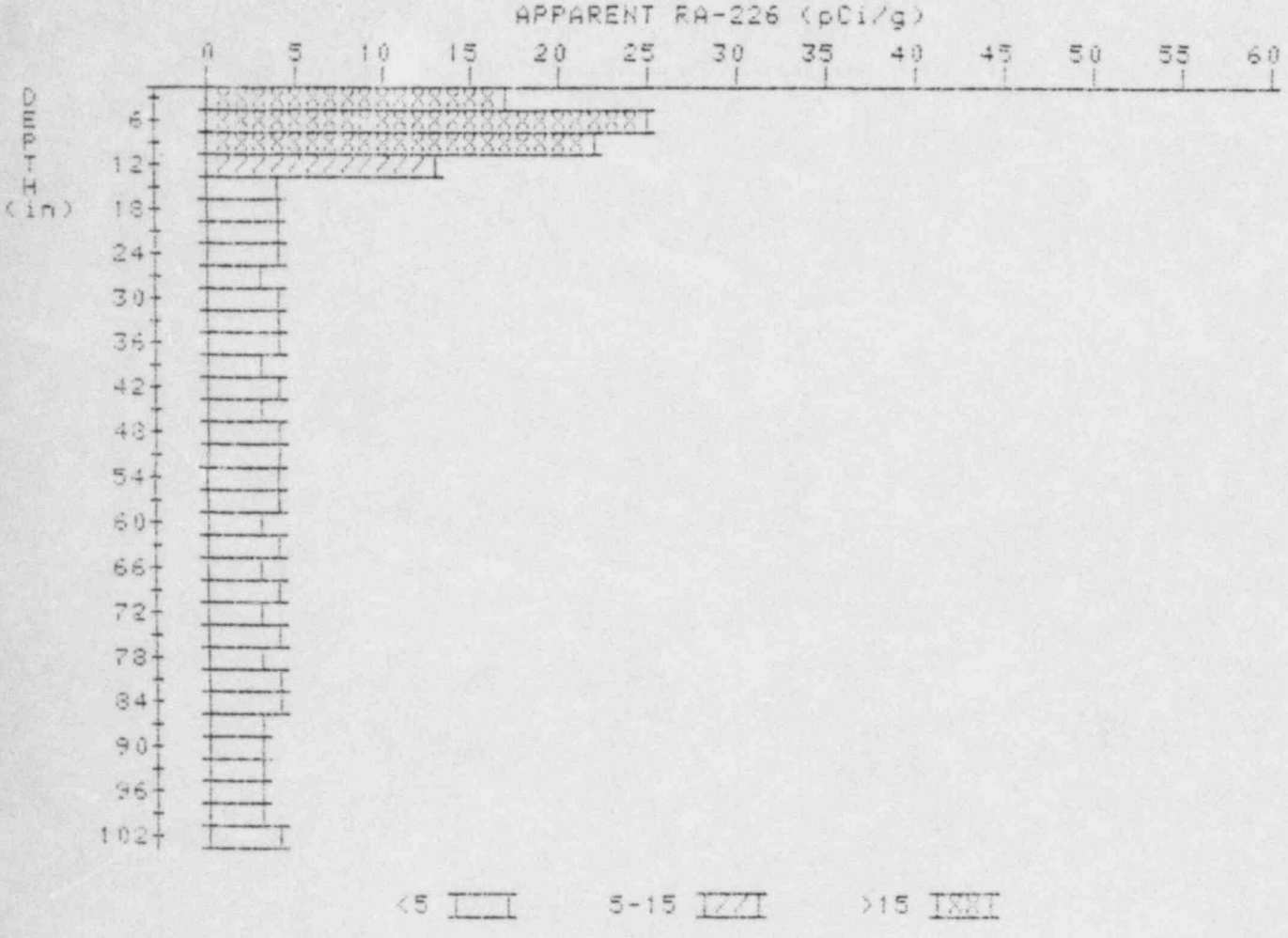


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	18.0	18.0
6	18.1	17.4
9	18.6	30.3
12	12.5	9.1
15	8.3	4.7
18	6.1	4.1
21	5.0	4.3
24	4.3	3.8
27	3.9	3.4
30	3.8	4.0
33	3.6	3.6
36	3.4	3.0
39	3.4	3.4
42	3.4	3.4
45	3.4	3.6
48	3.3	3.3

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION 5
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00913-RS
HOLE NUMBER: 5
LOCATION: 188238



