

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-08843-MR
ADDRESS: 2525 SOUTH BROADWAY

AUGUST 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION
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DATE

September 3, 1985

REA08843:GE010

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-08843-MR, is a single-family residence located at 2525 South Broadway, 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, 108 cu. yd.; interior, 71 cu. yd.

Estimated cost to perform remedial action is \$13,441. Remedial action on this property will take approximately 21 days to complete.

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

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 2525 South Broadway, Grand Junction, Colorado

Zoning: Commercial (C)

Lot Size: Approximately 12,646 sf (0.29 acre)

Legal Description: From the southwest corner of Section 15, T.1S, R.1W, N 76° 04' E 940.00 feet, thence N 59° 57' E 370.0 feet, thence N 30° 30' E 120.58' to point of beginning, thence N 30° 30' E 207.62 feet, thence N 67° 45' W 104.8 feet, thence S 36° 21' W 179.2 feet, thence S 48° 44' E 120.0 feet to beginning, except beginning N 65° 59' E 1,469.8 feet from southwest corner of Section 15, T.1S., R.1W., thence N 48° 11' W 111.9 feet, thence N 35° 32' E 66.9 feet, thence S 67° 45' E 104.8 feet, thence S 30° 30' W 103.4 feet to beginning, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 2 miles northwest 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:	Single-family residence
South:	Single-family residence
East:	Vacant land (watershed)
West:	South Broadway

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-family residence
Size:	Approximately 720 sf
Construction Date:	1935
Construction:	Wood-frame
Foundation:	Concrete

Footing Depth:	Approximately 72" to bottom of footing from grade
Basement:	Full
Crawl Space:	No
Condition:	Fair

Other Structures:

Type:	Garage
Size:	Approximately 576 sf
Construction:	Wood-frame
Foundation:	None
Condition:	Poor

Type:	Shed
Size:	Approximately 80 sf
Construction:	Wood-frame
Foundation:	None
Condition:	Poor

General Remarks:

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

Historical Data:

This structure is over 50 years old. Therefore, it does meet the eligibility criteria for consideration of inclusion on the National Register of Historic Places.

Alterations to Structure: Front porch

Architectural Significance: Minimal

Historical Significance: None known

3.0 RADIOLOGIC SURVEY

3.1 Introduction

Radiologic data were collected by Bendix at DOE ID No. GJ-08843-MR on March 5, 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 patio next to the garage, southeast of the garage, and east of 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, 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: 14 to 16 uR/h
Highest Outside Gamma Reading (HOG): 100 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: 11 to 14 uR/h
Highest Inside Gamma Reading (HIG): 37 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 (RDC)

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

3.5 Extent of Contamination

Appendix Figures 3.5a and 3.5b show identified areas and estimated depths of contamination on this property, based on assessments of all measurements taken. As noted in these figures, areas recommended for remedial action that contain identified residual radioactive materials are:

- (AREA A) A deposit extends under a covered porch on the west side of the primary structure to an unknown depth (approximately 48 sf; this area is excluded from remedial action).
- (AREA B) Contamination in the garage extends to a depth greater than 48 inches (approximately 480 sf).
- (AREA C) Contamination under the 2-inch-thick uncontaminated concrete and sandstone patio, south of the primary structure, is 10 inches deep. The total depth of contamination is 12 inches (approximately 220 sf).
- (AREA D) Southeast of the primary structure contaminated chunks of concrete extend to a depth of 6 inches (approximately 196 sf).
- (AREA E) A deposit on the north, south, and east side of the garage extends to a depth greater than 48 inches (approximately 1,298 sf).

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-08843-MR, includes removal of select areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figures 3.5a and 3.5b) and transport of removed material to the disposal site.

Remedial action will not be performed on Area A of this property because the levels of radioactivity in these areas do not exceed the EPA Standards (40 CFR 192), as described below:

- (1) Indoor radon-decay products shall not exceed a working level of 0.03, nor, to the extent possible, a working level of 0.02. (At this property the gross working level was not assessed by CDH or Bendix.
- (2) Indoor gamma radiation shall not exceed 20 microroentgens per hour (uR/h) above background levels. (At this location the interior background readings were found to be between 11 and 14 uR/h, with the highest mean surface gamma reading at 20 uR/h.)

An indoor RDC measurement shall be completed on this property. If the RDC measurement exceeds EPA Standards, then the REA will be revised and remedial action accomplished in accordance with the Vicinity Property Management and Implementation Manual. If EPA Standards are not exceeded, then the recommendation to exclude Area A will be considered valid, and a Property Completion Report will be prepared for DOE certification.

The spillover of Areas D and E are recommended for remedial action as part of the remedial action on GJ-08843-MR. The adjoining property is an unmaintained and heavily brushed watershed. The contamination on the adjoining property originated from property GJ-08843-MR, and the contamination is within the "area of beneficial use" of this property.

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 \$13,441.

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

The shed is mostly buried in the ground. Owner preference is to have the shed removed. 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 Exposure Rates and Sample Locations (basement)
Figure 3.3b	Interior Gamma Exposure Rates and Sample Locations (ground floor)
Figure 3.4	Exterior Sample Locations
Figure 3.5a	Interior Estimated Extent of Contamination
Figure 3.5b	Exterior Estimated Extent of Contamination

Official Survey Report

Memo of Understanding

Team Leader Notes

Deconvolution Graphs (Apparent Radium-226 Concentration)

Radium Concentrations at Exterior Locations

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
10	160260	00	DS	<1.0		*	Background
		00-06	SS			1.1	
		03	TC	2.3		*	DC = 0 inches
		06	TC	2.6		*	
		09	TC	2.8		*	
		12	TC	2.8		*	
		15	TC	2.8		*	
		18	TC	2.7		*	
		21	TC	2.6		*	
		24	TC	2.4		*	
		27	TC	2.4		*	
		30	TC	2.3		*	
		33	TC	2.2		*	
		36	TC	2.2		*	
		39	TC	2.2		*	
11	180273	00	DS	<1.0		*	Water line
		03	TC	2.4		*	North side of
		06	TC	2.6		*	primary structure
		09	TC	2.7		*	DC = 0 inches
		12	TC	2.6		*	
		15	TC	2.5		*	
		18	TC	2.5		*	
		21	TC	2.4		*	
		24	TC	2.3		*	
		27	TC	2.3		*	
		30	TC	2.2		*	
		33	TC	2.1		*	
12	185266	00	DS	<1.0		*	Gas line
		15	DS	<1.0		*	On gas line
13	190266	00	DS	<1.0		*	Sewer line
		03	TC	2.0		*	North of primary
		06	TC	2.1		*	structure
		09	TC	2.2		*	DC = 0 inches
		12	TC	2.2		*	
		15	TC	2.2		*	
		18	TC	2.2		*	
		21	TC	2.1		*	
		24	TC	2.2		*	
		27	TC	2.2		*	
		30	TC	2.2		*	
		33	TC	2.2		*	

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
13	190266	36	TC	2.2		*	
		39	TC	2.2		*	
		42	TC	2.2		*	
		45	TC	2.1		*	
		48	TC	2.1		*	
		51	TC	2.1		*	
		54	TC	2.1		*	
		57	TC	2.0		*	
		60	TC	2.0		*	
		63	TC	2.0		*	
		66	TC	2.0		*	
		69	TC	2.1		*	
		72	TC	2.1		*	
		75	TC	2.0		*	
		78	TC	2.1		*	
		81	TC	2.0		*	
		84	TC	2.0		*	
		87	TC	2.0		*	
		90	TC	2.0		*	
14	195249	00	DS	<1.0		*	Sewer line
		03	TC	2.3		*	South side of
		06	TC	2.3		*	primary structure
		09	TC	2.3		*	DC = 0 inches
		12	TC	2.4		*	
		15	TC	2.5		*	
		18	TC	2.4		*	
		21	TC	2.4		*	
		24	TC	2.4		*	
		27	TC	2.3		*	
		30	TC	2.3		*	
		33	TC	2.3		*	
		36	TC	2.3		*	
		39	TC	2.3		*	
		42	TC	2.3		*	
		45	TC	2.3		*	
		48	TC	2.3		*	
		51	TC	2.3		*	
		54	TC	2.2		*	
		57	TC	2.2		*	
		60	TC	2.2		*	
		63	TC	2.3		*	
		66	TC	2.3		*	
		69	TC	2.3		*	

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
14	195249	72	TC	2.3		*	
15	218243	00	DS	<1.0		*	Steps at flagstone patio
16	220220	03	TC	3.5		*	West of the garage DC = 0 inches
		06	TC	3.5		*	
		09	TC	3.5		*	
		12	TC	3.5		*	
		15	TC	3.6		*	
		18	TC	3.6		*	
		21	TC	3.6		*	
		24	TC	3.6		*	
		27	TC	3.7		*	
		30	TC	3.8		*	
		33	TC	3.9		*	
		36	TC	3.9		*	
		39	TC	3.9		*	
		42	TC	3.8		*	
		45	TC	3.6		*	
		48	TC	2.9		*	
		51	TC	3.7		*	
		54	TC	4.0		*	
		57	TC	4.0		*	
17	222238	00-02	SS			4.0	Core
		02-08	SS			76.3	Soil under core
		03	TC	37.3		*	Flagstone and
		06	TC	27.0		*	concrete patio
		09	TC	15.4		*	
		12	TC	9.1		*	DC = 12 inches
		15	TC	5.9		*	Based on the
		18	TC	4.3		*	deconvolution graph
		21	TC	3.7		*	
		24	TC	3.3		*	
		27	TC	3.1		*	
		30	TC	3.0		*	
		33	TC	2.9		*	
		36	TC	2.6		*	
		39	TC	2.4		*	
		42	TC	2.2		*	
		45	TC	2.2		*	

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
18	228241	00	DS	3.1		*	Flagstone patio
19	235267	03	TC	2.4		*	Septic system DC = 0 inches
		06	TC	2.4		*	
		09	TC	2.3		*	
		12	TC	2.4		*	
		15	TC	2.4		*	
		18	TC	2.4		*	
		21	TC	2.4		*	
		24	TC	2.4		*	
		27	TC	2.4		*	
		30	TC	2.5		*	
		33	TC	2.5		*	
		36	TC	2.4		*	
		39	TC	2.4		*	
		42	TC	2.4		*	
		45	TC	2.4		*	
		48	TC	2.4		*	
20	240200	03	TC	3.8		*	North of framed garage DC = >48 inches Based on all available data
		06	TC	4.1		*	
		09	TC	4.2		*	
		12	TC	4.3		*	
		15	TC	4.5		*	
		18	TC	4.8		*	
		21	TC	5.4		*	
		24	TC	6.0		*	
		27	TC	6.6		*	
		30	TC	7.7		*	
		33	TC	9.4		*	
		36	TC	12.0		*	
		39	TC	16.6		*	
		42	TC	24.6		*	
		45	TC	38.8		*	
		48	TC	49.0		*	
21	245194	03	TC	3.9		*	North of framed garage
		06	TC	5.1		*	

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
21	245194	09	TC	7.0		*	DC = >48 inches Based on all available data
		12	TC	9.5		*	
		15	TC	10.1		*	
		18	TC	7.4		*	
		21	TC	5.6		*	
		24	TC	4.7		*	
		27	TC	4.4		*	
		30	TC	4.2		*	
		33	TC	4.2		*	
		36	TC	4.3		*	
		39	TC	4.3		*	
		42	TC	4.4		*	
		45	TC	4.4		*	
		48	TC	4.5		*	
		51	TC	4.5		*	
		54	TC	4.6		*	
22	245207	00	DS	5.6		*	South of garage DC = >48 inches Based on all available data
		06	DS	11.0		*	
		03	TC	8.2		*	
		06	TC	9.5		*	
		09	TC	8.5		*	
		12	TC	6.4		*	
		15	TC	5.0		*	
		18	TC	4.4		*	
		21	TC	4.1		*	
		24	TC	3.9		*	
		27	TC	3.9		*	
		30	TC	3.9		*	
		33	TC	3.9		*	
		36	TC	4.0		*	
		39	TC	4.0		*	
		42	TC	3.8		*	
23	245242	00	DS	8.5		*	West side of shed DC = >48 inches Based on all available data
		06	DS	1.8		*	
		03	TC	4.4		*	
		06	TC	4.2		*	
		09	TC	4.2		*	
		12	TC	4.1		*	
		15	TC	4.1		*	

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
23	245242	18	TC	4.1		*	
		21	TC	4.1		*	
		24	TC	4.4		*	
		27	TC	5.2		*	
		30	TC	6.1		*	
		33	TC	7.8		*	
		36	TC	10.0		*	
		39	TC	11.7		*	
		42	TC	10.7		*	
		45	TC	7.7		*	
		48	TC	4.3		*	
		51	TC	3.9		*	
24	246232	00	DS	7.4		*	Northeast corner of garage
		06	DS	11.0		*	
		03	TC	7.6		*	
		06	TC	9.1		*	DC = >48 inches Based on all available data
		09	TC	9.4		*	
		12	TC	8.3		*	
		15	TC	6.6		*	
		18	TC	5.6		*	
		21	TC	5.0		*	
		24	TC	4.6		*	
		27	TC	4.5		*	
		30	TC	4.4		*	
		33	TC	4.4		*	
25	249225	00	DS	19.6		*	East side of garage
		06	DS	25.8		*	
		03	TC	17.9		*	DC = >48 inches Based on all available data
		06	TC	22.1		*	
		09	TC	24.3		*	
		12	TC	24.8		*	
		15	TC	24.5		*	
		18	TC	24.6		*	
		21	TC	22.8		*	
		24	TC	19.2		*	
		27	TC	14.3		*	
		30	TC	10.6		*	
		33	TC	8.5		*	
		36	TC	7.1		*	
		39	TC	5.8		*	
		42	TC	5.4		*	

