

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-11419-RS
ADDRESS: 505 29 ROAD

JULY 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION
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APPROVED BY

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DATE

July 29, 1985

REA11419:REA-704

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-11419-RS, is a single-family residence located at 505 29 Road, 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 found within the legal property boundaries 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, 104 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$6,357. Remedial action on this property will take approximately 12 days to complete.

Areas I and J are not included in this remedial action, as discussed in Section 4.0 of this REA.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 505 29 Road, Grand Junction, Colorado

Zoning: Residential (RSF-8)

Lot Size: Approximately 7,000 sf (0.16 acre)

Legal Description: Lot 8, Roscoe Giffin Subdivision, Section 7, T1S, R1E, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 3 mile(s) northeast 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:	Vacant Lot
East:	29 Road
West:	Alley

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-story residence
Size:	Approximately 876 sf
Construction Date:	1948
Construction:	Adobe block
Foundation:	Concrete wall on spread footing
Footing Depth:	Not determined
Basement:	Cellar (partial)
Crawl Space:	None
Condition:	Good

Other Structures:

Type:	Chicken coop
Size:	Approximately 74 sf
Construction:	Wood-frame
Foundation:	None (mudsill)
Condition:	Good

General Remarks:

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

Historical Data:

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

3.0 RADIOLOGIC SURVEY

3.1 Introduction

Radiologic data were collected by Bendix at DOE ID No. GJ-11419-RS on June 13, 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 contaminated materials in the backyard (west of the primary structure), along the east and south sides of the primary structure, and within the 29 Road easement.

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, deconvolution graphs, and Exterior Gamma Scan map are included in the Appendix (Section 6.0).

3.2 Gamma Exposure-Rate Surveys

3.2.1 Exterior Findings

Background Readings: 16 to 18 uR/h
Highest Outside Gamma Reading (HOG): 80 uR/h

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

3.2.2 Interior Findings

Background Readings: 16 to 18 uR/h
Highest Inside Gamma Reading (HIG): 18 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.

3.3 Boreholes, Soil Samples, and Other Measurements

Areas which displayed elevated gamma levels were further investigated; these areas are shown in Appendix Figure 3.2. Data from these investigations are included in Appendix 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 Figure 3.3 shows identified areas and estimated depths of contamination on this property, based on the assessments of all measurements taken. As noted in this figure, areas that contain identified residual radioactive materials are:

- (Area A) Surface Material: Soil
Direction From Primary Structure: West
Other Directions: Along west property boundary
Total Depth of Contamination: 15 inches
Approximate Square Footage: 494
- (Area B) Surface Material: Lawn
Direction From Primary Structure: Southwest
Other Directions: Adjacent to Area A
Total Depth of Contamination: 12 inches
Approximate Square Footage: 1,204
- (Area C) Surface Material: Concrete
Direction From Primary Structure: West
Total Depth of Contamination: 15 inches
Other (height or thickness): 3-inch thick uncontaminated concrete
Comments: This area is the east-west sidewalk in the west yard.
Approximate Square Footage: 184
- (Area D) Surface Material: Lawn
Direction From Primary Structure: West
Other Directions: North and south of sidewalk in west yard
Total Depth of Contamination: 9 inches
Approximate Square Footage: 324
- (Area E) Surface Material: Lawn
Direction From Primary Structure: Northwest
Other Directions: Adjacent to primary structure
Total Depth of Contamination: 12 inches
Approximate Square Footage: 56
- (Area F) Surface Material: Soil
Direction From Primary Structure: South
Other Directions: Adjacent to primary structure
Total Depth of Contamination: 9 inches
Approximate Square Footage: 124

- (Area G) Surface Material: Lawn
Direction From Primary Structure: Northeast
Total Depth of Contamination: 12 inches
Comments: Three isolated deposits are included in this area.
Approximate Square Footage: 213
- (Area H) Surface Material: Lawn
Direction From Primary Structure: East
Total Depth of Contamination: 6 inches
Comments: Two isolated deposits are included in this area.
Approximate Square Footage: 78
- (Area I) Surface Material: Lawn
Direction From Primary Structure: Northeast
Other Directions: Adjacent to irrigation ditch access
Total Depth of Contamination: 15 inches
Comments: This area is not included in remedial action.
Approximate Square Footage: 50
- (Area J) Surface Material: Road-base
Direction From Primary Structure: East
Other Directions: 29 Road easement
Total Depth of Contamination: 72 inches
Comments: It is suspected that this deposit is associated with the city water line. This area is not included in remedial action.
Approximate Square Footage: 270

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-11419-RS, includes removal of all areas within the legal property boundaries identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figure 3.3) and transport of removed material to the disposal site.

Areas I and J are located beyond the legal property boundaries in the street right-of-way. These areas are associated with a city water line that is bedded in tailings. These areas are not included in the remedial action for this property.

If the Department of Energy determines that the water line deposits should be removed, it is recommended that Areas I and J be removed as part of a DOE ID No. GJ-97002-OT remedial action project. This project would be performed in cooperation with the City of Grand Junction if water line improvements are made in this area. This DOE ID No. GJ-97002-OT remedial action project would be the most efficient and cost-effective method of tailings removal. It would allow for identification of tailings involvement of other adjacent properties along the utility and their removal under a single subcontract utilizing a utility subcontractor.

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

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

4.2 Evaluation of Recommended Remedial Action

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

Estimated cost of remedial action is \$6,357.

This remedial action will result in removal of the identified residual radioactive materials located within the legal property boundary.

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

5.0 REFERENCES

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

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

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

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

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

Bendix Field Engineering Corporation, Environmental Assessment of Preliminary Cleanup Activities at Offsite Properties Contaminated by Tailings from the Grand Junction Inactive Uranium Millsite, (GJ-04), for U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, 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 Sample Locations
Figure 3.3	Exterior Estimated Extent of Contamination

Official Survey Report

Memo of Understanding

Team Leader Notes

Deconvolution Graphs (Apparent Radium-226 Concentration)

Exterior Gamma Scan Map

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.		
7	134234	00	DS	5.4		*	Corner of garden
		06	DS	3.4		*	
		12	DS	2.3		*	
		18	DS	2.0		*	
8	140260	03	TC	8.1		*	Garden plot west of primary structure DC = 15 inches Based on the deconvolution graph
		06	TC	8.4		*	
		09	TC	6.9		*	
		12	TC	5.8		*	
		15	TC	5.0		*	
		18	TC	4.7		*	
		21	TC	4.5		*	
		24	TC	4.5		*	
		27	TC	4.5		*	
		30	TC	4.4		*	
		33	TC	4.3		*	
		36	TC	4.2		*	
9	140280	00	DS	2.2		*	By chicken coop
		06	DS	1.4		*	
10	150240	03	TC	6.3		*	West yard DC = 9 inches Based on the deconvolution graph
		06	TC	6.5		*	
		09	TC	5.5		*	
		12	TC	5.0		*	
		15	TC	4.6		*	
		18	TC	4.5		*	
		21	TC	4.5		*	
		24	TC	4.4		*	
		27	TC	4.4		*	
		30	TC	4.3		*	
11	153267	00	DS	17.2		*	
12	153273	03	TC	3.3		*	Through sidewalk near garden DC = 0 inches
		06	TC	4.0		*	
		09	TC	4.2		*	
		12	TC	4.1		*	
		15	TC	3.8		*	
		18	TC	3.9		*	

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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.		
12	153273	21	TC	3.8		*	
		24	TC	3.9		*	
		27	TC	3.8		*	
		30	TC	3.8		*	
		33	TC	3.8		*	
		36	TC	3.8		*	
13	160260	03	TC	11.8		*	West yard
		06	TC	12.4		*	
		09	TC	9.8		*	DC = 12 inches
		12	TC	7.8		*	Based on the
		15	TC	6.0		*	deconvolution
		18	TC	5.2		*	graph
		21	TC	5.0		*	
		24	TC	4.7		*	
		27	TC	4.6		*	
		30	TC	4.5		*	
		33	TC	4.4		*	
		36	TC	4.3		*	
14	165281	03	TC	11.8		*	West yard
		06	TC	10.7		*	
		09	TC	8.2		*	DC = 12 inches
		12	TC	6.2		*	Based on all
		15	TC	5.1		*	available data
		18	TC	4.7		*	
		21	TC	4.5		*	
		24	TC	4.5		*	
		27	TC	4.4		*	
		30	TC	4.2		*	
		33	TC	4.1		*	
		36	TC	3.9		*	
15	170250	39	TC	3.9		*	
		03	TC	8.0		*	South of walkway
		06	TC	9.2		*	in west yard
		09	TC	8.0		*	
		12	TC	6.1		*	DC = 12 inches
		15	TC	5.0		*	Based on the
		18	TC	4.4		*	deconvolution
		21	TC	4.1		*	graph
		24	TC	3.9		*	
		27	TC	3.8		*	

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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.		
15	170250	30	TC	3.7		*	
		33	TC	3.5		*	
		36	TC	3.5		*	
		39	TC	3.5		*	
16	170263	00	DS	3.8		*	
17	175235	03	TC	9.9		*	In yard west of primary structure
		06	TC	8.9		*	
		09	TC	7.3		*	
		12	TC	6.0		*	DC = 12 inches Based on the deconvolution graph
		15	TC	5.0		*	
		18	TC	4.7		*	
		21	TC	4.5		*	
		24	TC	4.2		*	
		27	TC	4.1		*	
		30	TC	4.1		*	
		33	TC	4.1		*	
		36	TC	4.1		*	
18	185257	03	TC	8.7		*	West of primary structure
		06	TC	9.5		*	
		09	TC	7.9		*	
		12	TC	6.1		*	DC = 12 inches Based on the deconvolution graph
		15	TC	5.0		*	
		18	TC	4.5		*	
		21	TC	4.1		*	
		24	TC	3.9		*	
		27	TC	3.8		*	
		30	TC	3.7		*	
		33	TC	3.6		*	
		36	TC	3.5		*	
19	187262	00	DS	1.8		*	
20	187281	03	TC	3.2		*	Near neighbor's garage
		06	TC	3.5		*	
		09	TC	3.7		*	
		12	TC	3.7		*	DC = 0 inches
		15	TC	3.6		*	
		18	TC	3.7		*	
		21	TC	3.7		*	
		24	TC	3.7		*	
		27	TC	3.5		*	

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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.		
20	187281	30	TC	3.3		*	
		33	TC	3.3		*	
		36	TC	3.2		*	
		39	TC	3.4		*	
21	190240	03	TC	6.2		*	West end of driveway
		06	TC	5.7		*	
		09	TC	4.9		*	
		12	TC	4.5		*	DC = 9 inches
		15	TC	4.2		*	Based on the
		18	TC	4.1		*	deconvolution
		21	TC	4.0		*	graph
		24	TC	4.0		*	
		27	TC	3.9		*	
		30	TC	3.9		*	
		33	TC	3.9		*	
		36	TC	4.0		*	
22	195275	03	TC	3.3		*	Dog pen
		06	TC	3.6		*	
		09	TC	3.9		*	DC = 0 inches
		12	TC	3.9		*	
		15	TC	3.9		*	
		18	TC	3.9		*	
		21	TC	3.8		*	
		24	TC	3.8		*	
		27	TC	3.7		*	
		30	TC	3.6		*	
		33	TC	3.6		*	
		36	TC	3.6		*	
23	198269	03	TC	3.9		*	Northwest corner of primary structure
		06	TC	4.8		*	
		09	TC	5.1		*	
		12	TC	4.6		*	DC = 12 inches
		15	TC	4.3		*	Based on the
		18	TC	4.0		*	deconvolution
		21	TC	3.8		*	graph
		24	TC	3.8		*	
		27	TC	3.8		*	
		30	TC	3.8		*	
		33	TC	3.8		*	
		36	TC	3.7		*	
		39	TC	3.5		*	

Radium Concentrations at Exterior Locations

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
23	198269	42	TC	3.5		*	
		45	TC	3.4		*	
		48	TC	3.5		*	
		51	TC	3.5		*	
		54	TC	3.5		*	
		57	TC	3.5		*	
		60	TC	3.7		*	
		63	TC	3.7		*	
		66	TC	3.7		*	
		69	TC	3.6		*	
24	202248	03	TC	2.9		*	Southwest corner of primary structure
		06	TC	3.3		*	
		09	TC	3.5		*	
		12	TC	3.7		*	DC = 0 inches
		15	TC	3.7		*	
		18	TC	3.8		*	
		21	TC	3.7		*	
		24	TC	3.7		*	
		27	TC	3.6		*	
		30	TC	3.6		*	
		33	TC	3.7		*	
		36	TC	3.7		*	
		39	TC	3.7		*	
25	210249	03	TC	6.6		*	Foundation on south side of primary structure
		06	TC	5.7		*	
		09	TC	5.0		*	
		12	TC	4.4		*	
		15	TC	4.2		*	DC = 9 inches
		18	TC	4.0		*	
		21	TC	3.9		*	Based on the deconvolution graph
		24	TC	3.8		*	
		27	TC	3.8		*	
		30	TC	3.8		*	
		33	TC	3.9		*	
		36	TC	3.9		*	
		39	TC	4.0		*	
		42	TC	4.1		*	
		45	TC	4.0		*	
		48	TC	4.1		*	
		51	TC	4.0		*	
		54	TC	4.0		*	
		57	TC	3.9		*	

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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	210249	60	TC	3.9		*	
		63	TC	4.0		*	
		66	TC	3.9		*	
26	210279	03	TC	3.7		*	Foundation on north side of primary structure
		06	TC	3.9		*	
		09	TC	4.0		*	
		12	TC	4.1		*	
		15	TC	4.1		*	DC = 0 inches
		18	TC	4.1		*	
		21	TC	4.0		*	
		24	TC	3.9		*	
		27	TC	3.9		*	
		30	TC	3.9		*	
		33	TC	3.8		*	
		36	TC	3.8		*	
		39	TC	3.9		*	
		42	TC	3.9		*	
		45	TC	4.0		*	
		48	TC	4.0		*	
		51	TC	4.1		*	
		54	TC	4.1		*	
		57	TC	4.1		*	
		60	TC	4.0		*	
		63	TC	3.9		*	
		66	TC	3.8		*	
		69	TC	3.9		*	
		72	TC	3.9		*	
		75	TC	3.9		*	
		78	TC	4.0		*	
		81	TC	4.0		*	
		84	TC	3.9		*	
		87	TC	3.8		*	
		90	TC	3.8		*	
		93	TC	3.8		*	
		96	TC	3.7		*	
		99	TC	3.7		*	
		102	TC	3.7		*	
		105	TC	3.7		*	
27	210283	00	DS	1.5		*	

