

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-02774-MR
ADDRESS: 3100 F ROAD

JUNE 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

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

APPROVED BY

M.K. Tucker ⁶³
M. TUCKER

DOE PROJECT ENGINEER

DATE

July 31 1985

REA02774:KL008

8508150292 850731
PDR WASTE
WM-54 PDR

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-02774-MR, is a single-family residence located at 3100 F 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 select 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, 76 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$7,079. Remedial action on this property will take approximately 15 days to complete.

1.3 Areas to be Excluded

Areas A and B, as discussed in Section 3.5 and shown on Appendix Figure 3.5a, will not be included in this remedial action for the reason discussed in Section 4.2.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 3100 F Road, Grand Junction, Colorado

Zoning: Residential (R-2)

Lot Size: Approximately 24,000 sf (0.5 acres)

Legal Description: Beginning Southwest corner Section 3, T1S, R1E, East 156.8 feet, North 246.4 feet, West 156.8 feet, South to beginning. Excluding right-of-way on West and South as described in Book 1370, pages 200 and 201, Mesa County Record, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 4 miles 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:	F Road
East:	Single-family residence
West:	31 Road

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-story residence with attached carport
Size:	Approximately 1,600 sf
Construction Date:	1964
Construction:	Wood-frame
Foundation:	Concrete stemwall on spread footing
Footing Depth:	Approximately 28" to bottom of footing from grade
Basement:	None
Crawl Space:	Yes, under entire living area
Condition:	Good

Other Structures:

Type:	Heavy-equipment garage and metal shop
Size:	Approximately 2,900 sf
Construction:	Heavy timber with galvanized metal siding
Foundation:	Monolithic concrete
Condition:	Good

Type:	Attached carport
Size:	Approximately 400 sf
Construction:	Wood-frame
Foundation:	Concrete slab-on-grade
Condition:	Good

General Remarks:

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

Historical Data:

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

3.0 RADIOLOGIC SURVEY

3.1 Introduction

Radiologic data were collected by Bendix at DOE ID No. GJ-02774-MR on March 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 contamination at the west, south, and east sides of the primary structure, including the driveway, patio, and the west entryway.

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: 9 to 15 uR/h
Highest Outside Gamma Reading (HOG): 226 uR/h

Exterior radium-concentration measurements are presented in Appendix Table 3.1. Grid-point survey results are shown in Appendix Figure 3.1. Appendix Figure 3.2 presents the ranges of elevated gamma readings and indicates areas of possible contamination.

3.2.2 Interior Findings

Background Readings: 12 to 16 uR/h
Highest Inside Gamma Reading (HIG): 16 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, 3.3b, and 3.3c 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 and 3.4. Data from these investigations are included in Appendix Tables 3.1 and 3.2.

3.4 Radon/Radon Daughter Concentration (RDC)

Determined by CDH: 0.013 gross working level (WL). No additional 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 material are:

- (AREA A) In the southeast corner of the crawl space the contamination extends to a depth of 12 inches (excluded).
- (AREA B) Adjacent to Area A on the west side, contamination is 6 inches deep (excluded).
- (AREA C) In the east yard there is contamination extending to a 12-inch depth (approximately 96 sf).
- (AREA D) Adjacent to Area C on the south, near an abandoned septic tank, contamination extends 30 inches deep (approximately 117 sf).
- (AREA E) East of Area F the depth of contamination is 9 inches (approximately 26 sf).
- (AREA F) Adjacent to Area J and extending south from the east corner of the primary structure, an area of contamination extends to a total depth of 9 inches from the surface of an uncontaminated 4-inch-thick concrete sidewalk (approximately 54 sf).
- (AREA G) Abutting Area I on the east and Areas C and D on the west, the total depth of contamination is 27 inches. The concrete sidewalk is 4 inches thick (approximately 33 sf).
- (AREA H) Adjacent to the northeast side of the primary structure, contamination extends to a depth of 12 inches (approximately 48 sf).
- (AREA I) Southeast of Area H and adjacent to the primary structure, contamination is 27 inches deep (approximately 44 sf).
- (AREA J) In the carport southeast of the primary structure, the

- (AREA J) In the carport southeast of the primary structure, the total depth of contamination is 15 inches from the surface of a contaminated 4-inch-thick concrete slab (approximately 400 sf).
- (AREA K) The gravel driveway is contaminated to a depth of 12 inches (approximately 600 sf).
- (AREA L) West of the carport the contamination is 12 inches deep (approximately 108 sf).
- (AREA M) The depth of contamination beneath the west entryway is 9 inches (approximately 50 sf).
- (AREA N) West of the primary structure and adjacent to Area M, the depth of contamination is 9 inches (approximately 40 sf).

(AREAS REQUIRING FURTHER INVESTIGATION DURING REMEDIAL ACTION)

- The concrete slab in the enclosed porch should be closely monitored during remedial action to ensure removal of all contaminated material.
- Area J needs to be carefully monitored after removal of the first 15 inches of contamination to establish whether low-level total-count readings represent secondary radiation or a low-level mix of tailings.

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-02774-MR, includes removal of all 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.

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 \$9,525.

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

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

5.0 REFERENCES

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

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

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

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

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

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

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

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

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

6.0 APPENDIX

This Appendix contains the following:

Appendix Tables:

Table 3.1	Radium Concentrations at Exterior Locations
Table 3.2	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 - Crawl Space
Figure 3.3b	Interior Gamma Exposure Rates - Ground Floor
Figure 3.3c	Interior Gamma Exposure Rates
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.		
7	127247	00	DS	<1.0		*	Gas line by garage
		12	DS	<1.0		*	
8	210200	00	DS	<1.0		*	Background Moist, loamy soil
		00-06	SS			2.4	
		03	TC	3.0		*	DC = 0 inches
		06	BH	3.2	1.3	*	
		09	TC	3.4		*	
		12	BH	3.4	1.3	*	
		15	TC	3.5		*	
		18	BH	3.4	1.2	*	
		21	TC	3.4		*	
		24	BH	3.4	1.8	*	
9	240242	03	TC	6.8		*	East of primary structure
		06	TC	8.2		*	
		09	TC	7.3		*	
		12	TC	5.8		*	DC = 12 inches Based on the deconvolution graph
		15	TC	4.9		*	
		18	TC	4.4		*	
		21	TC	4.1		*	
		24	TC	4.0		*	
		27	TC	3.8		*	
		30	TC	3.6		*	
		33	TC	3.6		*	
10	240250	03	TC	3.5		*	East of primary structure
		06	TC	3.7		*	
		09	TC	3.7		*	
		12	TC	3.6		*	DC = 0 inches
		15	TC	3.6		*	
		18	TC	3.6		*	
		21	TC	3.5		*	
		24	TC	3.4		*	
		27	TC	3.4		*	
		30	TC	3.3		*	
		33	TC	3.2		*	
11	240260	03	TC	3.4		*	East of primary structure
		06	TC	4.2		*	
		09	TC	4.1		*	
		12	TC	3.9		*	DC = 0 inches
		15	TC	3.8		*	
		18	TC	3.7		*	

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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.		
11	240260	21	TC	3.5		*	
		24	TC	3.4		*	
		27	TC	3.4		*	
		30	TC	3.4		*	
		33	TC	3.4		*	
		36	TC	3.4		*	
		39	TC	3.4		*	
12	242200	00	DS	<1.0		*	Gas line by primary
		12	DS	<1.0		*	structure
13	249201	03	TC	3.5		*	Water line
		06	TC	3.5		*	
		09	TC	3.4		*	DC = 0 inches
		12	TC	3.5		*	
		15	TC	3.5		*	
		18	TC	3.5		*	
		21	TC	3.4		*	
		24	TC	3.3		*	
		27	TC	3.4		*	
		30	TC	3.3		*	
		33	TC	3.3		*	
		36	TC	3.4		*	
		39	TC	3.4		*	
		42	TC	3.3		*	
		45	TC	3.3		*	
		48	TC	3.3		*	
		51	TC	3.3		*	
		54	TC	3.3		*	
		57	TC	3.4		*	
14	250251	03	TC	9.0		*	By abandoned
		06	TC	9.5		*	septic tank
		09	TC	8.1		*	
		12	TC	7.0		*	DC = 30 inches
		15	TC	6.3		*	Based on the
		18	TC	6.0		*	deconvolution graph
		21	TC	6.0		*	
		24	TC	6.2		*	
		27	TC	6.0		*	
		30	TC	5.6		*	
		33	TC	4.6		*	
		36	TC	4.2		*	
		39	TC	3.9		*	