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
25	249225	45	TC	5.0		*	
		48	TC	4.9		*	
		51	TC	4.9		*	
		54	TC	4.8		*	
		57	TC	4.9		*	
		60	TC	5.1		*	
		63	TC	5.6		*	
		66	TC	5.8		*	
		69	TC	5.3		*	
26	249255	00-06	SS			256.2	Rip-rap
		03	TC	4.4		*	North of the shed
		06	TC	3.7		*	
		09	TC	3.0		*	DC = 6 inches
		12	TC	2.7		*	Based on the
		15	TC	2.4		*	location of the
		18	TC	2.2		*	rip-rap
		21	TC	2.2		*	
		24	TC	2.3		*	
		27	TC	2.3		*	
		30	TC	2.5		*	
27	250200	03	TC	3.6		*	Southeast of garage
		06	TC	5.2		*	
		09	TC	7.4		*	DC = >48 inches
		12	TC	9.6		*	Based on all
		15	TC	9.0		*	available data
		18	TC	7.0		*	
		21	TC	5.7		*	
		24	TC	4.7		*	
		27	TC	4.4		*	
		30	TC	4.2		*	
		33	TC	4.0		*	
		36	TC	3.9		*	
		39	TC	3.9		*	
		42	TC	3.9		*	
		45	TC	3.8		*	
		48	TC	3.8		*	
		51	TC	3.8		*	
		54	TC	3.8		*	
		57	TC	3.8		*	
		60	TC	3.8		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-08843-MR

2525 South Broadway

Page 8 of 9

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
27	250200	63	TC	3.7		*	
		66	TC	3.2		*	
28	253235	03	TC	3.5		*	South of the shed in fill area
		06	TC	4.2		*	
		09	TC	5.2		*	
		12	TC	6.3		*	DC = >48 inches Based on all available data
		15	TC	8.3		*	
		18	TC	10.8		*	
		21	TC	13.2		*	
		24	TC	15.1		*	
		27	TC	15.9		*	
		30	TC	16.2		*	
		33	TC	16.0		*	
		36	TC	14.7		*	
		39	TC	12.9		*	
		42	TC	11.0		*	
		45	TC	9.3		*	
		48	TC	8.0		*	
		51	TC	7.5		*	
		54	TC	6.6		*	
		57	TC	5.4		*	
29	255189	60	TC	4.1		*	East of framed garage
		63	TC	3.5		*	
		66	TC	3.2		*	
		69	TC	3.4		*	DC = >48 inches Based on all available data
		72	TC	2.9		*	
		03	TC	3.8		*	
		06	TC	4.7		*	
		09	TC	6.1		*	
		12	TC	7.6		*	
		15	TC	6.7		*	
		18	TC	5.3		*	
		21	TC	4.4		*	
		24	TC	4.4		*	
		27	TC	4.1		*	
		30	TC	3.9		*	
		33	TC	3.7		*	
		36	TC	3.7		*	
		39	TC	3.7		*	
		42	TC	3.7		*	
		45	TC	3.7		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-08843-MR

2525 South Broadway

Page 9 of 9

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
30	255240	00	DS	<1.0		*	Southeast corner of the shed
		03	TC	4.2		*	
		06	TC	4.7		*	
		09	TC	7.3		*	DC = >48 inches Based on all available data
		12	TC	10.3		*	
		15	TC	12.2		*	
		18	TC	12.9		*	
		21	TC	13.1		*	
		24	TC	13.2		*	
		27	TC	13.1		*	
		30	TC	12.8		*	
		33	TC	12.2		*	
		36	TC	10.1		*	
		39	TC	7.5		*	
		42	TC	5.8		*	
		45	TC	4.6		*	
		48	TC	3.5		*	
		51	TC	3.2		*	

Measurement GB = GAD-6 Borehole
Types: 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 = 04-05-85
Team Leader = JJ

Radium Concentrations at Interior Locations

DOE ID #GJ-08843-MR

2525 South Broadway

Page 1 of 2

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
1		[60]	DS	11.0		*	Horizontal on wall
		00	DS	<1.0		*	Basement
2		00	DS	22.8		*	In front porch
3		00	DS	1.1		*	Inside front door
4		00	DS	5.6		*	In garage
		03	TC	11.3		*	
		06	TC	14.4		*	DC = >48 inches
		09	TC	16.2		*	Based on all
		12	TC	16.3		*	available data
		15	TC	16.9		*	
		18	TC	17.6		*	
		21	TC	15.9		*	
		24	TC	11.8		*	
		27	TC	8.7		*	
		30	TC	7.0		*	
		33	TC	5.9		*	
		36	TC	5.5		*	
		39	TC	4.9		*	
		42	TC	4.6		*	
		45	TC	4.4		*	
		48	TC	4.4		*	
		51	TC	4.2		*	
		54	TC	4.2		*	
		57	TC	4.0		*	
5		00	DS	<1.0		*	In garage
		06	DS	<1.0		*	
		03	TC	3.9		*	DC = >48 inches
		06	TC	3.9		*	Based on all
		09	TC	3.9		*	available data
		12	TC	4.0		*	
		15	TC	4.1		*	
		18	TC	4.2		*	
		21	TC	4.2		*	
		24	TC	4.5		*	
		27	TC	4.3		*	
		30	TC	4.3		*	
		33	TC	4.2		*	
		36	TC	4.4		*	
		39	TC	4.4		*	

Radium Concentrations at Interior Locations

DOE ID #GJ-08843-MR

2525 South Broadway

Page 2 of 2

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
5		42	TC	4.4		*	
		45	TC	4.3			
		48	TC	4.2		*	
		51	TC	4.1		*	
		54	TC	3.5		*	
		57	TC	3.2		*	
		60	TC	3.4		*	
		63	TC	2.9		*	
6		00	DS	5.8		*	In garage
		06	DS	1.8		*	
		12	DS	<1.0		*	
7		00	DS	<1.0		*	In garage
8		00	DS	<1.0		*	In shed
9		00	DS	<1.0		*	In shed

Measurement GB = GAD-6 Borehole
Types: 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 = 04-05-85
Team Leader = JJ

Table 3.3
Summary of Interior Gamma Exposure Rates
DOE ID No. GJ-08843-MR 2525 South Broadway Page 1 of 1
=====

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	12	12-21	14	12	12-16	14
ROOM A	05	14-21	16	05	14-37	20
ROOM B	02	11-13	12	02	12-13	13
ROOM C	01	11-11	11	01	11-11	11
ROOM D	05	11-14	13	05	12-19	14
ROOM E	05	11-11	11	05	11-11	11
ROOM F	05	11-11	11	05	11-11	11
GARAGE	09	14-20	16	09	14-27	18
SHED	05	14-21	16	05	14-25	18

=====

*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-08843-MR

Page 1 of 1

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
-------------	-------------------------	-----------	------------------	-----------	--------------------

INTERIOR

Contaminated Fill

A Area A is not included in this remedial action.

B 24 x 20 = 480 x 4.0 = 1,920

Volume of Contaminated Fill = 1,920 = 1,920/27 = 71

EXTERIOR

Concrete and Stone

C 20 x 11 = 220 x 0.2 = 44

D 14 x 14 = 196 x 0.5 = 98

Volume of Concrete and Stone = 142 = 142/27 = 5

Contaminated Fill

C 20 x 11 = 220 x 0.8 = 176

E 12 x 24 = 288
16 x 35 = 560
15 x 30 = 450

1,298 x 2.0* = 2,596

Volume of Contaminated Fill = 2,772 = 2,772/27 = 103

TOTAL VOLUME - EXTERIOR = 108

TOTAL VOLUME - INTERIOR = 71

* The steeply sloping ground at Area E required that the depths must be averaged to result in the correct volume of contaminated material.

See Appendix Figures 3.5a and 3.5b For Areas

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-08843-MR

Page 1 of 2

INTERIOR

Support existing garage walls	
Lump Sum	\$ 500
Remove contaminated fill	
71 cy @ \$44/cy	3,124
Replace with pit run to within 6"	
62 cy @ \$9/cy	558
Replace with roadbase (top 6")	
9 cy @ \$11.50/cy	104
New concrete footing	
3 cy @ \$175/cy	525
New CMU stem wall	
116 sf @ \$4/sf	464
	<hr/>
TOTAL INTERIOR	\$ 5,275

EXTERIOR

Remove contaminated concrete and stone rubble	
5 cy @ \$44/cy	\$ 220
Remove contaminated fill	
103 cy @ \$14.50/cy	1,494
Replace with pit run	
49 cy @ \$9/cy	441
Replace with topsoil (top 12")	
52 cy @ \$9.50/cy	494
Remove and replace grouted flagstone	
220 sf @ \$6/sf	1,320
Replace roadbase under flagstone	
7 cy @ \$11.50/cy	81
Remove shed and backfill	
Lump Sum	250
	<hr/>
TOTAL EXTERIOR	\$ 4,300

TOTAL EXTERIOR	\$	4,300
TOTAL INTERIOR		5,275
ACCESS CONTROL		200
		<hr/>
SUBTOTAL	\$	9,775
CONTINGENCY @ 10%		978
		<hr/>
SUBTOTAL	\$	10,753
CONTRACTOR OVERHEAD & PROFIT @ 25%		2,688
		<hr/>
GRAND TOTAL	\$	13,441

=====

FHW/083085
REA08843.GE:GEO10:MJP



FIGURE 2.1
VICINITY MAP

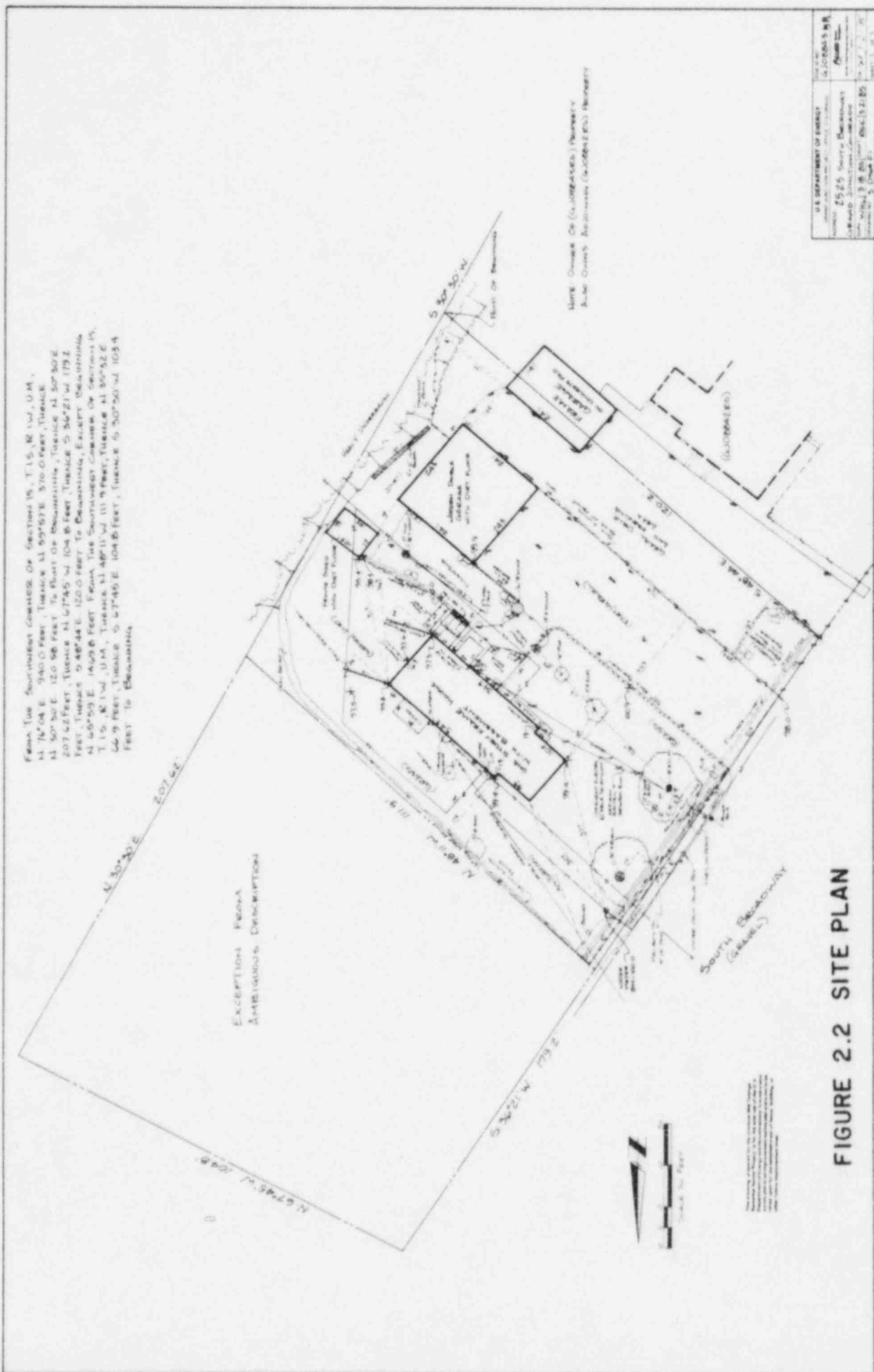
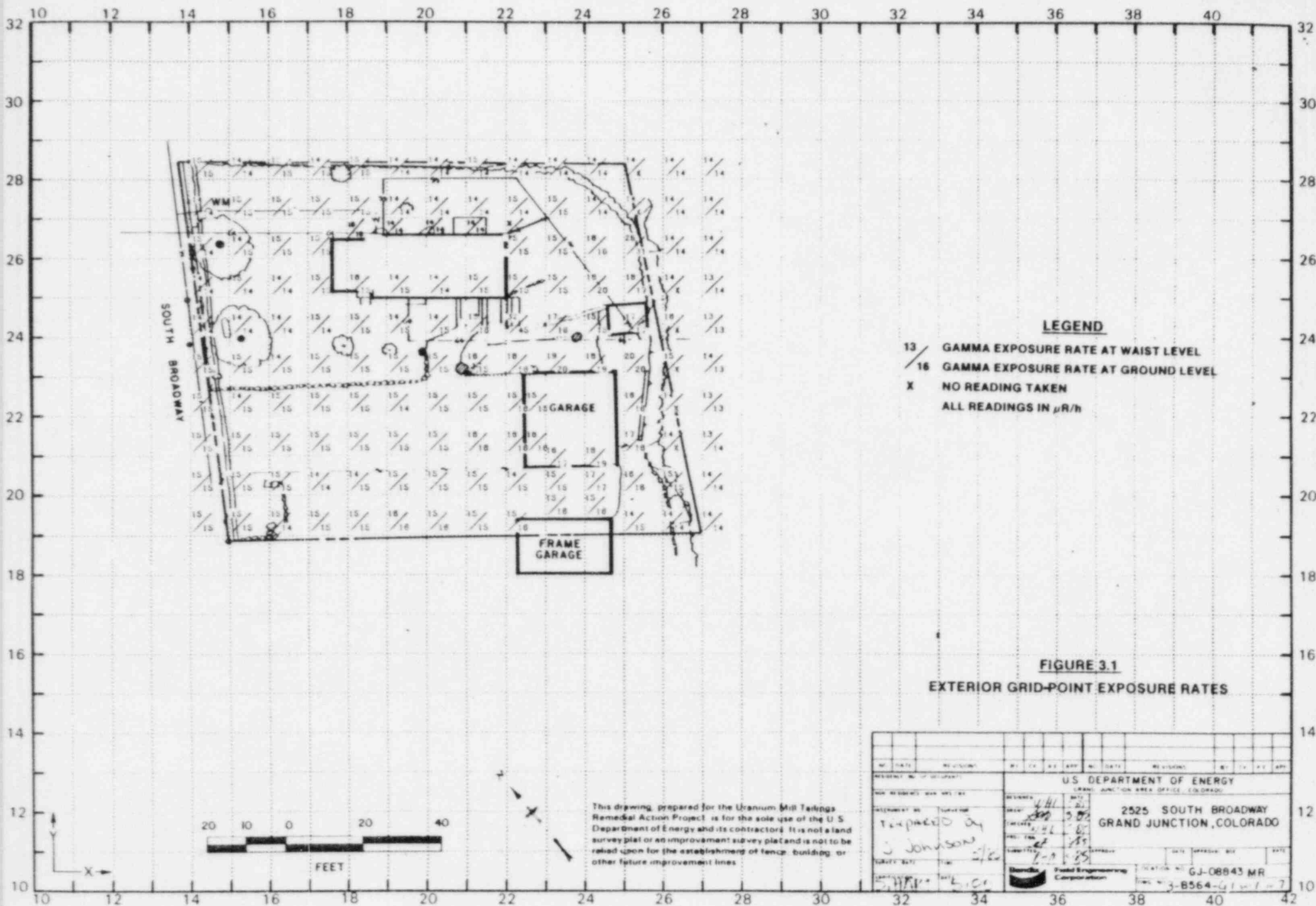