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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.		
28	220248	00	DS	6.5		*	South side of primary structure
		06	DS	3.2		*	
		12	DS	1.9		*	
29	226249	03	TC	5.4		*	Southeast corner of primary structure
		06	TC	5.2		*	
		09	TC	4.4		*	DC = 9 inches Based on the deconvolution graph
		12	TC	4.0		*	
		15	TC	3.8		*	
		18	TC	3.7		*	
		21	TC	3.6		*	
		24	TC	3.6		*	
		27	TC	3.4		*	
		30	TC	3.5		*	
		33	TC	3.5		*	
		36	TC	3.5		*	
30	229282	00	DS	2.2		*	North of primary structure
		06	DS	1.7		*	
31	231268	00	DS	4.1		*	Gas line
		06	DS	5.6		*	
		12	DS	4.3		*	
		18	DS	2.0		*	
		24	DS	2.4		*	
32	231270	03	TC	5.6		*	Foundation on the east side of primary structure
		06	TC	6.5		*	
		09	TC	6.1		*	
		12	TC	5.1		*	DC = 12 inches Based on the deconvolution graph
		15	TC	4.4		*	
		18	TC	4.0		*	
		21	TC	3.8		*	
		24	TC	3.6		*	
		27	TC	3.6		*	
		30	TC	3.5		*	
		33	TC	3.4		*	
		36	TC	3.4		*	
		39	TC	3.4		*	
33	231276	00	DS	5.2		*	East side of primary structure
		06	DS	2.5		*	
		12	DS	2.0		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-11419-RS

505 29 Road

Page 8 of 12

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
34	236267	03	TC	3.2		*	East of primary structure
		06	TC	3.5		*	
		09	TC	3.7		*	
		12	TC	3.8		*	DC = 0 inches
		15	TC	3.8		*	
		18	TC	3.9		*	
		21	TC	3.8		*	
		24	TC	3.7		*	
		27	TC	3.7		*	
		30	TC	3.8		*	
		33	TC	3.7		*	
		36	TC	3.8		*	
		39	TC	3.8		*	
		42	TC	3.9		*	
		45	TC	3.8		*	
		48	TC	3.8		*	
		51	TC	3.7		*	
		54	TC	3.6		*	
		57	TC	3.6		*	
35	237282	00	DS	3.1		*	Northeast corner of primary structure
		06	DS	2.1		*	
36	250260	00	DS	1.2		*	East side of primary structure
		06	DS	1.5		*	
		03	TC	2.7		*	
		06	TC	3.2		*	Background
		09	TC	3.4		*	
		12	TC	3.5		*	
		15	TC	3.6		*	DC = 0 inches
		18	TC	3.6		*	
		21	TC	3.6		*	
		24	TC	3.6		*	
		27	TC	3.7		*	
		30	TC	3.7		*	
		33	TC	3.7		*	
		36	TC	3.7		*	
		39	TC	3.7		*	
		42	TC	3.7		*	
		45	TC	3.9		*	
		48	TC	3.9		*	
		51	TC	3.8		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-11419-RS

505 29 Road

Page 9 of 12

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
37	251282	00	DS	3.3		*	Northeast of primary structure
		06	DS	3.7		*	
		12	DS	3.0		*	
		18	DS	1.8		*	
38	259282	00	DS	5.2		*	East of primary structure
		06	DS	3.2		*	
		12	DS	1.9		*	
39	268258	00	DS	<1.0		*	
40	269265	00	DS	3.6		*	Water meter
		06	DS	2.7		*	
		10	DS	1.7		*	
41	269282	00	DS	4.5		*	East of primary structure
		06	DS	4.3		*	
		12	DS	1.9		*	
42	278282	03	TC	15.4		*	Near ditch DC = 15 inches Based on the deconvolution graph
		06	TC	19.8		*	
		09	TC	19.8		*	
		12	TC	15.0		*	
		15	TC	10.3		*	
		18	TC	8.6		*	
		21	TC	7.4		*	
		24	TC	6.4		*	
		27	TC	6.1		*	
		30	TC	5.6		*	
		33	TC	5.2		*	
		36	TC	5.0		*	
		39	TC	4.8		*	
		42	TC	4.7		*	
		45	TC	4.6		*	
		48	TC	4.6		*	
		51	TC	4.7		*	
		54	TC	4.8		*	
		57	TC	4.8		*	
		60	TC	4.6		*	
		63	TC	4.6		*	
43	280243	03	TC	4.0		*	29 Road easement
		06	TC	4.5		*	
		09	TC	4.5		*	
		12	TC	4.7		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-11419-RS

505 29 Road

Page 10 of 12

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
43	280243	15	TC	5.2		*	DC = 48 inches Based on the deconvolution graph
		18	TC	5.6		*	
		21	TC	5.7		*	
		24	TC	5.9		*	
		27	TC	5.8		*	
		30	TC	5.7		*	
		33	TC	5.8		*	
		36	TC	5.7		*	
		39	TC	5.5		*	
		42	TC	5.4		*	
		45	TC	5.2		*	
		48	TC	4.9		*	
		51	TC	4.8		*	
		54	TC	4.6		*	
		57	TC	4.6		*	
		60	TC	4.5		*	
		63	TC	4.5		*	
		66	TC	4.2		*	
		69	TC	4.1		*	
		72	TC	3.9		*	
		75	TC	3.8		*	
		78	TC	3.8		*	
		81	TC	3.7		*	
		84	TC	3.7		*	
		87	TC	3.6		*	
		90	TC	3.5		*	
		93	TC	3.5		*	
		96	TC	3.6		*	
		99	TC	3.5		*	
		102	TC	3.4		*	
44	284266	00	DS	3.9		*	29 Road easement DC = 66 inches Based on the deconvolution graph
		06	DS	7.6		*	
		03	TC	5.1		*	
		06	TC	5.2		*	
		09	TC	4.8		*	
		12	TC	4.9		*	
		15	TC	5.0		*	
		18	TC	5.0		*	
		21	TC	5.0		*	
		24	TC	4.9		*	
		27	TC	5.0		*	
		30	TC	4.9		*	
		33	TC	4.9		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-11419-RS

505 29 Road

Page 11 of 12

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
44	284266	36	TC	5.0		*	
		39	TC	5.1		*	
		42	TC	5.0		*	
		45	TC	5.1		*	
		48	TC	5.1		*	
		51	TC	5.2		*	
		54	TC	5.2		*	
		57	TC	5.1		*	
		60	TC	5.0		*	
		63	TC	4.9		*	
		66	TC	4.6		*	
		69	TC	4.5		*	
		72	TC	4.4		*	
		75	TC	4.2		*	
		78	TC	4.2		*	
		81	TC	4.1		*	
		84	TC	3.9		*	
		87	TC	3.8		*	
		90	TC	3.7		*	
		93	TC	3.6		*	
45	285252	03	TC	5.5		*	29 Road easement
		06	TC	5.6		*	
		09	TC	5.2		*	DC = 72 inches Based on the deconvolution graph
		12	TC	5.3		*	
		15	TC	5.7		*	
		18	TC	5.8		*	
		21	TC	6.0		*	
		24	TC	6.5		*	
		27	TC	7.0		*	
		30	TC	7.2		*	
		33	TC	7.5		*	
		36	TC	7.9		*	
		39	TC	8.3		*	
		42	TC	8.6		*	
		45	TC	8.8		*	
		48	TC	8.8		*	
		51	TC	8.5		*	
		54	TC	8.0		*	
		57	TC	7.4		*	
		60	TC	6.9		*	
		63	TC	6.6		*	
		66	TC	6.1		*	
		69	TC	5.8		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-11419-RS

505 29 Road

Page 12 of 12

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
45	285252	72	TC	5.5		*	
		75	TC	5.1		*	
		78	TC	4.9		*	
		81	TC	4.5		*	
		84	TC	4.4		*	
		87	TC	4.3		*	
		90	TC	4.0		*	
		93	TC	3.8		*	
		96	TC	3.9		*	

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

Notes: DC = Depth of Contamination
* = No Soil Sample Taken
[n] = Reading Taken n-Inches
Above Floor or Ground
Date of Survey = 06-13-85
Team Leader = JD

Radium Concentrations at Interior Locations

DOE ID #GJ-11419-RS

505 29 Road

Page 1 of 1

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
1		00	DS	1.6		*	Center of coop
2		00	DS	1.4		*	East wall of coop
3		00	DS	<1.0		*	Northwest corner of cellar
4		00	DS	<1.0		*	Southwest corner of cellar
5		00	DS	<1.0		*	Center of cellar
6		00	DS	<1.0		*	Northeast corner of cellar

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

Notes: DC = Depth of Contamination
* = No Soil Sample Taken
[r] = Reading Taken n-Inches
Above Floor or Ground
Date of Survey = 06-13-85
Team Leader = JD

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)
CELLAR	08	17-19	18	07	19-20	19
CRAWL SPACE	-	-	-	01	20-20	20
CHICKEN COOP	04	18-19	18	04	18-20	19
GROUND FLOOR	*	*	*	*	16-18	*

=====

* A walking gamma scan of the ground floor was performed to confirm the absence of interior contamination at this location.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-11419-RS

Page 1 of 2

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
EXTERIOR					
	Concrete				
C	46 x 4 =	184			
	6 x 6 =	36			
	8 x 6/2 =	24			
	4 x 15 =	60			
		304	x 0.3 =	91	
D	4 x 17 =	68	x 0.3 =	20	
	Volume of Concrete			111	= 111/27 = 4
	Contaminated Fill				
A	13 x 38 =	494	x 1.3 =	642	
B	43 x 24 =	1,032			
	43 x 8/2 =	172			
		1,204	x 1.0 =	1,204	
C	46 x 4 =	184	x 1.0 =	184	
D	4 x 20 =	80			
	34 x 6 =	204			
	10 x 4 =	40			
		324	x 0.8 =	259	
E	8 x 7 =	56	x 1.0 =	56	
F	28 x 4 =	112			
	3 x 4 =	12			
		124	x 0.8 =	99	

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-11419-RS

Page 2 of 2

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
G	4 x 10	= 40			
	25 x 5	= 125			
	6 x 8	= 48			
		<hr/>			
		213	x 1.0	= 213	
H	6 x 6	= 36			
	6 x 7	= 42			
		<hr/>			
		78	x 0.5	= 39	
				<hr/>	
Volume of Fill				= 2,696	= 2,696/27 = 100
TOTAL VOLUME - EXTERIOR					= 104

Note: Calculations are based on deposits located within the legal property boundaries.

See Appendix Figure 3.3 For Areas

=====

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-11419-RS Page 1 of 1

EXTERIOR

Remove/replace concrete
372 sf @ \$3/sf \$ 1,116

Remove identified residual radioactive material
90 cy @ \$14.50/cy (machine-open) 1,305
10 cy @ \$44/cy (manual-open) 440

Replace areas with topsoil
82 cy @ \$9.50/cy 779

Replace areas with compacted roadbase
18 cy @ \$11.50/cy 207

Replace areas with sod
1,740 sf @ \$.20/sf 348

TOTAL EXTERIOR \$ 4,195

TOTAL INTERIOR 0

ACCESS CONTROL 250

SUBTOTAL \$ 4,445

CONTINGENCY @ 10% 445

SUBTOTAL \$ 4,890

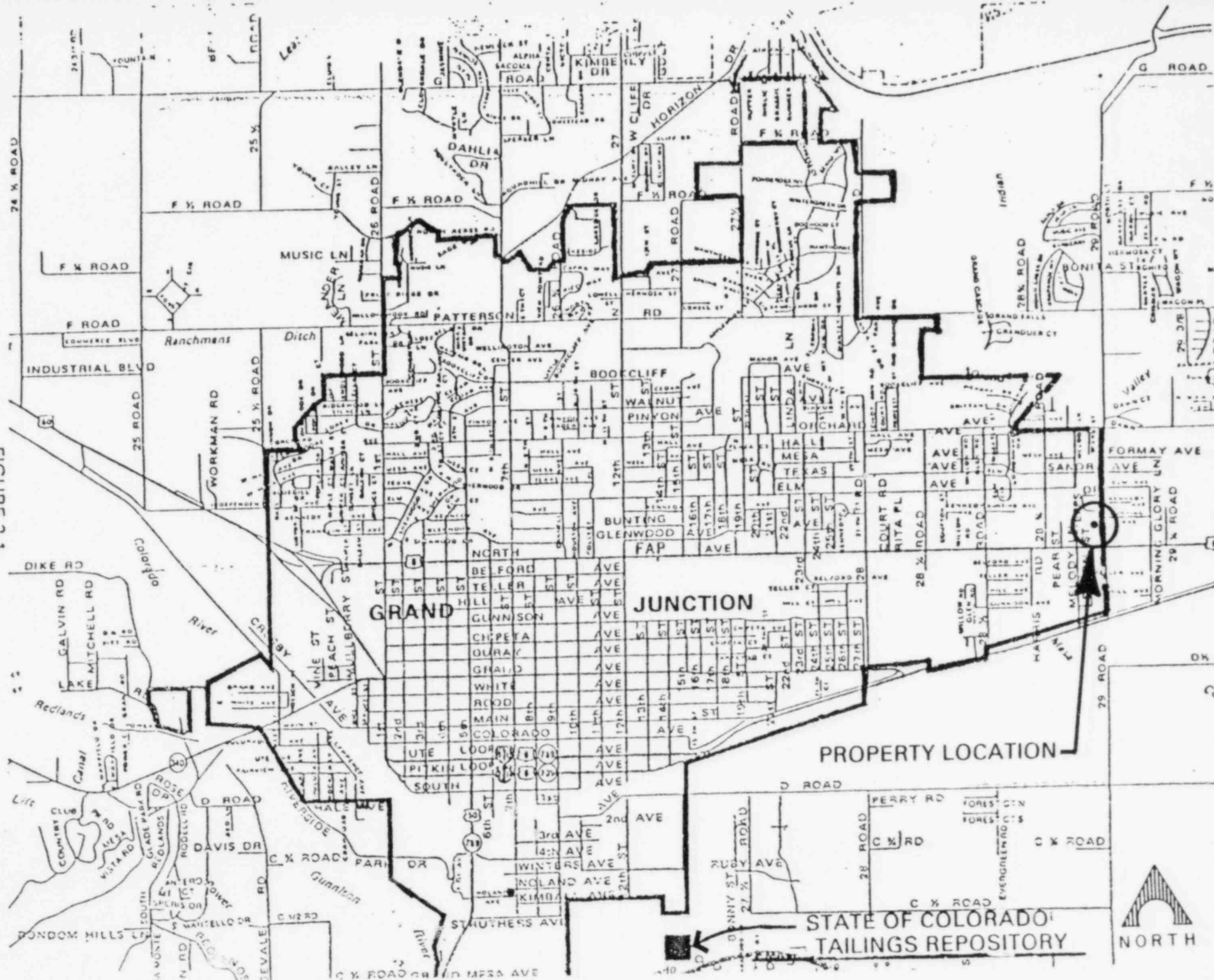
CONTRACTOR OVERHEAD & PROFIT @ 30% 1,467

