RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-00712-RS
ADDRESS: 1522 ELM AVENUE

APRIL 1985

REVISED JULY 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION
P.O. Box 1569
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DOE PROJECT ENGINEER

DATE July 31, 1985

REA:00712:REA-701

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-00712-RS, is a single-family residence located at 1522 Elm Street, 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 partial 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, 253 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is $15,956. Remedial action on this property will take approximately 20 days to complete.

Area A will not be included in this remedial action, as discussed in Section 4.0.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 1522 Elm Street, Grand Junction, Co.

Zoning: Residential (RMF-32)

Lot Size: Approximately 10,881 sf (0.25 acre)

Legal Description: Lot 9, Paulson Subdivision, Sec. 12, 1S, 1W, City of Garnd 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:	Utility easment
South:	Elm Street
East:	Residence
West:	Residence

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-story residence with attached garage
Size:	Approximately 1,850 sf
Construction Date:	1960
Construction:	Brick veneer on wood frame walls, full height to eaves
Foundation:	Concrete stem wall on spread footing, 24" above grade down to basement level, 6′ below existing grade
Footing Depth:	Approximately 6′ to bottom of footing from grade
Basement:	Full
Crawl Space:	None
Condition:	Good

Other Structures: None

General Remarks:

Tailings are extensive under landscaped areas. 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-00712-RS on December 20, 1984. 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 under and around the primary structure. There were 63 cubic yards of contaminated material removed in the basement and around the foundation during remedial action in 1975. CDH stated that contaminated material remains under the front porch, in mixed deposits in the yard, and in the mortar of the southeast, east, and northeast walls. The ORNL survey in 1984 indicates significant deposits on several sides of the primary structure, as well as in the entire south yard.

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, Memo of Understanding, team leader notes, and deconvolution graphs are included in the Appendix (Section 6.0).

3.2 Gamma Exposure-Rate Surveys

3.2.1 Exterior Findings

Background Readings: 12 to 14 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. Appendix Figure 3.2 presents the ranges of elevated gamma readings and indicates areas of possible contamination.

3.2.2 Interior Findings

Background Readings: 12 to 14 uR/h
Highest Inside Gamma Reading (HIG): 53 uR/h
Interior radium-concentration measurements are presented in Appendix Table 3.2. Interior gamma exposure-rate measurements are summarized in Appendix Table 3.3. Appendix Figures 3.3a and 3.3b show interior exposure rates and locations of these measurements.

3.3 Boreholes, Soil Samples, and Other Measurements

Areas which displayed elevated gamma levels were further investigated; these areas are shown in Appendix Figures 3.3a, 3.3b, and 3.4. Data from these investigations are included in Appendix Tables 3.1 and 3.2.

3.4 Radon/Radon Daughter Concentration

Radon daughter concentration (RDC):
Determined by CDH: 0.01230 working level (WL).
No additional RDC measurements were taken by Bendix.

3.5 Extent of Contamination

Appendix Figure 3.5 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) The mortar and/or the bricks in the facing are contaminated to a height of 50 inches. This contamination extends 2 feet east of the northwest corner of the primary structure, around the west and south walls as far as the northwest corner of the porch. This remedial action was performed by CDH under GJRAP and is not part of the UMTRA Program.

(AREA B) A deposit 33 inches deep is adjacent to the south side of the primary structure (approximately 243 sf).

(AREA C) Adjacent to the west side of the primary structure, contamination is 6 inches deep (approximately 216 sf).

(AREA D) Based on information collected in Area G, contamination is 12 inches deep under the north sidewalk and the north and west edges of the patio. The patio slab is 4 inches thick. Total depth of contamination is 16 inches. This area appears to have been recontaminated during removal of flagstone patio and replacement of concrete patio (approximately 177 sf).

(AREA E) Contamination under the concrete driveway is 20 inches deep. The concrete is 4 inches thick. Total depth of contamination is 24 inches (approximately 340 sf).

(AREA F) Contamination under the north portion of the concrete driveway is 11 inches deep. The concrete is 4 inches thick. Total depth of contamination is 15 inches (approximately 130 sf).

(AREA G) Contamination under the sidewalk south of the primary structure extends to an estimated depth of 20 inches, based on information collected in Area I. The concrete is approximately 4 inches thick. Total depth of contamination is 24 inches (approximately 81 sf).

(AREA H) A large deposit north of the primary structure west of the sidewalk is contaminated to a depth of 12 inches (approximately 1,320 sf).

(AREA I) The middle of the south yard is contaminated to a depth of 24 inches (approximately 500 sf).

(AREA J) The south yard, north of the city sidewalk, is contaminated to a depth of 18 inches (approximately 752 sf).

(AREA K) Contamination was found in the rock garden between the south sidewalk and the primary structure. This area was not disturbed at the request of the occupants. Based on information collected in Area I, this contamination is estimated to extend to a depth of 24 inches (approximately 68 sf).

(AREA L) The deposit on the east side of the north sidewalk is contaminated to a depth of 12 inches, based on information collected in Area G (approximately 450 sf).

(AREA M) A section of the north yard is contaminated to a depth of 9 inches (approximately 821 sf).

(AREA N) A small deposit northeast of the primary structure is 6 inches deep (approximately 170 sf).

(AREA O) A planter in the patio north of the garage is contaminated to a depth of 12 inches (approximately 20 sf).

(AREA P) A deposit east of the driveway is contaminated to a depth of 12 inches (approximately 108 sf).

(AREA Q) A deposit along the east property line is contaminated to a depth of 9 inches (approximately 90 sf).

(AREA R) A small deposit next to the east retaining wall is contaminated to a depth of 9 inches (approximately 42 sf).

(AREA S) A small deposit next to the north fence is 12 inches deep. (approximately 35 sf).

(AREA T) Two small deposits in the northeast corner of the backyard are contaminated to a depth of 6 inches (approximately 95 sf).

(AREAS REQUIRING FURTHER INVESTIGATION DURING REMEDIAL ACTION)

Area G and Area K should be closely monitored because it was not possible to explore with depth deltas or borehole measurements in these areas. In addition, the south steps adjacent to Area G should be closely monitored. This area is obscured by concrete.

This property had remedial action work done under the GJRAP program in 1975, the UMTRA program cannot duplicate efforts done under previous programs. Therefore work can be done only up to the foundation line.

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-00712-RS, includes removal of select areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figure 3.5) and transport of removed material to the disposal site.

Interior decontamination work was done by CDH under GJRAP Program in 1975 as determined by ARIX as-built drawings. Area A is exempt from remedial action under UMTRAP Legislation, Section 102, Paragraph A, Sub-paragraph C.

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 $15,956.

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

Owner preference is to proceed immediately to construction 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	Radium Concentrations at Interior Locations
Table 3.3	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	Exterior Gamma Scan
Figure 3.3a	Interior Gamma Survey and Sample Locations - Basement
Figure 3.3b	Interior Gamma Survey and Sample Locations - Ground Floor
Figure 3.4	Exterior Sample Locations
Figure 3.5	Estimated Extent of Contamination

Official Survey Report
Memo of Understanding
Team Leader Notes
Deconvolution Graphs (Apparent Radium-226 Concentration)

Table 3.1
Radium Concentrations at Exterior Locations
DOE ID No. GJ-00712-RS 1522 Elm Avenue

Loc No.	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
3	132220	00	DS	<1.0		*	W of house
		06	DS	<1.0		*	
4	135215	00	DS	1.3		*	W side yard
		00-06	SS			4.4	DC = 6 inches
		03	TC	3.8		*	Based on soil
		06	BH	3.8	1.4	*	sample analysis
		09	TC	3.8		*	
		12	BH	3.8	1.1	*	
		15	TC	3.8		*	
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	BH	3.8	1.2	*	
		27	TC	3.8		*	
		30	TC	3.7		*	
		33	TC	3.8		*	
		36	BH	3.9	<1.0	*	
5	135226	00	DS	<1.0		*	W fence
		06	DS	<1.0		*	
6	139201	00	DS	2.6		*	Gas line
		03	TC	5.6		*	DC = 6 inches
		06	BH	5.0	1.9	*	Based on the de-
		09	TC	4.6		*	convolution graph
		12	BH	4.3	1.4	*	
		15	TC	4.2		*	
		18	TC	4.0		*	
		21	TC	4.1		*	
		24	TC	4.0		*	
		27	TC	4.1		*	
		30	TC	4.0		*	
		33	TC	4.1		*	
		36	TC	4.1		*	
		39	TC	4.1		*	
		42	TC	4.1		*	
		45	TC	4.1		*	
		48	TC	4.1		*	
		51	TC	4.1		*	

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Loc No.	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
6	139201	54	TC	4.1		*	Gas line
		57	TC	4.1		*	
		60	BH	4.2	1.8	*	
		63	TC	4.1		*	
7	140170	00	DS	1.7		*	
		06	DS	<1.0		*	
8	140210	[32]	DS	19.3		*	On brick facing
		[64]	GS		4.3	*	
		[32]	GS		17.7	*	
9	140220	[64]	DS	1.7		*	On brick facing
		[32]	DS	24.7		*	
		[64]	GS		4.8	*	
		[32]	GS		25.7	*	
10	140240	00	DS	2.8		*	10′ N of the NW corner of house
11	140280	00	DS	2.4		*	W part of garden
		00-06	SS			2.4	DC = 0 inches
		03	TC	3.3		*	Background
		06	BH	3.5	1.4	*	
		09	TC	3.7		*	
		12	BH	3.8	<1.0	*	
		15	TC	3.9		*	
		18	TC	3.9		*	
		21	TC	3.9		*	
		24	BH	4.0	1.3	*	
		27	TC	4.1		*	
		30	TC	4.1		*	
		33	TC	4.1		*	
		36	TC	3.9		*	
12	142230	[60]	DS	1.4		*	On brick facing
		[30]	DS	24.7		*	
		[60]	GS		5.3	*	
		[30]	GS		23.6	*	

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Loc No.	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	145230	[44]	DS	2.9		*	On brick facing
		[44]	GS		3.3	*	
14	145235	00	DS	3.8		*	5′ N of the NW
		06	DS	2.7		*	corner of house
15	151198	00	DS	4.2		*	Water line
		03	TC	8.4		*	DC = 33 inches
		06	BH	9.3	6.1	*	Based on the de-
		09	TC	9.6		*	convolution graph
		12	BH	9.8	6.7	*	
		15	TC	9.3		*	
		18	TC	8.2		*	
		21	TC	7.7		*	
		24	BH	7.2	4.2	*	
		27	TC	6.8		*	
		30	TC	6.3		*	
		33	TC	5.8		*	
		36	BH	5.2	2.4	*	
		39	TC	5.1		*	
16	152199	[72]	DS	11.5		*	On brick facing
		[66]	DS	9.3		*	
		[48]	DS	25.7		*	
		[72]	GS		21.7	*	
		[48]	GS		36.7	*	
17	152265	00	DS	1.8		*	
		06	DS	<1.0		*	
		00-06	SS			8.2	
18	155295	03	TC	2.8		*	Sewer line in
		06	TC	3.3		*	garden
		09	TC	3.6		*	DC = 0 inches
		12	TC	3.7		*	
		15	TC	3.6		*	
		18	TC	3.7		*	
		21	TC	3.7		*	
		24	TC	3.9		*	
		27	TC	3.9		*	
		30	TC	3.7		*	
		33	TC	3.7		*	

Table 3.1
Radium Concentrations at Exterior Locations
DOE ID No. GJ-00712-RS 1522 Elm Avenue

Loc No.	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
18	155295	36	TC	3.8		*	Sewer line by
		39	TC	3.9		*	garden
		42	TC	3.9		*	
		45	TC	4.1		*	
		48	TC	4.1		*	
		51	TC	4.1		*	
		54	TC	4.3		*	
		57	TC	4.2		*	
		60	TC	4.2		*	
19	159231	00	DS	2.1		*	By sewer line
		03	TC	3.6		*	DC = 0 inches
		06	BH	3.8	1.6	*	
		09	TC	3.9		*	
		12	BH	4.0	1.7	*	
		15	TC	4.2		*	
		18	TC	4.2		*	
		21	TC	4.1		*	
		24	BH	4.3	1.7	*	
		27	TC	4.6		*	
		30	TC	4.7		*	
		33	TC	4.9		*	
		36	BH	4.6	2.0	*	
		39	TC	4.7		*	
		42	BH	4.3	1.2	*	
		45	TC	4.3		*	
		48	TC	4.3		*	
		51	TC	4.3		*	
		54	TC	4.4		*	
		57	TC	4.4		*	
		60	TC	4.5		*	
		63	TC	4.5		*	
		66	TC	4.4		*	
		69	TC	4.5		*	
		72	TC	4.4		*	
		75	TC	4.2		*	
		78	TC	4.1		*	
		81	TC	4.0		*	
		84	TC	4.0		*	
		87	TC	4.0		*	
20	159240	00	DS	4.3		*	By sewer line
		03	TC	7.5		*	10 feet N of
		06	TC	7.9		*	house