FIGURE 2.2 SITE PLAN

U.S. DEPARTMENT OF ENERGY	PROJECT NUMBER	14-000000-1
	PROJECT NAME	2525 Square Mile Project
	PROJECT LOCATION	2525 Square Mile Project
	PROJECT STATUS	2525 Square Mile Project
	PROJECT DATE	2525 Square Mile Project
	PROJECT SCALE	2525 Square Mile Project
	PROJECT SHEET	2525 Square Mile Project



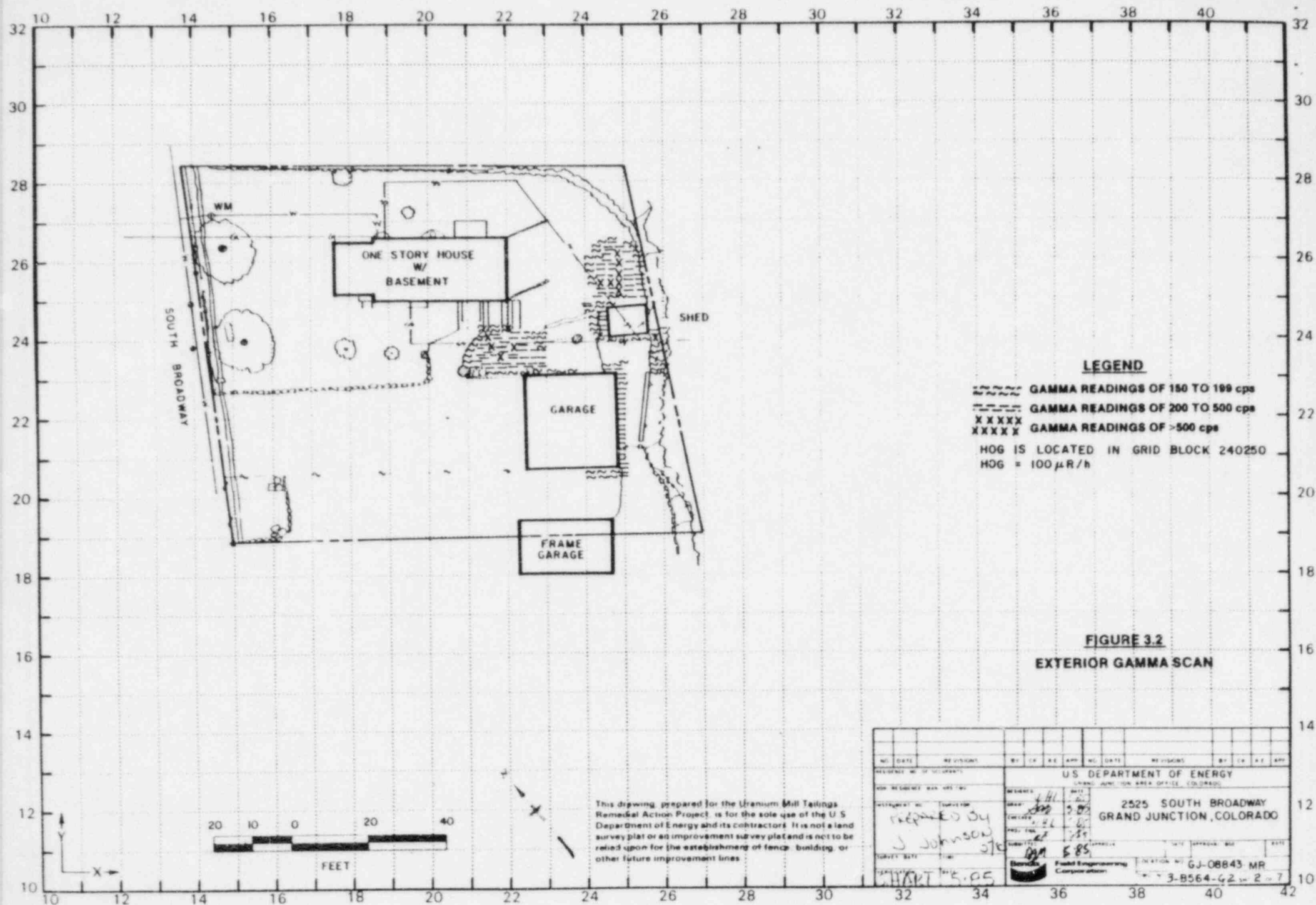
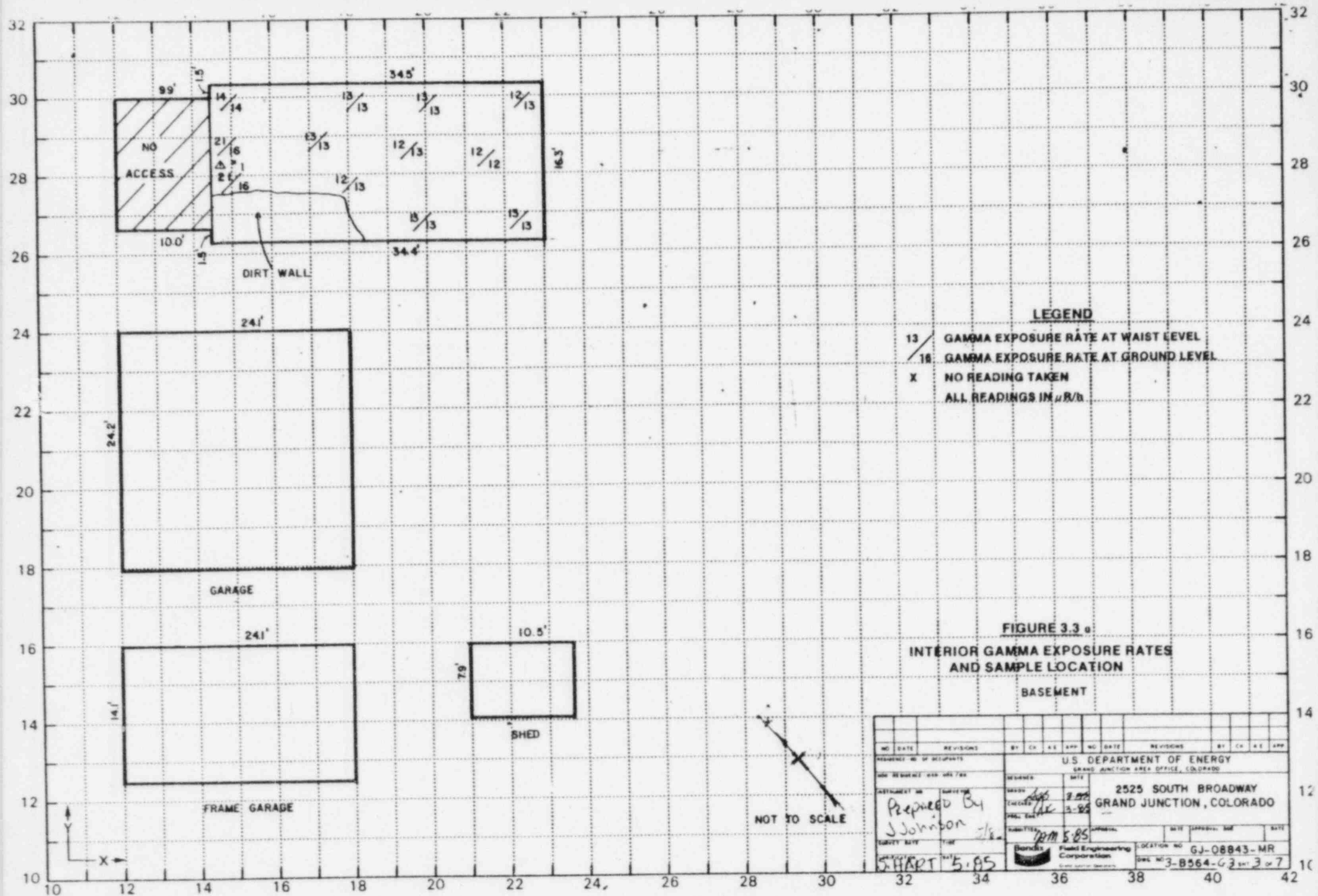
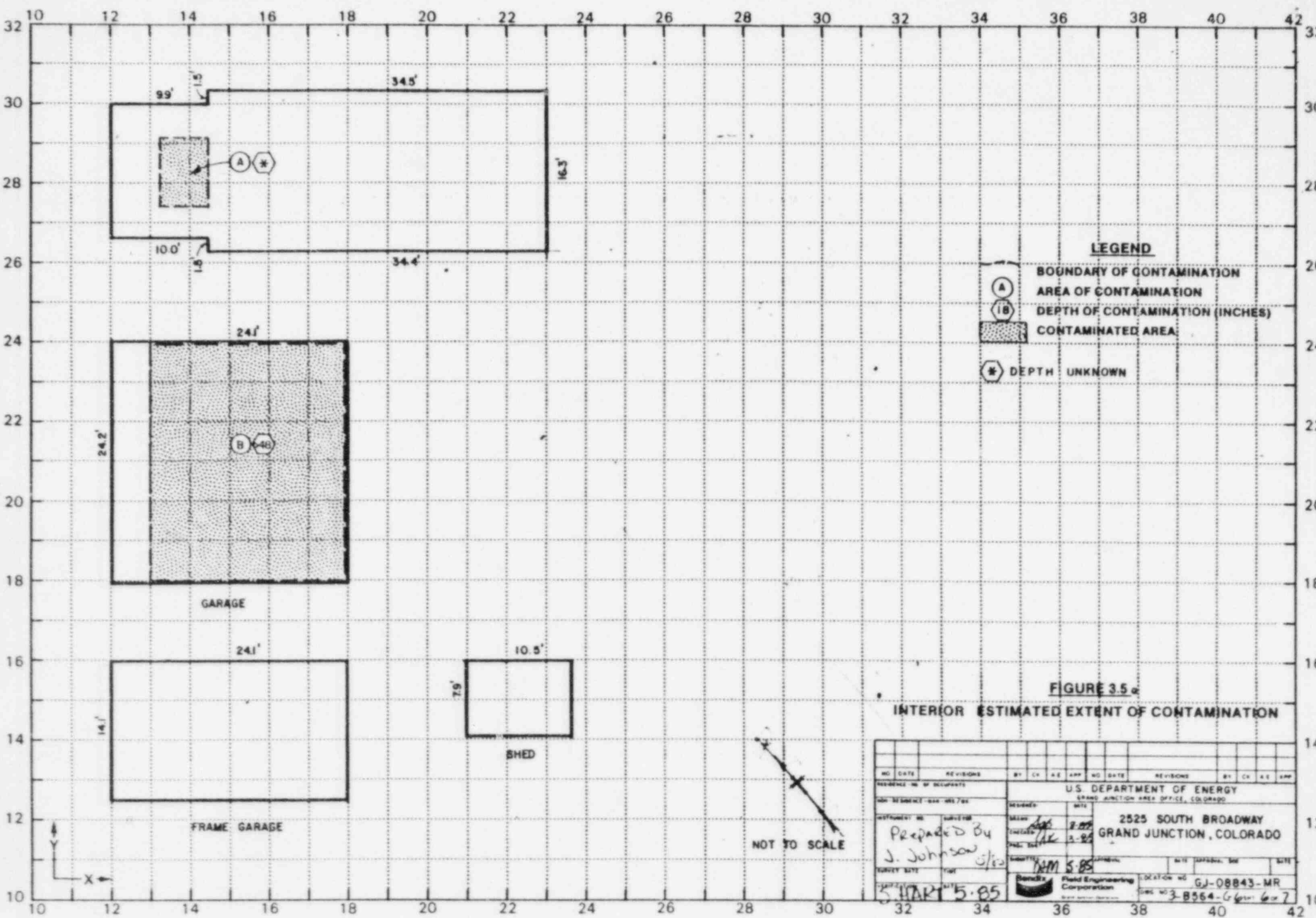