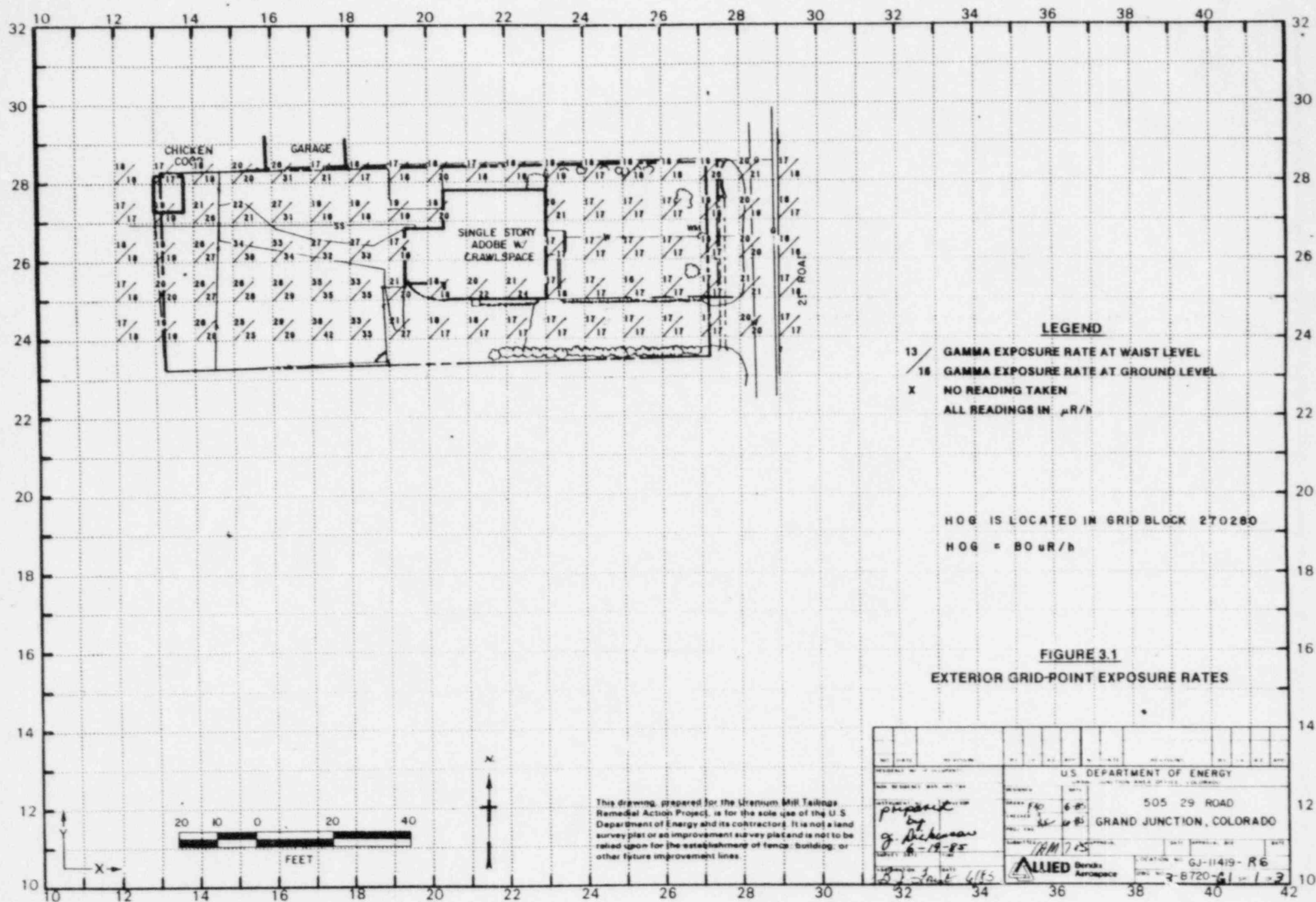
GRAND TOTAL \$ 6,357

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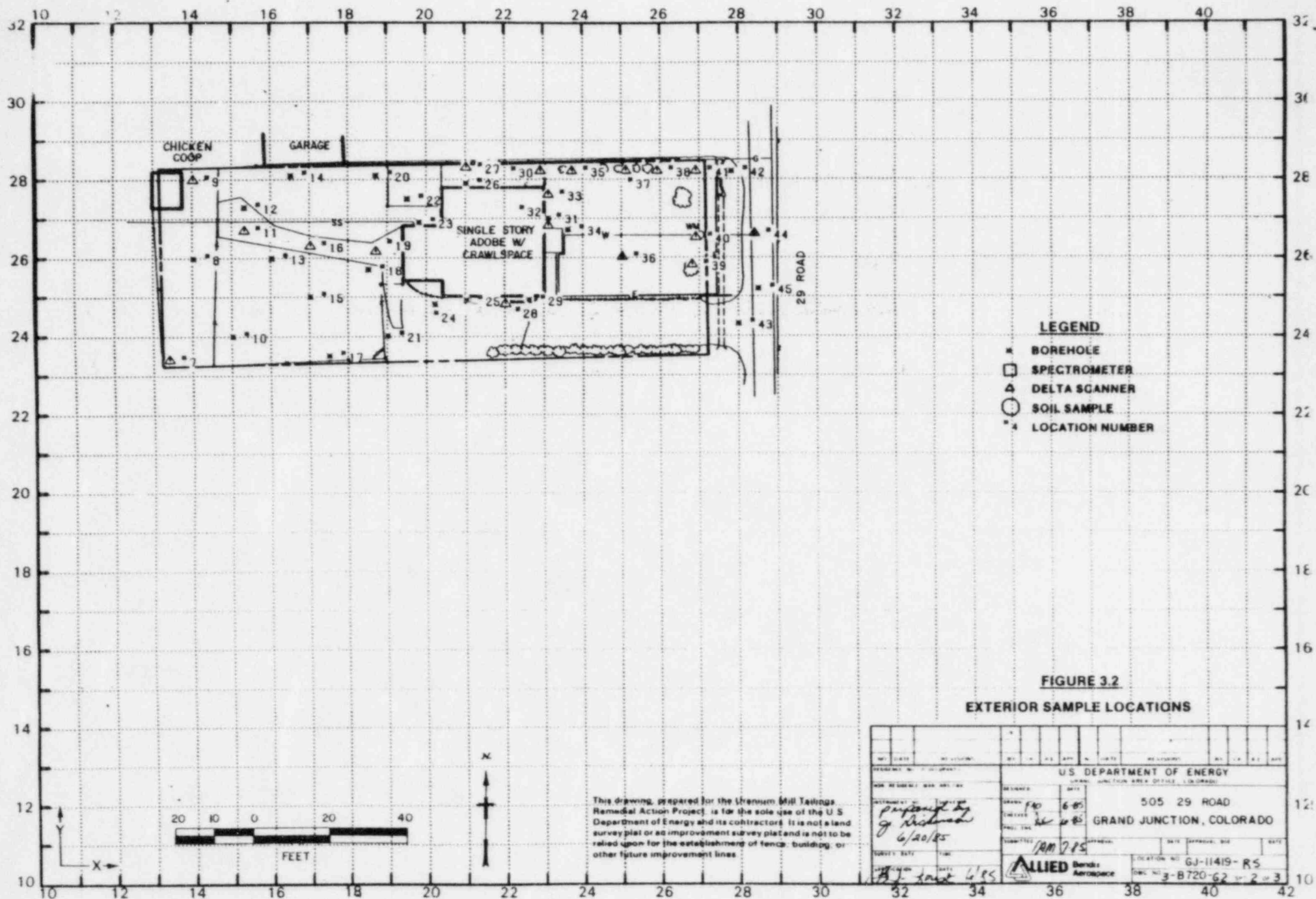
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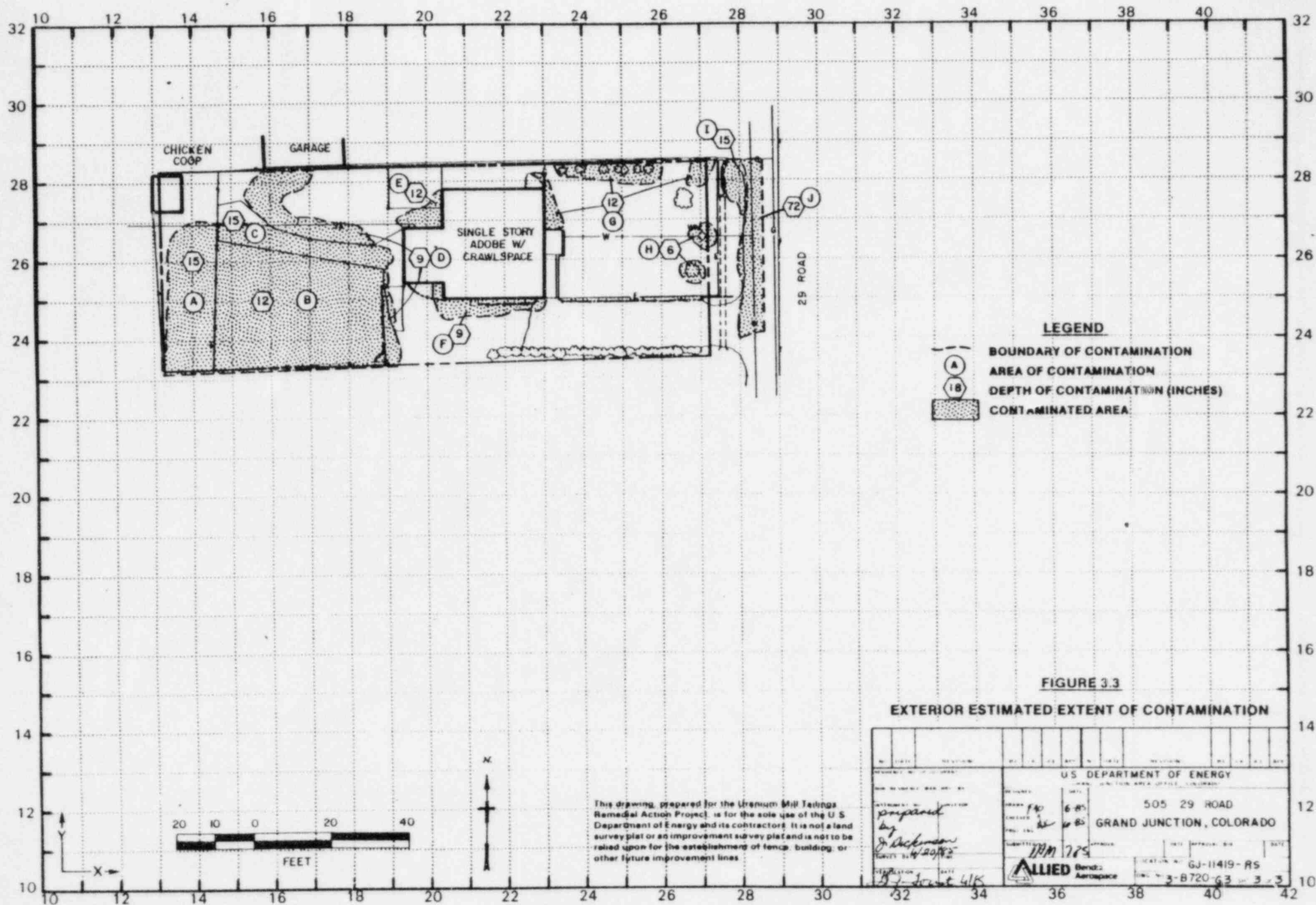
FIGURE 2.1
VICINITY MAP





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.





3/85

DOE ID NO. GJ-11419-RS Date 6-17-85

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

Official Survey Report

Property Address 505 29 Road
Property Owner J. Salazar
Address of Owner (if different from above) 556 Ashley Lane
Report Prepared By J. Dickerson

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 = 18 uR/h
HOG = 80 uR/h

July 1, 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 concerning Department of Energy (DOE) Identification (ID) number GJ-11419-RS (505 29 Road), conducted on 27 June 1985.

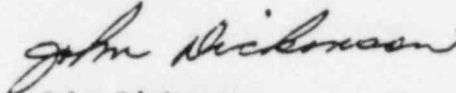
1. According to the criteria we are now using in our radiologic assessments, the area east of the chicken coop has been removed from the area of delineated contamination.
2. The depth of contamination for Area 'B' has been changed to be 12 inches.
3. Area 'C' now has a total depth of contamination of 15 inches. This depth includes 3 inches of uncontaminated concrete which will require removal prior to excavation of 12 inches of contaminated material.
4. In regards to the elevated gamma readings near coordinate point 181282, the greater waist level exposure-rate reading (compared to the ground level reading) at 180280, and the absence of contamination at 187281, suggests that the elevated readings derive from 'shine' from GJ-11418, which has been included for later radiologic assessment.
5. The Mesa County Department of Environmental Health has no record of the previously existing septic system for this property.

Elaine Brummett
Colorado Department of Health
GJ-11419-RS
July 1, 1985
Page 2

6. As per our telephone conversation, the 6-inch depth of contamination you questioned was not in reference to GJ-11419-RS.

Thank you for your time and cooperation. If you should have additional questions or comments you may contact me at 242-8621, extension 506.

Sincerely,



John Dickerson
RSD Survey Team Leader

JD:pr

CDH.LETTER:11419.DICKERSON

MEMORANDUM

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado

Date: June 17, 1985

To: Files

From: John Dickerson

Subject: Team Leader Notes - GJ-11419-RS

Address: 505 29 Road

Owner: J. Salazar

Occupant: T. Corless

Team Members

John Dickerson (Team Leader)	R. Wilkins
G. Meeker	N. Wallace
R. Herman	M. Johnson
D. Bell, Jr.	

Instruments

Crutch Scintillometer: C-1115, C-1042, C-1205, C-1181, C-1169
Downhole Scintillometer: C-1214, C-1213
Delta Scintillometer: C-4060, C-4059, C-3943
Total Count: C-3957, C-1062, C-4005
Downhole Spectrometer: C-3361

The structure is a single story frame house with a crawl space.

All utility lines were investigated by delta (gas) or total count (water and sewer) instruments. No contamination was associated with the buried utilities.

Team Leader Notes
John Dickerson
GJ-11419-RS
June 17, 1985
Page 2

The gas line, as marked by Public Service, was 90-percent off (Bendix locations were correct). Prevalence of contaminated areas over the gas/electrical lines necessitated use of a delta (rather than a total count).

Primary structure has a cellar, rather than a crawl space.

Contamination was discovered in the backyard, along the north edge of the front lawn, along the east and south sides of the primary structure, and within the easement of 29 Road.

Contamination extends north of GJ-11419-RS within the 29 Road easement (130 to 160 cps) in front of 507 29 Road.

In the backyard, contamination underlies portions of the east-west sidewalk.

This property was 'policed', and team members were frisked.

The survey was completed at 1525 hours.

Revisit

Date: June 17, 1985

A revisit was conducted in order to confirm scintillometer readings, which were slightly elevated, with a delta scanner. The cellar is a former coal storage bin. The slightly elevated gamma scintillometer readings are most likely due to the geometry of the confined cellar, and possibly to some residual coal and shale dust on the cellar walls and floor.

Contamination appears to be exclusively exterior. No contamination was found inside the interior of the chicken coop, which was also investigated by a delta scintillometer.