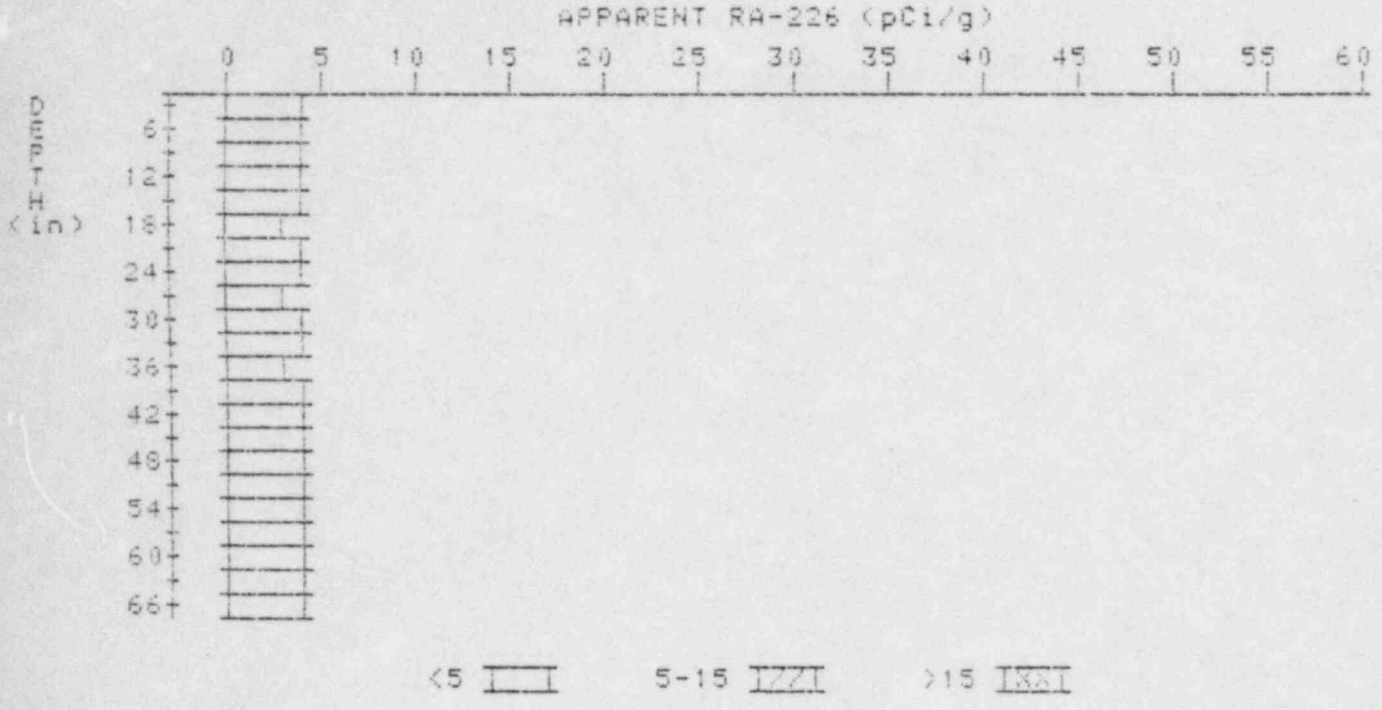
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	16.7	16.7
6	18.6	24.8
9	17.0	22.0
12	12.6	12.6
15	8.2	4.3
18	6.0	4.2
21	4.8	3.6

24	4.3	4.1
27	3.9	3.4
30	3.8	3.8
33	3.7	3.5
36	3.7	3.9
39	3.6	3.4
42	3.6	3.8
45	3.5	3.1
48	3.6	3.8
51	3.6	3.6
54	3.6	3.6
57	3.6	3.8
60	3.5	3.1
63	3.6	4.0
66	3.5	3.3
69	3.5	3.7
72	3.4	3.0
75	3.5	3.7
78	3.5	3.3
81	3.6	4.0
84	3.5	3.5
87	3.4	3.4
90	3.3	3.1
93	3.3	3.3
96	3.3	3.1
99	3.4	3.2
102	3.6	3.6

DECON V85.1(850524.0823)

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: CJ-00913-RS
HOLE NUMBER: 8
LOCATION: 194272