FIGURE 3.2
EXTERIOR GAMMA SCAN

[illegible]

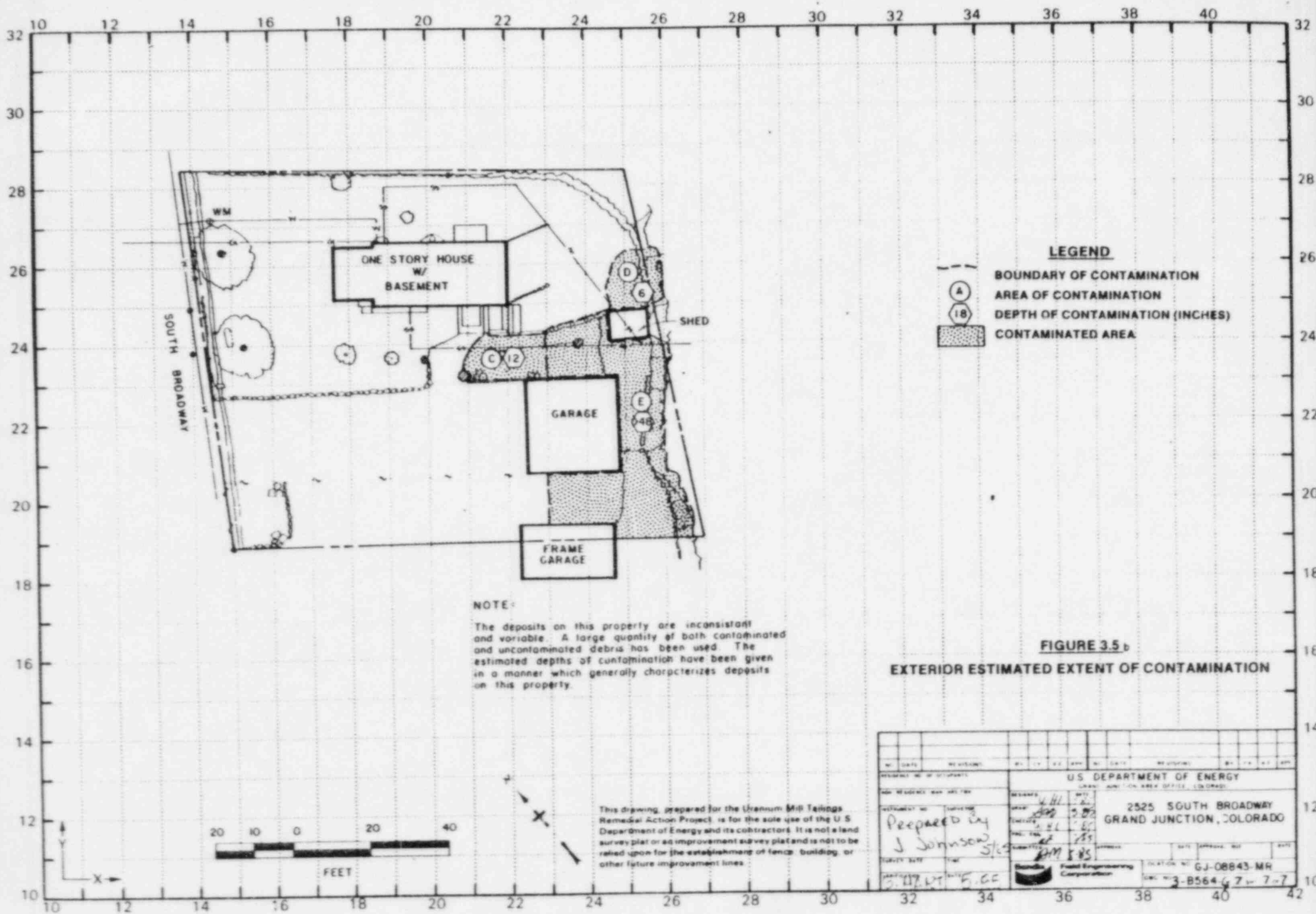




- LEGEND**
- (A) BOUNDARY OF CONTAMINATION
 - (B) AREA OF CONTAMINATION
 - [Stippled Box] DEPTH OF CONTAMINATION (INCHES)
 - (*) CONTAMINATED AREA
 - (*) DEPTH UNKNOWN

FIGURE 3.5a
INTERIOR ESTIMATED EXTENT OF CONTAMINATION

NO. DATE REVISIONS BY CH AE APP NO. DATE REVISIONS BY CH AE APP				U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO			
APPROVAL NO. OF DELEGATES				2525 SOUTH BROADWAY GRAND JUNCTION, COLORADO			
APPROVED BY: J. Johnson 5/10				DATE: 5-85			
SURVEY DATE: 5-85				SITE: 3-B554-Gr 6 or 7			



3/85

DOE ID NO. GJ-08943-MR

Date 05-20-85

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

Official Survey Report

Property Address 2525 South Broadway

Property Owner Claude R. and Hazel E. Wright

Address of Owner (if different from above) 2521 South Broadway

Report Prepared By Jay Johnson

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

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

1 XX 1 Residual radioactive materials found at the following locations:

1 XX 1 In open areas.

1 XX 1 Under or around exterior improvements.

1 XX 1 Under or around a typically nonoccupied structure.

1 XX 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 XX 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 = 37 uR/h
HOG = 100 uR/h



ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
P. O. Box 1569
Grand Junction, CO 81502-1569
Telephone (303) 242-8621
Telex: 454-338

May 20, 1985

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

ATTN: Elaine Brummett

Dear Elaine:

The following is in response to your questions and comments during the Technical Review concerning Department of Energy (DOE) Identification (ID) number GJ-08843-~~RR~~ (2525 South Broadway).

MR mg 7-25

1. A call was made to the owner of the property to locate the septic system. Mr. Wright, the owner, indicated that the tank is south of the primary structure. The tank has been there for more than thirty years.
2. An exploration hole was augered in the area of the septic tank, the results were negative.
3. Locations 4, 5, and 6 (Table 3.2) says greater than 48 inches because of the history of the property. All of the backyard was filled with at least 10 feet of assorted rubbish. The deepest contaminated hole on this property is greater than 48 inches.
4. All of the utility lines enter the house through the crawl space. The sewer line was augered in the location shown on the facility drawing.
5. The depth of contamination (equals greater than 48 inches) is incorrect. It should read greater than 48 inches. This will be corrected in the final maps and tables.
6. Locations 19 and 20 were called greater than 48 inches based on all data available as indicated in comment 3.
7. Location 23 could be called greater than 69 inches. Due to the possibility of spillage down the borehole it was called as greater than 48 inches.

AT 8-25

Elaine Brummett
Colorado Department of Health
GJ-08843-RS-MR *mg* 7-85
May 20, 1985
Page 2

8. Bendix has not changed the procedure for interpreting the deconvolution graph, but personnel interpretation may differ from one person to another. My interpretation would show the possibility of shine or sluff down the hole. To be safe it was called greater than 48 inches.
9. A borehole was augered west of the garage, it had negative results. This area is felt to be part of the original grade.
10. The shed on the east side of the property is on the original grade with fill on the west and south sides. No indication of contamination was observed in the shed.

Thank you for your time and cooperation. If you should have additional questions or comments you may contact me at 242-8621, extension 431.

Very truly yours,

Jay Johnson
RSD Survey Team Leader

JJ:pr

CDH.LETTER:08843.JOHNSON

MEMORANDUM

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado

Date: April 5, 1985

To: Files

From: Jay Johnson

Subject: Team Leader Notes - GJ-08843-~~RM~~ MR *mg* 7.85

Address: 2525 South Broadway

Owner: Hazel E. Wright

Team Members

J. Johnson (Team Leader)
M. Heronema
R. Schouten

C. Adams
B. Beltz
M. Gilfillian

Instruments

C-1184, C-1208, C-1118, C-3935, C-3943, C-3957, C-4006

The owner of this property also owns Department of Energy (DOE) Identification (ID) number GJ-08842, which is currently being surveyed.

Team members gridded and scanned the property. Elevated readings were located in the flagstone patio, around the garage, around the shed, and in an area of brush and rip-rap.

This property apparently has been backfilled towards the back part of the yard, it originally sloped towards the east. Fill was used behind the garage, therefore, behind the garage a hole was drilled in an area where the surface readings were negative but contamination was evident within the hole. The same was experienced on the adjacent property.

Team Leader Notes

GJ-08843-RS-MR *my* T-85

Jay Johnson

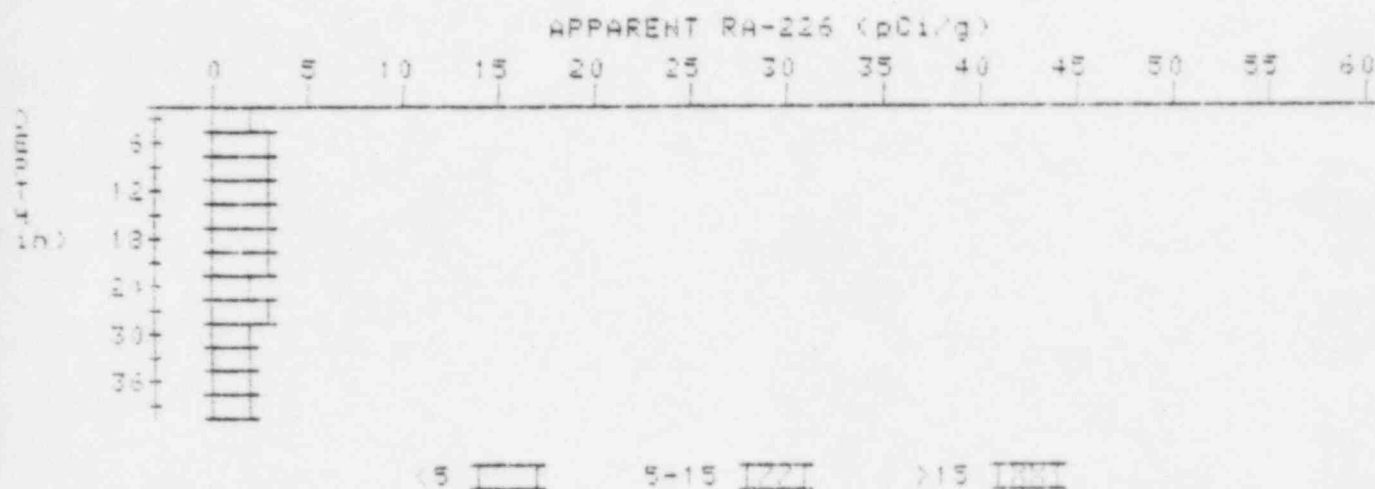
April 5, 1985

Page 2

Elevated readings were found in the covered front porch. Ms. Wright (the owner) stated that there was once a concrete step under the porch and was not sure if the step was removed. There was no access under the porch to determine area or depth.