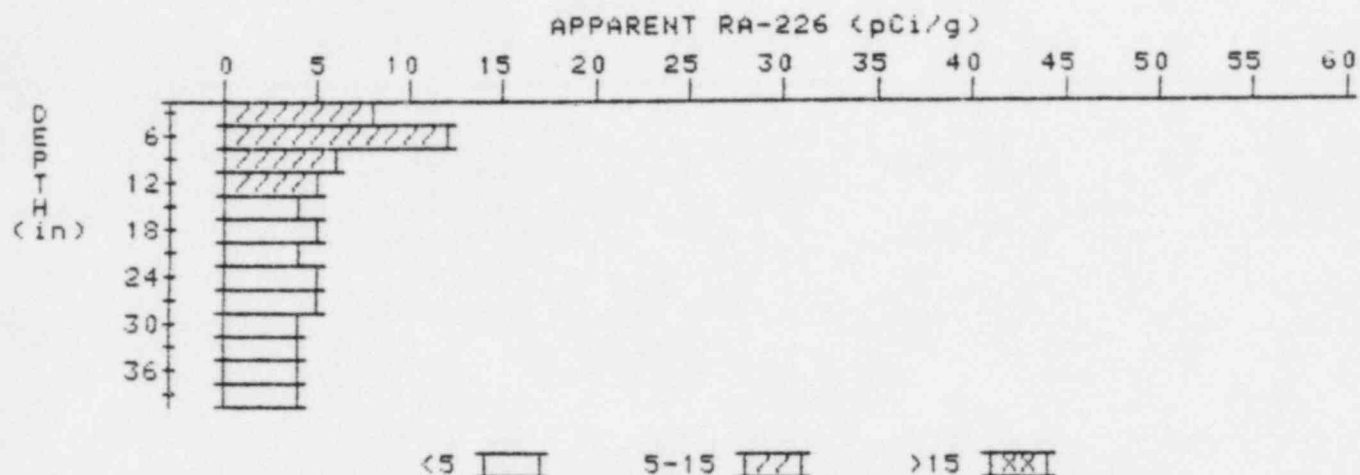
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

8

PROPERTY NUMBER: GJ-11419-R3

HOLE NUMBER: 8

LOCATION: 140260



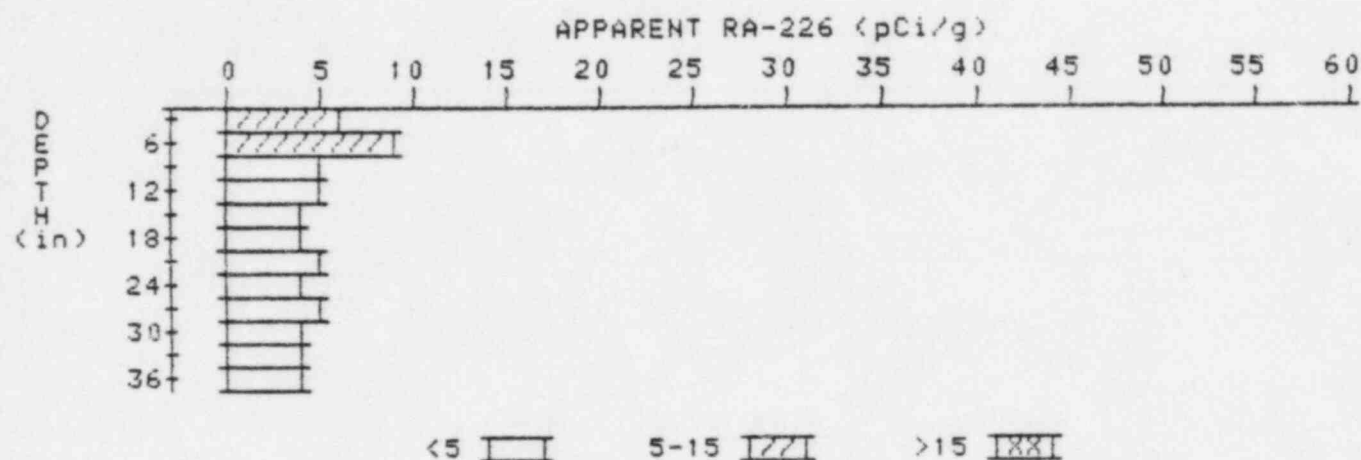
Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	8.1	8.1
6	8.4	11.6
9	6.9	6.2
12	5.8	5.3
15	5.0	4.1
18	4.7	4.5
21	4.5	4.1
24	4.5	4.5
27	4.5	4.7
30	4.4	4.4
33	4.3	4.3
36	4.2	4.0
39	4.2	4.2

APPARENT RADIUM-226 CONCENTRATION 10 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS

HOLE NUMBER: 10

LOCATION: 150240



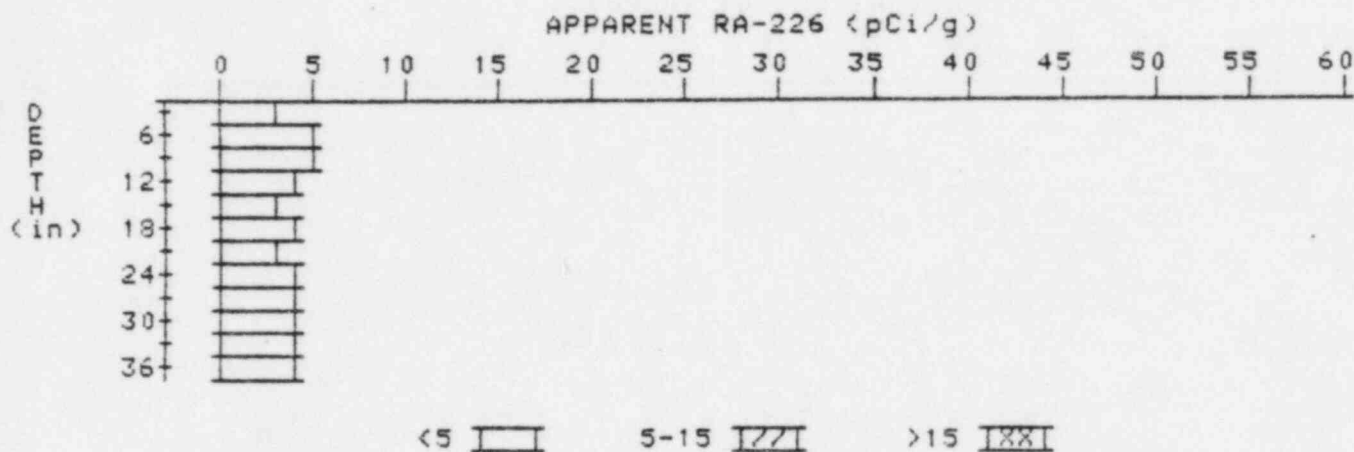
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.3	6.3
6	6.5	8.6
9	5.5	4.6
12	5.0	4.8
15	4.6	4.1
18	4.5	4.3
21	4.5	4.7
24	4.4	4.2
27	4.4	4.6
30	4.3	4.5
33	4.1	3.7
36	4.1	4.1

APPARENT RADIUM-226 CONCENTRATION 12 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS

HOLE NUMBER: 12

LOCATION: 153273



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	4.0	4.9
9	4.2	4.7
12	4.1	4.5
15	3.8	3.1
18	3.9	4.3
21	3.8	3.4
24	3.9	4.3
27	3.8	3.6
30	3.8	3.8
33	3.8	3.8
36	3.8	3.8

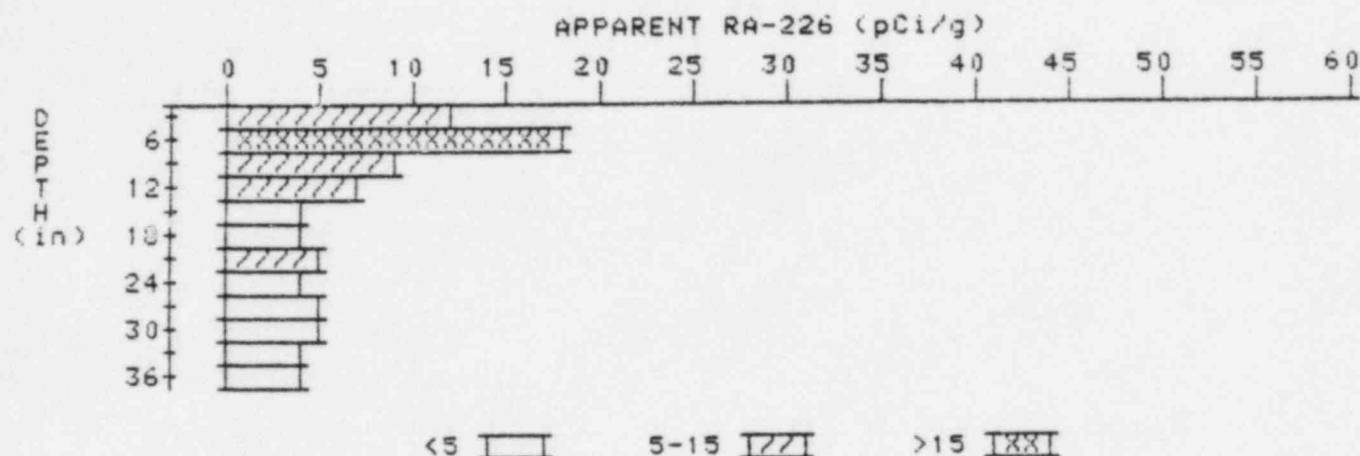
APPARENT RADIUM-226 CONCENTRATION 13

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS

HOLE NUMBER: 13

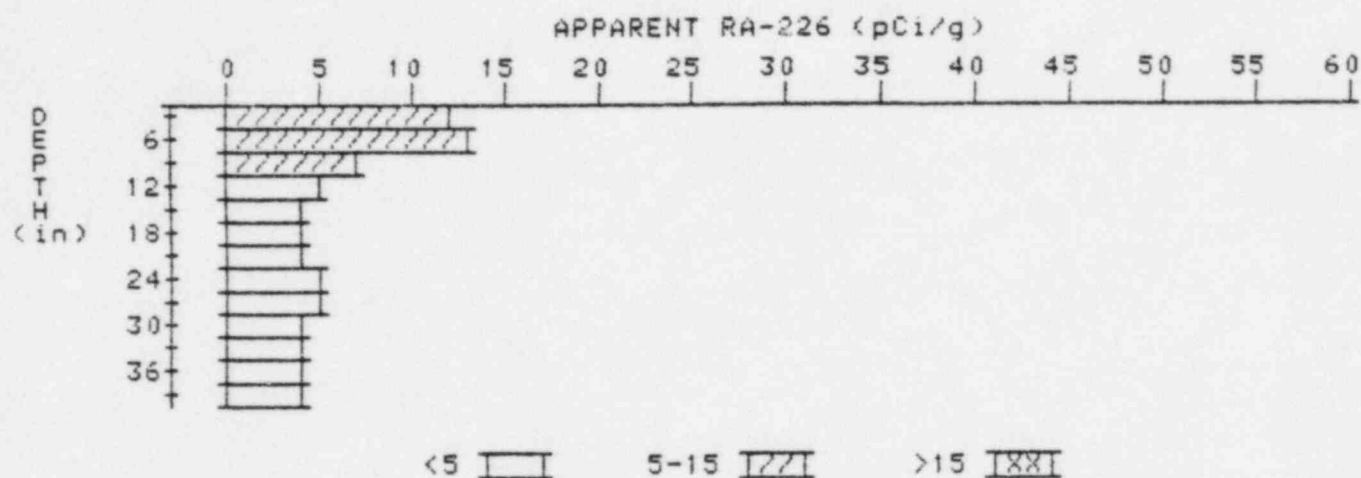
LOCATION: 160260



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	11.8	11.8
6	12.4	18.1
9	9.8	8.7
12	7.8	7.4
15	6.0	4.2
18	5.2	4.1
21	5.0	5.2
24	4.7	4.3
27	4.6	4.6
30	4.5	4.5
33	4.4	4.4
36	4.3	4.3

APPARENT RADIUM-226 CONCENTRATION 14 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS
HOLE NUMBER: 14
LOCATION: 165281



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	11.8	11.8
6	10.7	13.2
9	8.2	7.3
12	6.2	4.6
15	5.1	3.9
18	4.7	4.3
21	4.5	4.1
24	4.5	4.7
27	4.4	4.6
30	4.2	4.0
33	4.1	4.3
36	3.9	3.5
39	3.9	3.9

APPARENT RADIUM-226 CONCENTRATION 15

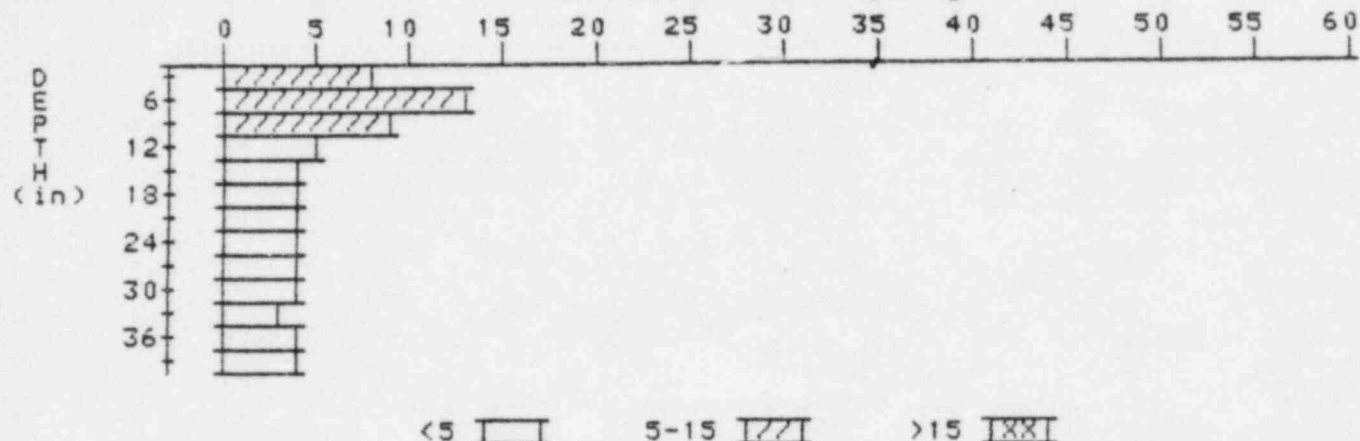
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS