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Loc No.	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
20	159240	09	TC	6.5		*	DC = 12 inches
		12	TC	5.7		*	Based on the
		15	TC	5.3		*	deconvolution
		18	TC	5.2		*	graph
		21	TC	5.0		*	
		24	TC	4.7		*	
		27	TC	4.7		*	
		30	TC	4.7		*	
		33	TC	4.7		*	
		36	TC	4.8		*	
		39	TC	4.8		*	
		42	TC	4.7		*	
		45	TC	4.8		*	
		48	TC	4.7		*	
		51	TC	4.6		*	
		54	TC	4.5		*	
		57	TC	4.4		*	
		60	TC	4.5		*	
		63	TC	4.4		*	
		66	TC	4.4		*	
		69	TC	4.4		*	
		72	TC	4.4		*	
		75	TC	4.3		*	
		78	TC	4.3		*	
		81	TC	4.3		*	
		84	TC	4.3		*	
21	164197	[96]	DS	3.4		*	On brick facing
22	164303	00	DS	4.6		*	N easement
		06	DS	3.9		*	DC = 12 inches
		12	DS	2.9		*	
23	166197	00-06	SS			1.8	Front planter
24	170170	00	DS	24.4		*	Middle front yard
		03	TC	13.1		*	DC = 18 inches
		06	BH	8.9	5.7	*	Based on the de-
		09	TC	6.6		*	convolution graph
		12	BH	5.4	3.5	*	
		15	TC	4.7		*	
		18	TC	5.7		*	

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Loc No.	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
24	170170	21	TC	4.5		*	Middle front yard
		24	BH	4.4	1.9	*	
		27	TC	4.4		*	
		30	TC	4.4		*	
		33	TC	4.3		*	
		36	TC	4.4		*	
		39	TC	4.4		*	
		42	TC	4.5		*	
		45	TC	4.5		*	
		48	TC	4.5		*	
		51	TC	4.4		*	
		54	TC	4.5		*	
		57	TC	4.4		*	
		60	TC	4.3		*	
		63	TC	4.4		*	
		66	TC	4.5		*	
25	170191	00	DS	4.3		*	Front sidewalk
26	172242	00	DS	5.5		*	On back patio
		06	DS	12.9		*	Horizontal under back patio
27	175199	[30]	DS	<1.0		*	On brick facing
		[72]	GS		1.7	*	
28	180250	00	DS	19.5		*	Middle backyard
		03	TC	13.1		*	DC = 12 inches
		06	BH	10.1	<1.0	*	Based on the de-
		09	TC	7.4		*	convolution graph
		12	BH	5.7	3.3	*	
		15	TC	4.9		*	
		18	TC	4.6		*	
		21	TC	4.4		*	
		24	BH	4.3	1.9	*	
		27	TC	4.3		*	
		30	TC	4.3		*	
		33	TC	4.4		*	
		36	TC	4.4		*	

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Loc No.	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
29	180280	00	DS	9.0		*	E part of garden
		03	TC	6.5		*	DC = 9 inches
		06	BH	5.7	2.0	*	Based on the de-
		09	TC	4.9		*	convolution graph
		12	BH	4.5	2.0	*	
		15	TC	4.3		*	
		18	TC	4.2		*	
		21	TC	4.2		*	
		24	BH	4.3	1.3	*	
		27	TC	4.3		*	
		30	TC	4.3		*	
		33	TC	4.2		*	
30	185191	00	DS	15.8		*	Front sidewalk
31	188187	00	DS	49.5		*	Front yard S. of
		03	TC	33.2		*	sidewalk
		06	BH	26.6	13.7	*	DC = 24 inches
		09	TC	17.9		*	Based on the de-
		12	BH	10.7	3.0	*	convolution graph
		15	TC	8.0		*	
		18	TC	6.3		*	
		21	TC	5.7		*	
		24	BH	5.3	2.0	*	
		27	TC	5.0		*	
		30	TC	5.0		*	
		33	TC	4.8		*	
		36	TC	4.8		*	
		39	TC	4.7		*	
		42	TC	4.6		*	
		45	TC	4.5		*	
		48	TC	4.5		*	
		51	TC	4.4		*	
		54	TC	4.5		*	
		57	TC	4.4		*	
		60	BH	4.5	1.6	*	
		63	TC	4.5		*	
		66	TC	4.5		*	
32	195275	00	DS	4.2		*	N yard by garden
		06	DS	2.8		*	DC = 6 inches
		00-06	SS			7.4	

Table 3.1
Radium Concentrations at Exterior Locations
DOE ID No. GJ-00712-RS 1522 Elm Avenue

Loc No.	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
33	200163	00	DS	3.7		*	On driveway
		00-04	SS			2.7	Concrete core
		04-10	SS			12.0	DC = 24 inches
		03	TC	7.8		*	Based on the de-
		06	TC	13.7		*	convolution graph
		09	TC	13.9		*	
		12	TC	10.3		*	
		15	TC	8.3		*	
		18	TC	7.3		*	
		21	TC	6.5		*	
		24	TC	5.9		*	
		27	TC	5.6		*	
		30	TC	5.4		*	
		33	TC	5.2		*	
		36	TC	5.1		*	
		39	TC	5.0		*	
		42	TC	4.9		*	
34	200231	00	DS	5.0		*	On the patio
		06	DS	3.2		*	DC = 12 inches
		12	DS	2.1		*	
35	202198	00	DS	3.6		*	On driveway
		00-04	SS			3.0	Concrete core
		04-10	SS			9.0	DC = 15 inches
		03	TC	4.2		*	Based on the de-
		06	TC	6.0		*	convolution graph
		09	TC	6.4		*	Hit a large rock at
		12	TC	5.6		*	18 inches
		15	TC	4.9		*	
		18	TC	4.7		*	
36	203163	08	DS	7.4		*	Horizontal
		08	DS	1.2		*	Adjacent to driveway
37	203198	06	DS	6.6		*	Horizontal
		06	DS	2.2		*	Adjacent to driveway
38	205202	00	DS	12.7		*	E front yard
		03	TC	11.9		*	DC = 12 inches
		06	BH	11.2	10.9	*	Based on the de-
		09	TC	8.5		*	convolution graph
		12	BH	6.5	5.2	*	
		15	TC	5.4		*	

Table 3.1
Radium Concentrations at Exterior Locations
DOE ID No. GJ-00712-RS 1522 Elm Avenue

Loc No.	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
38	205202	18	TC	4.8		*	E front yard
		21	TC	4.6		*	
		24	BH	4.3	1.2	*	
		27	TC	4.3		*	
		30	TC	4.2		*	
		33	TC	4.2		*	
39	205288	00	DS	7.9		*	NE yard
		06	DS	2.2		*	DC = 6 inches
40	212218	00	DS	4.2		*	E of house
		06	DS	3.1		*	DC = 9 inches
41	217280	00	DS	2.7		*	NE corner backyard
		06	DS	4.0		*	DC = 9 inches
		12	DS	2.6		*	

Tool Types:
GB = GAD-6 Borehole
GS = GAD-6 Surface
DS = Delta Scanner
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 = 12-20-84
Team Leader = TC

Table 3.2
Radium Concentrations at Interior Locations
DOE ID No. GJ-00712-RS 1522 Elm Avenue

Loc No.	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
1		[84]	DS	>1.0		*	On wall
		00	DS	1.2		*	Basement floor
2		[36]	DS	7.5		*	On wall
		00	DS	1.1		*	Ground floor

Tool Types:
GB = GAD-6 Borehole
GS = GAD-6 Surface
DS = Delta Scanner
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 = 12-20-84
Team Leader = TC

Table 3.3
Summary of Interior Gamma Exposure Rates

DOE ID No. GJ-00712-RS 1522 Elm 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)
ROOM A	07	12-15	14	07	12-16	14
ROOM B	05	11-13	12	05	12-13	13
ROOM C	05	11-14	13	05	12-13	12
ROOM D	06	14-17	16	06	15-17	16
ROOM E	10	12-16	13	10	11-16	13
ROOM F	06	13-25	16	06	13-41	22
ROOM G	01	13-13	13	01	12-12	12
ROOM H	04	13-14	14	04	12-13	13
ROOM I	05	13-13	13	05	12-13	12
ROOM J	04	13-13	13	04	11-13	12
ROOM K	05	13-14	13	05	13-14	13
ROOM L	01	13-13	13	01	12-12	12
ROOM M	01	13-13	13	01	12-12	12
ROOM N	07	14-35	25	07	14-53	31
ROOM O	06	13-39	25	06	13-53	30
ROOM P	07	13-16	15	07	12-16	14

*Exposure Rates and Room Locations Shown in Appendix Figures 3.3a and 3.3b.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-00712-RS

AREA	CALCULATIONS(ft)		SF		DEPTH(ft)		CF				CUBIC YARDS
EXTERIOR											
	Concrete										
D	15 x 12	=	180								
	5 x 8	=	40								
	3 x 25	=	75								
			295	x	0.3	=	89				
E	10 x 27	=	270								
	14 x 5	=	70								
			340	x	0.3	=	102				
F	10 x 13.8	=	138	x	0.3	=	42				
G	27 x 3	=	81	x	0.3	=	24				
	Total Volume of Concrete					=	257	=	257/27	=	10
	Contaminated Fill										
B	17 x 3	=	51								
	6 x 32	=	192								
			243	x	2.8	=	680				
C	8 x 27	=	216	x	0.5	=	108				
D	5 x 12	=	60								
	14 x 3	=	42								
	3 x 25	=	75								
			177	x	1.0	=	177				
E	10 x 27	=	270								
	14 x 5	=	70								
			340	x	1.7	=	578				
F	10 x 13	=	130	x	0.9	=	117				
G	27 x 3	=	81	x	1.7	=	138				

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-00712-RS

AREA	CALCULATIONS(ft)		SF		DEPTH(ft)		CF			CUBIC YARDS
H	36 x 25	=	900							
	29 x 10	=	290							
	10 x 13	=	130							
			1,320	x	1.0	=	1,320			
I	50 x 10	=	500	x	2.0	=	1,000			
J	47 x 16	=	752	x	1.5	=	1,128			
K	17 x 4	=	68	x	2.0	=	136			
L	18 x 25	=	450	x	1.0	=	450			
M	31 x 21	=	651							
	17 x 10	=	170							
			821	x	0.8	=	657			
N	10 x 17	=	170	x	0.5	=	85			
O	10 x 2	=	20	x	1.0	=	20			
P	4 x 27	=	108	x	1.0	=	108			
Q	5 x 18	=	90	x	0.8	=	72			
R	6 x 7	=	42	x	0.8	=	34			
S	5 x 7	=	35	x	1.0	=	35			
T	5 x 5	=	25							
	14 x 5	=	70							
			95	x	0.5	=	48			
	Total Volume of Contaminated Fill					=	6,891	=	6,891/27	= 255
	TOTAL VOLUME - EXTERIOR									= 265

See Appendix Figure 3.5 For Areas

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-00712-RS

EXTERIOR	
Remove and replace chain link fence	
76.5 lf @ $2.60/lf	$ 199
Remove driveway	
478 sf @ $1.48/sf	707
Remove front sidewalk	
81 sf @ $1.48/sf	120
Remove rear sidewalk	
75 sf @ $1.48/sf	111
Saw-cut rear patio 2" deep	
16 lf @ $1.26/lf	20
Remove rear patio slab	
220 sf @ $1.48/sf	326
Remove identified residual radioactive material	
238 cy @ $14.50/cy (open - machine)	3,451
17 cy @ $44.00/cy (open - manual)	748
Replace areas with:	
Compacted roadbase	
80 cy @ $11.50/cy	920
Topsoil	
151 cy @ $9.50/cy	1,435
Soil/compost (weed free)	
24 cy @ $12.50/cy	300
Replace rear patio slab	
220 sf @ $1.50/sf	330
Replace driveway	
478 sf @ $1.50/sf	717
Replace front sidewalk	
81 sf @ $1.50/sf	122
Replace rear sidewalk	
75 sf @ $1.50/sf	113
Replace tall junipers (front)	
3 @ $50.00 each	150
Replace 4' shrubs (front)	
2 @ $50.00 each	100

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-00712-RS Page 2 of 2

Replace trees - 3" caliper 3 @ $150.00 each	450
Replace rose bush 1 @ $20.00 each	20
Replace gravel Lump sum	15
Remove/replace decorative rock (lava - washed) 140 sf @ $2.50/sf	350
Remove/replace rock border (front) Lump sum	50
Replace sod 2,106 sf @ $.50/sf	1,053
Waterproof front basement wall Lump sum	50
TOTAL EXTERIOR	$ 11,857
TOTAL INTERIOR	0
ACCESS CONTROL	300
SUBTOTAL	$ 12,157
CONTINGENCY @ 5%	608
SUBTOTAL	$ 12,765
CONTRACTOR OVERHEAD & PROFIT @ 25%	3,191
GRAND TOTAL	$ 15,956