APPARENT RADIUM-226 CONCENTRATION 10 DECONVOLUTION GRAPH

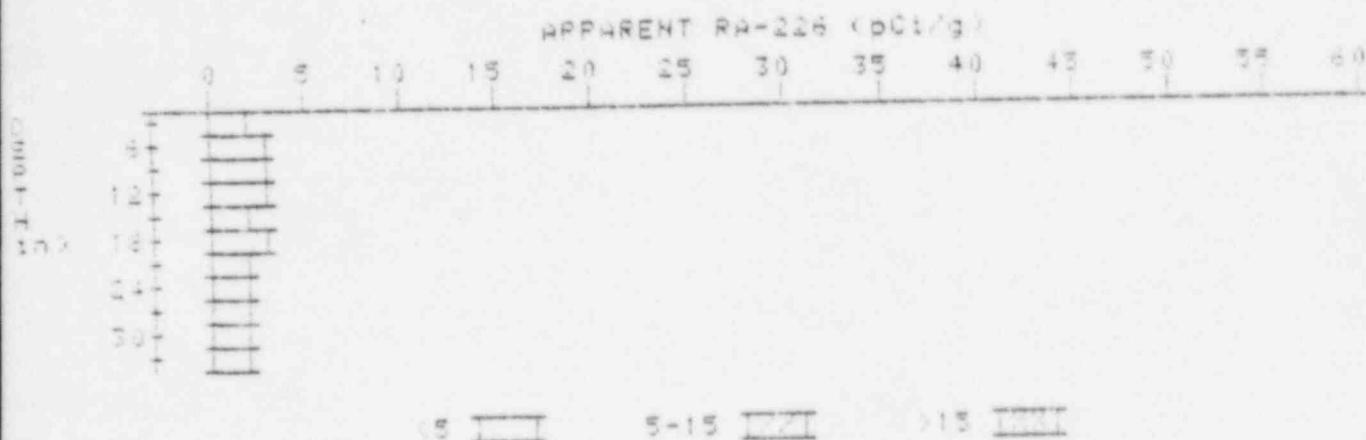
PROPERTY NUMBER: GJ-08843-MR
HOLE NUMBER: 10
LOCATION: 160260



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
0.3	2.3	2.3
0.6	2.5	2.5
0.9	2.6	2.6
1.2	2.6	2.6
1.5	2.6	2.6
1.8	2.7	2.7
2.1	2.8	2.8
2.4	2.4	2.4
2.7	2.4	2.4
3.0	2.4	2.4
3.3	2.6	2.6
3.6	2.6	2.6

APPARENT RADIUM-226 CONCENTRATION 11 DECONVOLUTION GRAPH

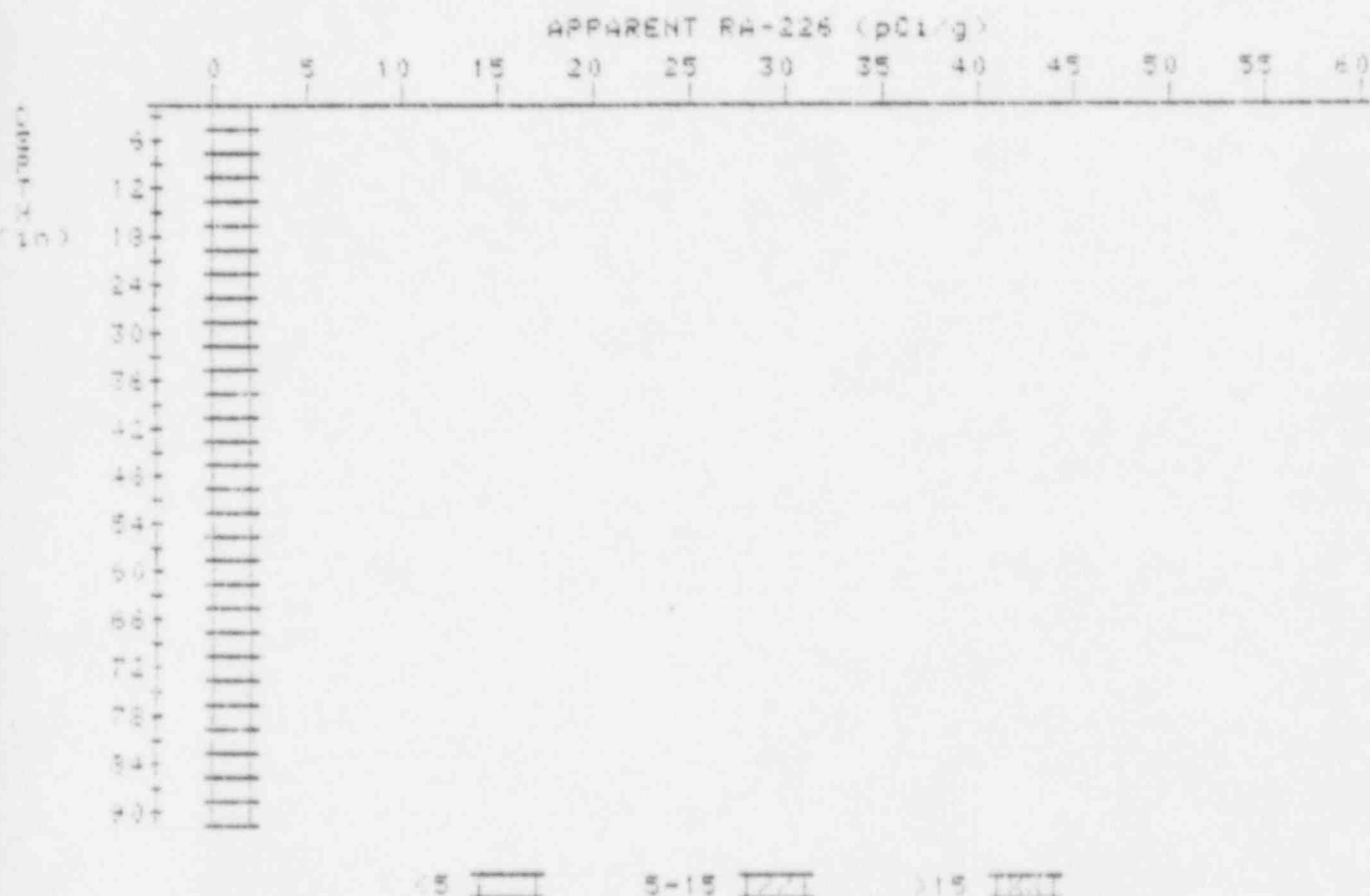
PROPERTY NUMBER: GJ-08843-MR
HOLE NUMBER: 11
LOCATION: 180273



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
0.0	2.4	2.4
0.2	2.0	2.0
0.4	2.0	2.0
0.6	2.0	2.0
0.8	2.0	2.0
1.0	2.0	2.0
1.2	2.0	2.0
1.4	2.0	2.0
1.6	2.0	2.0
1.8	2.0	2.0
2.0	2.0	2.0
2.2	2.0	2.0
2.4	2.0	2.0
2.6	2.0	2.0
2.8	2.0	2.0
3.0	2.0	2.0
3.2	2.0	2.0
3.4	2.0	2.0
3.6	2.0	2.0
3.8	2.0	2.0
4.0	2.0	2.0
4.2	2.0	2.0
4.4	2.0	2.0
4.6	2.0	2.0
4.8	2.0	2.0
5.0	2.0	2.0
5.2	2.0	2.0
5.4	2.0	2.0
5.6	2.0	2.0
5.8	2.0	2.0
6.0	2.0	2.0

APPARENT RADIUM-226 CONCENTRATION 13 DECONVOLUTION GRAPH

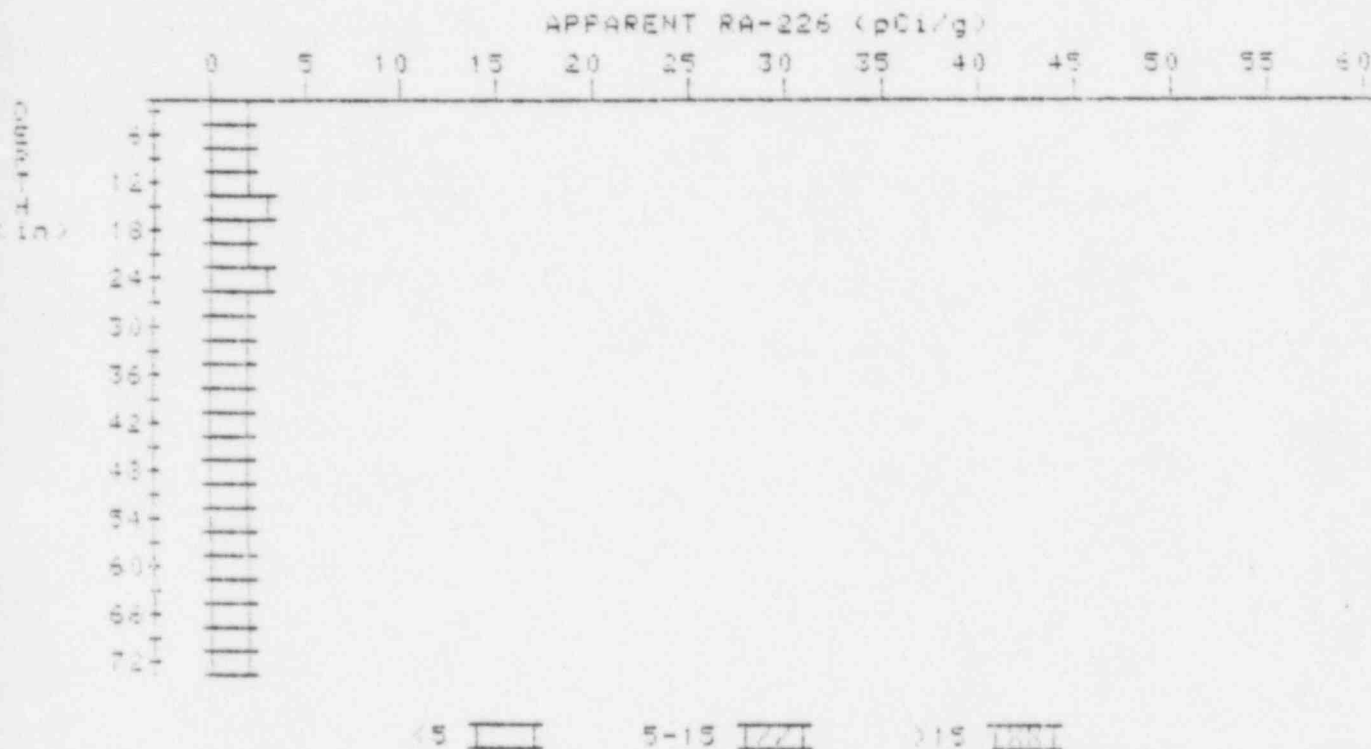
PROPERTY NUMBER: GJ-08843-MR
HOLE NUMBER: 13
LOCATION: 190266



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
2	2.0	2.0
4	2.1	2.1
6	2.2	2.4
8	2.2	2.6
10	2.2	2.6
12	2.2	2.6
14	2.1	2.4
16	2.1	2.4
18	2.2	2.6
20	2.2	2.6

APPARENT RADIUM-226 CONCENTRATION 14 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08843-MR
HOLE NUMBER: 14
LOCATION: 195249



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.3	2.3
6	2.3	2.3
9	2.3	2.1
12	2.4	2.4
15	2.3	2.9
18	2.4	2.2
21	2.4	2.4
24	2.4	2.6
27	2.3	2.1
30	2.3	2.3
33	2.3	2.3
36	2.3	2.3
39	2.3	2.3
42	2.3	2.3
45	2.3	2.3

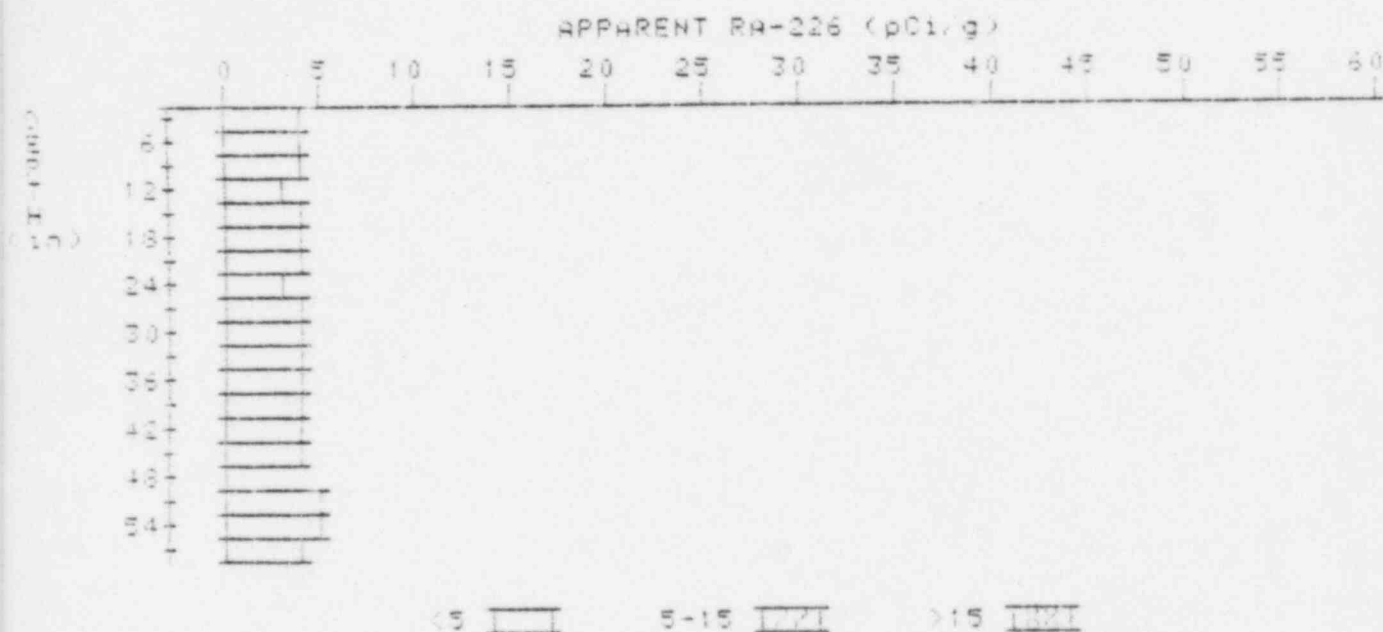
4 6 6 6 6 6 6 6 6 6
6 6 6 6 6 6 6 6 6 6

6 6 6 6 6 6 6 6 6 6
6 6 6 6 6 6 6 6 6 6

6 6 6 6 6 6 6 6 6 6
6 6 6 6 6 6 6 6 6 6

APPARENT RADIUM-226 CONCENTRATION 16 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-06343-MR
HOLE NUMBER: 16
LOCATION: 220220