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.		
14	250251	42	TC	3.7		*	
		45	TC	3.6		*	
		48	TC	3.5		*	
		51	TC	3.5		*	
		54	TC	3.6		*	
		57	TC	3.6		*	
		60	TC	3.6		*	
		63	TC	3.5		*	
		66	TC	3.5		*	
15	250260	03	TC	6.0		*	
		06	TC	6.7		*	
		09	TC	5.6		*	By abandoned
		12	TC	4.7		*	septic tank
		15	TC	4.2		*	
		18	TC	3.8		*	DC = 12 inches
		21	TC	3.6		*	Based on the
		24	TC	3.5		*	deconvolution graph
		27	TC	3.4		*	
		30	TC	3.5		*	
		33	TC	3.5		*	
		36	TC	3.5		*	
		39	TC	3.5		*	
		42	TC	3.3		*	
		45	TC	3.2		*	
		48	TC	3.2		*	
		51	TC	3.4		*	
		54	TC	3.5		*	
		57	TC	3.5		*	
		60	TC	3.5		*	
		63	TC	3.5		*	
		66	TC	3.5		*	
		69	TC	3.5		*	
16	254246	03	TC	9.3		*	Sewer line
		06	TC	10.7		*	
		09	TC	10.5		*	
		12	TC	9.4		*	DC = 27 inches
		15	TC	8.0		*	Based on the
		18	TC	7.1		*	deconvolution graph
		21	TC	6.5		*	
		24	TC	5.9		*	
		27	TC	5.4		*	
		30	TC	4.9		*	

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.		
16	254246	33	TC	4.4		*	
		36	TC	4.1		*	
		39	TC	4.0		*	
		42	TC	3.9		*	
		45	TC	3.8		*	
		48	TC	3.8		*	
		51	TC	3.7		*	
		54	TC	3.7		*	
		57	TC	3.6		*	
		60	TC	3.6		*	
17	257204	03	TC	3.9		*	Front step
		06	TC	3.7		*	
		09	TC	3.6		*	DC = 0 inches
		12	TC	3.6		*	
		15	TC	3.5		*	
		18	TC	3.5		*	
		21	TC	3.5		*	
		24	TC	3.4		*	
18	260199	03	TC	4.7		*	West of front step
		06	TC	4.5		*	
		09	TC	4.1		*	DC = 0 inches
		12	TC	3.9		*	
		15	TC	3.7		*	
		18	TC	3.6		*	
		21	TC	3.6		*	
		24	TC	3.6		*	
19	260256	03	TC	4.0		*	East of primary structure
		06	TC	3.8		*	
		09	TC	3.7		*	
		12	TC	3.7		*	DC = 0 inches
		15	TC	3.6		*	
		18	TC	3.5		*	
		21	TC	3.5		*	
		24	TC	3.4		*	
		27	TC	3.4		*	
		30	TC	3.3		*	
20	265203	00	DS	2.9		*	Concrete step
		00-06	SS			31.1	Moist soil

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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	268203	03	TC	8.4		*	
		06	TC	7.6		*	Next to front step
		09	TC	5.8		*	
		12	TC	4.6		*	
		15	TC	4.1		*	
		18	TC	3.8		*	DC = 9 inches Based on the deconvolution graph
		21	TC	3.6		*	
		24	TC	3.5		*	
		27	TC	3.5		*	
		30	TC	3.4		*	
		33	TC	3.4		*	
22	270255	03	TC	4.0		*	DC = 0 inches
		06	TC	4.5		*	
		09	TC	4.7		*	
		12	TC	4.6		*	
		15	TC	4.4		*	
		18	TC	4.5		*	
		21	TC	4.5		*	
		24	TC	4.6		*	
		27	TC	4.7		*	
		30	TC	5.0		*	
		33	TC	5.2		*	
		36	TC	4.9		*	
		39	TC	4.4		*	
		42	TC	4.1		*	
		45	TC	3.9		*	
		48	TC	3.7		*	
		51	TC	3.7		*	
		54	TC	3.6		*	
		57	TC	3.5		*	
		60	TC	3.3		*	
23	271206	00	DS	<1.0		*	By front step
24	280232	00	DS	<1.0		*	Buried telephone line Below telephone line
		06	DS	<1.0		*	
		12	DS	<1.0		*	
		18	DS	<1.0		*	
25	280258	03	TC	4.8		*	East of driveway DC = 9 inches Based on the deconvolution graph
		06	TC	5.1		*	
		09	TC	4.8		*	
		12	TC	4.6		*	

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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	280258	15	TC	4.4		*	
		18	TC	4.5		*	
		21	TC	4.5		*	
		24	TC	4.5		*	
		27	TC	4.6		*	
		30	TC	4.6		*	
		33	TC	4.5		*	
		36	TC	4.3		*	
		39	TC	4.2		*	
		42	TC	4.1		*	
		45	TC	4.0		*	
		48	TC	3.9		*	
		51	TC	3.8		*	
		54	TC	3.7		*	
		57	TC	3.6		*	
26	290230	03	TC	3.3		*	West of carport
		06	TC	3.4		*	
		09	TC	3.5		*	DC = 0 inches
		12	TC	3.5		*	
		15	TC	3.5		*	
		18	TC	3.6		*	
		21	TC	3.5		*	
		24	TC	3.6		*	
27	290240	00-03	SS			11.2	Carport on a concrete slab
		03	TC	181.4		*	
		06	TC	201.7		*	
		09	TC	158.6		*	
		12	TC	89.2		*	DC = 15 inches
		15	TC	54.9		*	Based on all
		18	TC	34.8		*	data available
		21	TC	24.4		*	
		24	TC	18.8		*	
		27	TC	16.5		*	
		30	TC	15.2		*	
		33	TC	14.6		*	
		36	TC	13.8		*	
		39	TC	12.5		*	
		42	TC	10.3		*	
		45	TC	9.1		*	
		48	TC	8.1		*	
		51	TC	7.4		*	

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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.		
27	290240	54	TC	6.7		*	
		57	TC	6.0		*	
		60	TC	5.4		*	
		63	TC	5.2		*	
		66	TC	4.9		*	
		69	TC	4.8		*	
28	290256	03	TC	36.5		*	
		06	BH	67.0	50.5	*	By driveway
		09	TC	71.3		*	
		12	BH	44.2	12.8	*	DC = 12 inches
		15	TC	23.9		*	Based on the
		18	BH	13.5	4.9	*	deconvolution graph
		21	TC	10.2		*	
		24	BH	7.7	4.3	*	
		27	TC	6.5		*	
		30	TC	5.9		*	
		33	TC	5.5		*	
		36	BH	5.2	3.3	*	
		39	TC	4.9		*	
		42	TC	4.6		*	
		45	TC	4.4		*	
		48	TC	4.4		*	
		51	TC	4.2		*	
		54	TC	4.1		*	
		57	TC	4.0		*	
		60	TC	3.9		*	
		63	TC	3.9		*	
29	290260	03	TC	6.3		*	South of driveway
		06	TC	7.9		*	
		09	TC	7.2		*	
		12	TC	5.7		*	DC = 12 inches
		15	TC	4.9		*	Based on the
		18	TC	4.4		*	deconvolution graph
		21	TC	4.2		*	
		24	TC	4.1		*	
		27	TC	4.1		*	
		30	TC	3.9		*	
		33	TC	3.9		*	
		36	TC	4.0		*	
		39	TC	3.9		*	