AAB071185
REA00712:REA-701:AP

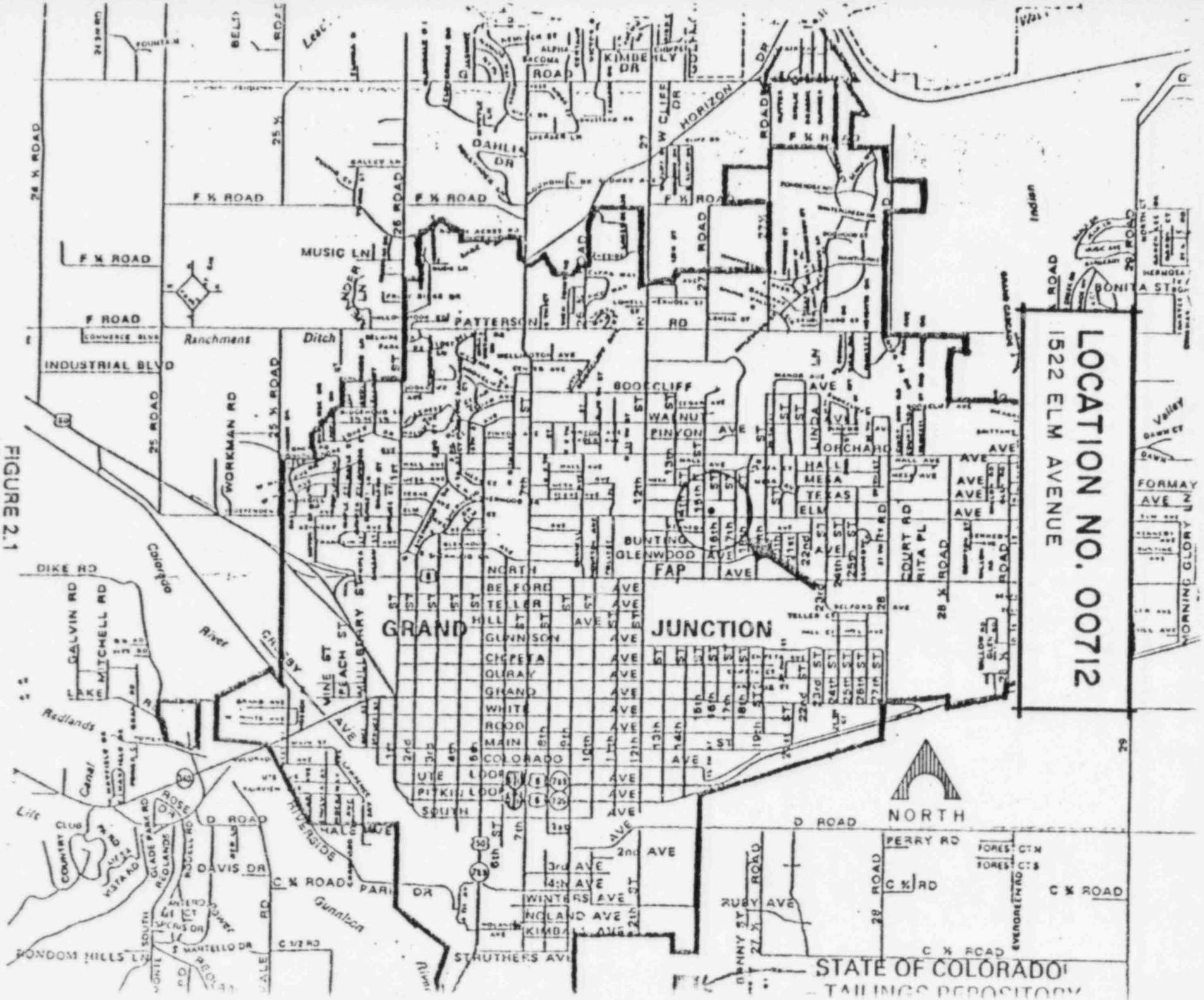
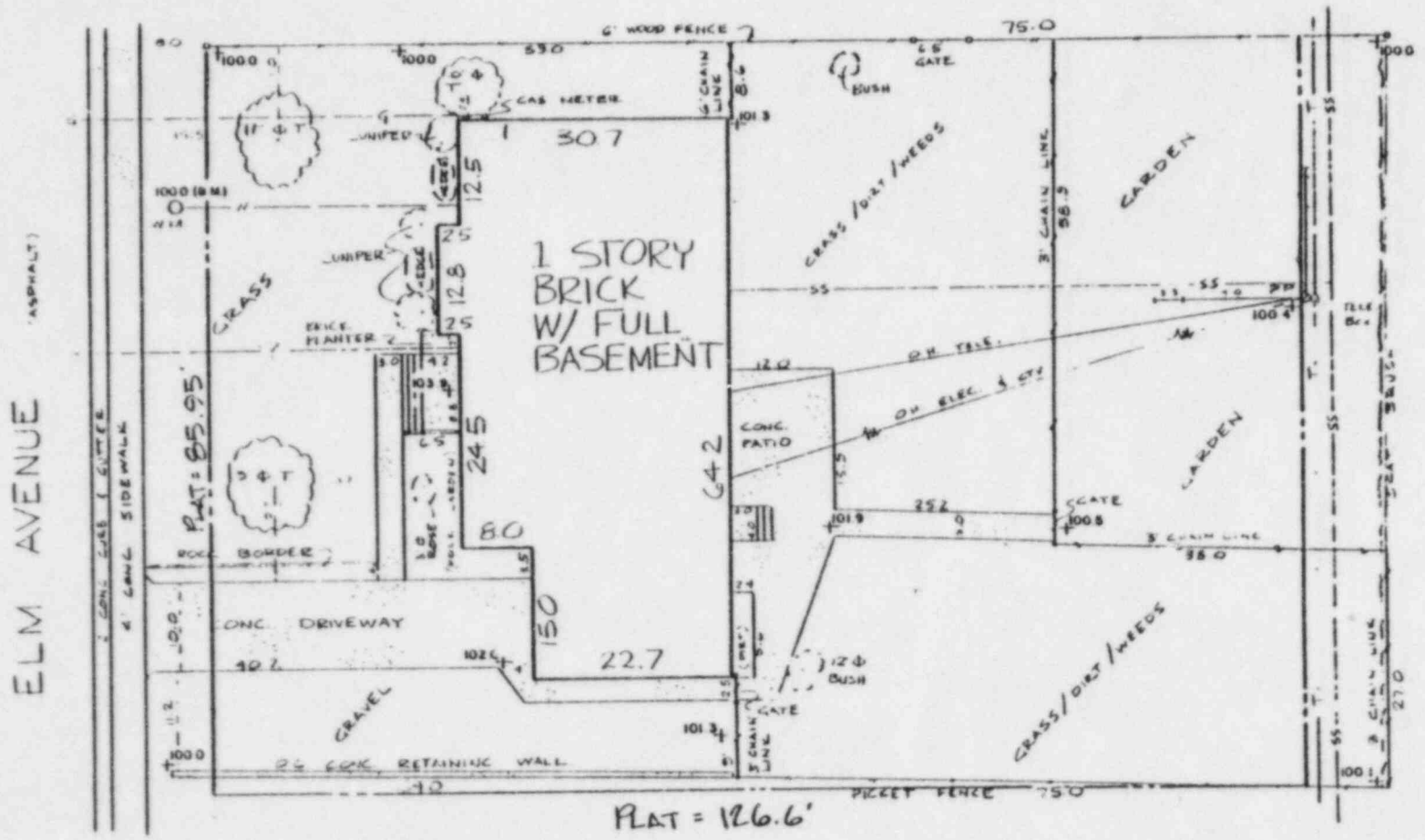


FIGURE 2.1
VICINITY MAP



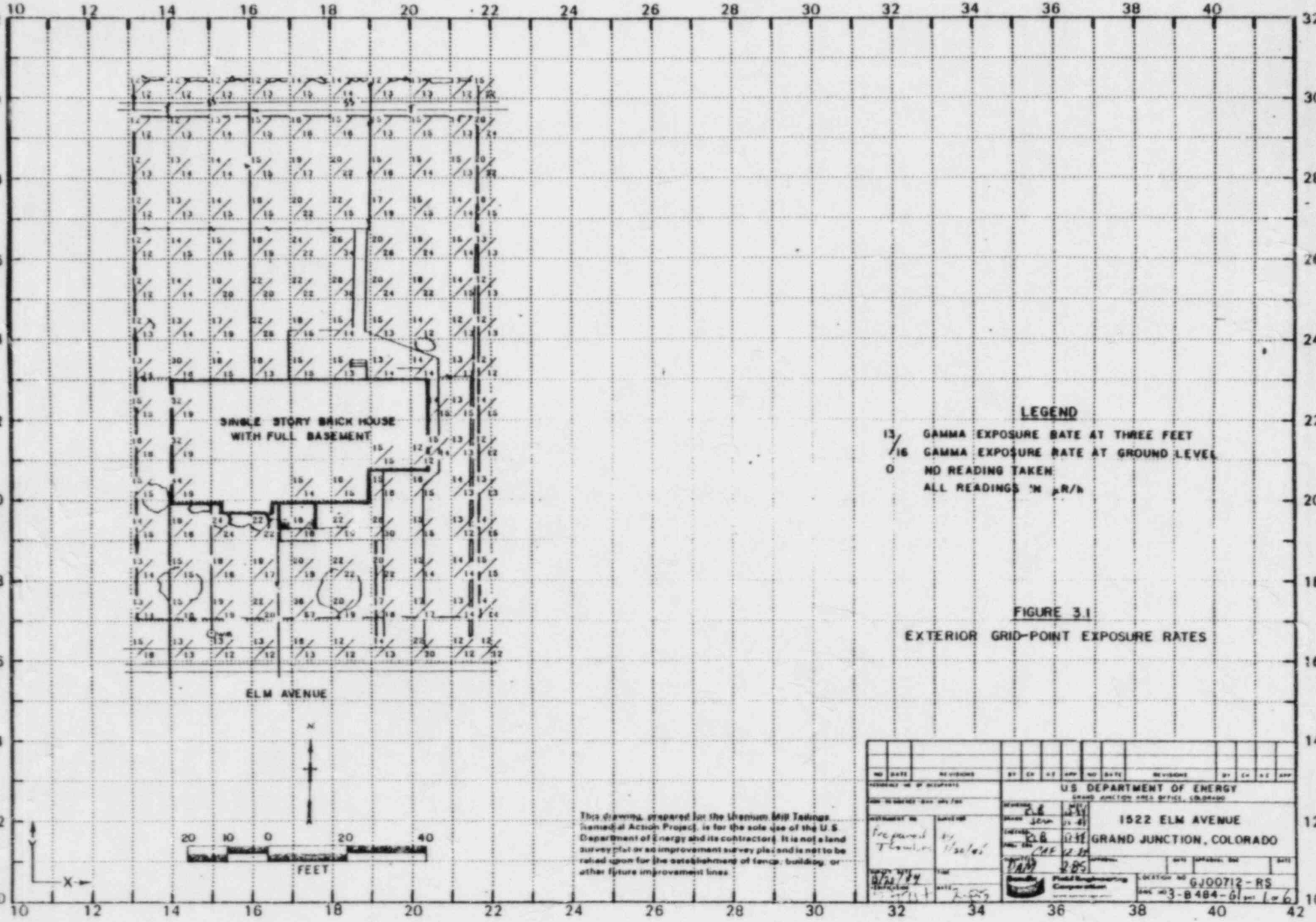
LOT 9, PAULSON SUBDIVISION

FIGURE 2.2
SITE PLAN

10 5 0 10 20
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.

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO	LOCATION NO GJ007.2K
ADDRESS 1522 Elm Ave Grand Junction, CO	Bendix Field Engineering Corporation
OWNER [illegible]	TITLE AND SIZE
TENANT Robert Wine (Deceased)	TITLE
SURV. [illegible] 12/9/89 DRAFT. [illegible] 1/31/89	CK [illegible]
DRAWING NO [illegible]	SHEET 1 OF 1



LEGEND

13/16 GAMMA EXPOSURE RATE AT THREE FEET / GAMMA EXPOSURE RATE AT GROUND LEVEL

0 NO READING TAKEN

ALL READINGS IN μR/h

FIGURE 3.1

EXTERIOR GRID-POINT EXPOSURE RATES

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.

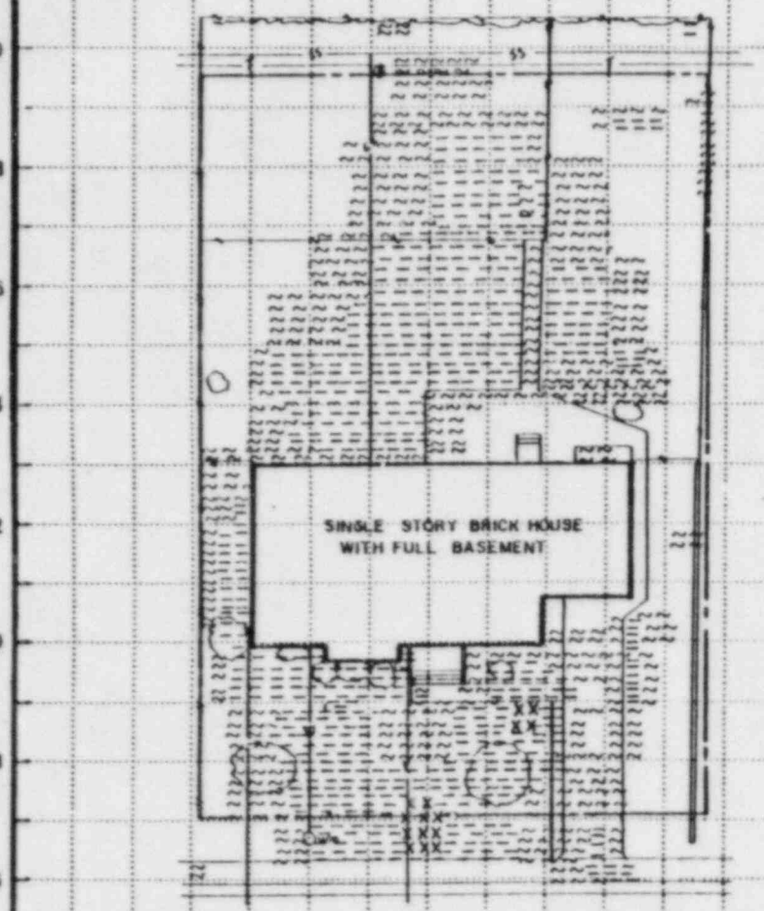
US DEPARTMENT OF ENERGY
GRAND JUNCTION AREA OFFICE, COLORADO

1522 ELM AVENUE
GRAND JUNCTION, COLORADO

Prepared by Technical Engineering Corporation

GJ00712-RS

3-B484-G1



LEGEND

GAMMA READINGS OF 180 TO 199 cps

GAMMA READINGS OF 200 TO 500 cps

GAMMA READINGS OF >500 cps

FIGURE 3.2

EXTERIOR GAMMA SCAN

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.