HOLE NUMBER: 15

LOCATION: 170250

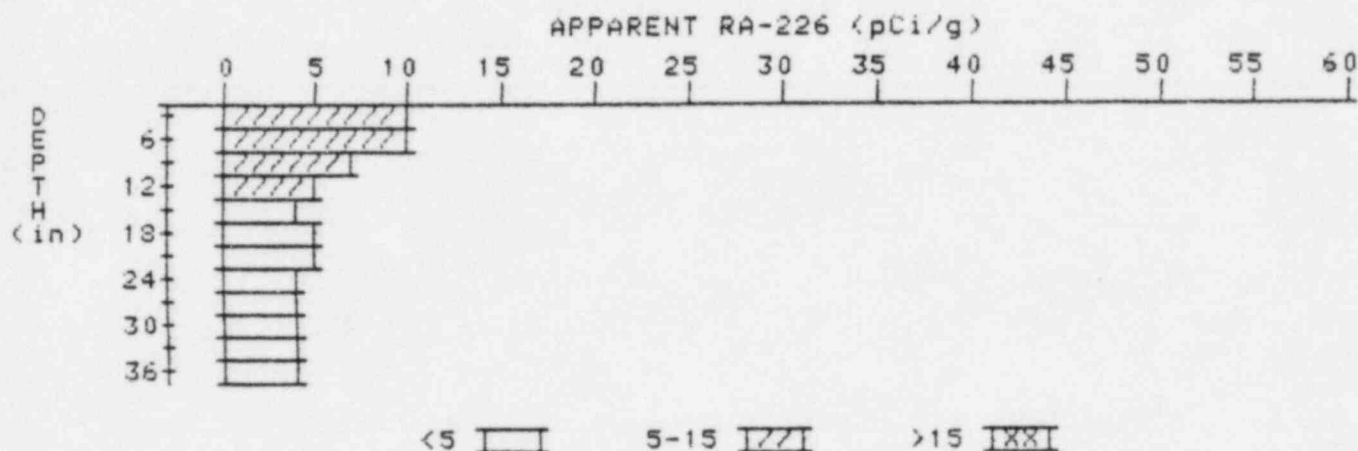
APPARENT RA-226 (pCi/g)



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	8.0	8.0
6	9.2	13.5
9	8.0	9.2
12	6.1	4.7
15	5.0	4.1
18	4.4	3.9
21	4.1	3.9
24	3.9	3.7
27	3.8	3.8
30	3.7	3.9
33	3.5	3.1
36	3.5	3.5
39	3.5	3.5

APPARENT RADIUM-226 CONCENTRATION 17 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS
HOLE NUMBER: 17
LOCATION: 175235



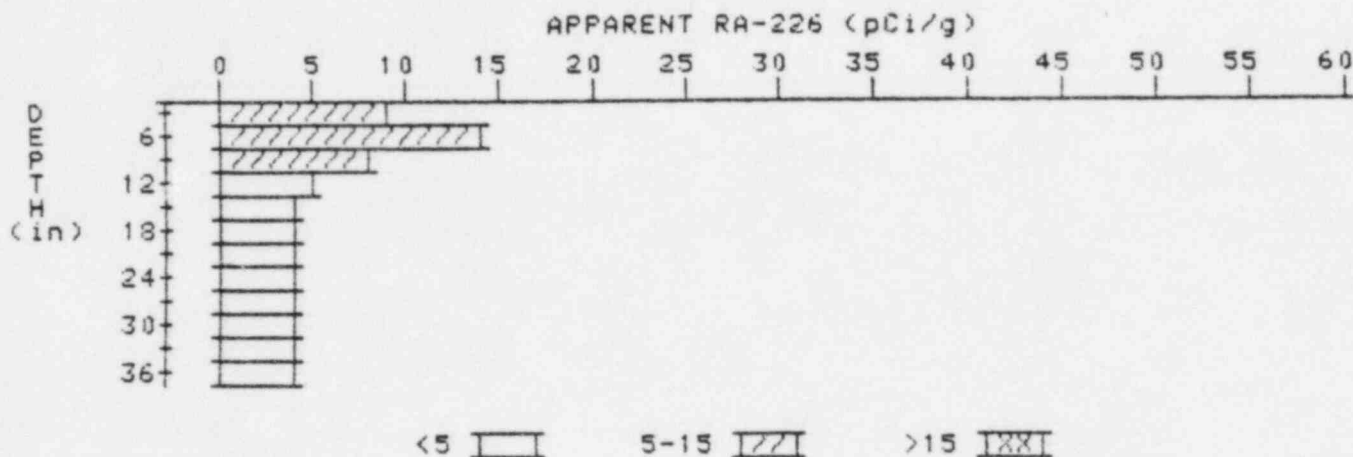
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	9.9	9.9
6	8.9	10.0
9	7.3	6.8
12	6.0	5.5
15	5.0	3.8
18	4.7	4.5
21	4.5	4.7
24	4.2	3.8
27	4.1	3.9
30	4.1	4.1
33	4.1	4.1
36	4.1	4.1

APPARENT RADIUM-226 CONCENTRATION 18 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS

HOLE NUMBER: 18

LOCATION: 185257



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	8.7	8.7
6	9.5	13.8
9	7.9	8.3
12	6.1	4.9
15	5.0	3.9
18	4.5	4.3
21	4.1	3.7
24	3.9	3.7
27	3.8	3.8
30	3.7	3.7
33	3.6	3.6
36	3.5	3.5

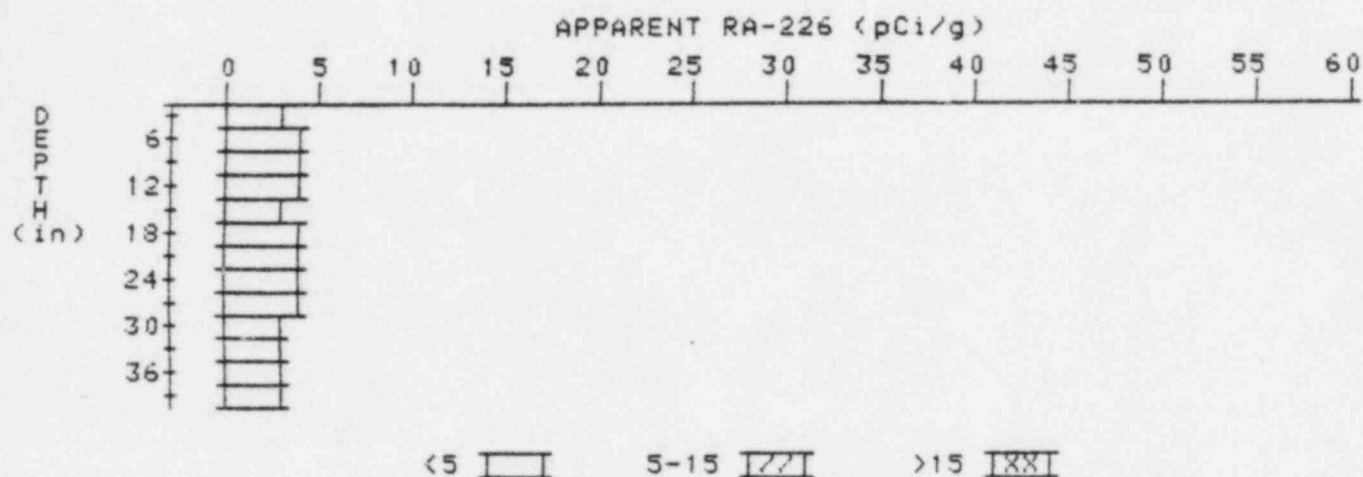
APPARENT RADIUM-226 CONCENTRATION 20

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS

HOLE NUMBER: 20

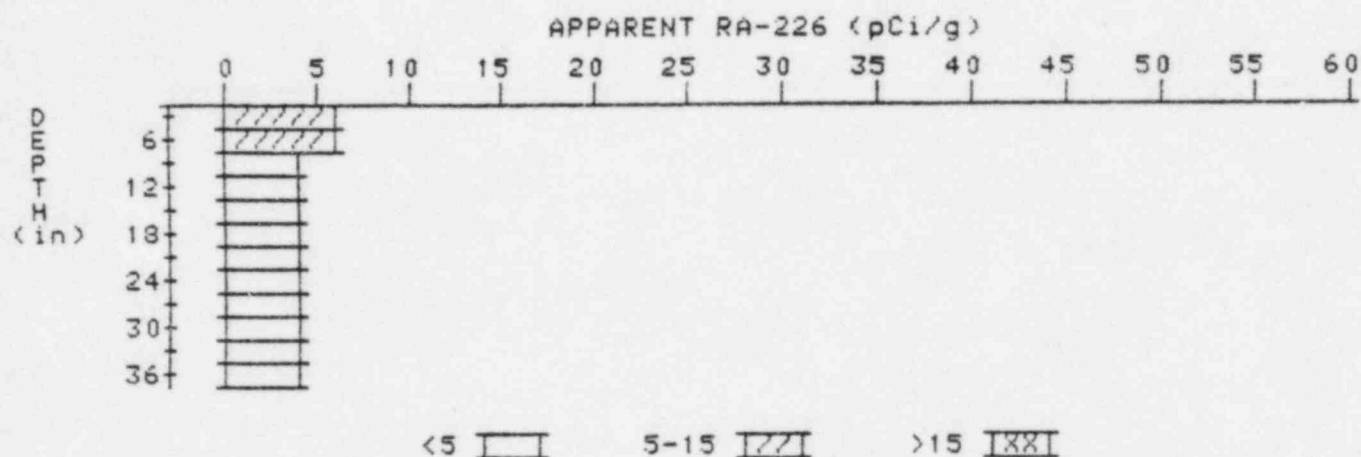
LOCATION: 187281



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.2	3.2
6	3.5	3.7
9	3.7	4.1
12	3.7	3.9
15	3.6	3.2
18	3.7	3.9
21	3.7	3.7
24	3.7	4.1
27	3.5	3.5
30	3.3	2.9
33	3.3	3.5
36	3.2	2.7
39	3.4	3.4

APPARENT RADIUM-226 CONCENTRATION 21 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS
HOLE NUMBER: 21
LOCATION: 190240



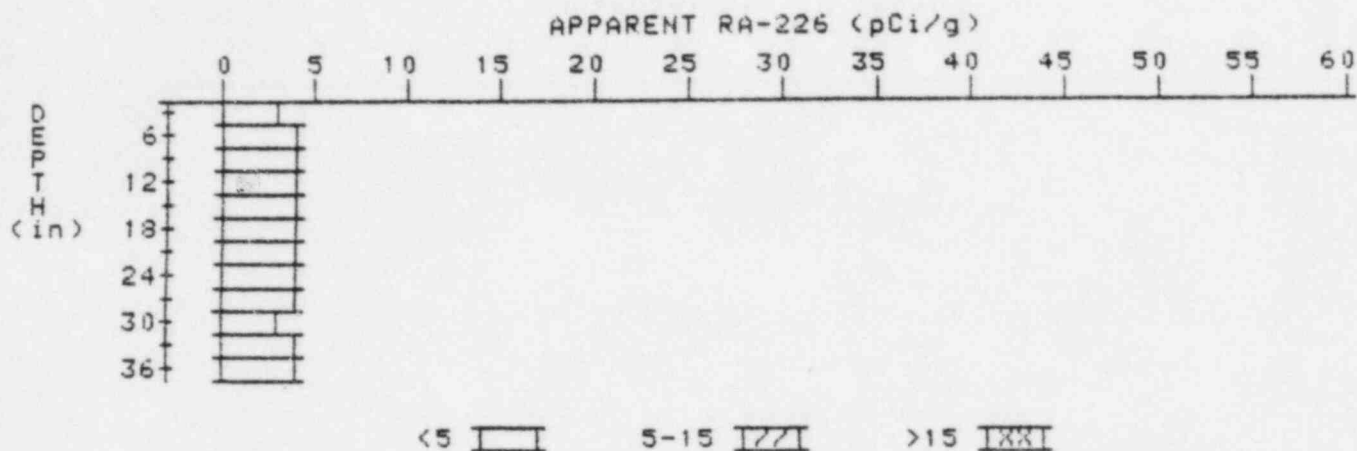
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.2	6.2
6	5.7	6.2
9	4.9	4.2
12	4.5	4.3
15	4.2	3.8
18	4.1	4.1
21	4.0	3.8
24	4.0	4.2
27	3.9	3.7
30	3.9	3.9
33	3.9	3.7
36	4.0	4.0

APPARENT RADIUM-226 CONCENTRATION 22 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS

HOLE NUMBER: 22

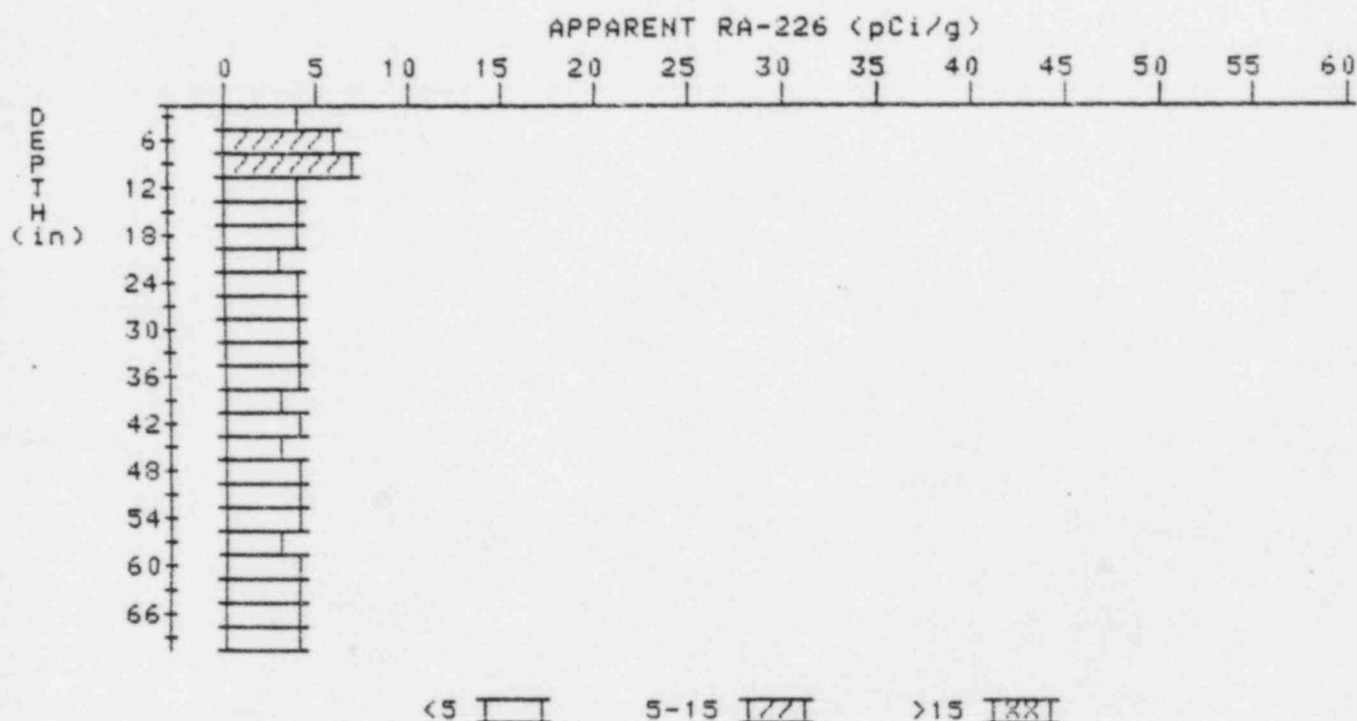
LOCATION: 195275



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.6	3.6
9	3.9	4.4
12	3.9	3.9
15	3.9	3.9
18	3.9	4.1
21	3.8	3.6
24	3.8	4.0
27	3.7	3.7
30	3.6	3.4
33	3.6	3.6
36	3.6	3.6