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
0	5.5	5.5
2	5.5	5.5
4	5.5	5.5
6	5.5	5.5
8	5.5	5.5
10	5.5	5.5
12	5.5	5.5
14	5.5	5.5
16	5.5	5.5
18	5.5	5.5
20	5.5	5.5
22	5.5	5.5
24	5.5	5.5
26	5.5	5.5
28	5.5	5.5
30	5.5	5.5
32	5.5	5.5
34	5.5	5.5
36	5.5	5.5
38	5.5	5.5
40	5.5	5.5
42	5.5	5.5
44	5.5	5.5
46	5.5	5.5
48	5.5	5.5
50	5.5	5.5
52	5.5	5.5
54	5.5	5.5

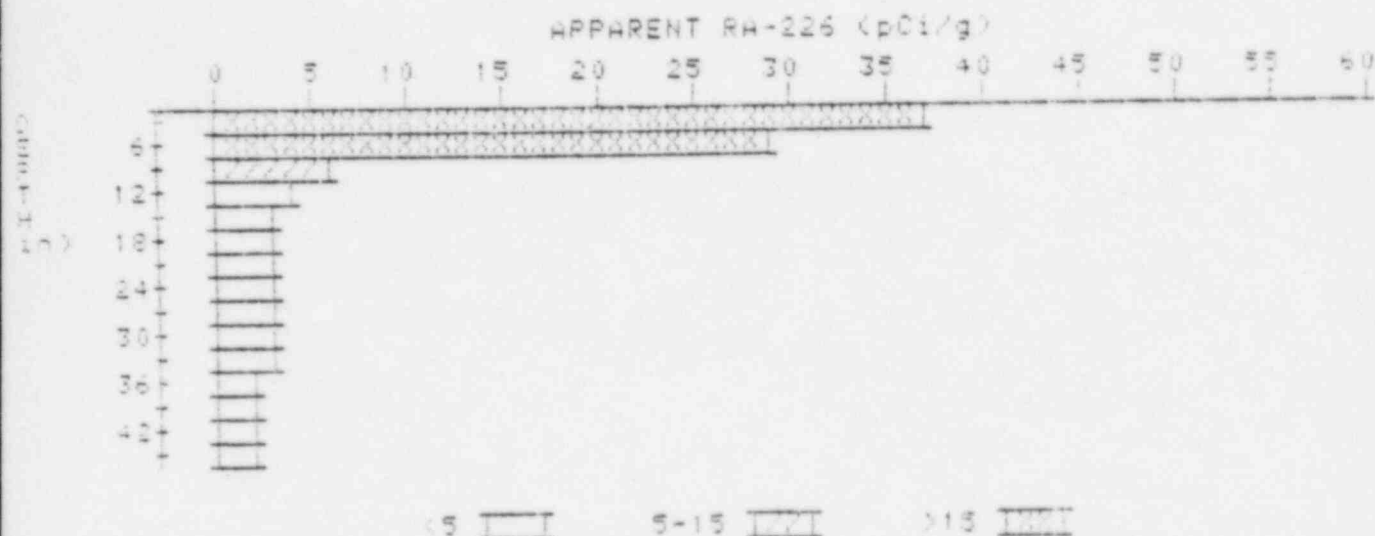
57

4.0

4.0

APPARENT RADIUM-226 CONCENTRATION 17 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08843-MR
HOLE NUMBER: 17
LOCATION: 222238



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
0.3	37.3	37.3
0.6	27.0	29.3
0.9	15.4	6.0
1.2	9.1	3.6
1.5	5.9	3.1
1.8	4.3	2.6
2.1	3.7	2.1
2.4	3.3	1.9
2.7	3.1	1.9
3.0	3.0	1.8
3.3	2.9	1.8
3.6	2.6	1.4
3.9	2.4	1.4
4.2	2.0	1.0
4.5	2.0	1.0

APPARENT RADIUM-226 CONCENTRATION 19 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08843-MR

HOLE NUMBER: 19

LOCATION: 235267

APPARENT RA-226 (pCi/g)



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.4	2.4
6	2.4	2.6
9	2.3	1.9
12	2.4	2.6
15	2.4	2.4
18	2.4	2.4
21	2.4	2.4
24	2.4	2.4
27	2.4	2.6
30	2.8	2.7
33	2.8	2.7
36	2.4	2.4
39	2.4	2.4
42	2.4	2.4
45	2.4	2.4
48	2.4	2.4

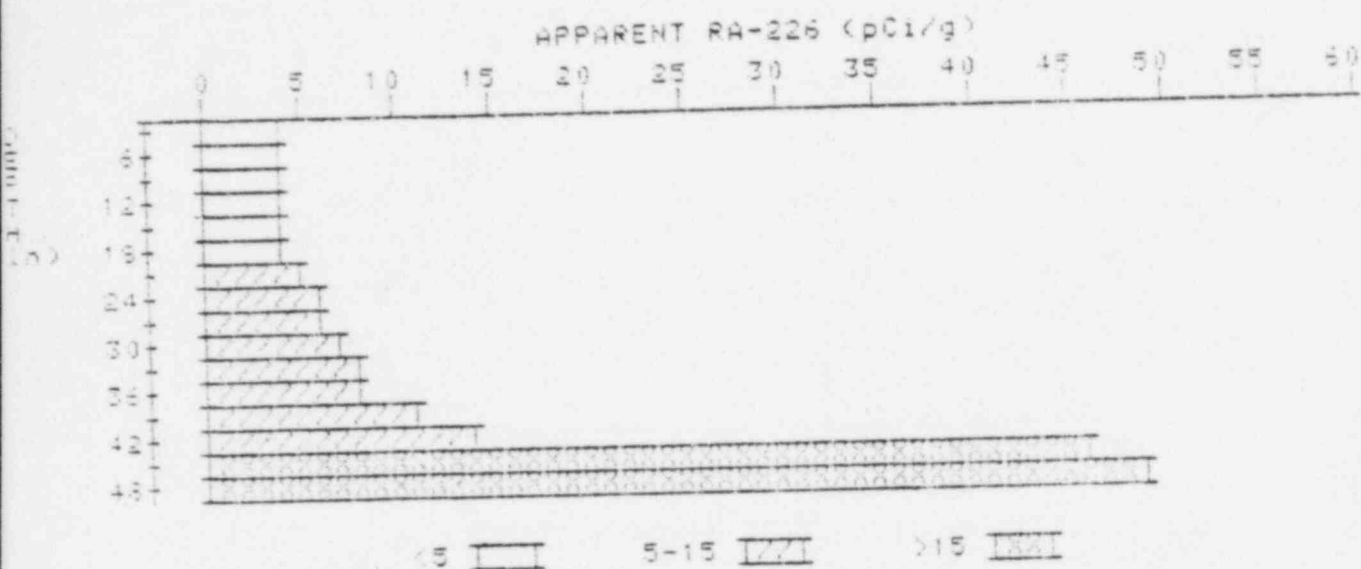
APPARENT RADIUM-226 CONCENTRATION 20

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08843-MR

HOLE NUMBER: 20

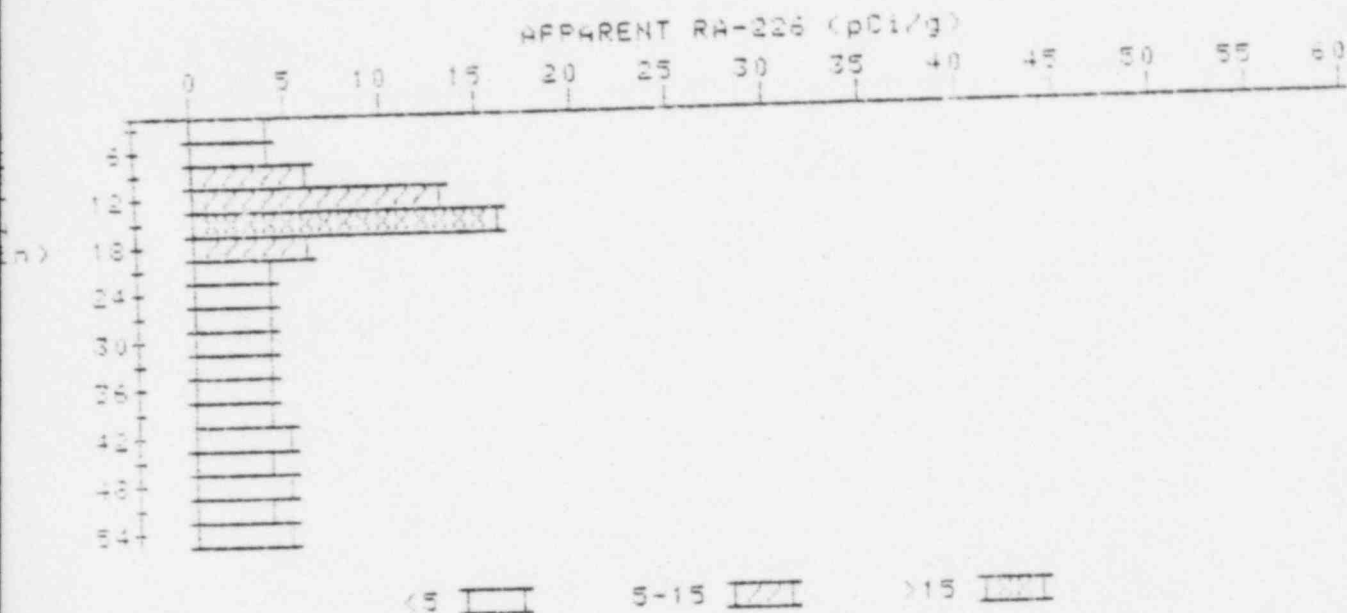
LOCATION: 240200



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.8	3.8
6	4.1	4.5
9	4.2	4.2
12	4.3	4.1
15	4.5	4.3
18	4.8	4.3
21	5.4	5.4
24	6.0	6.0
27	6.6	6.7
30	7.7	6.6
33	9.4	7.8
36	12.0	8.4
39	15.6	10.5
42	24.6	13.6
45	36.6	18.9
48	49.0	19.0

APPARENT RADIUM-226 CONCENTRATION 21 DECONVOLUTION GRAPH

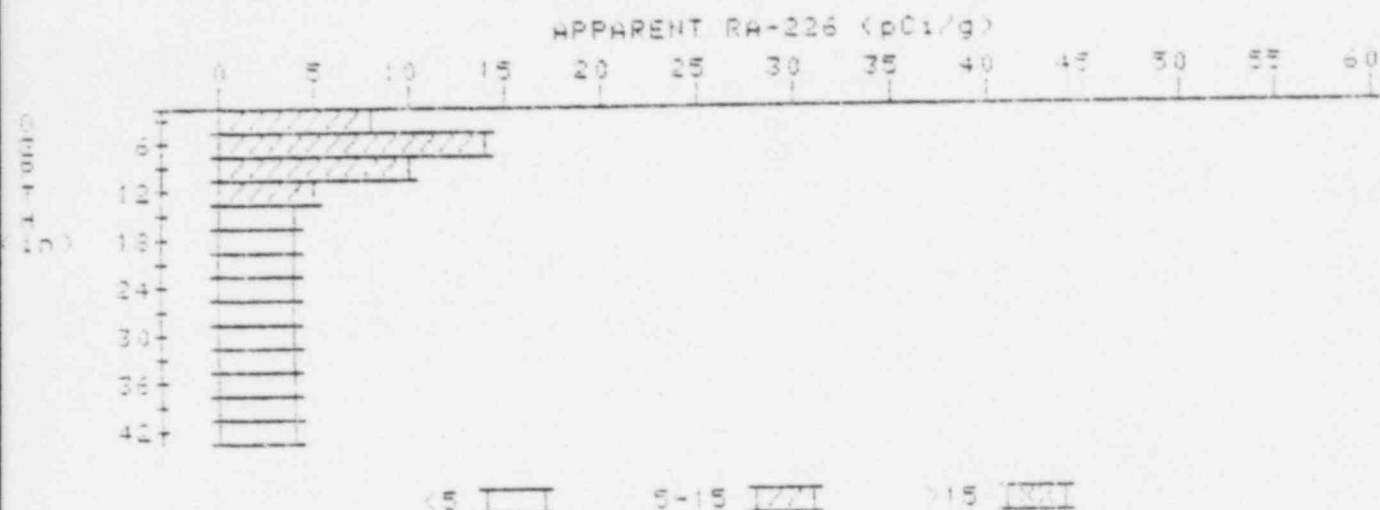
PROPERTY NUMBER: GJ-08843-MR
HOLE NUMBER: 21
LOCATION: 245194



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.9	3.9
6	5.1	3.9
9	7.0	3.9
12	9.5	12.9
15	10.1	15.0
18	7.4	6.8
21	3.6	4.0
24	4.7	3.6
27	4.4	4.2
30	4.2	3.6
33	4.2	4.0
36	4.3	4.5
39	4.3	4.1
42	4.4	4.6
45	4.4	4.2
48	4.3	4.7
51	4.3	4.3
54	4.6	4.6