US DEPARTMENT OF ENERGY

GRAND JUNCTION AREA OFFICE, COLORADO

1522 ELM AVENUE

GRAND JUNCTION, COLORADO

Prepared by T Conlin 1/10/85

Rocky Flats Engineering Corporation

LOCATION NO GJ00712-RS

DRWG NO 3-8484-63 SHT 2 of 6

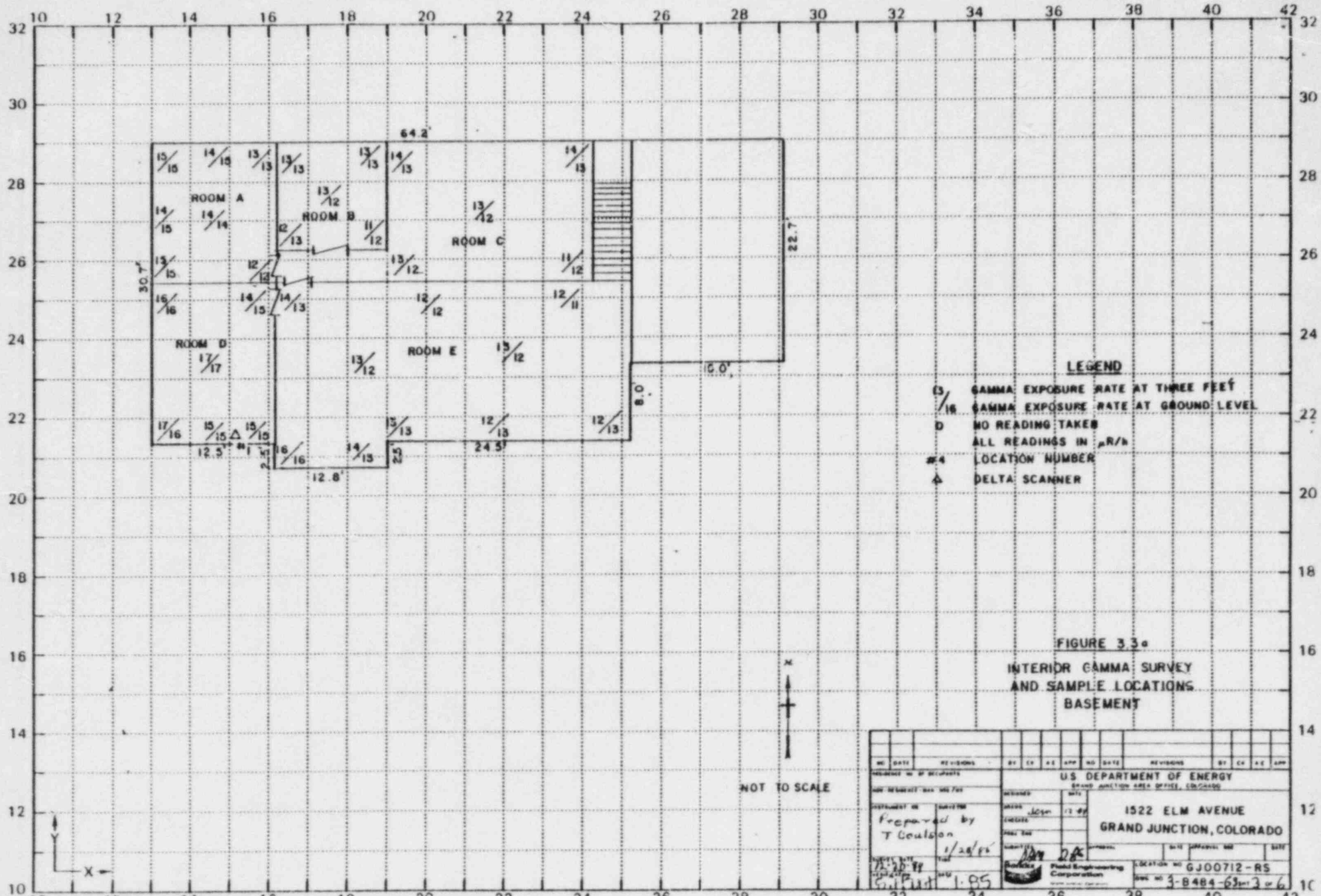


FIGURE 3.3a

INTERIOR GAMMA SURVEY
AND SAMPLE LOCATIONS
BASEMENT

US DEPARTMENT OF ENERGY	
GRAND JUNCTION AREA OFFICE, COLORADO	
Prepared by T Coulson 1/28/85	1522 ELM AVENUE GRAND JUNCTION, COLORADO
Bendix Field Engineering Corporation	LOCATION NO GJ00712-RS
	DWG NO 3-8484-63-3 of 6