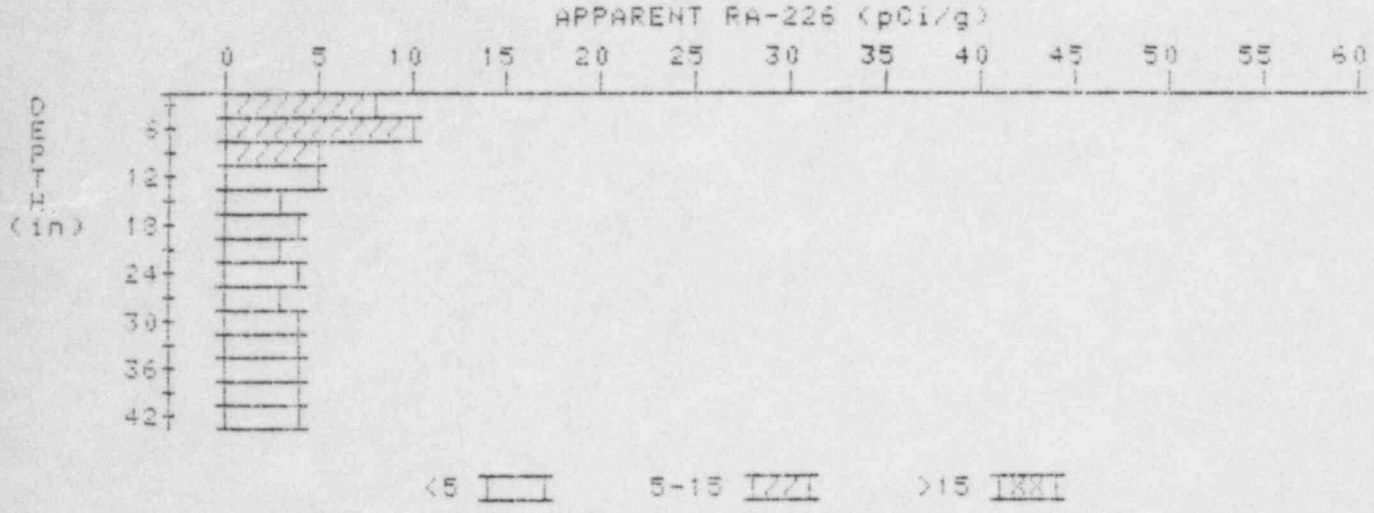
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.8	3.8
6	3.9	4.1
9	3.9	3.9
12	3.9	4.3
15	3.7	3.7
18	3.5	3.1
21	3.5	3.5
24	3.5	3.5
27	3.5	3.3
30	3.6	3.8
33	3.6	3.6
36	3.6	3.4
39	3.7	3.9
42	3.7	3.7
45	3.7	3.7
48	3.7	3.7

51	3.7	3.7
54	3.7	3.7
57	3.7	3.7
60	3.7	3.7
63	3.7	3.7
66	3.7	3.7

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION 13
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00913-RS
HOLE NUMBER: 13
LOCATION: 217272