APPARENT RADIUM-226 CONCENTRATION 22 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08843-MR
HOLE NUMBER: 22
LOCATION: 245207

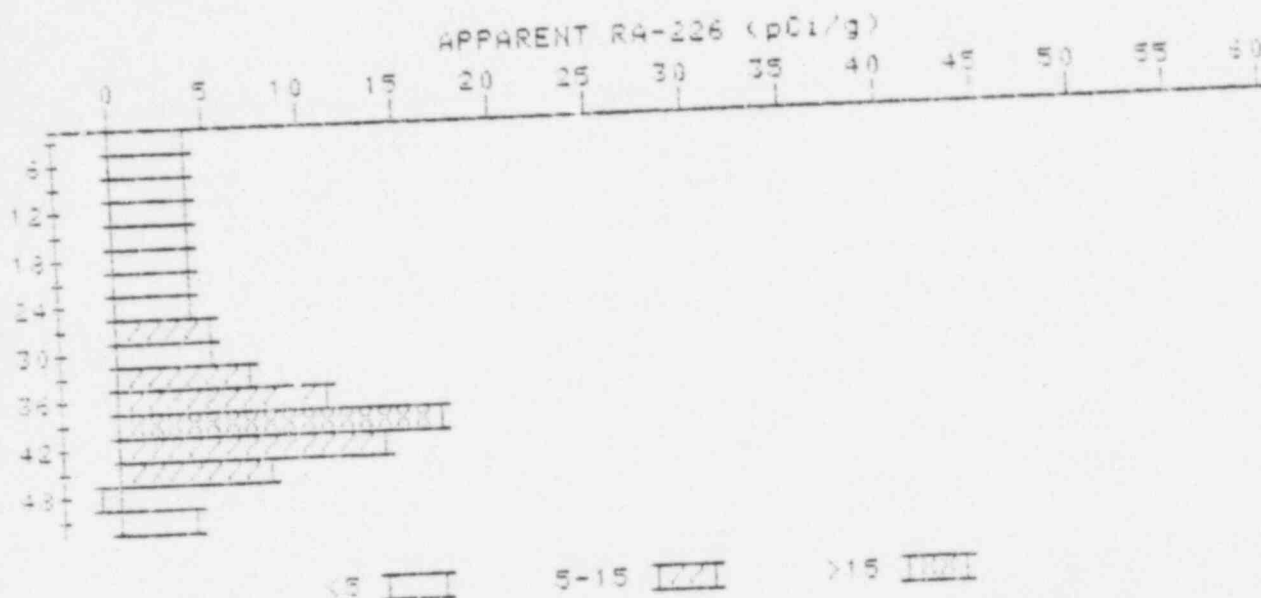


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	8.2	8.2
6	9.5	13.6
9	8.5	10.8
12	6.4	8.2
15	5.0	3.5
18	4.4	3.9
21	4.1	3.9
24	3.9	3.5
27	3.9	3.9
30	3.9	3.9
33	3.9	3.9
36	4.0	4.2
39	4.0	4.4
42	3.8	3.8

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

23

PROPERTY NUMBER: GJ-08843-MR
HOLE NUMBER: 23
LOCATION: 245242

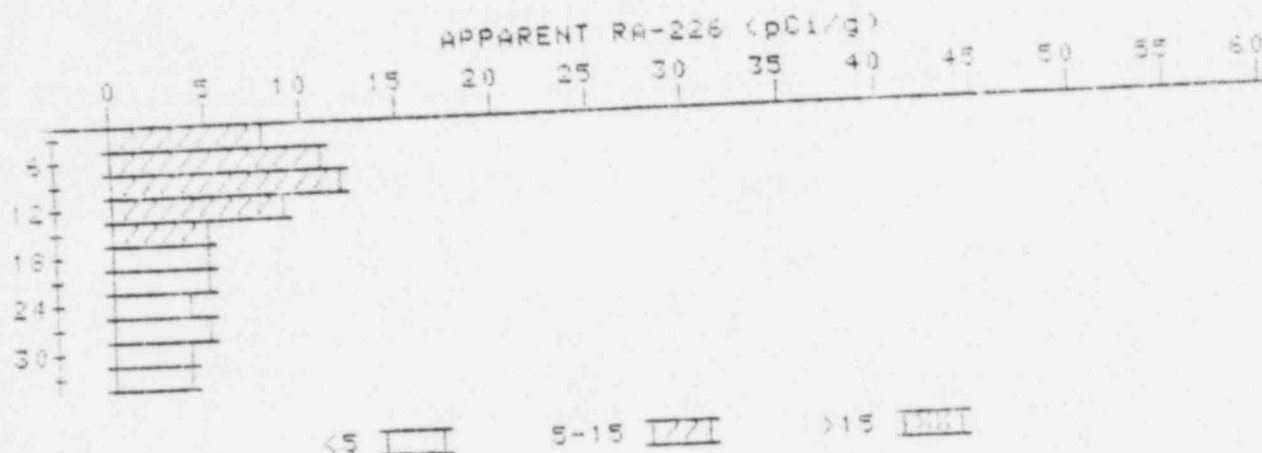


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.4	4.4
6	4.2	3.8
9	4.2	4.4
12	4.1	3.9
15	4.1	4.1
18	4.1	4.1
21	4.1	3.5
24	4.4	3.5
27	3.2	3.0
30	3.1	4.4
33	7.8	3.9
36	10.0	10.9
39	11.7	16.3
42	10.7	14.3
45	7.7	3.4
48	4.3	1.0
51	3.9	3.9

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

24

PROPERTY NUMBER: GJ-08843-MR
HOLE NUMBER: 24
LOCATION: 246232



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	7.6	7.6
6	9.1	11.2
9	9.4	11.2
12	8.3	9.4
15	6.6	8.4
18	5.6	4.6
21	5.0	4.6
24	4.6	4.1
27	4.6	4.8
30	4.4	4.0
33	4.4	4.4

APPARENT RADIUM-226 CONCENTRATION 25 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03843-MR
HOLE NUMBER: 25
LOCATION: 249225



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
0	17.9	17.9
2	22.1	22.1
4	24.3	24.3
6	24.3	24.3
8	24.3	24.3
10	24.3	24.3
12	24.3	24.3
14	22.3	22.3
16	19.2	19.2
18	14.3	14.3
20	10.3	10.3
22	9.3	9.3
24	7.1	7.1
26	6.0	6.0
28	5.4	5.4
30	5.0	5.0

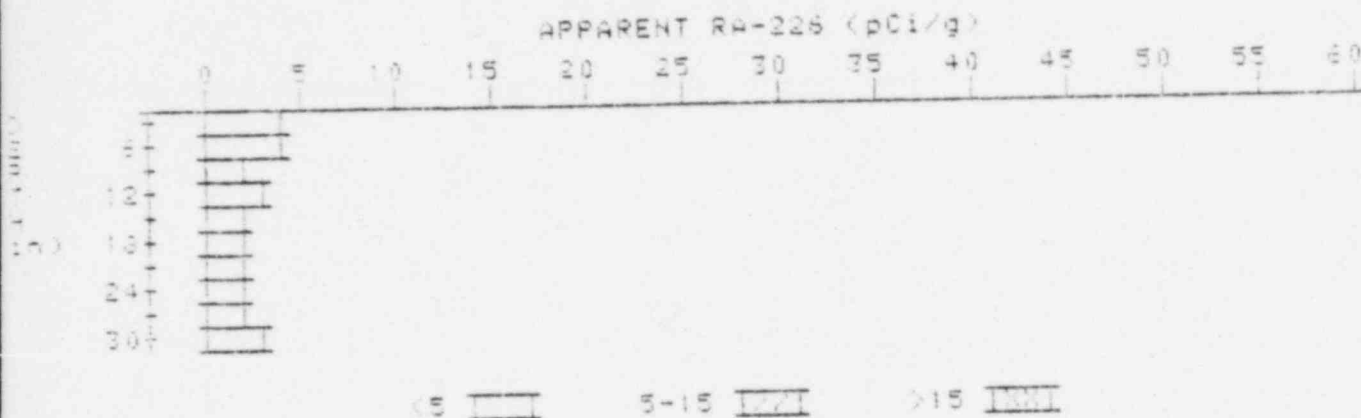
48
51
54
57
60
63
66
69

4.9
4.9
4.6
4.9
5.1
5.6
5.6
5.6

4.7
5.1
4.4
4.7
4.6
5.1
7.0
5.3

APPARENT RADIUM-226 CONCENTRATION 26 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08843-MR
HOLE NUMBER: 26
LOCATION: 249255

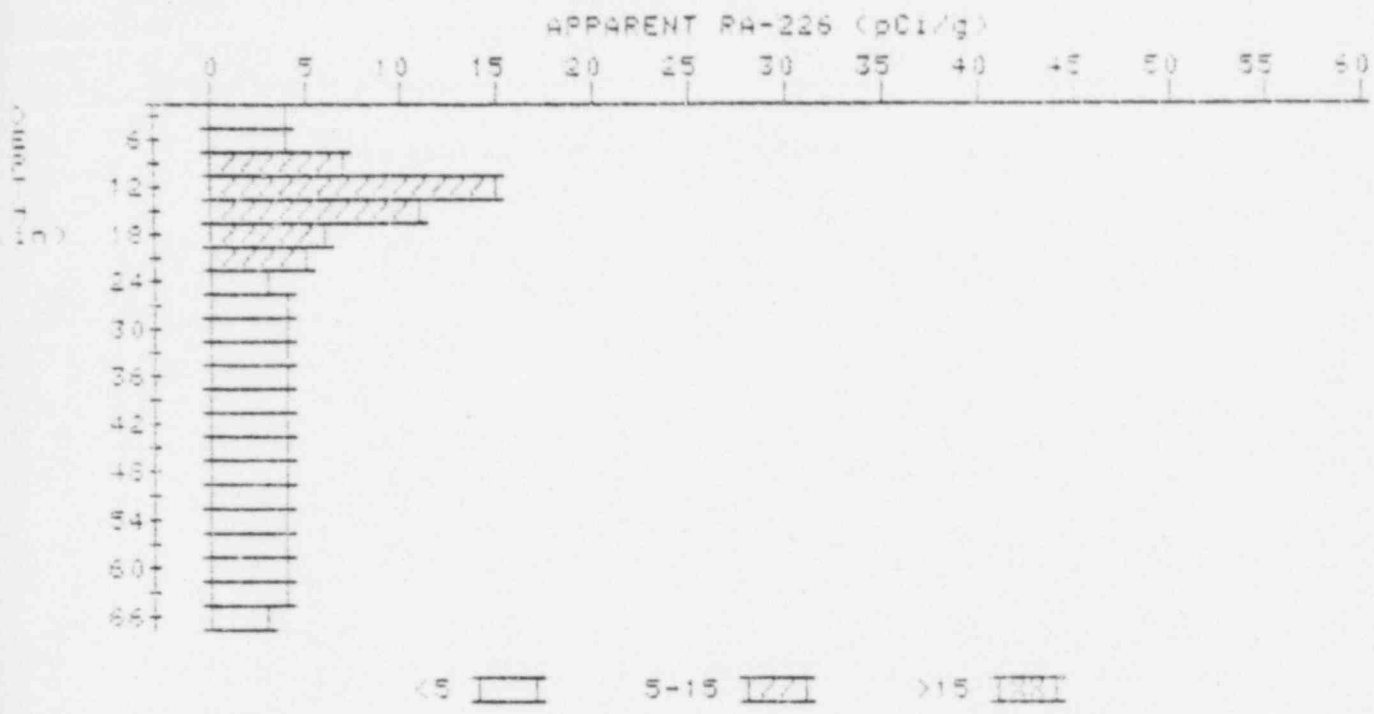


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
0	4.4	4.4
3	3.7	3.7
6	3.0	2.3
9	2.7	2.7
12	2.4	2.2
15	2.2	1.8
18	2.2	2.0
21	2.3	2.8
24	2.6	1.9
27	2.8	2.8