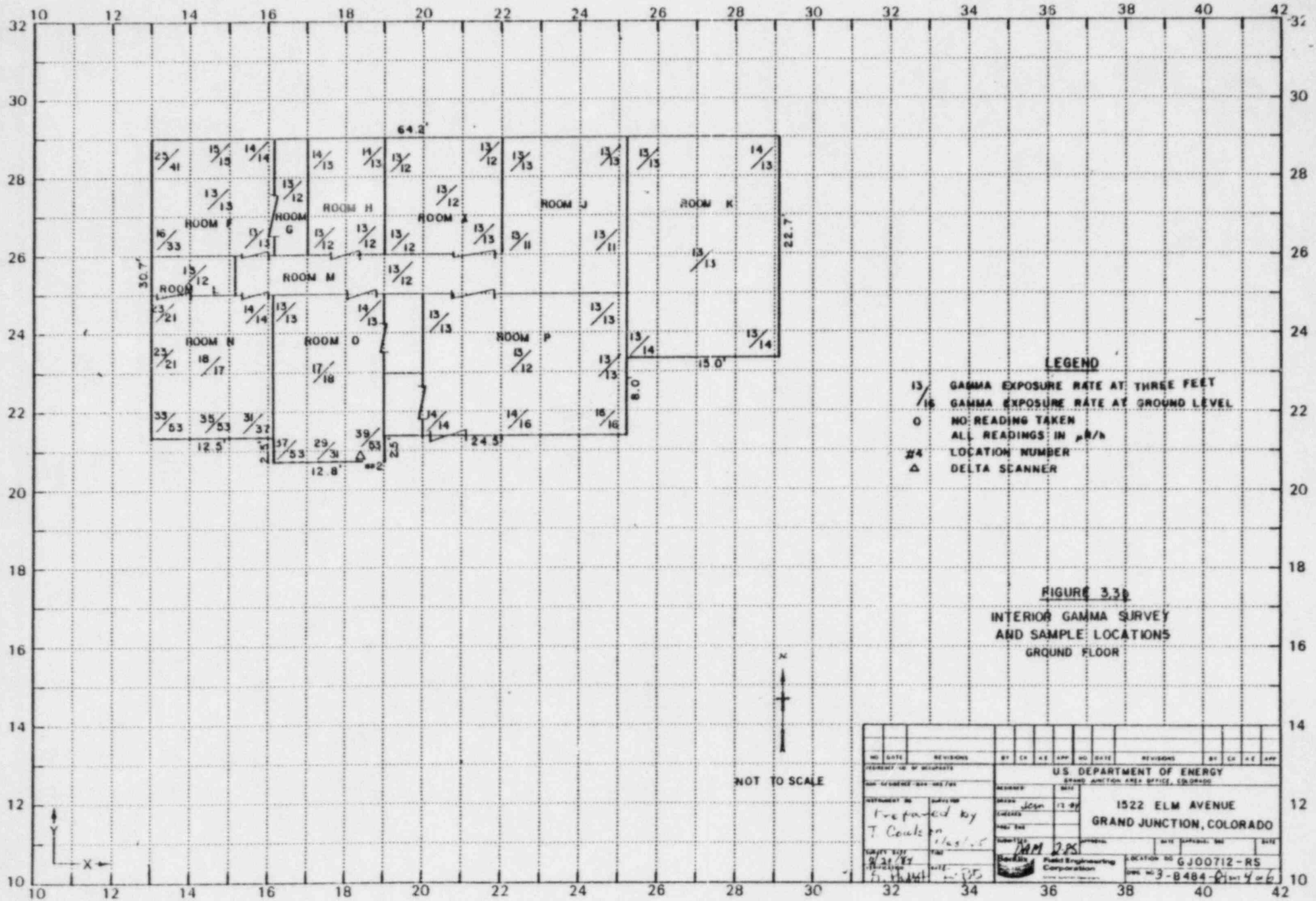


FIGURE 3.3b

INTERIOR GAMMA SURVEY
AND SAMPLE LOCATIONS
GROUND FLOOR

NO	DATE	REVISIONS	BY	CK	AE	APP	NO	DATE	REVISIONS	BY	CK	AE	APP						

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

1522 ELM AVENUE
GRAND JUNCTION, COLORADO

Reviewed by T. Coulson 1/25/95

Bendix Field Engineering Corporation

LOCATION NO. GJ00712-RS

DRW. NO. 3-B484-B SHT 4 OF 6

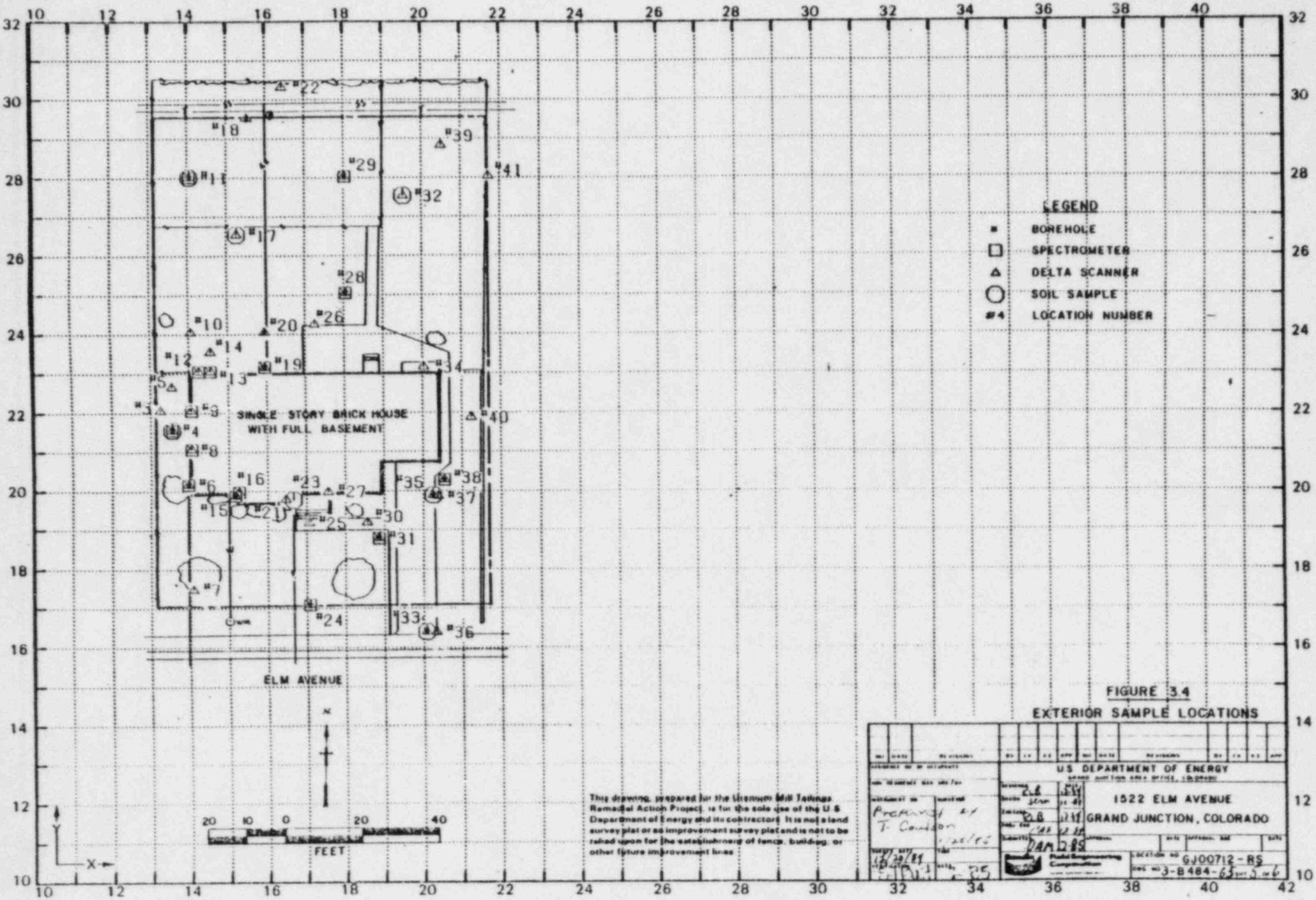


FIGURE 3.4
EXTERIOR SAMPLE LOCATIONS

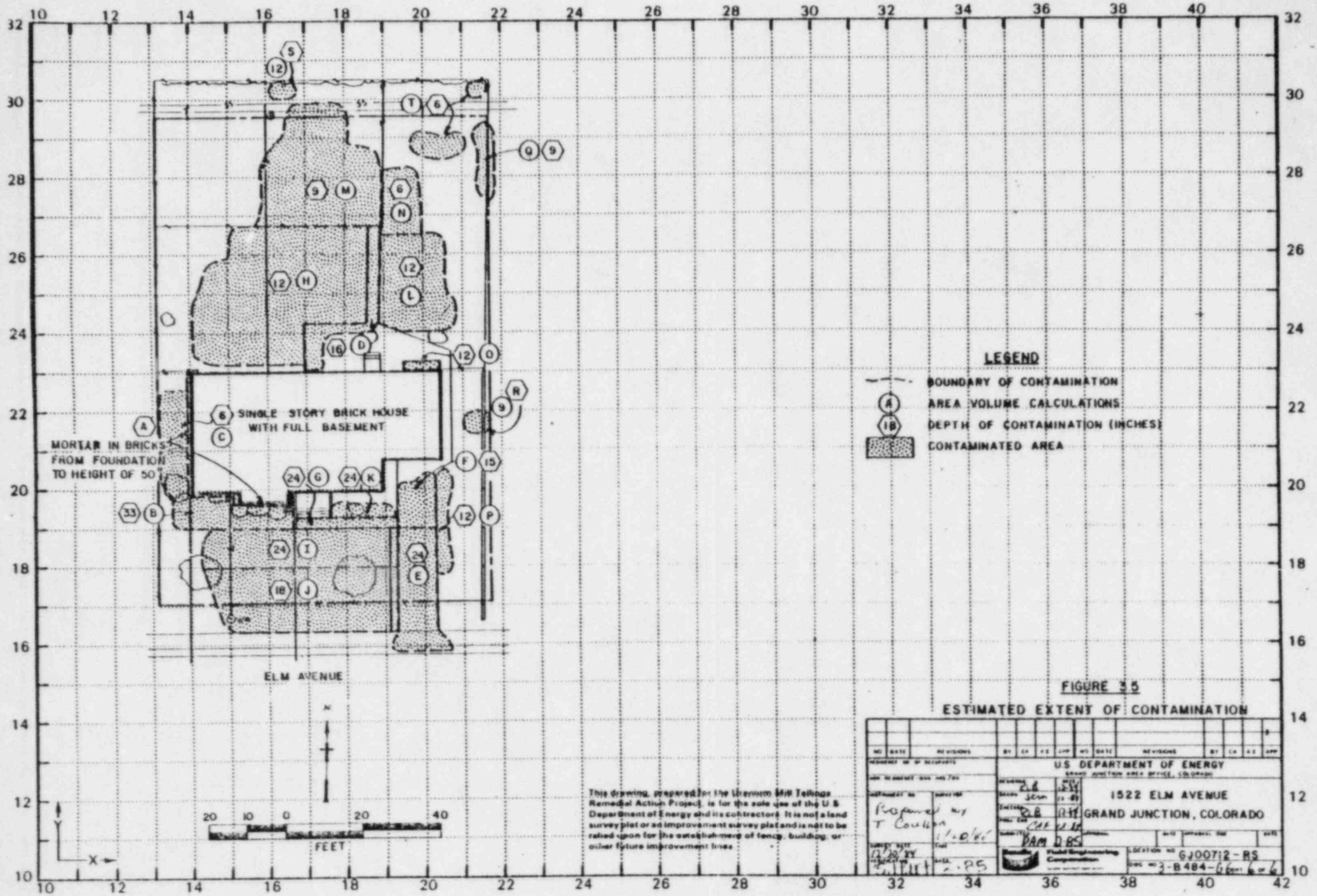


FIGURE 35

ESTIMATED EXTENT OF CONTAMINATION

12/84

Location No. GJ-00712-RS Date 1/20/95

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

Official Survey Report

Property Address 1522 Elm Ave Grand Jct Colo

Property Owner First Church of The Nazarene

Address of Owner (if different from above) _____

Report Prepared By Terry Coulson

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

☐ No evidence of residual radioactive material on surveyed property.

☐ Residual radioactive materials found at the following locations:

- ☒ In open areas.
- ☐ Under or around exterior improvements.
- ☐ Under or around a typically nonoccupied structure.
- ☒ Under or around a typically occupied structure.

II. RESULTS OF RADIOLOGIC ASSESSMENT

☐ 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.

☒ 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 = 53 uR/hr

HOG = 90 uR/hr

15, 53 uR/hr
17, 80 uR/hr

Bendix

Field Engineering Corporation

Grand Junction Operations

P.O. Box 1569
Grand Junction, CO 81502
Tel (303) 242-8821

A Subsidiary of
The Bendix Corporation

January 21, 1985

Colorado Department of Health
222 South 6th Street
Grand Junction, Colorado 81501

ATTN: Elaine Brummett

Dear Elaine:

This letter is a follow-up of the technical review on property number GJ-00712-RS (1522 Elm Avenue).

1. The updated copy of Colorado Department of Health, work level has been noted.

2. The soil sample analysis was 4.4 pCi/g. This area has been added to the map of estimated extent of contamination as Area C.

3. Location number 6 is also included as part of Area C.

4. At the time of our revisit we took a scintillometer reading in the water meter tank. Its range was 150 to 250 cps as did the area around the outside of the tank.

5. The grade level has been up. It is at least 2 feet higher than the surrounding residence at the house, from the house it slopes down to the property line which is at street level. Because of the probability that tailings were used to accomplish this and to fill in next to the house, this area was included at 33 inches.

Bendix

6. During our revisit we augered to a depth of 87 inches. The top 48 inches produced basically the same readings as previously recorded. The lower levels of the hole were clear as were the lower levels of the other two subsequent holes we drilled along the sewer line.

7. Again, the grade of the yard along with the deconvolution table was our reasoning in leaving this area at 18 inches.

8. A note was entered in the REA to the effect that the front steps should be further investigated during remedial action.

9. Location 29 (now location 31) was judged to be 24 inches because of the deconvolution table and the grade of the front yard. This area will be further investigated during remedial action.

10. The soil sample at this location was 7.4 pCi/g. This information was entered onto the radium concentration table.

11. This area was reconsidered and the depth of contamination was changed to 24 inches. It will be watched during remedial action.

12. During our revisit we located the highest reading in the grid. A new delta reading was taken and this area was added at a depth of 6 inches.

13. The sewer line was augered to a depth of 87 inches which would be lower than the basement footing.

Thank you for your time and cooperation. If you have any questions or additional comments, please contact me at 242-8621, extension 433.

Yours very truly,

Terry Coulson

Terry Coulson
RAD Technician

TC:pr

G 00172 12/20/84
1572 Elm Avenue

Johnson, Tuhey, Milton Young.
Adams, Egidi, Rangle — Crew

Scintillometer 1127 - malfunctioned
Scintillometer 1208 - Malfunctioned

Instruments used
Scintillometers - C-1181, 1127, 1208, 1184
BFEC Delta C 3936 3935
PRS-1 PE-3959
Spectrometer C-3361

Revisit - 12/27/84
To check unusually high Grid point readings on the west side of house. Readings were found to be accurate. The first 13 courses of brick on the west and south west sides of the house read between 350+ 650 cps. Abdvel and below this

area. The readings are between 140 + 225 cps. According to an Oct. 10, 1975 communication from COH 63 cubic yards were removed from this structure, some remain under the front porch, mixed deposits are in the yard and the mortar of the SE, and NE walls. This was after remedial construction which removed the basement concrete floor slabs, the slab in the garage and the 4 ft apron in front of the garage. Tailings were removed from under these areas. Tailings were also removed from under the South patio (slate replaced) also from planter in front of the house. 4" of tailing were left under the front side walk.

Revisit 11/2/85
Scintilometer C 1179
Spectrometer C-1372
Cello C-3972

Rangel + Young
Further evaluation of brick veneer, Spectrometer and Pello reading were taken of the exterior brick veneer. Unusually high readings are on the first 13 courses of brick the readings drop off immediately above and below this area.

The grade on this property has been build up to approximately 2 ft. at the house sloping down to 8" at the side walk in front (south) the back yard slopes down to the garden which is on grade with the rest of the neighborhood. We had elevated reading directly in front of the house to the sidewalk and directly behind the house touching the property line in places, also on the S. Side.

The sewer, water, and gas

lines were investigated.
The waterline showed the
most contamination

Revisit 1/16/85
Total Count 3573
Delta BKC 3935
Sewer line was further investigated
at the suggestion of C.D.H. Location
20 was drilled deeper, Location's
17 and 18 were added. No different
deposits were found in the sewer
line

T Coulson
1/20/85

CJ-09356-RS 1/14/85
3037 D½ Rd.

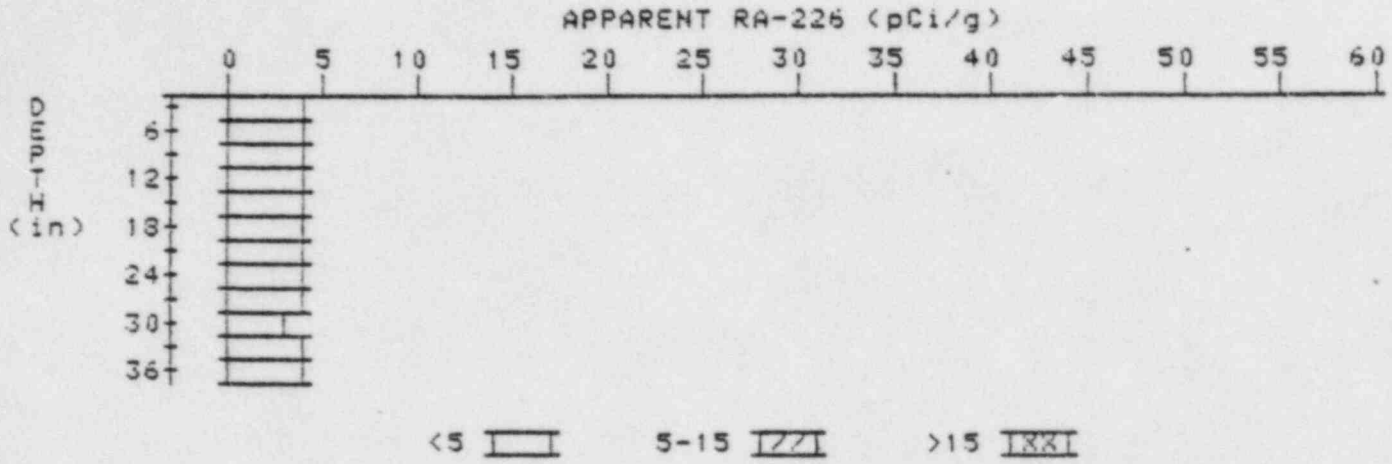
Equipment
Little Beaver 505484 Friskar 06966
Core drill 3771 OH. spec # 0498
Saint. Homefors
1206, 1184, 1181, 1185, 1127, 1196
PRS-1
3956 5573
Delta Scanner 3943, 3942
Tukey Egid Johnson } Crew
young Belly Milton
Duran Bell Adam