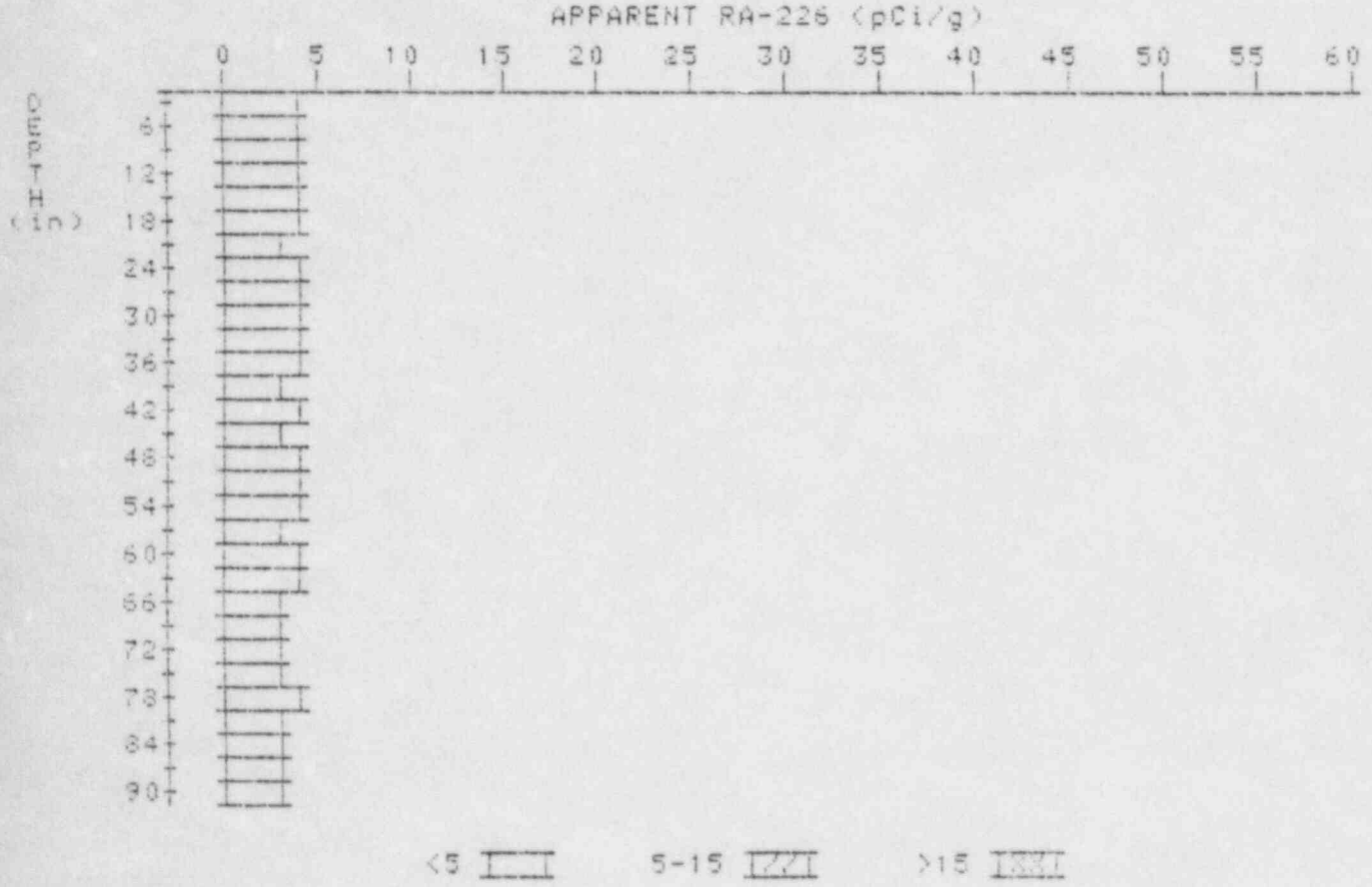


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	8.4	8.4
6	8.0	10.3
9	6.3	5.4
12	5.1	4.6
15	4.2	3.1
18	3.9	3.7
21	3.7	3.3
24	3.7	3.9
27	3.6	3.4
30	3.6	3.6
33	3.6	3.6
36	3.6	3.6
39	3.6	3.6
42	3.6	3.6

DECON V85.1(850524.0823)

APPARENT RADIUM-226 CONCENTRATION 14
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00913-R3
HOLE NUMBER: 14
LOCATION: 220253