Radium Concentrations at Exterior Locations

DOE ID No. GJ-02774-MR

3100 F Road

Page 8 of 10

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
30	300230	03	TC	3.5		*	West of carport
		06	TC	3.4		*	
		09	TC	3.5		*	DC = 0 inches
		12	TC	3.6		*	
		15	TC	3.5		*	
		18	TC	3.5		*	
		21	TC	3.5		*	
		24	TC	3.5		*	
		27	TC	3.5		*	
31	300238	03	TC	4.6		*	
		06	TC	4.7		*	Northwest of driveway
		09	TC	4.4		*	
		12	TC	4.1		*	
		15	TC	3.9		*	DC = 0 inches
		18	TC	3.8		*	
		21	TC	3.7		*	
		24	TC	3.8		*	
		27	TC	3.7		*	
32	300254	03	TC	28.6		*	South of driveway
		06	BH	48.6	17.9	*	
		09	TC	33.5		*	DC = 12 inches
		12	BH	17.4	4.9	*	Based on the deconvolution graph
		15	TC	10.2		*	
		18	TC	6.4		*	
		21	TC	5.0		*	
		24	BH	4.5	1.0	*	
		27	TC	4.2		*	
		30	TC	4.1		*	
		33	TC	3.9		*	
		36	TC	4.0		*	
33	300267	00	DS	<1.0		*	Gravel driveway
		00-06	SS			2.0	
		03	TC	2.9		*	
		06	TC	3.2		*	
		09	TC	3.4		*	DC = 0 inches
		12	TC	3.5		*	
		15	TC	3.5		*	
		18	TC	3.5		*	
		21	TC	3.4		*	
		24	TC	3.4		*	

Radium Concentrations at Exterior Locations

DOE ID No. GJ-02774-MR

3100 F Road

Page 9 of 10

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
33	300267	27	TC	3.4		*	
		30	TC	3.4		*	
		33	TC	3.2		*	
		36	TC	3.1		*	
34	305265	03	TC	3.9		*	Driveway
		06	TC	3.9		*	
		09	TC	3.8		*	DC = 0 inches
		12	TC	3.8		*	
		15	TC	3.8		*	
		18	TC	3.8		*	
		21	TC	3.7		*	
		24	TC	3.7		*	
		27	TC	3.7		*	
		30	TC	3.6		*	
		33	TC	3.5		*	
35	310240	03	TC	3.1		*	West of driveway
		06	TC	3.3		*	
		09	TC	3.5		*	DC = 0 inches
		12	TC	3.4		*	
		15	TC	3.5		*	
		18	TC	3.5		*	
		21	TC	3.4		*	
		24	TC	3.4		*	
36	310250	03	TC	27.5		*	
		06	BH	48.5	17.0	*	By F Road
		09	TC	40.5		*	
		12	BH	20.3	4.3	*	DC = 12 inches
		15	TC	11.4		*	Based on the
		18	BH	6.9	2.1	*	deconvolution graph
		21	TC	5.2		*	
		24	TC	4.5		*	
		27	TC	4.2		*	
		30	TC	4.1		*	
		33	TC	3.9		*	
		36	TC	3.8		*	
		39	TC	3.7		*	
37	315260	03	TC	3.9		*	South of driveway
		06	TC	4.1		*	
		09	TC	3.9		*	DC = 0 inches

Radium Concentrations at Exterior Locations

DOE ID No. GJ-02774-MR

3100 F Road

Page 10 of 10

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
37	315260	12	TC	3.9		*	
		15	TC	3.8		*	
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	TC	3.8		*	
		27	TC	3.8		*	
		30	TC	3.7		*	
		33	TC	3.6		*	
		36	TC	3.5		*	
		39	TC	3.6		*	
38	316246	03	TC	3.1		*	Southwest of driveway
		06	TC	3.4		*	
		09	TC	3.5		*	
		12	TC	3.6		*	DC = 0 inches
		15	TC	3.6		*	
		18	TC	3.5		*	
		21	TC	3.5		*	
		24	TC	3.5		*	
		27	TC	3.5		*	
		30	TC	3.4		*	
		33	TC	3.4		*	
		36	TC	3.5		*	

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

Notes: DC = Depth of Contamination
 * = No Soil Sample Taken
 [n] = Reading Taken n-Inches
 Above Floor or Ground
 Date of Survey = 03-13-85
 Team Leader = RRV

Radium Concentrations at Interior Locations

DOE ID No. GJ-02774-MR

3100 F 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		[08]	DS	1.1		*	Taken on footing
		00	DS	1.9		*	Taken on dirt
2		[08]	DS	1.7		*	Taken on footing
		00	DS	6.0		*	Taken on dirt
		06	DS	3.6		*	Sandy and moist
		12	DS	1.8		*	Soil
		00-06	SS			12.9	
3		[08]	DS	1.2		*	Taken on footing
		00	DS	1.7		*	Taken on dirt
4		[08]	DS	1.5		*	Taken on footing
		00	DS	7.4		*	Taken on dirt
		06	DS	2.2		*	Taken on dirt
		00-06	SS			10.1	Crawl space Moist and sandy
5		[18]	DS	<1.0		*	Taken on stem wall
6		[08]	DS	1.7		*	Taken on footing
		00	DS	6.3		*	Taken on dirt
		06	DS	<1.0		*	

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

Notes: DC = Depth of Contamination
 * = No Soil Sample Taken
 [n] = Reading Taken n-Inches
 Above Floor or Ground
 Date of Survey = 03-13-85
 Team Leader = RRV

Table 3.3

Summary of Interior Gamma Exposure Rates

DOE ID No. GJ-02774--MR

3100 F Road

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)
CRAWL SPACE ADDITION	10	17-21	19	10	16-24	20
CRAWL SPACE	15	14-18	15	15	15-19	16
GROUND FLOOR	*	*	*	*	12-16	*
METAL SHOP	14	11-12	14	14	12-13	12
BAY AREA	25	11-13	25	25	11-13	12
STORAGE SHED	01	13-13	13	01	13-13	13

* The CDH and ORNL data indicated the absence of interior contamination at this property. This information was investigated by performing a walking gamma scan on the ground floor. These areas and the ranges of gamma measurements are shown in Appendix Figure 3.3b. Exposure rates in the crawl space, shop, and bay are shown in Appendix Figures 3.3a and 3.3c.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-02774-MR

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>
-------------	-------------------------	-----------	------------------	-----------	--------------------

INTERIOR

A and B These Areas are excluded in this Remedial Action.

EXTERIOR

Concrete

F	3 x 20	=	60	x	0.3	=	18
G	3 x 18	=	54	x	0.3	=	16
J	20 x 20	=	400	x	0.3	=	120
M	3 x 5	=	15	x	0.3	=	5
*M	5 x 7	=	35	x	1.5	=	53

Volume of Concrete	=	212	=	212/27	=	8
--------------------	---	-----	---	--------	---	---

Contaminated Fill

C	8 x 12	=	96	x	1.0	=	96
D	13 x 9	=	117	x	2.5	=	293
E	2 x 13	=	26	x	0.8	=	21
F	3 x 18	=	54	x	0.5	=	27
G	3 x 11	=	33	x	2.0	=	66
H	12 x 4	=	48	x	1.0	=	48
I	11 x 4	=	44	x	2.3	=	101
J	20 x 20	=	400	x	1.0	=	400
K	25 x 24	=	600	x	1.0	=	600

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-02774-MR

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>
L	18 x 6	=	108	x 1.0	= 108	
M	10 x 5	=	50	x 0.8	= 40	
N	10 x 4	=	40	x 0.8	= 32	
Volume of Fill					= 1,832	= 1,832/27 = 68
TOTAL VOLUME - EXTERIOR						= 76

*Area M includes a bulk concrete front step.