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

4

PROPERTY NUMBER: GJ-00712-RS
HOLE NUMBER: 4
LOCATION: 135215



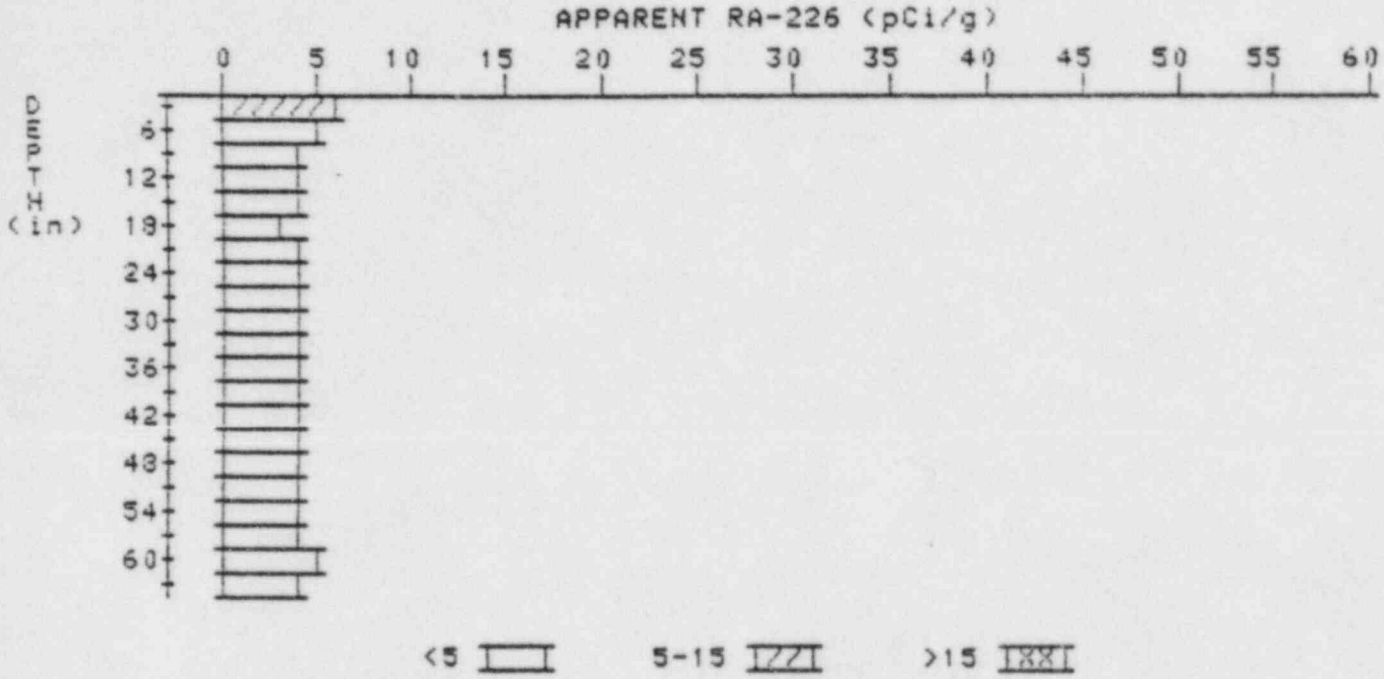
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.8	3.8
6	3.8	3.8
9	3.8	3.8
12	3.8	3.8
15	3.8	3.8
18	3.8	3.8
21	3.8	3.8
24	3.8	3.8
27	3.8	4.0
30	3.7	3.3
33	3.8	3.8
36	3.9	3.9

DECON V85.1(850117.1233)

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

6

PROPERTY NUMBER: GJ-00712-RS
HOLE NUMBER: 6
LOCATION: 139201



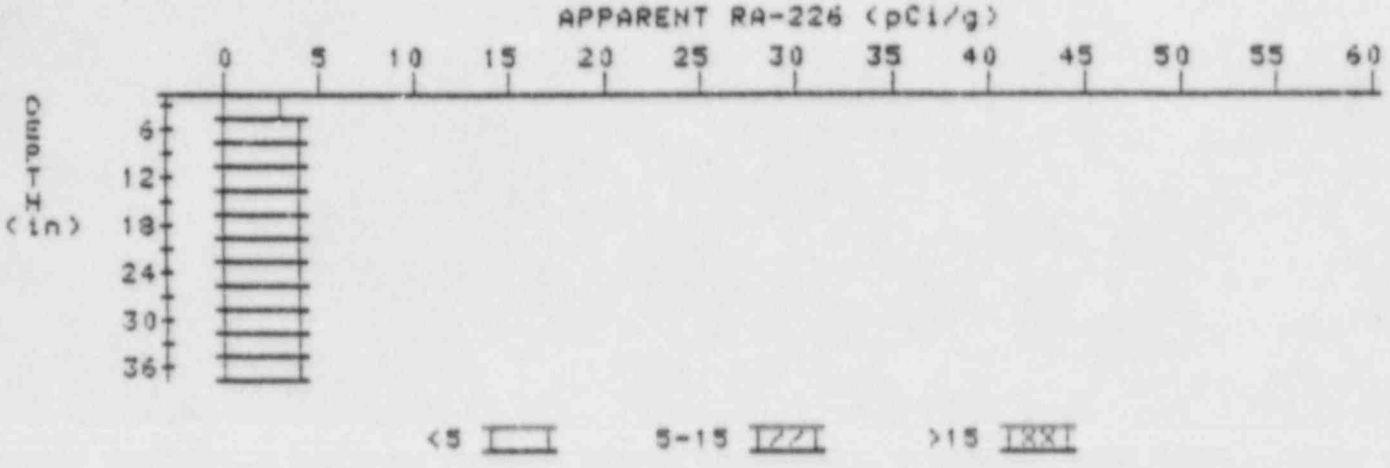
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.6	5.6
6	5.0	4.6
9	4.6	4.4
12	4.3	3.9
15	4.2	4.4
18	4.0	3.5
21	4.1	4.5
24	4.0	3.6
27	4.1	4.5
30	4.0	3.6
33	4.1	4.3
36	4.1	4.1
39	4.1	4.1
42	4.1	4.1
45	4.1	4.1
48	4.1	4.1
51	4.1	4.1

54	4.1	4.1
57	4.1	3.9
60	4.2	4.6
63	4.1	4.1

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION 11
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00712-RS
HOLE NUMBER: 11
LOCATION: 140280



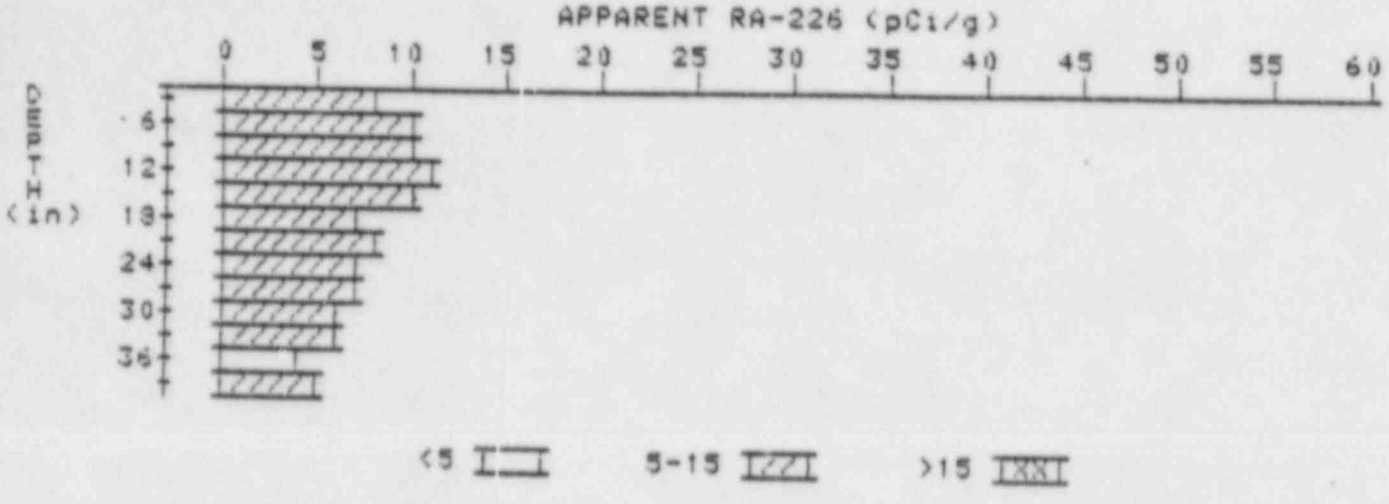
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.5	3.5
9	3.7	3.9
12	3.8	3.8
15	3.9	4.1
18	3.9	3.9
21	3.9	3.7
24	4.0	4.0
27	4.1	4.3
30	4.1	4.1
33	4.1	4.5
36	3.9	3.9

DECON V85.1(850117.1233)

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

15

PROPERTY NUMBER: GJ-00712-RS
HOLE NUMBER: 15
LOCATION: 151198

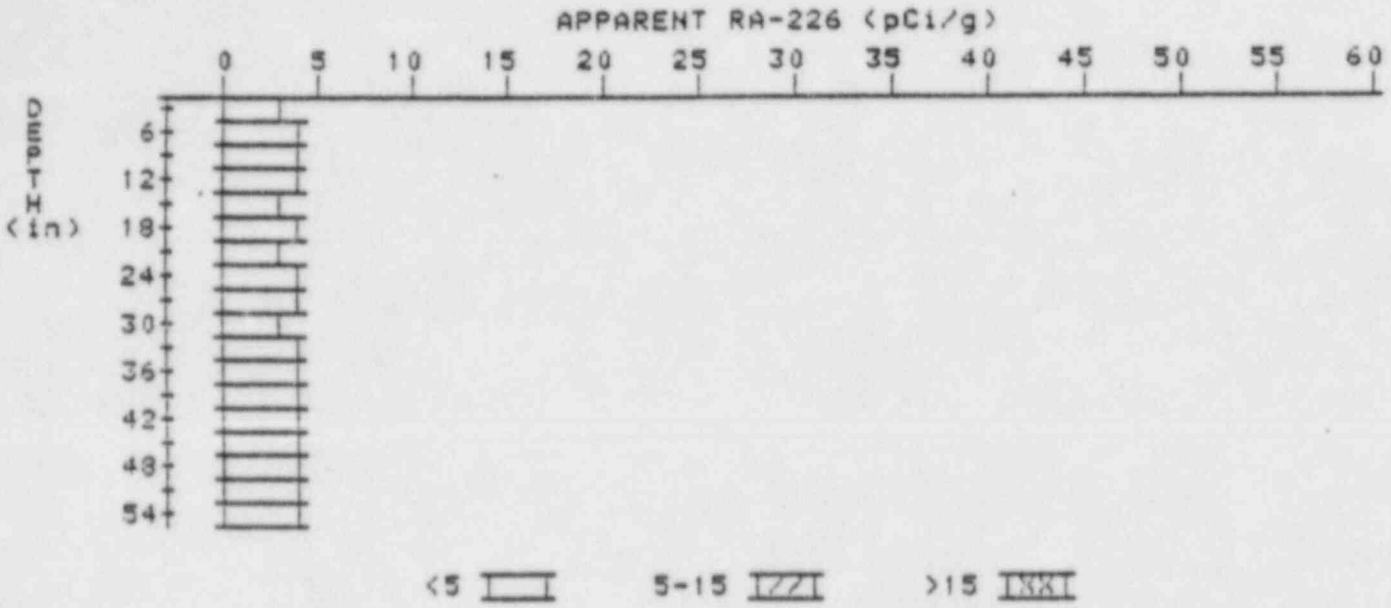


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	8.4	8.4
6	9.3	10.4
9	9.6	9.8
12	9.8	11.0
15	9.3	10.4
18	8.2	7.1
21	7.7	7.7
24	7.2	7.0
27	6.8	7.0
30	6.3	6.3
33	5.8	6.0
36	5.2	4.3
39	5.1	5.1

DECON V85.1(850117.1233)

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00712-RS
HOLE NUMBER: 18
LOCATION: 155295

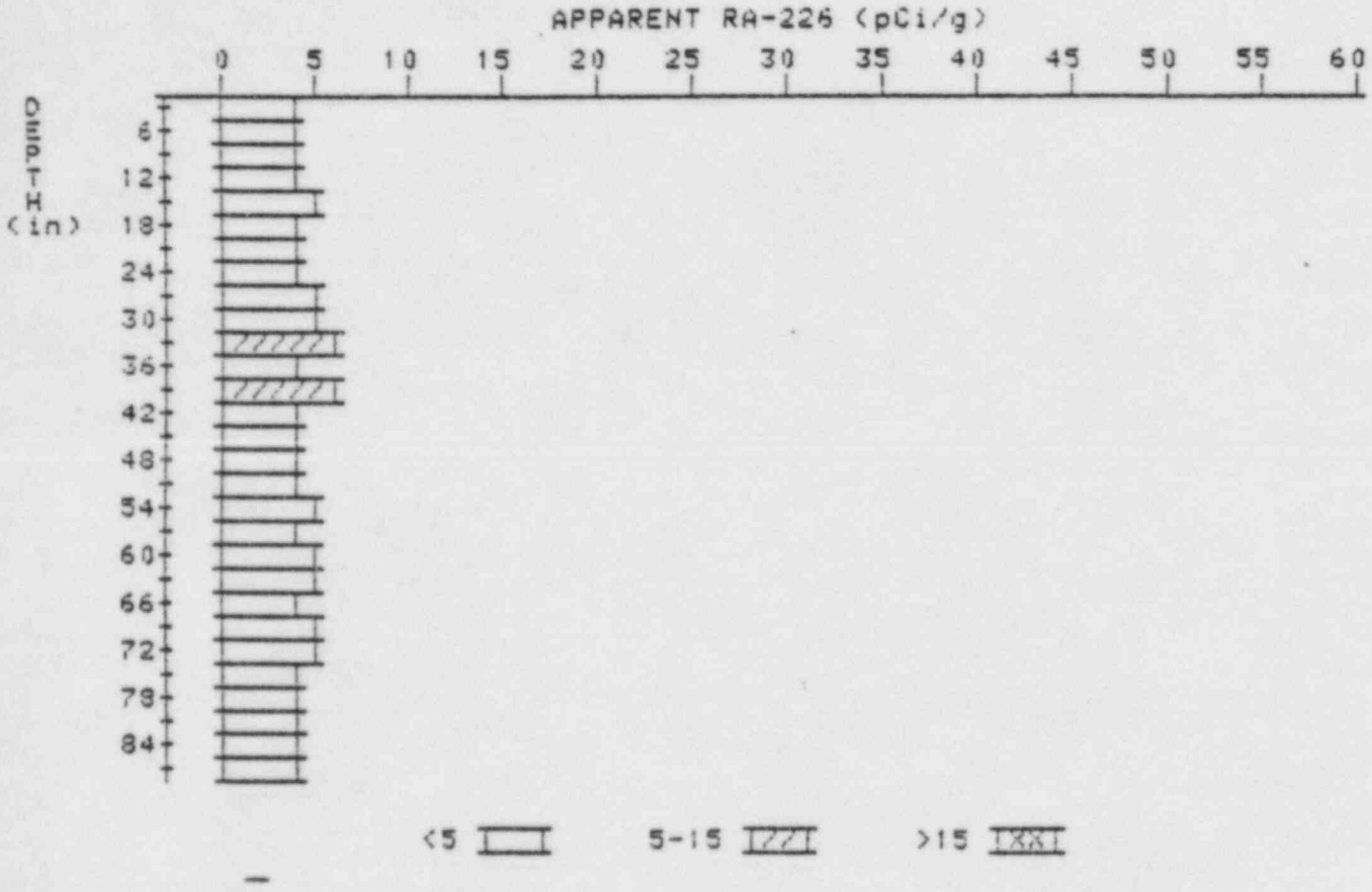


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.8	2.8
6	3.3	3.7
9	3.6	4.0
12	3.7	4.1
15	3.6	3.2
18	3.7	3.9
21	3.7	3.3
24	3.9	4.3
27	3.9	4.3
30	3.7	3.3
33	3.7	3.5
36	3.8	3.8
39	3.9	4.1
42	3.9	3.5
45	4.1	4.5
48	4.1	4.1
51	4.1	3.7
54	4.3	4.3