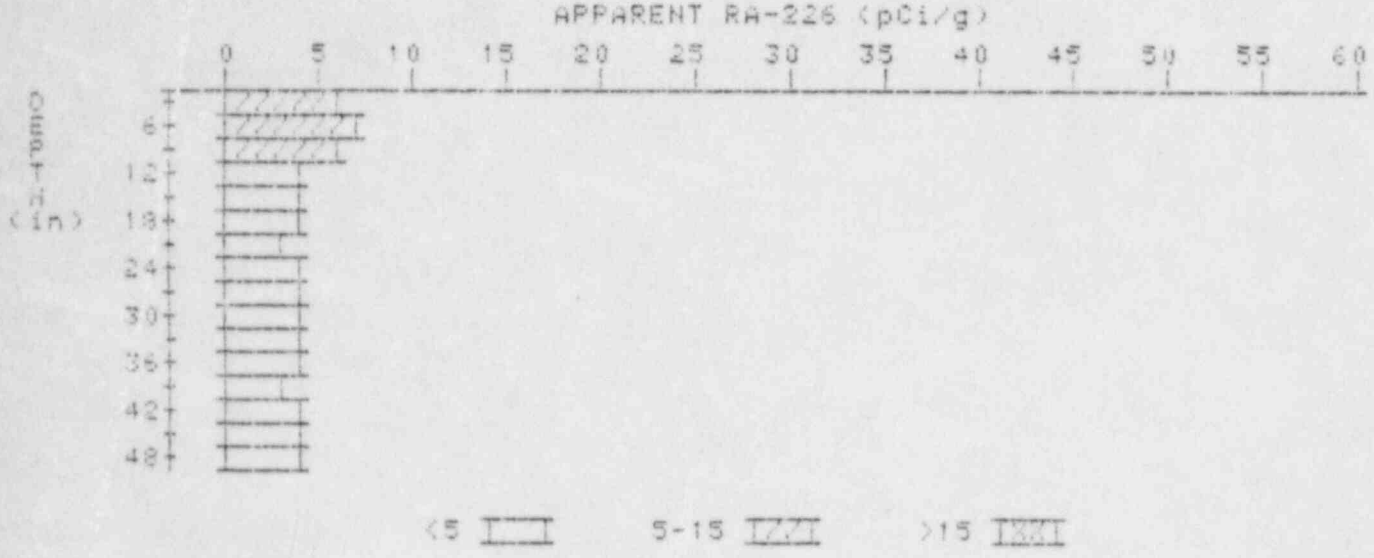
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.6	3.6
6	3.7	3.9
9	3.7	3.6
12	3.8	4.2
15	3.7	3.5
18	3.7	3.9
21	3.6	3.2
24	3.7	3.7
27	3.8	3.8
30	3.9	4.3

33	3.8	3.8
36	3.7	3.7
39	3.6	3.4
42	3.6	3.8
45	3.5	3.3
48	3.5	3.5
51	3.5	3.6
54	3.5	3.7
57	3.4	3.0
60	3.5	3.7
63	3.5	3.9
66	3.3	2.9
69	3.3	3.3
72	3.3	3.5
75	3.2	2.7
78	3.4	3.8
81	3.4	3.4
84	3.4	3.4
87	3.4	3.4
90	3.4	3.4

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION 17
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00913-R8
HOLE NUMBER: 17
LOCATION: 230220

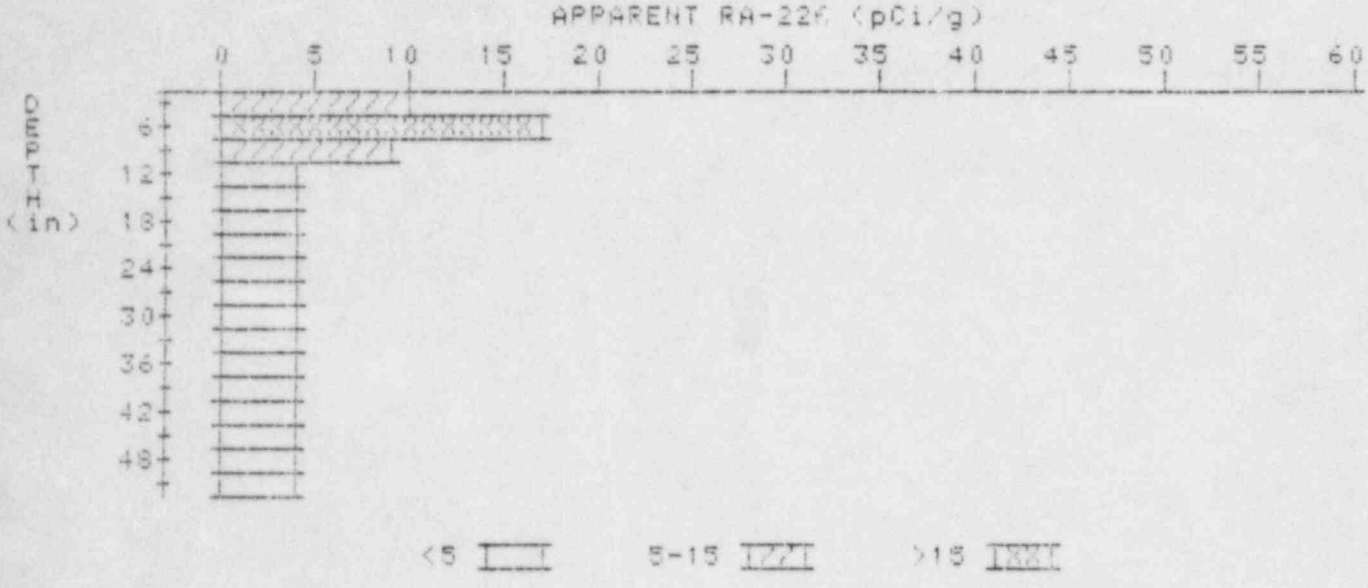


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.7	5.7
6	6.0	7.4
9	5.5	6.0
12	4.7	4.0
15	4.3	4.1
18	4.0	3.8
21	3.9	3.3
24	3.9	4.1
27	3.9	3.9
30	3.9	4.1
33	3.8	3.6
36	3.8	4.0
39	3.7	3.3
42	3.8	4.0
45	3.8	4.2
48	3.6	3.6