See Appendix Figures 3.5a and 3.5b For Areas

=====

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-02774-MR

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>
L	18 x 6 =	108	x 1.0 =	108	
M	10 x 5 =	50	x 0.8 =	40	
N	10 x 4 =	40	x 0.8 =	32	
Volume of Fill				= 1,832	= 1,832/27 = 68
TOTAL VOLUME - EXTERIOR					= 76

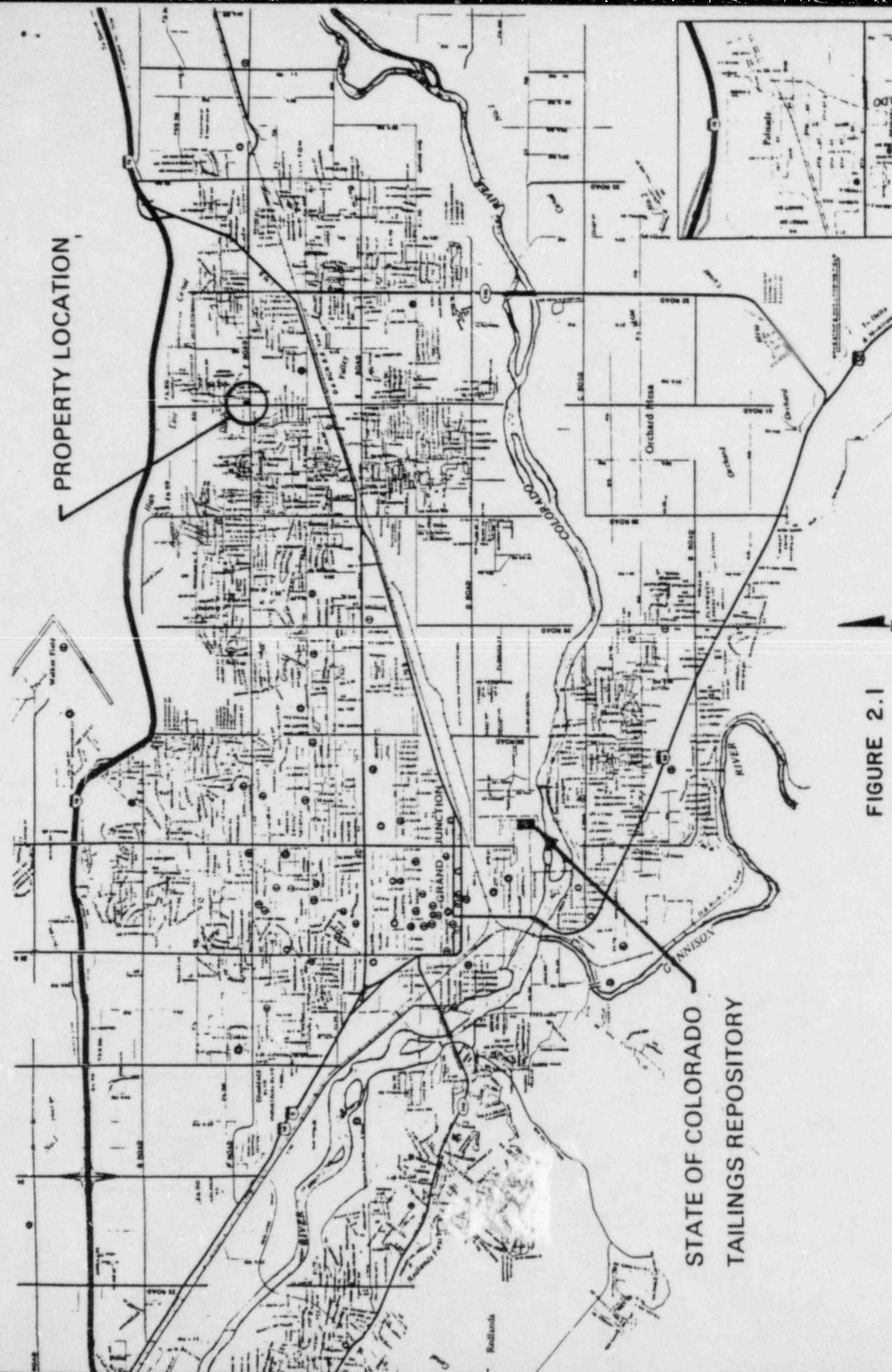
*Area M includes a bulk concrete front step.

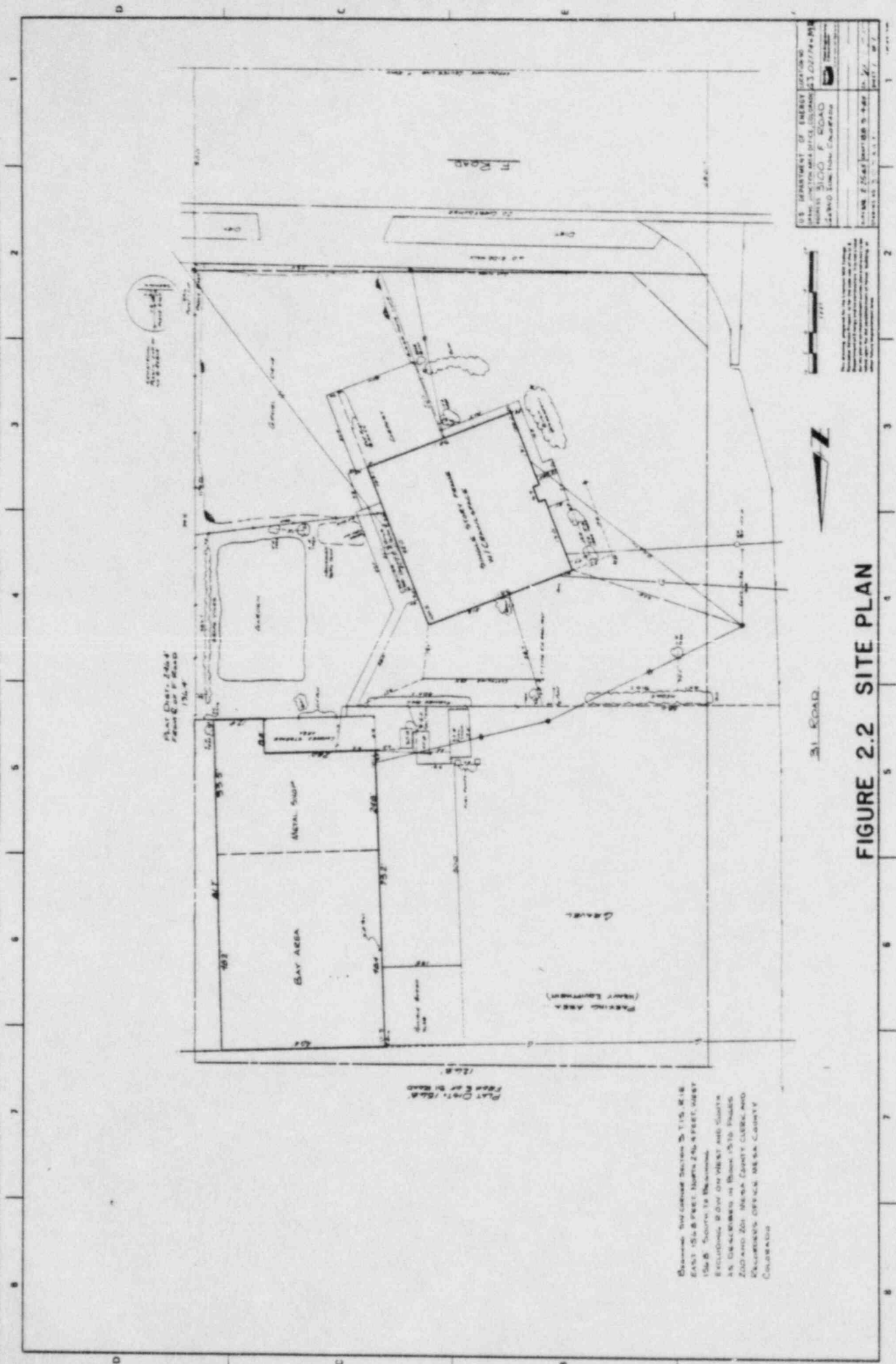
See Appendix Figures 3.5a and 3.5b For Areas