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION 19
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00712-RS
HOLE NUMBER: 19
LOCATION: 159231



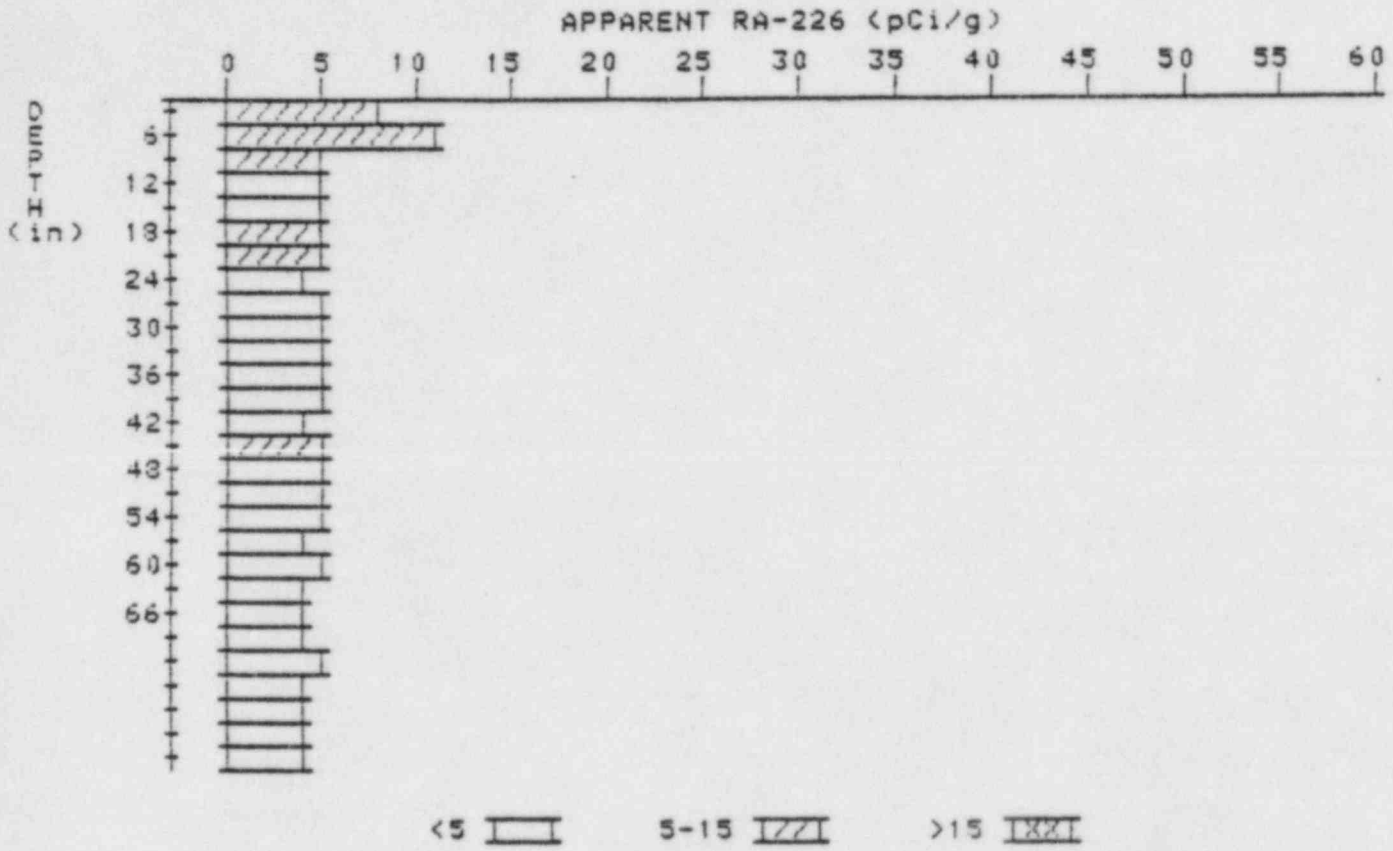
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.6	3.6
6	3.8	4.0
9	3.9	3.9
12	4.1	3.8
15	4.2	4.6
18	4.2	4.4
21	4.1	3.6
24	4.3	4.1
27	4.6	5.0
30	4.7	4.5
33	4.9	5.8

36	4.6	3.9
39	4.7	5.6
42	4.3	3.6
45	4.3	4.3
48	4.3	4.3
51	4.3	4.1
54	4.4	4.6
57	4.4	4.2
60	4.5	4.7
63	4.5	4.7
66	4.4	4.0
69	4.5	4.9
72	4.4	4.6
75	4.2	4.0
78	4.1	4.1
81	4.0	3.8
84	4.0	4.0
87	4.0	4.0

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 20

PROPERTY NUMBER: GJ-00712-RS
HOLE NUMBER: 20
LOCATION: 159240



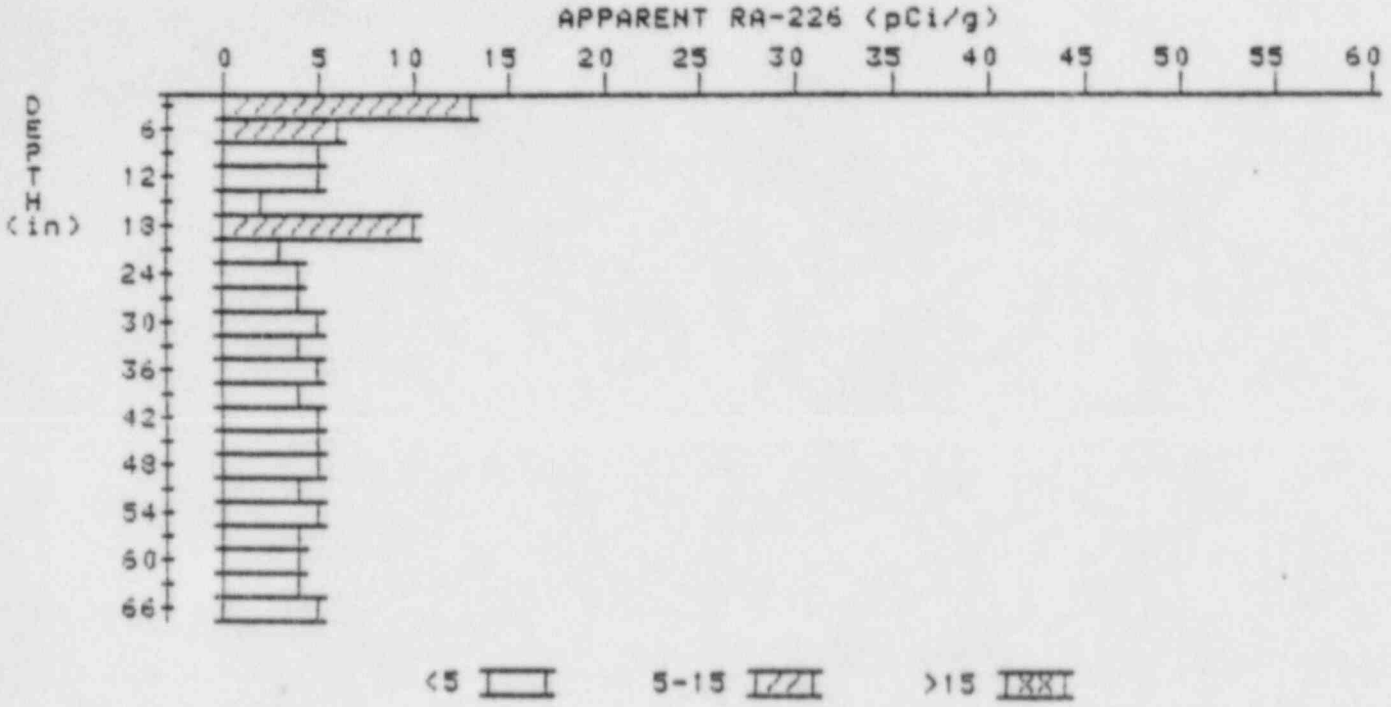
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	7.5	7.5
6	7.9	11.1
9	6.5	5.4
12	5.7	5.0
15	5.3	4.8
18	5.2	5.4
21	5.0	5.2
24	4.7	4.2
27	4.7	4.7
30	4.7	4.7
33	4.7	4.5
36	4.8	5.0

39	4.8	5.0
42	4.7	4.3
45	4.8	5.2
48	4.7	4.7
51	4.6	4.6
54	4.5	4.5
57	4.4	4.0
60	4.5	4.9
63	4.4	4.2
66	4.4	4.4
69	4.4	4.4
71	4.4	4.6
74	4.3	4.1
77	4.3	4.3
80	4.3	4.3
83	4.3	4.3

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION 24 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00712-PS
HOLE NUMBER: 24
LOCATION: 170170



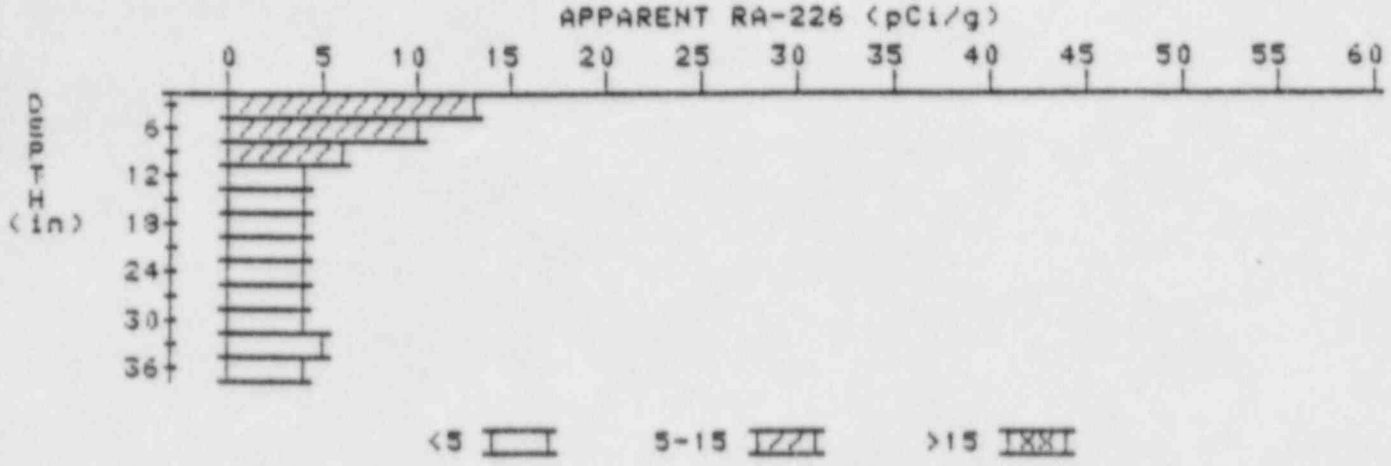
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	13.1	13.1
6	8.9	5.5
9	6.6	4.6
12	5.4	4.5
15	4.7	1.7
18	5.7	9.6
21	4.5	2.5
24	4.4	4.2
27	4.4	4.4
30	4.4	4.6
33	4.3	3.9
36	4.4	4.6
39	4.4	4.2
42	4.5	4.7
45	4.5	4.5
48	4.5	4.7