DECON V85.1(850524.0823)

APPARENT RADIUM-226 CONCENTRATION 24
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00913-R3
HOLE NUMBER: 24
LOCATION: 275220

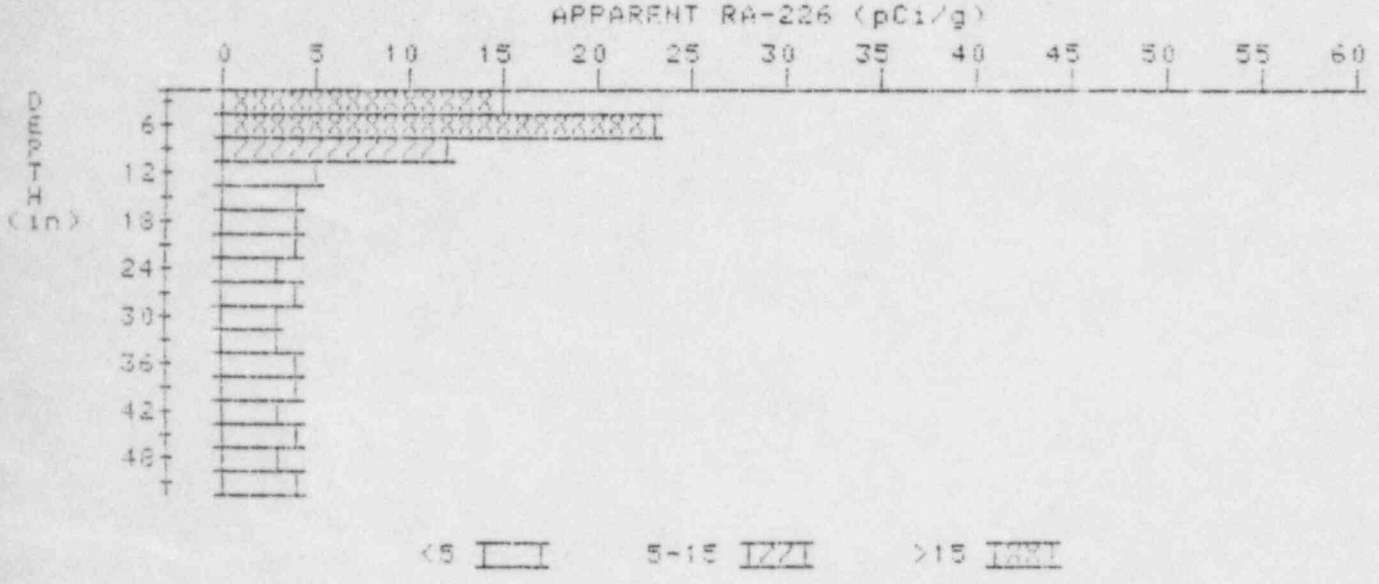


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	9.6	9.6
6	10.8	16.8
9	8.6	8.8
12	6.3	4.3
15	5.1	3.9
18	4.6	4.2
21	4.3	3.9
24	4.2	4.0
27	4.2	4.2
30	4.2	4.2
33	4.2	4.4
36	4.1	4.1
39	4.0	3.8
42	4.0	4.0
45	4.0	4.2
48	3.9	3.9
51	3.8	3.8

DECON V85.1(850524.0623)

APPARENT RADIUM-226 CONCENTRATION 26
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00913-RS
HOLE NUMBER: 26
LOCATION: 280235