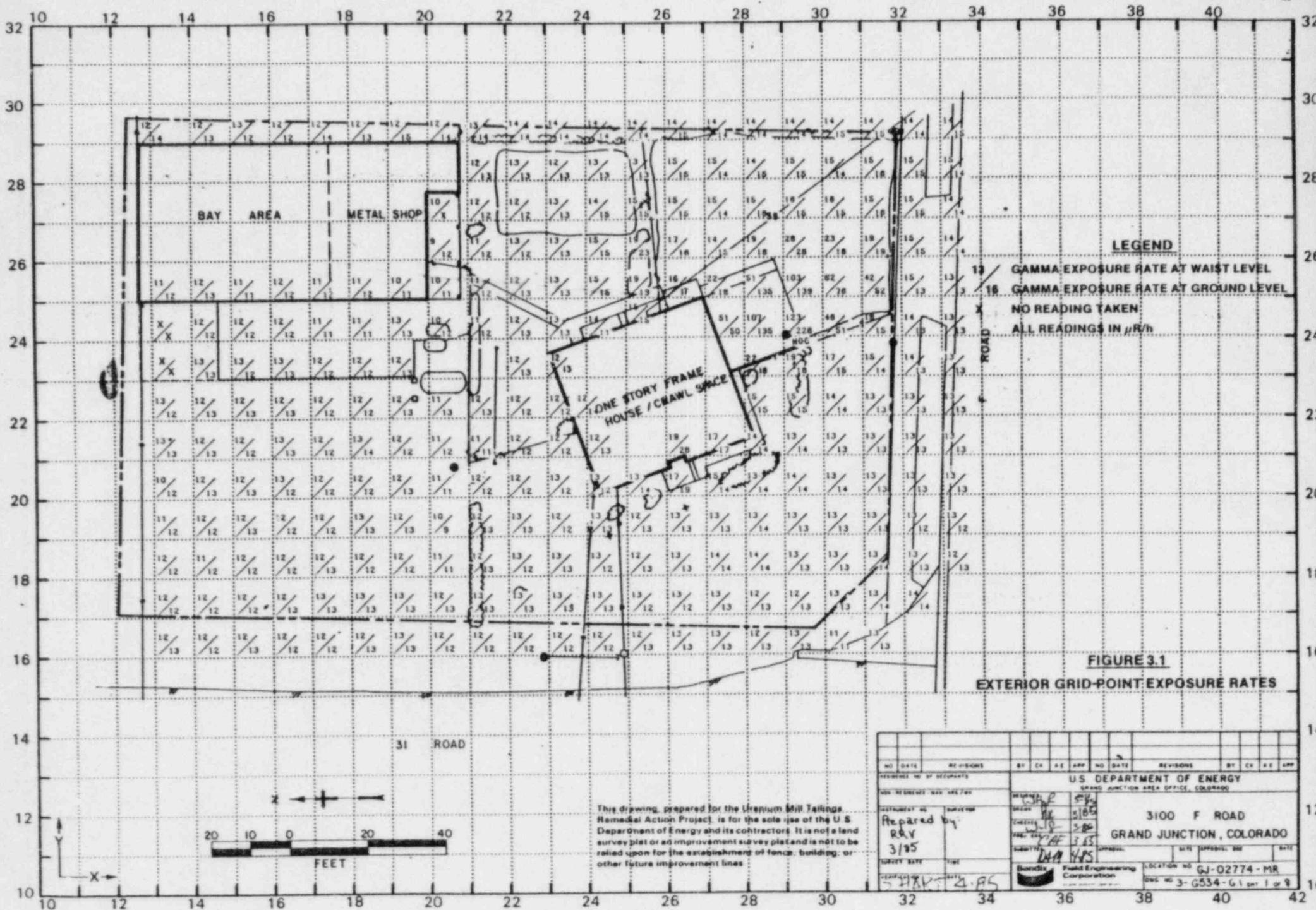
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EXTERIOR

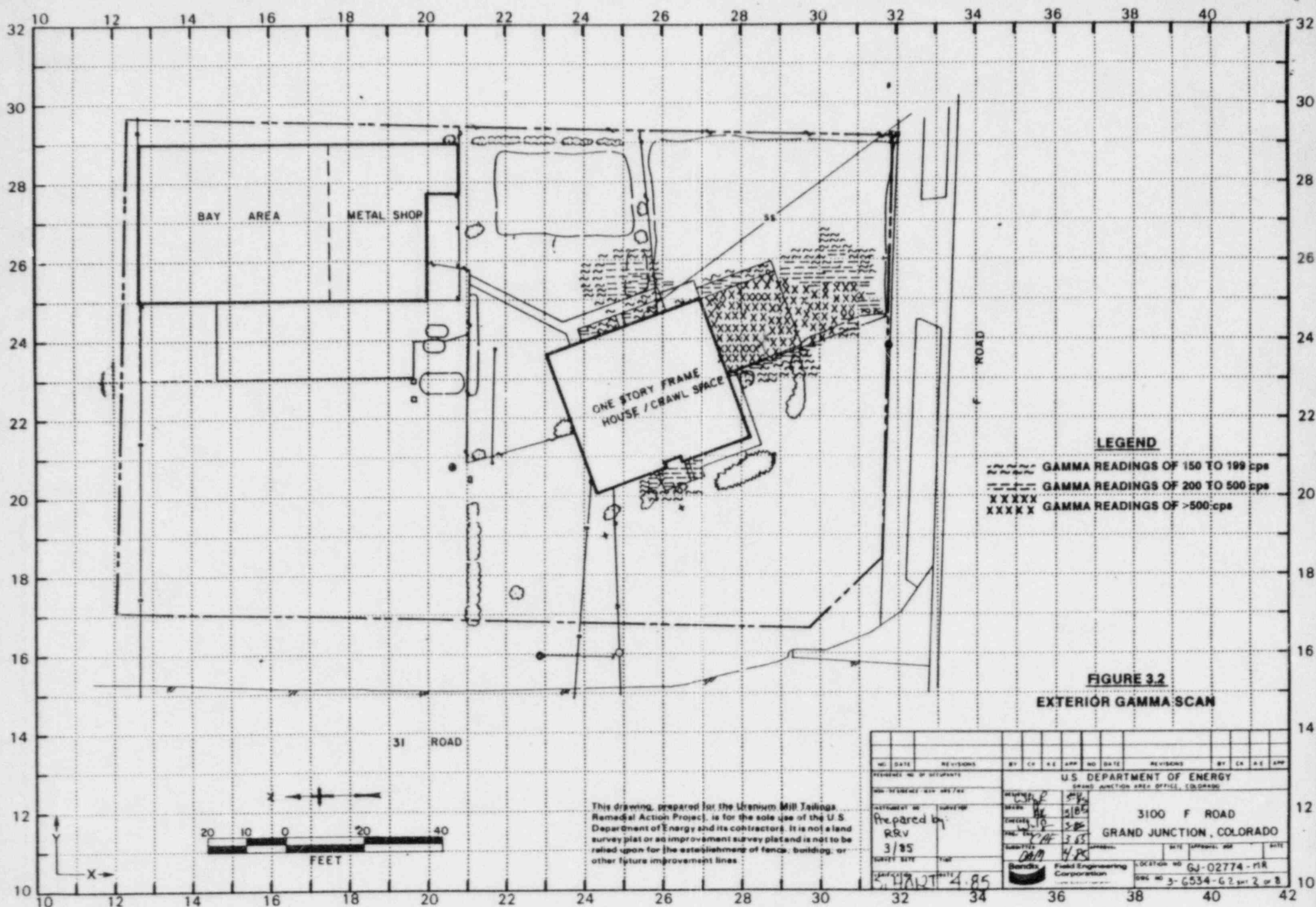
Remove/replace concrete sidewalks and carport 529 sf @ \$3/sf	\$ 1,587
Remove/replace concrete stoop/steps 2 cy @ \$300/cy	600
Remove identified residual radioactive material 53 cy @ \$14.50/cy (machine-open)	769
15 cy @ \$44/cy (manual-open)	660
Replace areas with topsoil 18 cy @ \$9.50/cy	171
Replace areas with roadbase 50 cy @ \$11.50/cy	575
Replace areas with sod 280 sf @ \$.40/sf	112
Replace miscellaneous landscaping (shrubs/plants) Lump sum	200
<hr/>	
TOTAL EXTERIOR	\$ 4,674
TOTAL INTERIOR	0
ACCESS CONTROL	250
<hr/>	
SUBTOTAL	\$ 4,924
CONTINGENCY @ 15%	739
<hr/>	
SUBTOTAL	\$ 5,663
CONTRACTOR OVERHEAD & PROFIT @ 25%	1,416
<hr/>	
GRAND TOTAL	\$ 7,079