APPARENT RADIUM-226 CONCENTRATION 23 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS
HOLE NUMBER: 23
LOCATION: 198269



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.9	3.9
6	4.8	5.9
9	5.1	6.5
12	4.6	4.2
15	4.3	4.3
18	4.0	3.8
21	3.8	3.4
24	3.8	3.8
27	3.8	3.8
30	3.8	3.8
33	3.8	4.0
36	3.7	3.9
39	3.5	3.1
42	3.5	3.7
45	3.4	3.0

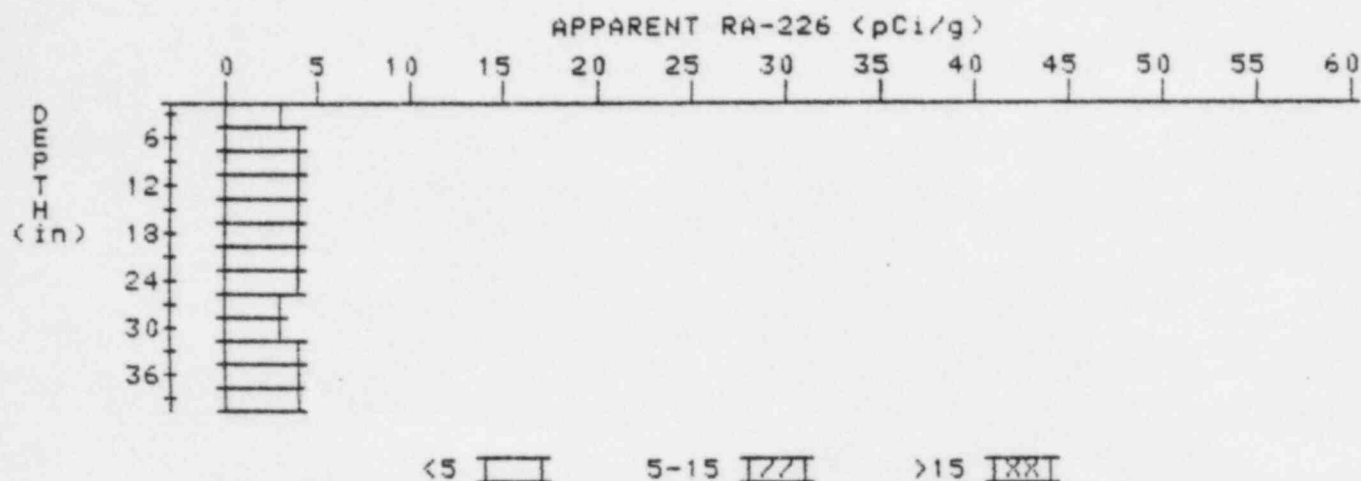
48
51
54
57
60
63
66
69

3.5
3.5
3.5
3.5
3.7
3.7
3.7
3.6

3.7
3.5
3.5
3.1
4.1
3.7
3.9
3.6

APPARENT RADIUM-226 CONCENTRATION 24 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS
HOLE NUMBER: 24
LOCATION: 202248



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.9	2.9
6	3.3	3.7
9	3.5	3.5
12	3.7	4.1
15	3.7	3.5
18	3.8	4.2
21	3.7	3.5
24	3.7	3.9
27	3.6	3.4
30	3.6	3.4
33	3.7	3.9
36	3.7	3.7
39	3.7	3.7

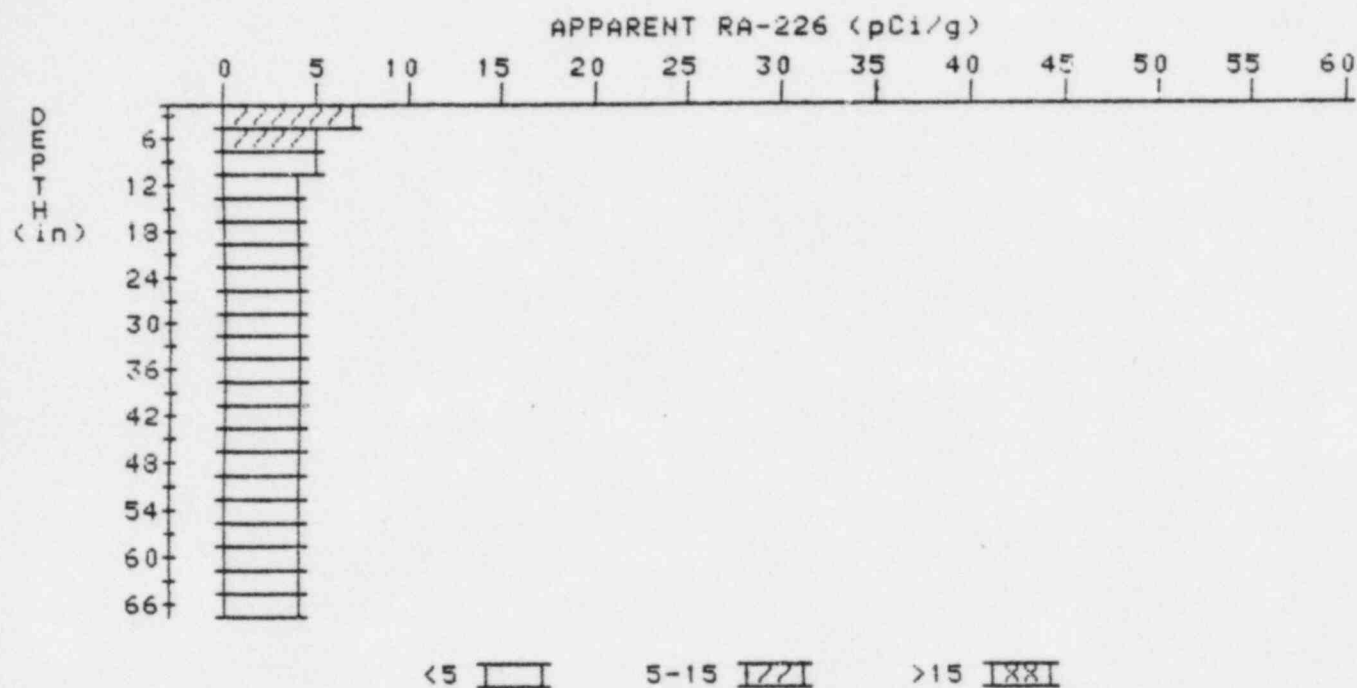
APPARENT RADIUM-226 CONCENTRATION 25

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS

HOLE NUMBER: 25

LOCATION: 210249



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.6	6.6
6	5.7	5.3
9	5.0	4.8
12	4.4	3.7
15	4.2	4.2
18	4.0	3.8
21	3.9	3.9
24	3.8	3.6
27	3.8	3.8
30	3.8	3.6
33	3.9	4.1
36	3.9	3.7
39	4.0	4.0
42	4.1	4.5
45	4.0	3.6
48	4.1	4.5

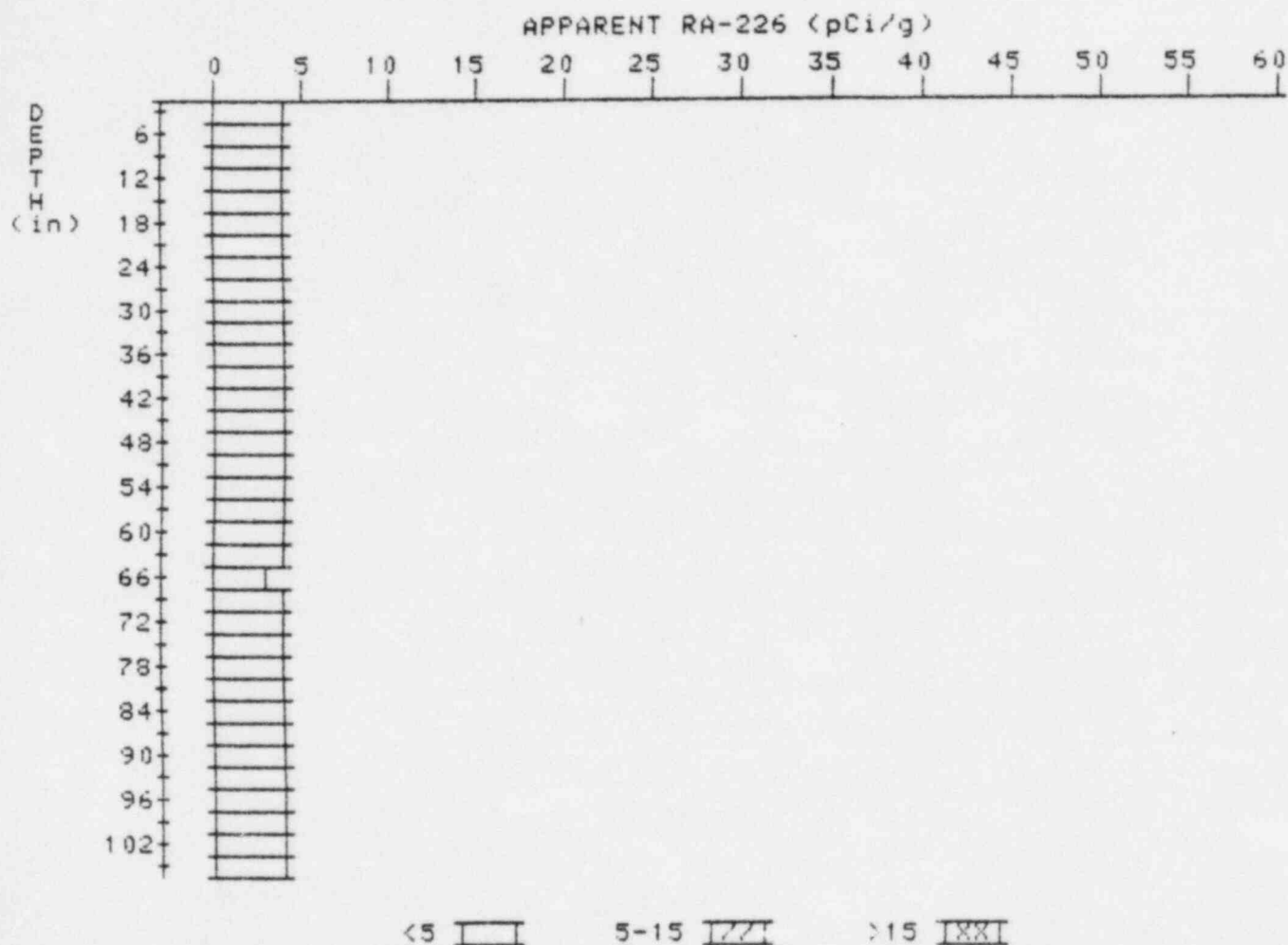
51
54
57
60
63
66

4.0
4.0
3.9
3.9
4.0
3.9

3.8
4.2
3.7
3.7
4.4
3.9

APPARENT RADIUM-226 CONCENTRATION 26 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS
HOLE NUMBER: 26
LOCATION: 210279



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.7	3.7
6	3.9	4.1
9	4.0	4.0
12	4.1	4.3
15	4.1	4.1
18	4.1	4.3

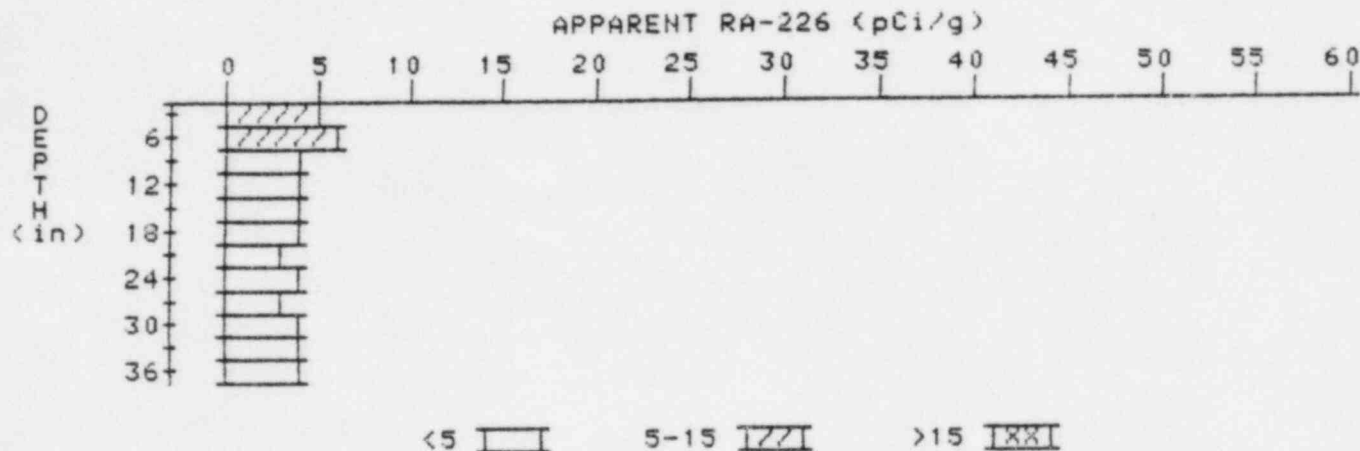
21	4.0	4.0
24	3.9	3.7
27	3.9	3.9
30	3.9	4.1
33	3.8	3.6
36	3.8	3.6
39	3.9	4.1
42	3.9	3.7
45	4.0	4.2
48	4.0	3.8
51	4.1	4.3
54	4.1	4.1
57	4.1	4.3
60	4.0	4.0
63	3.9	3.9
66	3.8	3.4
69	3.9	4.1
72	3.9	3.9
75	3.9	3.7
78	4.0	4.2
81	4.0	4.2
84	3.9	3.9
87	3.8	3.6
90	3.8	3.8
93	3.8	4.0
96	3.7	3.5
99	3.7	3.7
102	3.7	3.7
105	3.7	3.7

APPARENT RADIUM-226 CONCENTRATION 29 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS

HOLE NUMBER: 29

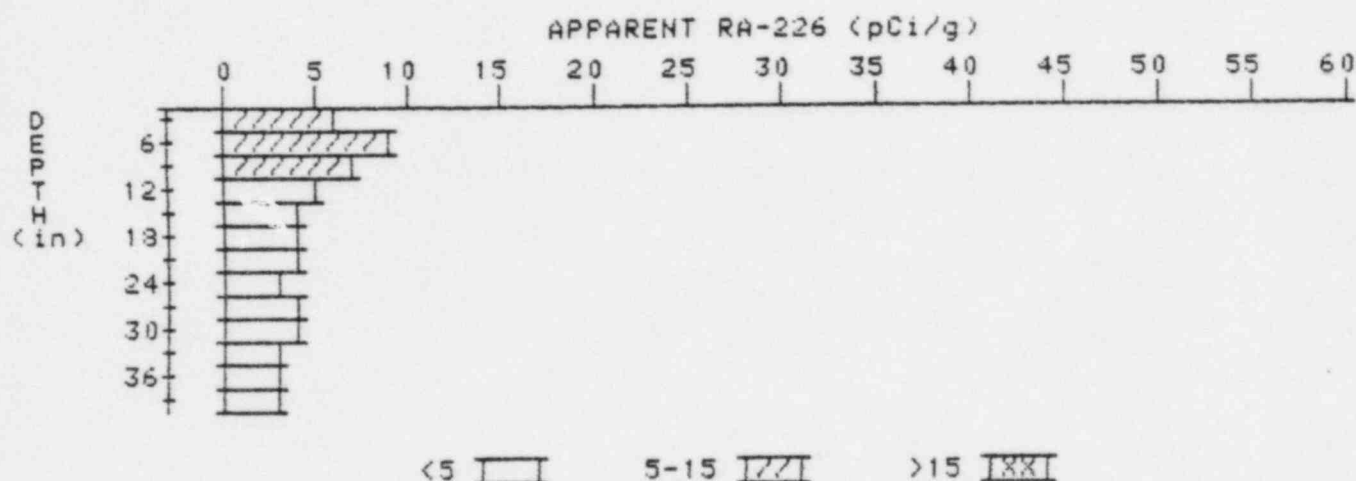
LOCATION: 226249



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.4	5.4
6	5.2	6.3
9	4.4	3.7
12	4.0	3.6
15	3.8	3.6
18	3.7	3.7
21	3.6	3.4
24	3.6	4.0
27	3.4	2.9
30	3.5	3.7
33	3.5	3.5
36	3.5	3.5

APPARENT RADIUM-226 CONCENTRATION 32 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS
HOLE NUMBER: 32
LOCATION: 231270



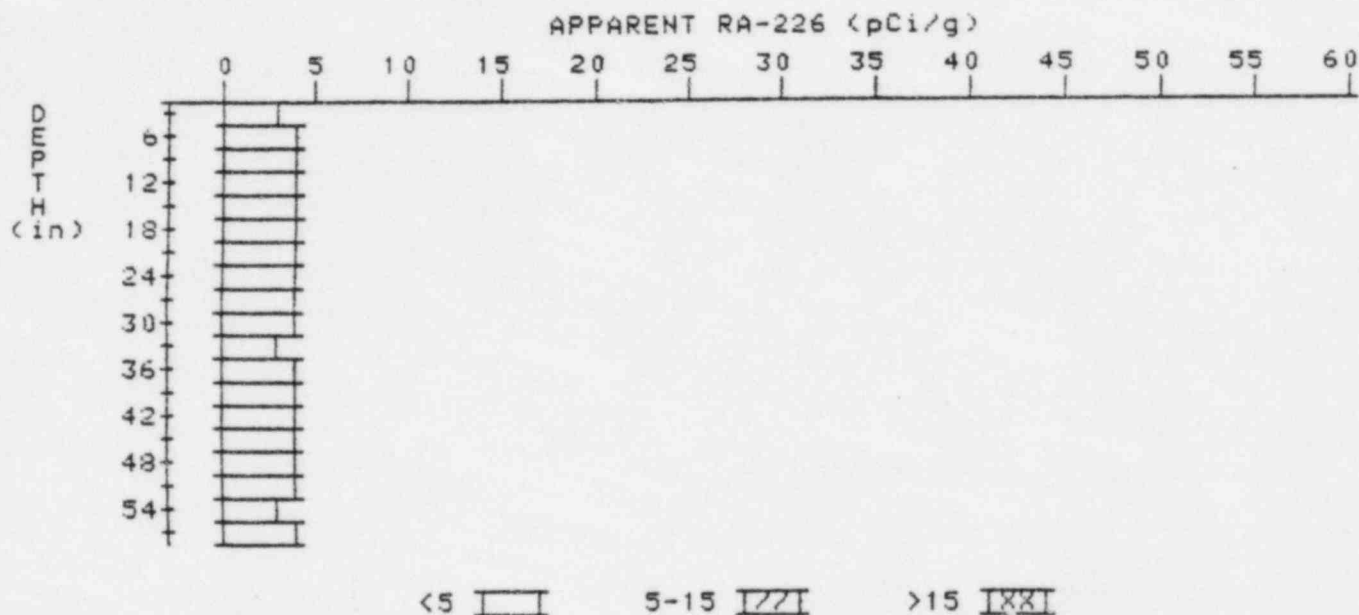
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.6	5.6
6	6.5	8.8
9	6.1	7.2
12	5.1	4.6
15	4.4	3.9
18	4.0	3.6
21	3.8	3.8
24	3.6	3.2
27	3.6	3.8
30	3.5	3.5
33	3.4	3.2
36	3.4	3.4
39	3.4	3.4

APPARENT RADIUM-226 CONCENTRATION 34 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS

HOLE NUMBER: 34

LOCATION: 236267



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.2	3.2
6	3.5	3.7
9	3.7	3.9
12	3.8	4.0
15	3.8	3.6
18	3.9	4.3
21	3.8	3.8
24	3.7	3.5
27	3.7	3.5
30	3.8	4.2
33	3.7	3.3
36	3.8	4.0
39	3.8	3.6
42	3.9	4.3
45	3.8	3.6
48	3.8	4.0
51	3.7	3.7
54	3.6	3.4

57

3.6

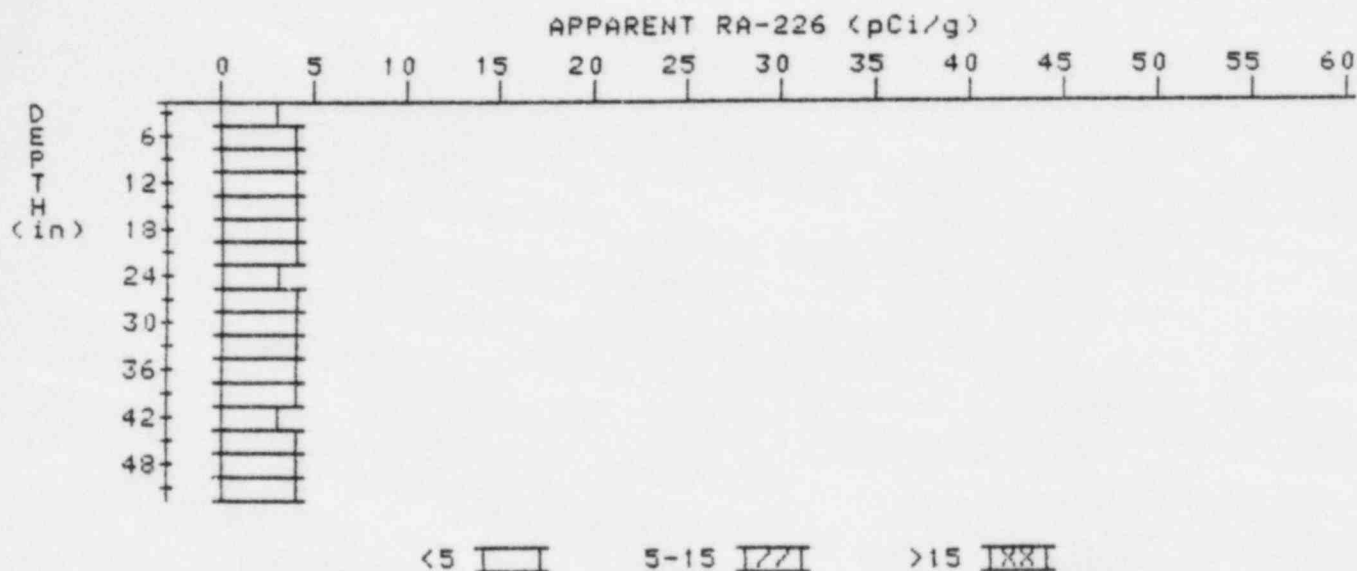
3.6

APPARENT RADIUM-226 CONCENTRATION 36 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS

HOLE NUMBER: 36

LOCATION: 250260



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.7	2.7
6	3.2	3.7
9	3.4	3.6
12	3.5	3.5
15	3.6	3.8
18	3.6	3.6
21	3.6	3.6
24	3.6	3.4
27	3.7	3.9
30	3.7	3.7
33	3.7	3.7
36	3.7	3.7
39	3.7	3.7
42	3.7	3.3
45	3.9	4.3
48	3.9	4.1
51	3.8	3.8

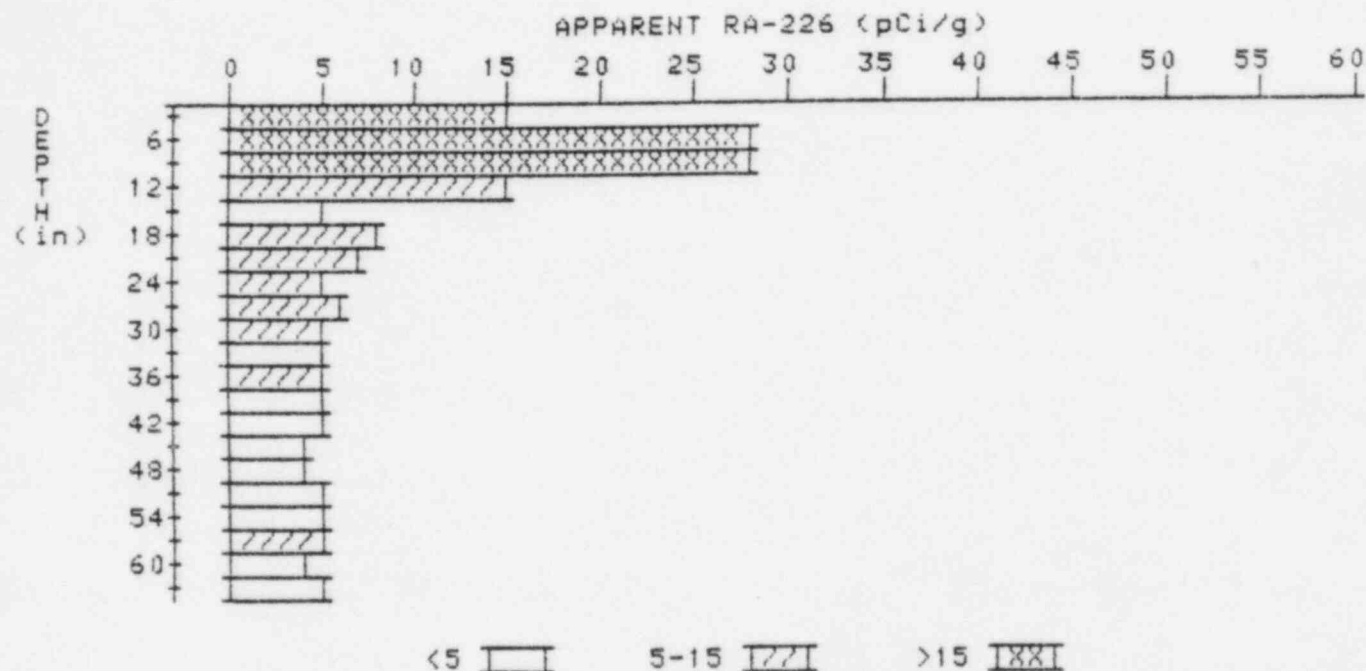
APPARENT RADIUM-226 CONCENTRATION 42

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS

HOLE NUMBER: 42

LOCATION: 278282



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	15.4	15.4
6	19.8	27.6
9	19.8	28.3
12	15.0	14.8
15	10.3	5.0
18	8.6	7.7
21	7.4	7.0
24	6.4	5.2
27	6.1	6.5
30	5.6	5.4
33	5.2	4.8
36	5.0	5.0
39	4.8	4.6
42	4.7	4.7
45	4.6	4.4
48	4.6	4.4
51	4.7	4.7

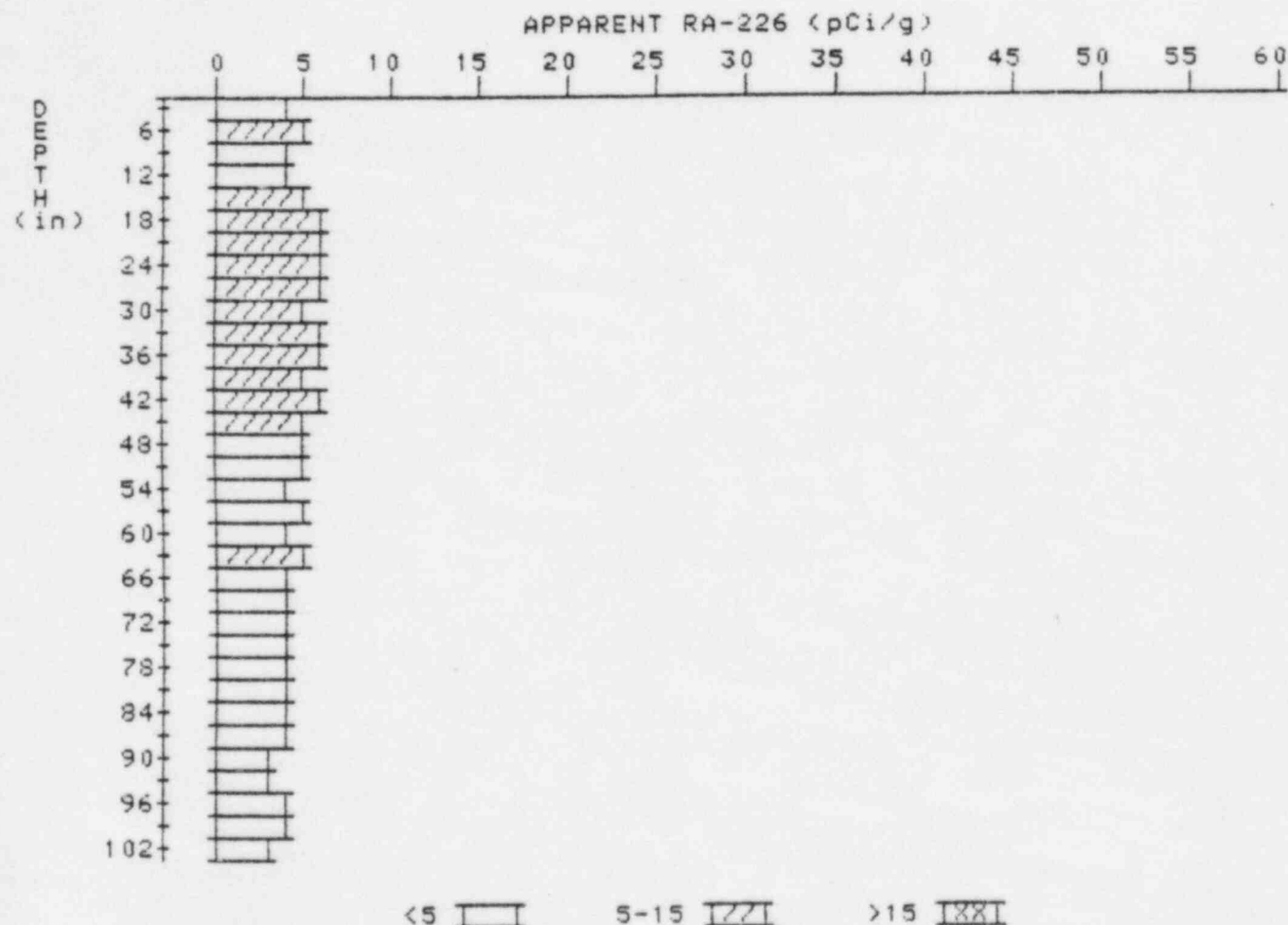
54
57
60
63

4.8
4.8
4.6
4.6

5.0
5.2
4.2
4.6

APPARENT RADIUM-226 CONCENTRATION 43 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS
HOLE NUMBER: 43
LOCATION: 280243