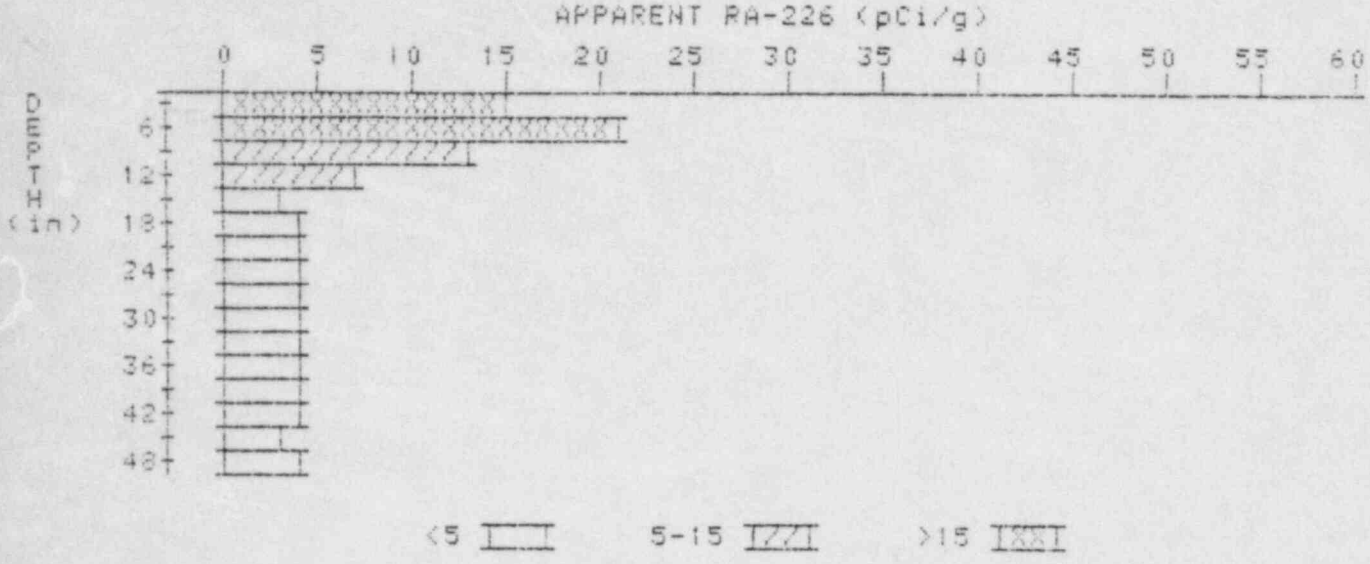


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	15.3	15.3
6	15.6	22.7
9	11.9	12.4
12	7.9	4.7
15	5.7	3.6
18	4.7	3.8
21	4.2	4.0
24	3.8	3.3
27	3.7	3.7
30	3.6	3.4
33	3.6	3.4
36	3.7	3.9
39	3.7	3.9
42	3.6	3.4
45	3.6	3.8
48	3.5	3.3
51	3.5	3.5

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION 27
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00913-RS
HOLE NUMBER: 27
LOCATION: 280245