51	4.4	4.0
54	4.5	4.9
57	4.4	4.4
60	4.3	3.9
63	4.4	4.4
66	4.5	4.5

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 28

PROPERTY NUMBER: GJ-00712-RS
HOLE NUMBER: 28
LOCATION: 180250

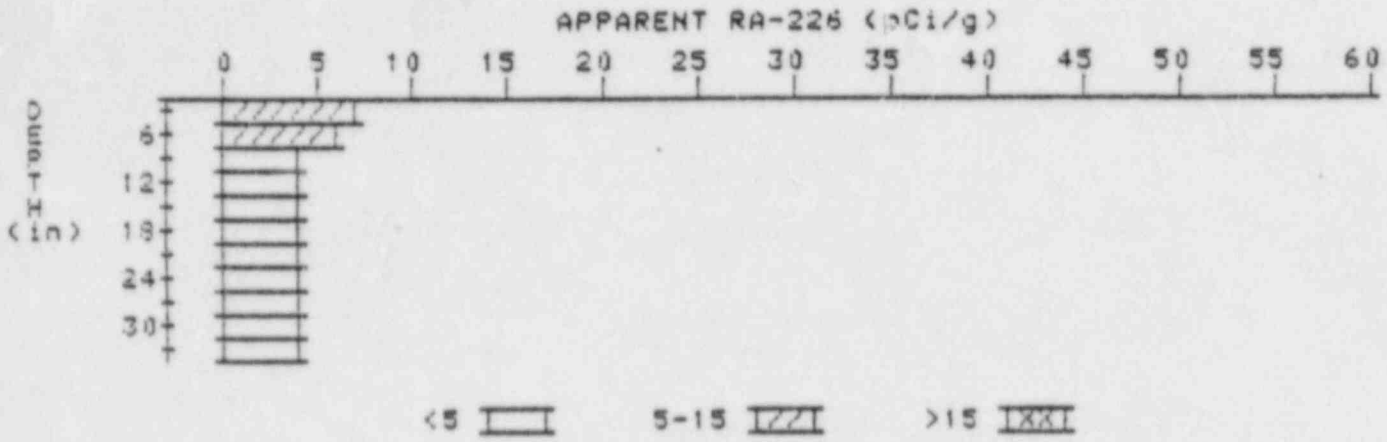


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	13.1	13.1
6	10.1	9.6
9	7.4	5.6
12	5.7	4.1
15	4.9	4.0
18	4.6	4.4
21	4.4	4.2
24	4.3	4.1
27	4.3	4.3
30	4.3	4.1
33	4.4	4.6
36	4.4	4.4

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION 29
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00712-RS
HOLE NUMBER: 29
LOCATION: 180280

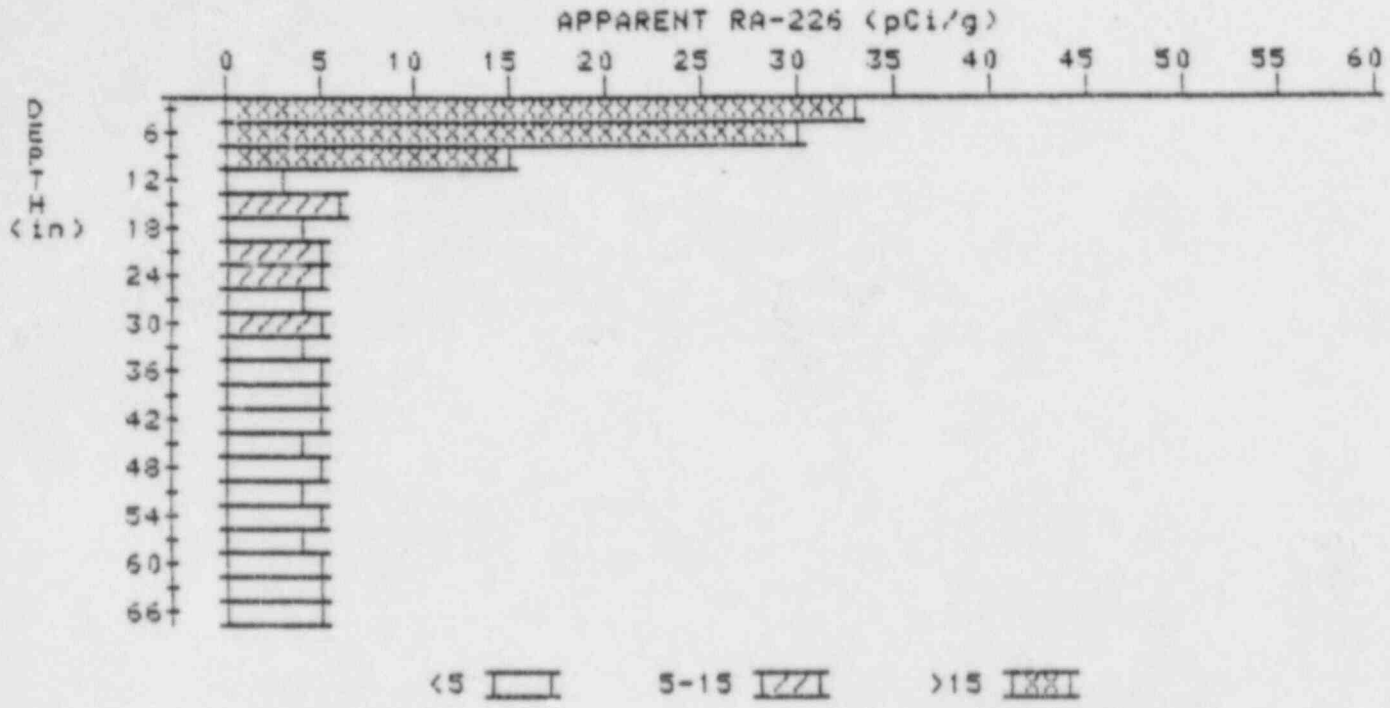


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.5	6.5
6	5.7	5.7
9	4.9	4.2
12	4.5	4.1
15	4.3	4.1
18	4.2	4.0
21	4.2	4.0
24	4.3	4.5
27	4.3	4.3
30	4.3	4.5
33	4.2	4.2

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 31

PROPERTY NUMBER: GJ-00712-RS
HOLE NUMBER: 31
LOCATION: 188187



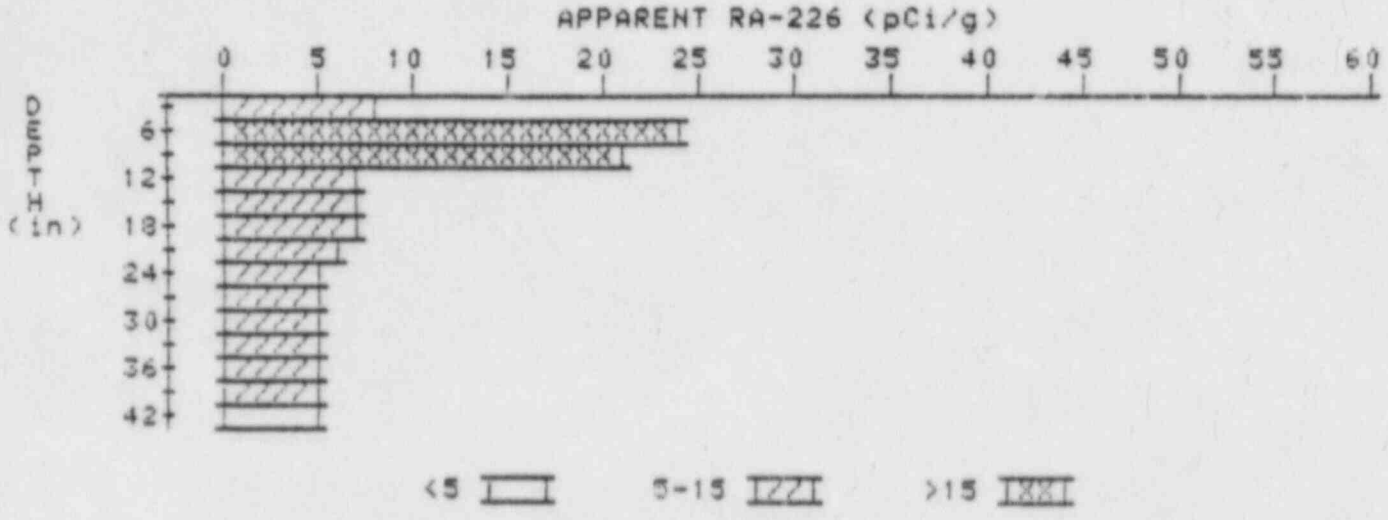
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	33.2	33.2
6	26.6	30.3
9	17.9	15.2
12	10.7	2.7
15	8.0	6.2
18	6.3	4.3
21	5.7	5.3
24	5.3	5.1
27	5.0	4.5
30	5.0	5.4
33	4.8	4.4
36	4.8	5.0
39	4.7	4.7
42	4.6	4.6
45	4.5	4.3
48	4.5	4.7

51	4.4	4.0
54	4.5	4.9
57	4.4	4.0
60	4.5	4.7
63	4.5	4.5
66	4.5	4.5

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION 33
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00712-RS
HOLE NUMBER: 33
LOCATION: 200163

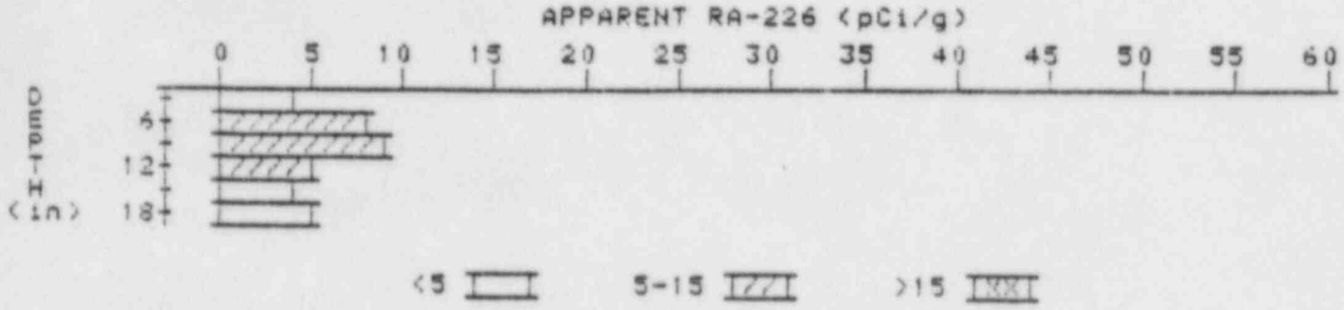


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	7.8	7.8
6	13.7	23.8
9	13.9	20.7
12	10.3	7.5
15	8.3	6.0
18	7.3	6.9
21	6.6	6.1
24	5.9	5.6
27	5.6	5.4
30	5.4	5.4
33	5.2	5.0
36	5.1	5.1
39	5.0	5.0
42	4.9	4.9

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 35

PROPERTY NUMBER: GJ-00712-RS
HOLE NUMBER: 35
LOCATION: 202198

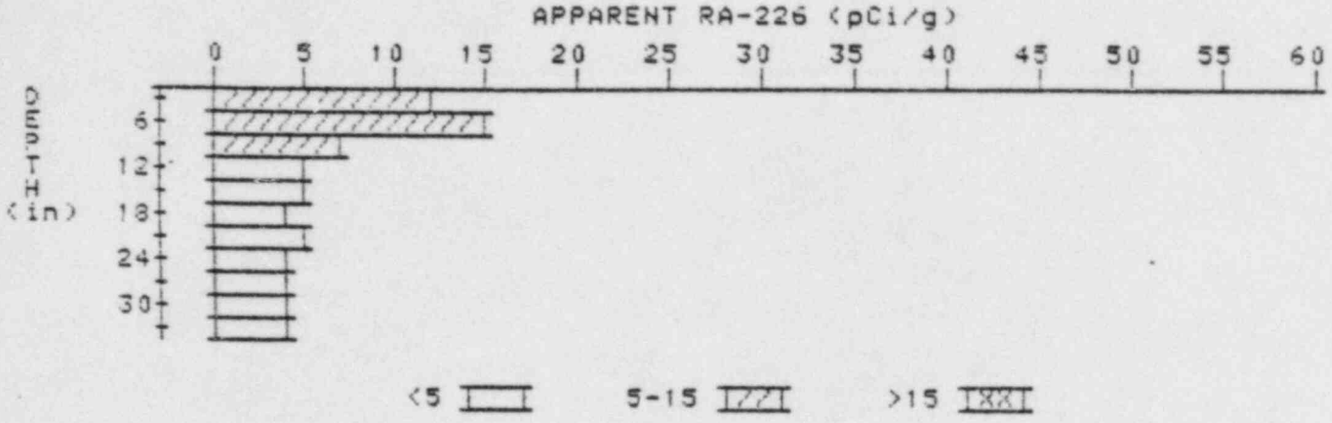


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.2	4.2
6	6.0	8.5
9	6.4	8.5
12	5.6	5.4
15	4.9	4.0
18	4.7	4.7

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION 38
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00712-RS
HOLE NUMBER: 38
LOCATION: 205202



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	11.9	11.9
6	11.2	14.8
9	8.5	7.3
12	6.5	4.9
15	5.4	4.5
18	4.8	4.1
21	4.6	4.8
24	4.3	3.8
27	4.3	4.5
30	4.2	4.0
33	4.2	4.2