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.0	4.0
6	4.5	5.4
9	4.5	4.1
12	4.7	4.2
15	5.2	5.4
18	5.6	6.1
21	5.7	5.5

24	5.9	6.4
27	5.8	5.8
30	5.7	5.3
33	5.8	6.2
36	5.7	5.9
39	5.5	5.3
42	5.4	5.6
45	5.2	5.4
48	4.9	4.5
51	4.8	5.0
54	4.6	4.2
57	4.6	4.8
60	4.5	4.3
63	4.5	5.0
66	4.2	3.8
69	4.1	4.3
72	3.9	3.7
75	3.8	3.6
78	3.8	4.0
81	3.7	3.5
84	3.7	3.9
87	3.6	3.6
90	3.5	3.3
93	3.5	3.3
96	3.6	4.0
99	3.5	3.5
102	3.4	3.4

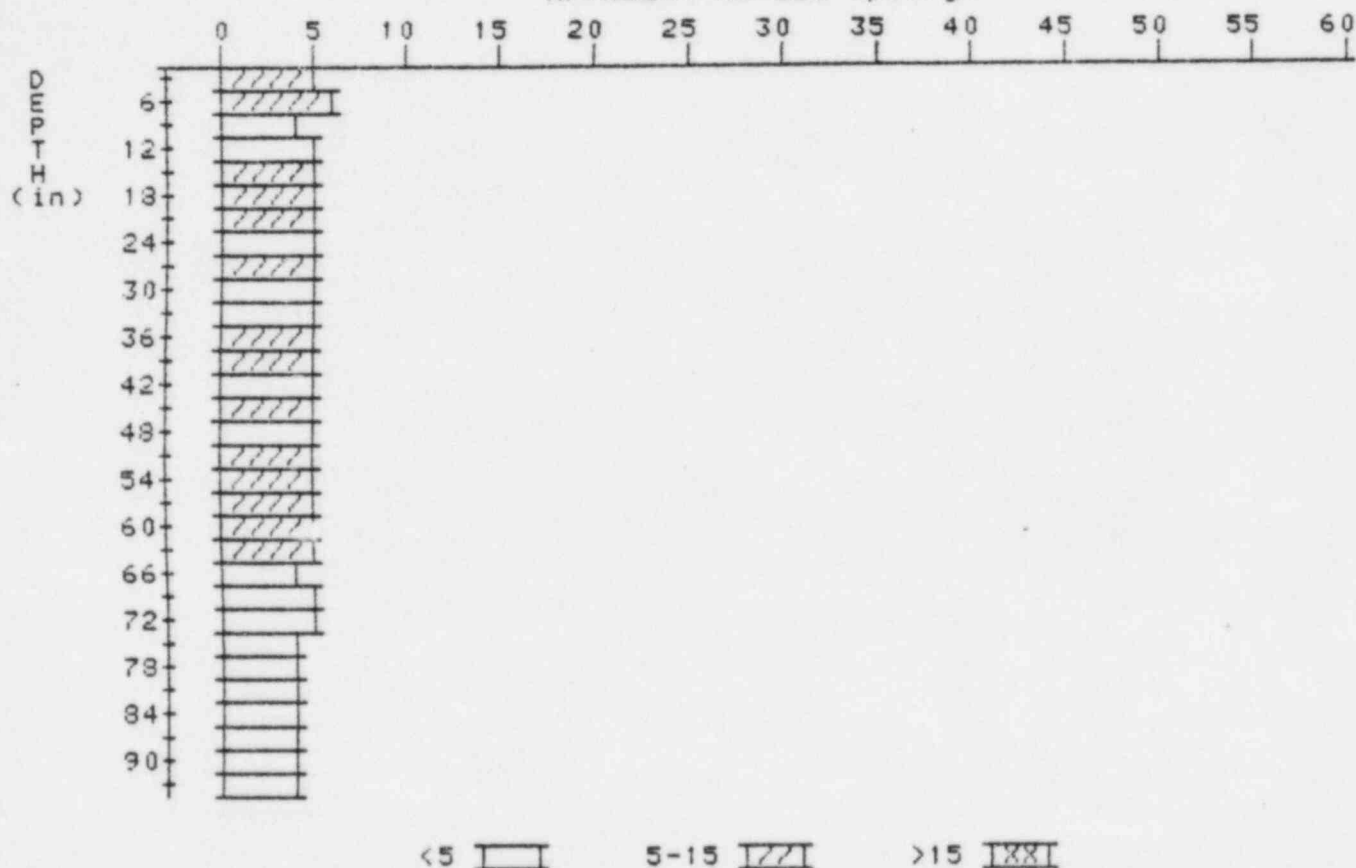
APPARENT RADIUM-226 CONCENTRATION 44 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-RS

HOLE NUMBER: 44

LOCATION: 284266

APPARENT RA-226 (pCi/g)



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.1	5.1
6	5.2	6.1
9	4.8	3.9
12	4.9	4.9
15	5.0	5.2
18	5.0	5.0
21	5.0	5.2
24	4.9	4.5
27	5.0	5.4

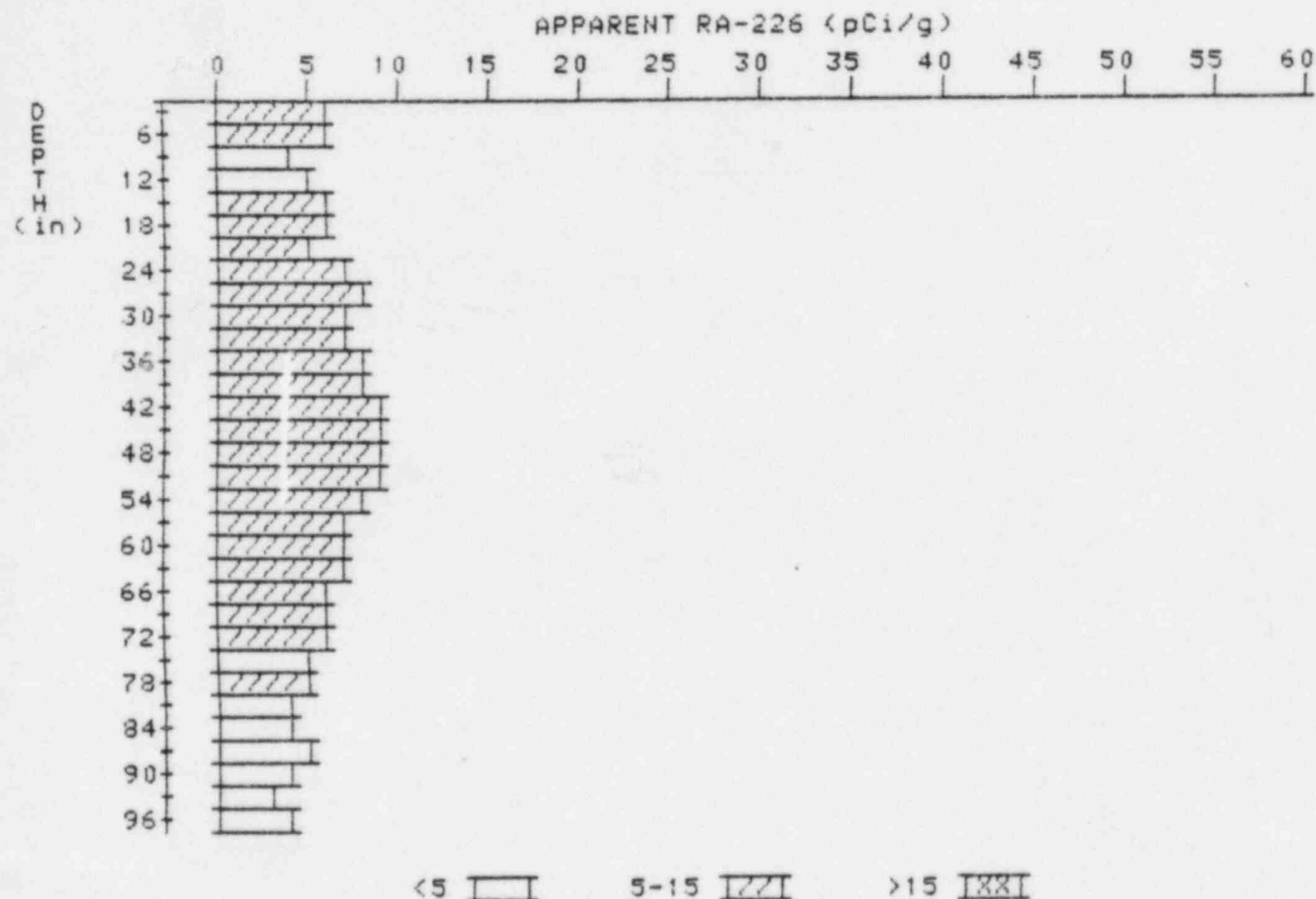
30	4.9	4.7
33	4.9	4.7
36	5.0	5.0
39	5.1	5.5
42	5.0	4.6
45	5.1	5.3
48	5.1	4.9
51	5.2	5.4
54	5.2	5.4
57	5.1	5.1
60	5.0	5.0
63	4.9	5.3
66	4.6	4.2
69	4.5	4.5
72	4.4	4.6
75	4.2	3.8
78	4.2	4.4
81	4.1	4.3
84	3.9	3.7
87	3.8	3.8
90	3.7	3.7
93	3.6	3.6

APPARENT RADIUM-226 CONCENTRATION 45 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-11419-R3

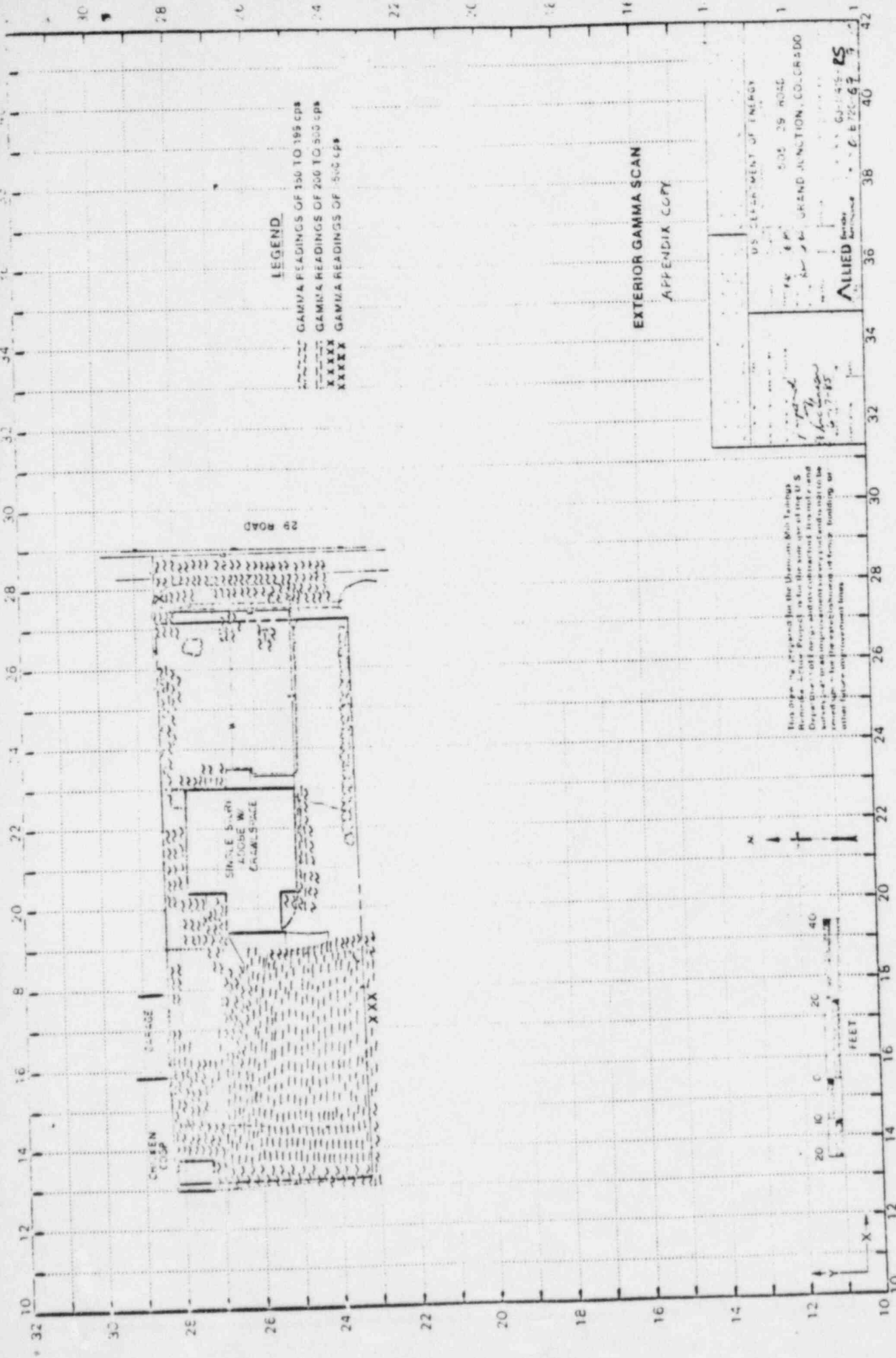
HOLE NUMBER: 45

LOCATION: 285252



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.5	5.5
6	5.6	6.5
9	5.2	4.3
12	5.3	4.8
15	5.7	6.2
18	5.8	5.6
21	6.0	5.5
24	6.5	6.5
27	7.0	7.5

30	7.2	7.0
33	7.5	7.3
36	7.9	7.9
39	8.3	8.5
42	8.6	8.8
45	8.8	9.2
48	8.8	9.3
51	8.5	8.9
54	8.0	8.2
57	7.4	7.2
60	6.9	6.5
63	6.6	7.0
66	6.1	5.7
69	5.8	5.8
72	5.5	5.7
75	5.1	4.7
78	4.9	5.3
81	4.5	4.0
84	4.4	4.4
87	4.3	4.7
90	4.0	3.8
93	3.8	3.3
96	3.9	3.9



**EXTERIOR GAMMA SCAN
APPENDIX COPY**

US DEPARTMENT OF ENERGY
505 29 ROAD
GRAND JUNCTION, COLORADO

ALLIED
63-45-25
6 E 72-62

This report was prepared for the Uranium Mill Tailings Remedial Action Project on the site of the U.S. Atomic Energy Commission's Grand Junction Uranium Mill. The purpose of this report is to provide information on the gamma scan results for the exterior of the building. The gamma scan results are presented in the form of a map showing the distribution of gamma readings. The gamma readings are presented in the form of a map showing the distribution of gamma readings. The gamma readings are presented in the form of a map showing the distribution of gamma readings.