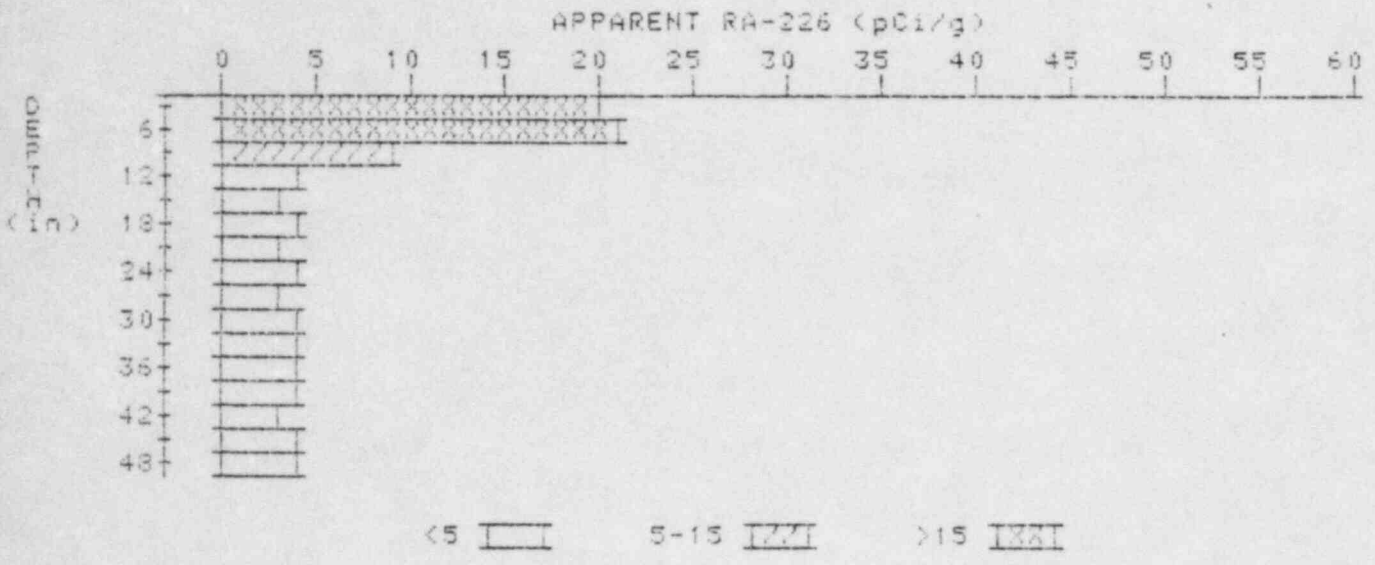


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	15.1	15.1
6	15.3	21.0
9	12.3	13.4
12	8.7	7.1
15	6.0	3.2
18	4.9	3.7
21	4.5	4.5
24	4.1	3.6
27	4.0	4.0
30	3.9	3.7
33	3.9	3.9
36	3.9	3.9
39	3.9	4.1
42	3.8	3.8
45	3.7	3.7
48	3.8	3.8

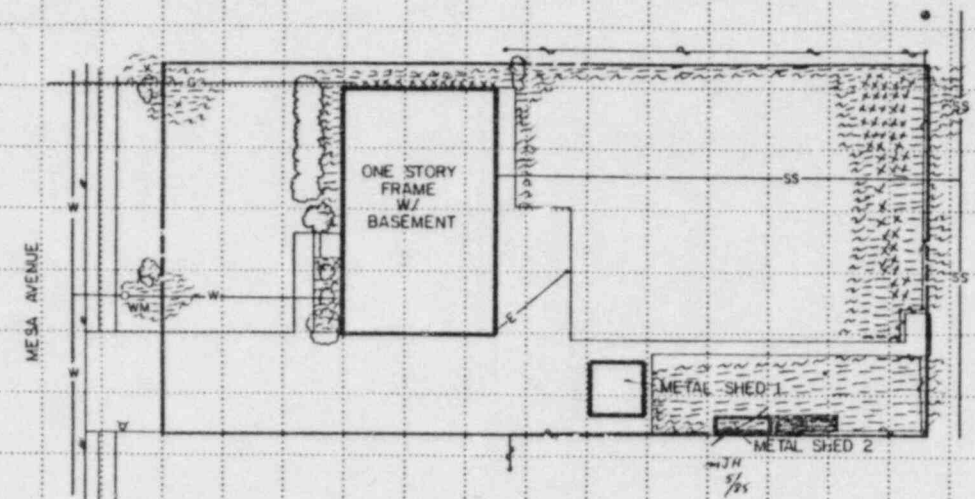
DECON V85.1(850524.0823)

APPARENT RADIUM-226 CONCENTRATION 28
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00913-R8
HOLE NUMBER: 28
LOCATION: 280265



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	20.3	20.3
6	17.0	20.9
9	11.5	9.0
12	7.4	3.7
15	5.4	3.3
18	4.6	4.1
21	4.1	3.4
24	4.0	4.2
27	3.8	3.4
30	3.8	3.8
33	3.8	4.0
36	3.7	3.5
39	3.7	3.9
42	3.6	3.2
45	3.7	3.9
48	3.7	3.7



LEGEND

Gamma Readings of 150 TO 199 cps

Gamma Readings of 200 TO 500 cps

XXXX Gamma Readings of 7500 cps

Exterior Gamma Scan

(Appendix Copy)

X

Y

20 10 0 20 40

FEET

This drawing, prepared for the Uranium Mill Tailings Remedial Action Project, is for the sole use of the U.S. Department of Energy and its contractors. It is not a land survey plat or an improvement survey plat and is not to be relied upon for the establishment of fence, building, or other future improvement lines.

NO	DATE	REVISIONS	BY	CK	AE	APP

U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION AREA OFFICE, COLORADO

2215 MESA AVENUE
GRAND JUNCTION, COLORADO

Prepared By

5/85

5/85

Bendix Field Engineering Corporation

GJ-00913-RS

D-B650-G2