APPARENT RADIUM-226 CONCENTRATION 27

DECONVOLUTION GRAPH

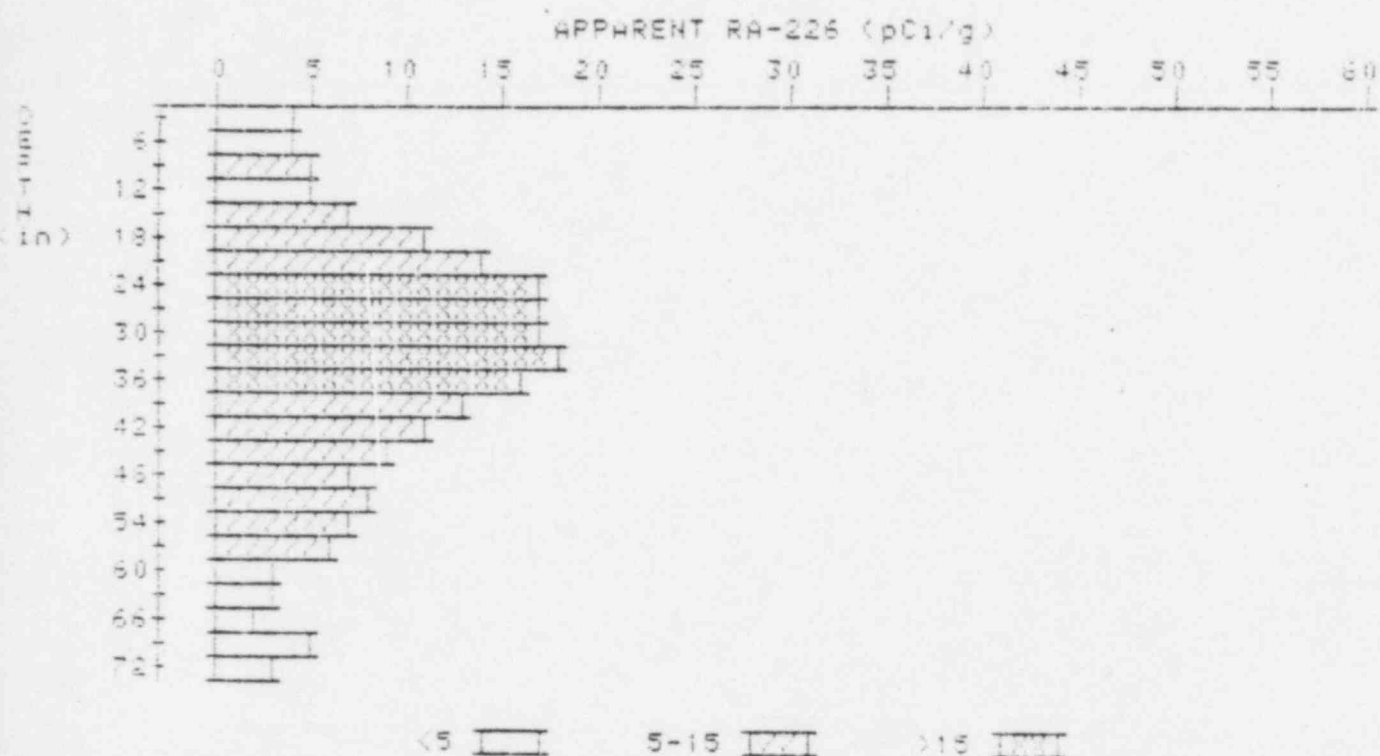
PROPERTY NUMBER: GJ-08843-MR
HOLE NUMBER: 27
LOCATION: 250200



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.6	3.6
6	5.2	4.1
9	7.4	7.4
12	9.6	14.6
15	9.0	11.5
18	7.0	8.0
21	5.7	5.6
24	4.7	5.5
27	4.4	4.6
30	4.2	4.6
33	4.0	3.6
36	3.9	3.7
39	3.9	3.9
42	3.9	4.1
45	3.8	3.6
48	3.8	3.8

APPARENT RADIUM-226 CONCENTRATION 28 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08843-MR
HOLE NUMBER: 28
LOCATION: 253235



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.5	3.5
6	4.2	3.7
9	5.2	3.0
12	6.3	4.7
15	8.3	7.4
18	10.8	11.0
21	13.2	14.1
24	15.1	17.1
27	15.9	16.8
30	16.2	17.1
33	16.0	16.0
36	14.7	15.6
39	12.9	13.1
42	11.0	10.6
45	9.3	8.6

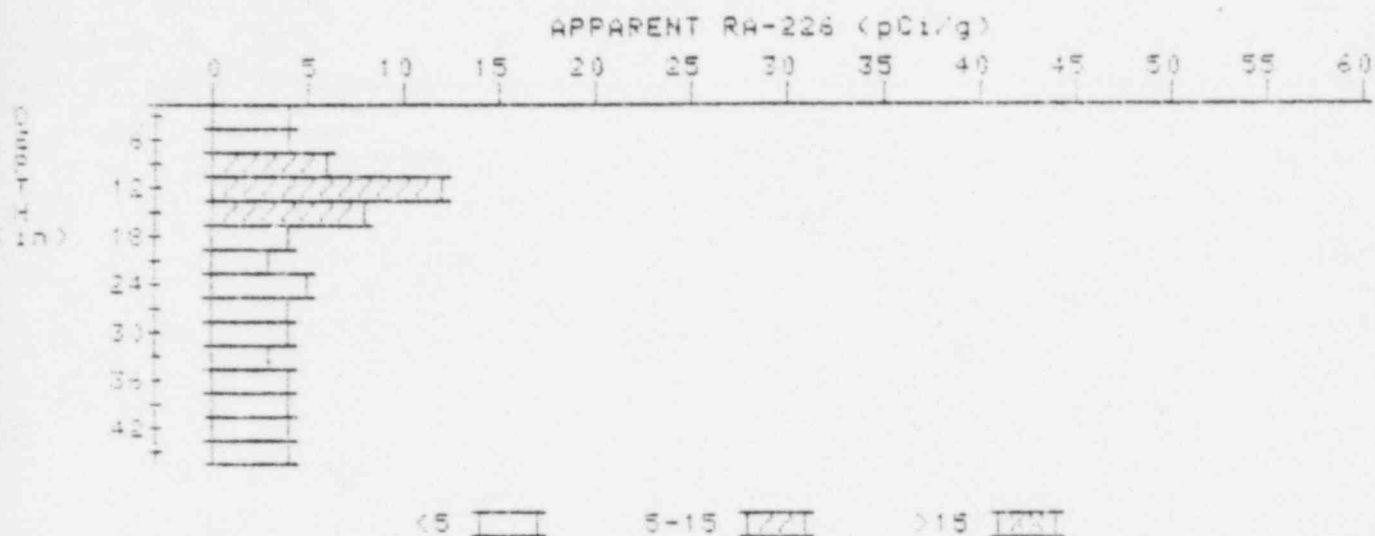
4 0
5 1
5 4
5 7
5 11
5 13
5 15
5 17
5 19
5 21

5 23
5 25
5 27
5 29
5 31
5 33
5 35
5 37
5 39

5 41
5 43
5 45
5 47
5 49
5 51
5 53
5 55
5 57

APPARENT RADIUM-226 CONCENTRATION 29 DECONVOLUTION GRAPH

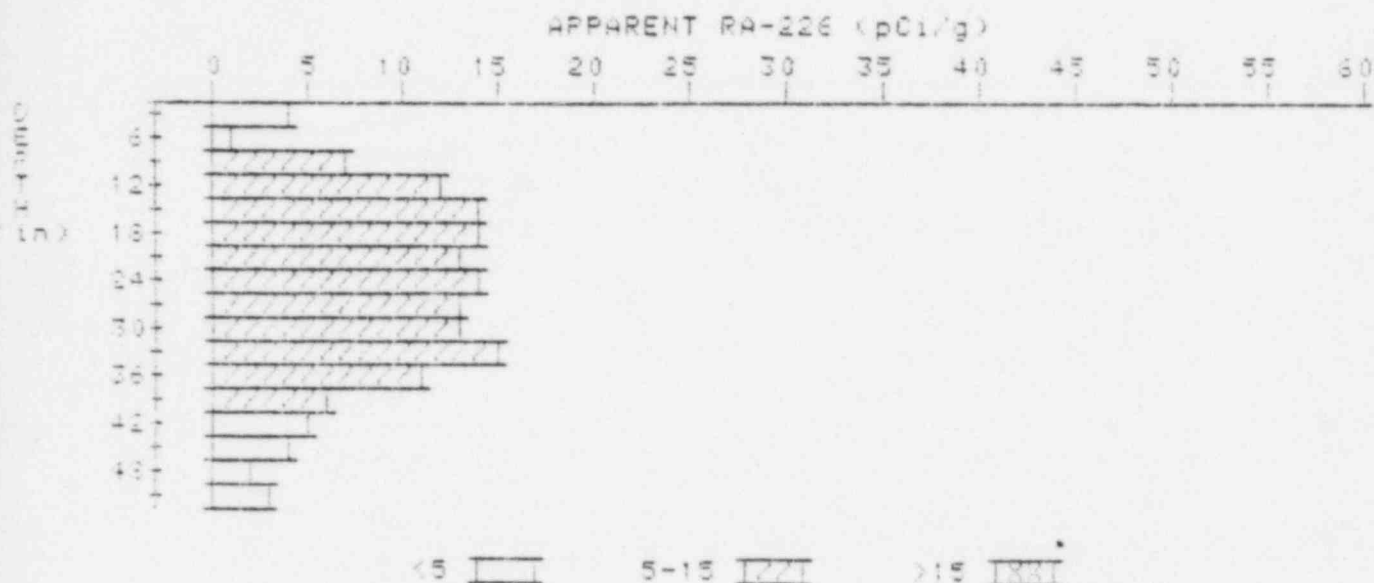
PROPERTY NUMBER: GJ-08843-MR
HOLE NUMBER: 29
LOCATION: 255189



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.8	3.8
6	4.7	3.8
9	6.1	5.9
12	7.6	11.9
15	6.7	7.6
18	5.3	4.4
21	4.4	2.8
24	4.4	4.9
27	4.1	3.9
30	3.9	3.9
33	3.7	3.6
36	3.7	3.7
39	3.7	3.7
42	3.7	3.7
45	3.7	3.7

APPARENT RADIUM-226 CONCENTRATION 30 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08843-MR
HOLE NUMBER: 30
LOCATION: 255240



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.2	4.2
6	4.7	1.0
9	7.3	6.6
12	10.3	12.3
15	12.2	14.3
18	12.9	13.8
21	13.1	13.3
24	13.2	13.6
27	13.1	13.5
30	12.9	13.3
33	12.2	14.9
36	10.1	11.0
39	7.6	8.9
42	6.8	4.9
45	4.6	4.4
48	6.8	2.1
51	6.2	6.2

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

4

PROPERTY NUMBER: GJ-08843-MR

HOLE NUMBER: 4

LOCATION:



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	11.3	11.3
6	14.4	16.7
9	16.2	19.2
12	16.3	18.4
15	16.9	16.7
18	17.6	21.9
21	16.9	20.2
24	11.8	10.0
27	6.7	6.2
30	7.0	6.6
33	6.6	4.7
36	5.6	5.9
39	4.9	4.4
42	4.6	4.4
45	4.4	4.0
48	4.4	4.6
49	4.6	4.6

3.7

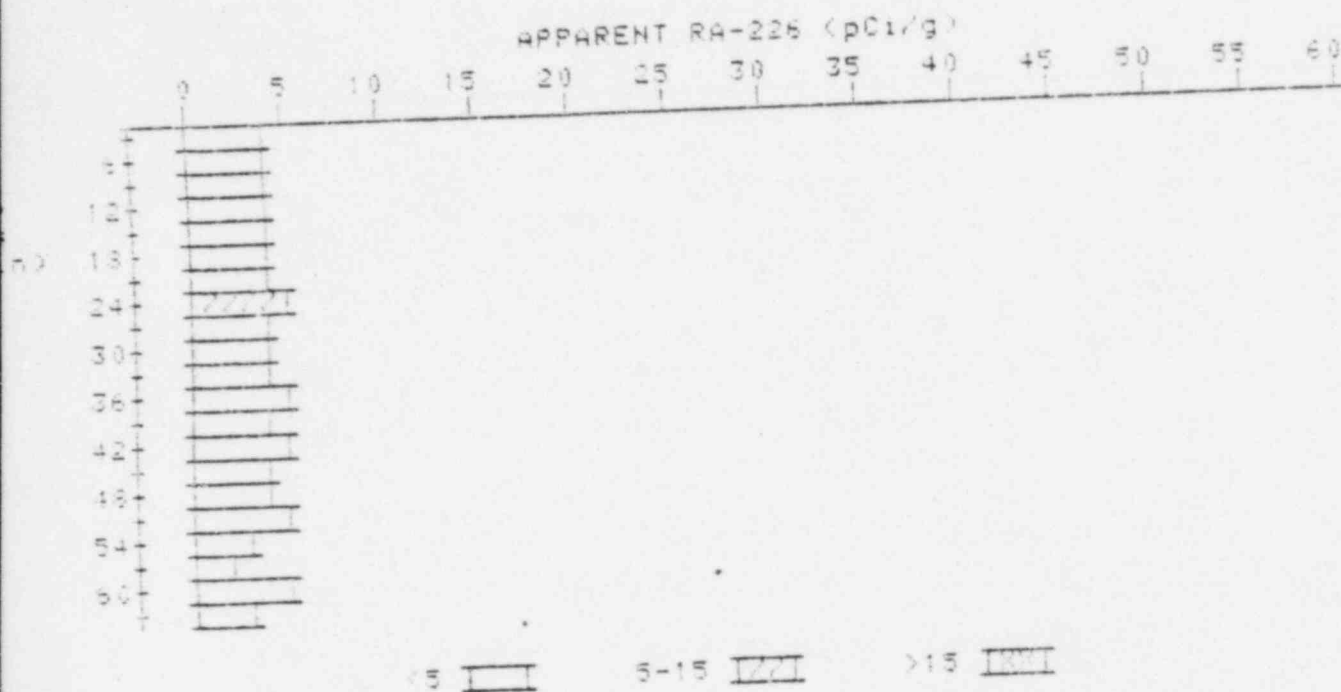
4.0

4.0

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

5

PROPERTY NUMBER: GJ-08643-NR
HOLE NUMBER: 5
LOCATION:



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.9	3.9
6	3.9	3.9
9	3.9	3.7
12	4.0	4.0
15	4.1	4.1
18	4.2	4.4
21	4.2	4.7
24	4.5	4.4
27	4.5	4.6
30	4.6	4.8
33	4.2	4.3
36	4.4	4.4
39	4.4	4.4
42	4.4	4.6
45	4.3	4.6
48	4.6	4.6
51	4.1	4.0

6. 0. 0. 0. 4

6. 0. 0. 0. 4

6. 0. 0. 0. 4