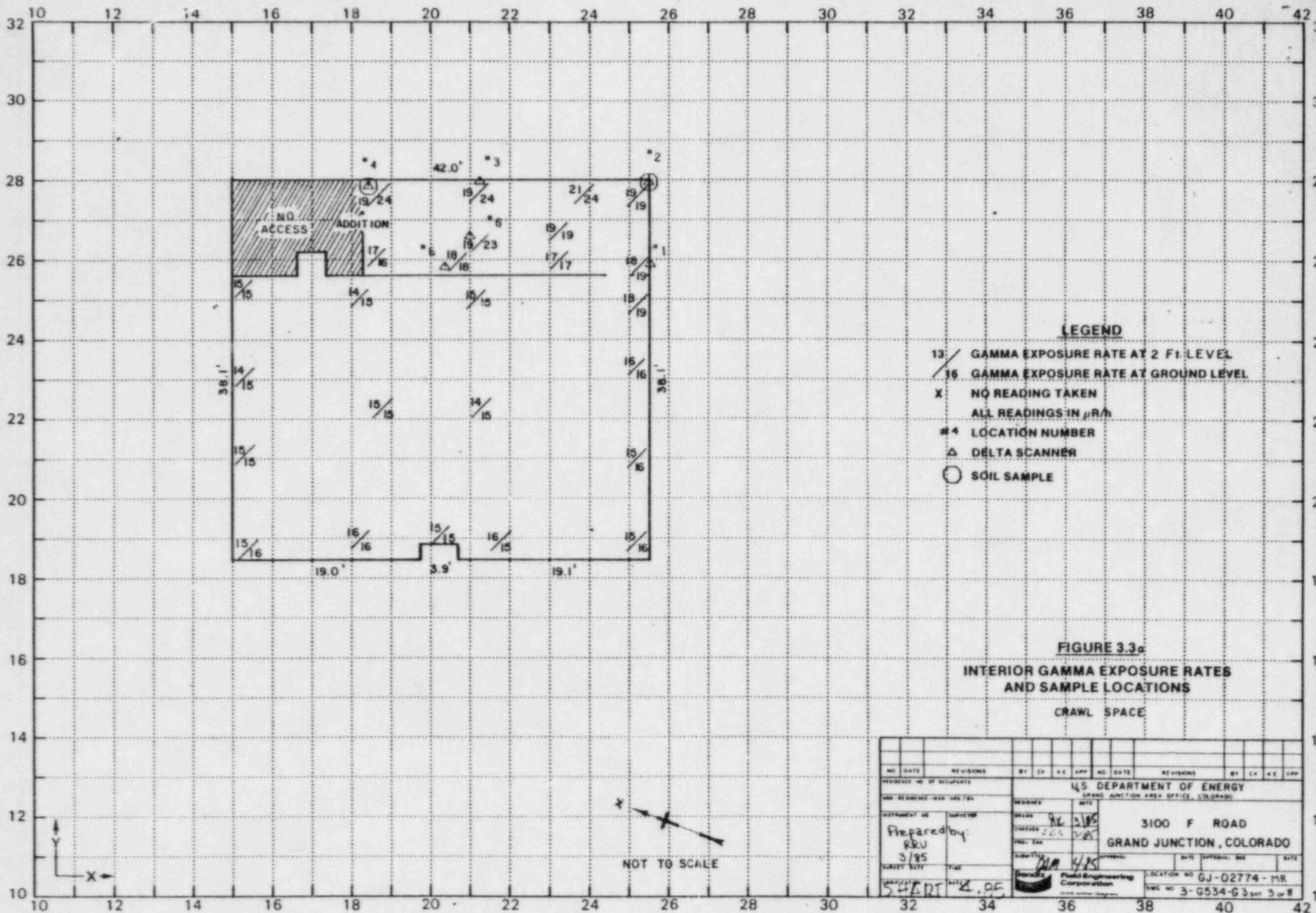


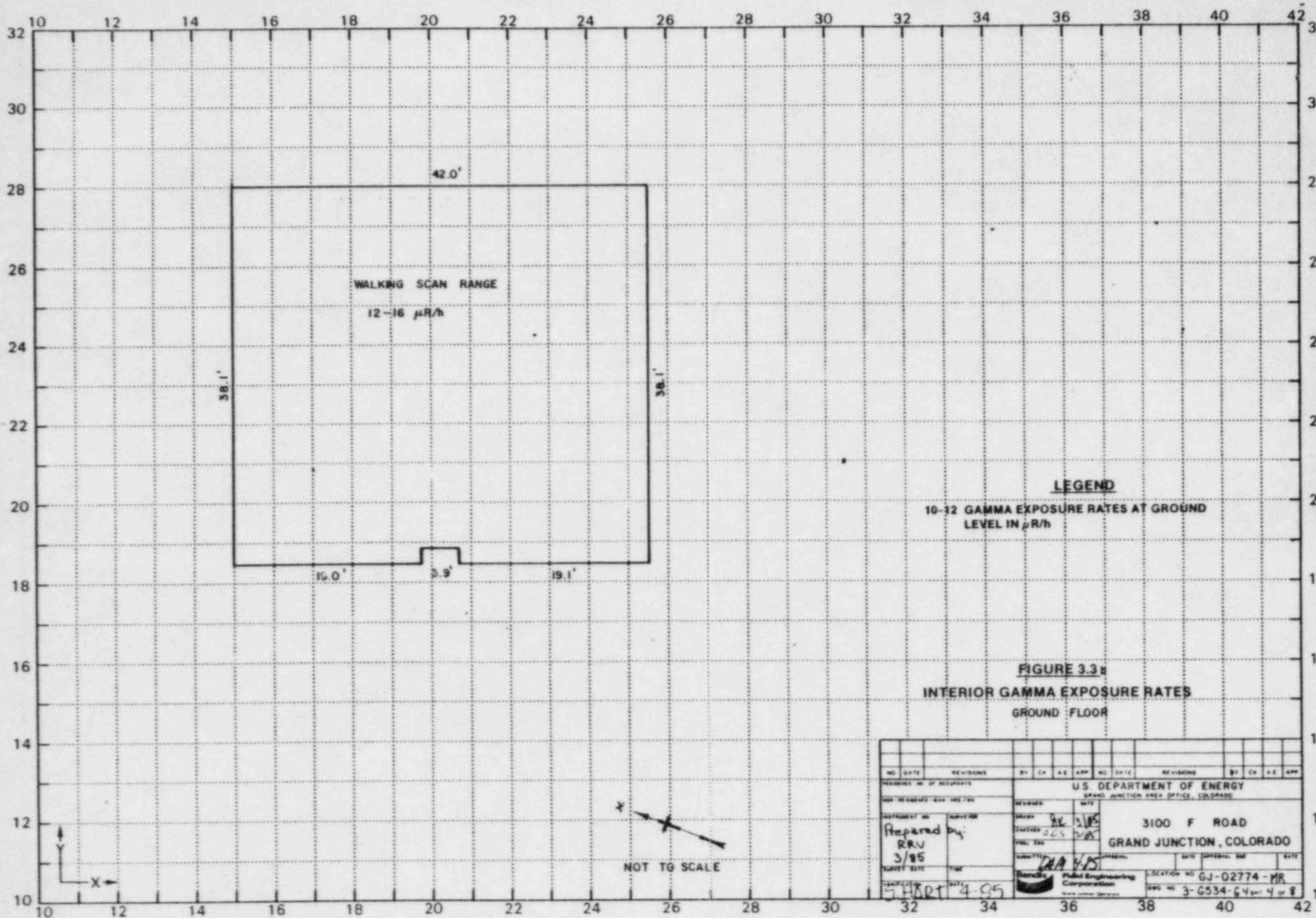




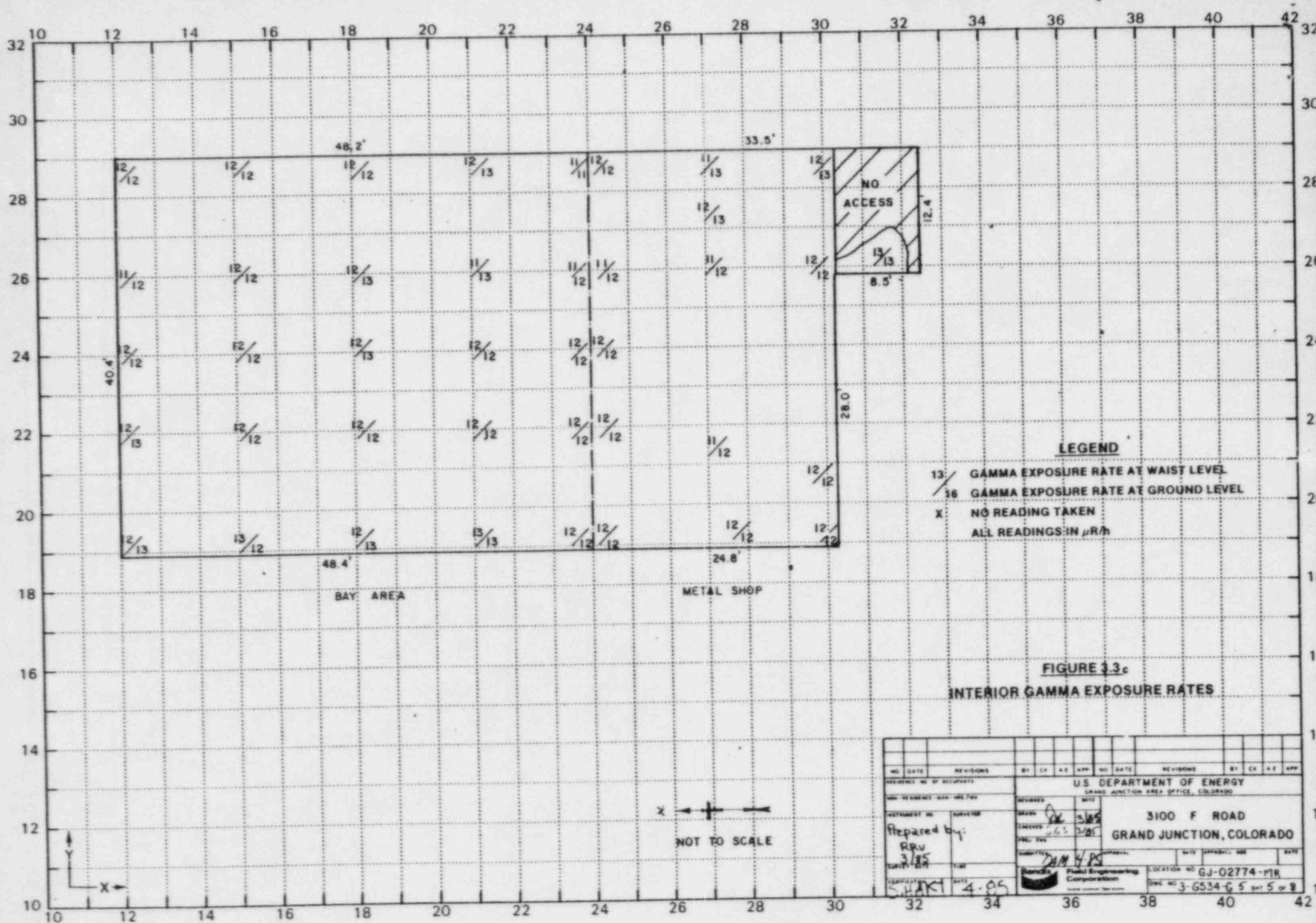
NO. DATE		REVISIONS		BY CH. A.E. APP. NO. DATE		REVISIONS		BY CH. A.E. APP.	
SEQUENCE NO. OF DEPARTMENTS									
HOW REVISIONS MADE AND WHEN									
INSTRUMENT NO.					DRAWING NO.				
Prepared by RKY 3/95					DESIGNED BY <i>[Signature]</i> DATE 3/95 CHECKED BY <i>[Signature]</i> DATE 3/95 PLOT BY <i>[Signature]</i> DATE 3/95 SURVEYED BY <i>[Signature]</i> DATE 3/95				
SURVEY DATE					TIME				
DRAWN BY <i>[Signature]</i> DATE 3/95					FIELD ENGINEERING CORPORATION LOCATION NO. GJ-02774-MR DOW NO. 3-G534-G1 SHEET 1 OF 8				



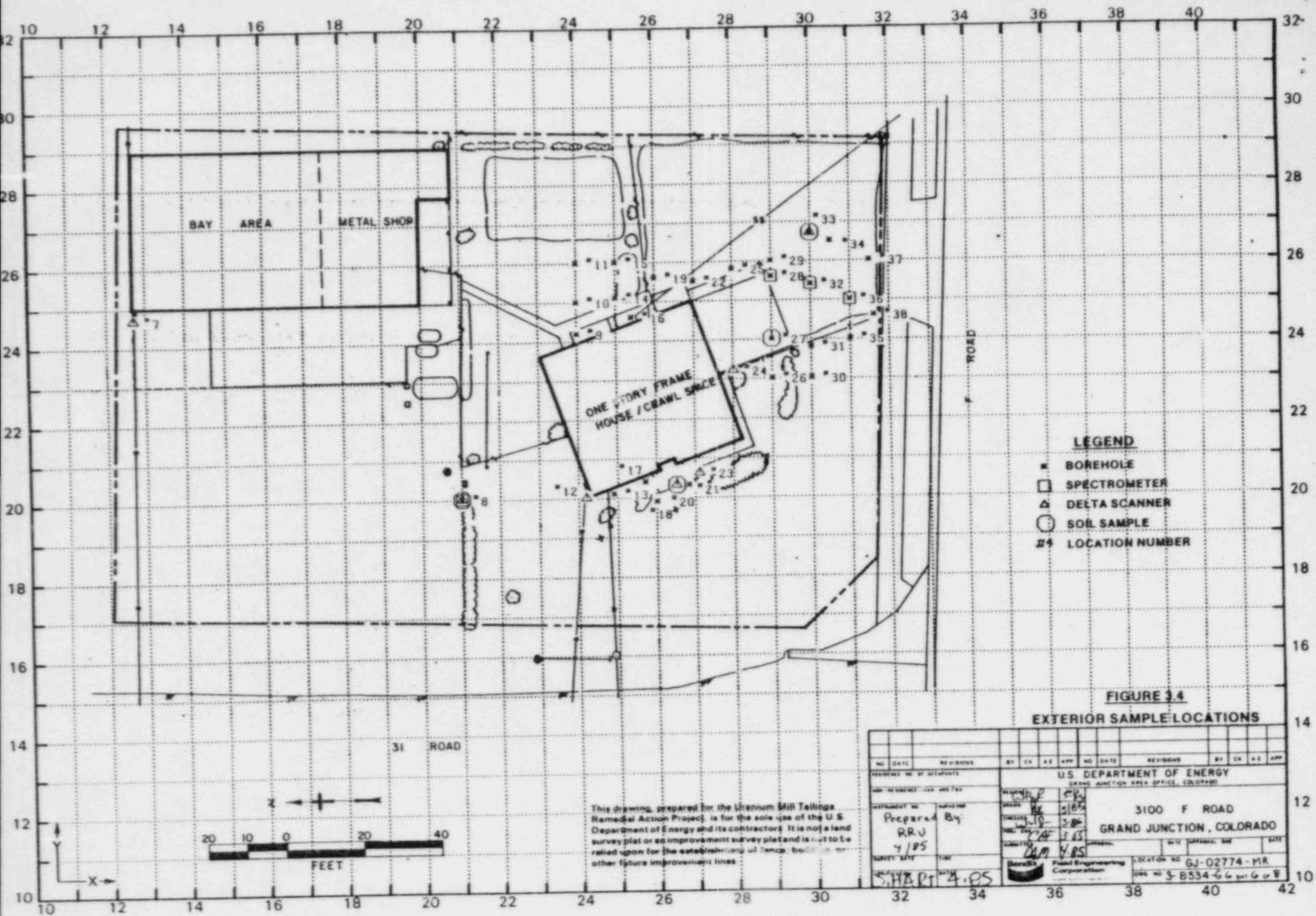


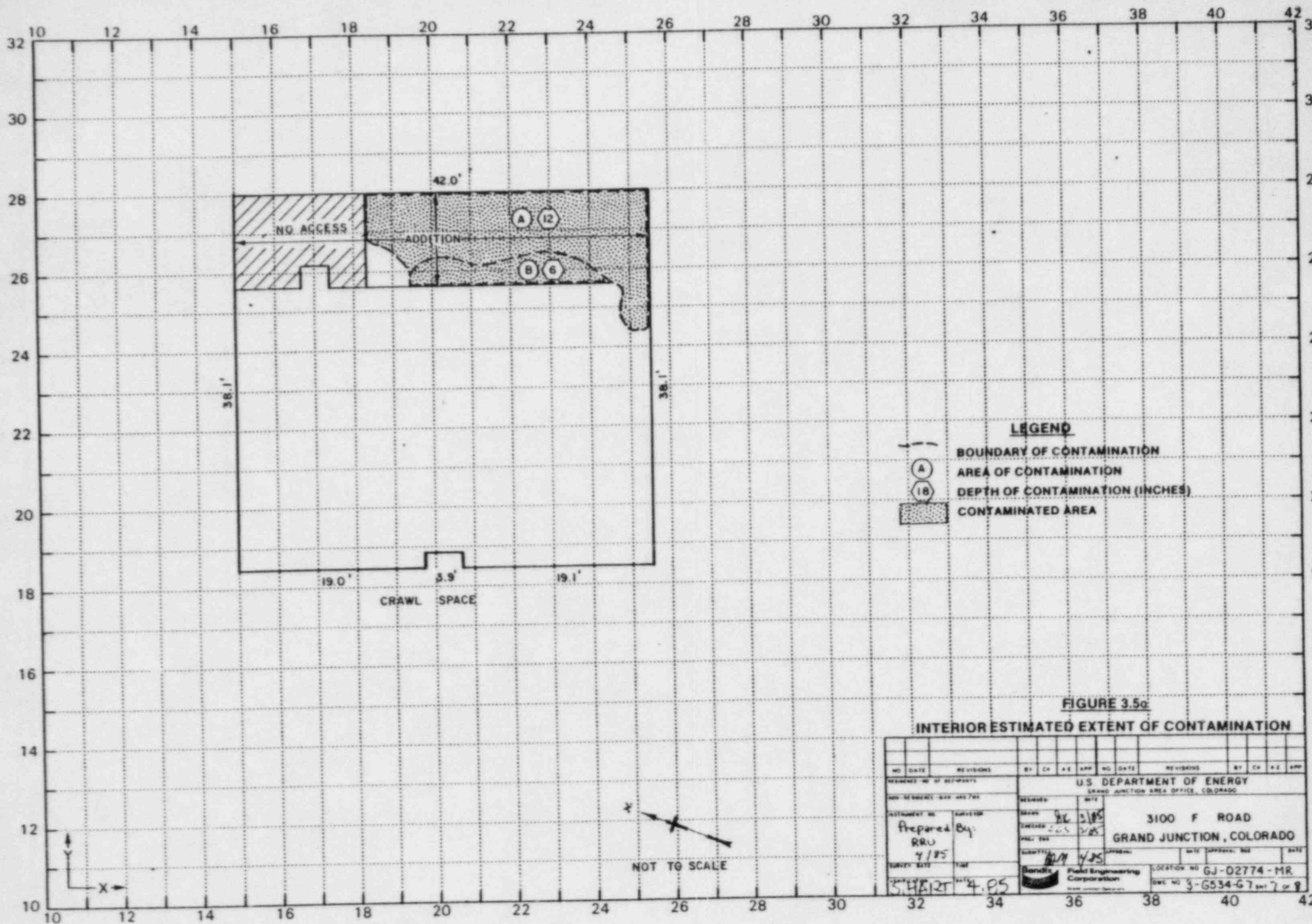


NO	DATE	REVISIONS	BY	CHK	A.E.	APP	NO	DATE	REVISIONS	BY	CHK	A.E.	APP
<div style="display: flex; justify-content: space-between;"> <div> <p>PREPARED BY: R/V 3/85</p> <p>DATE: 4-85</p> </div> <div> <p>U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO</p> <p>3100 F ROAD GRAND JUNCTION, COLORADO</p> <p>LOCATION NO: GJ-02774-MR SWS NO: 3-G534-G4</p> </div> </div>													



NO.	DATE	REVISIONS	BY	CHK	APP	NO.	DATE	REVISIONS	BY	CHK	APP
<div style="display: flex; justify-content: space-between;"> <div> <p>U.S. DEPARTMENT OF ENERGY</p> <p>GRAND JUNCTION AREA OFFICE, COLORADO</p> <p>3100 F ROAD</p> <p>GRAND JUNCTION, COLORADO</p> </div> <div> <p>DATE: 4-85</p> <p>TIME: 3:05</p> <p>BY: J. H. P.</p> <p>FOR: J. H. P.</p> </div> </div>											
<p>PREPARED BY:</p> <p>RRV</p> <p>3/85</p>						<p>DATE: 4-85</p> <p>TIME: 4:05</p> <p>BY: J. H. P.</p> <p>FOR: J. H. P.</p>					
<p>LOCATION NO: GJ-02774-MR</p>						<p>DATE: 3-6534-G 5</p>					





LEGEND

- BOUNDARY OF CONTAMINATION
- AREA OF CONTAMINATION
- DEPTH OF CONTAMINATION (INCHES)
- CONTAMINATED AREA

FIGURE 3.5a

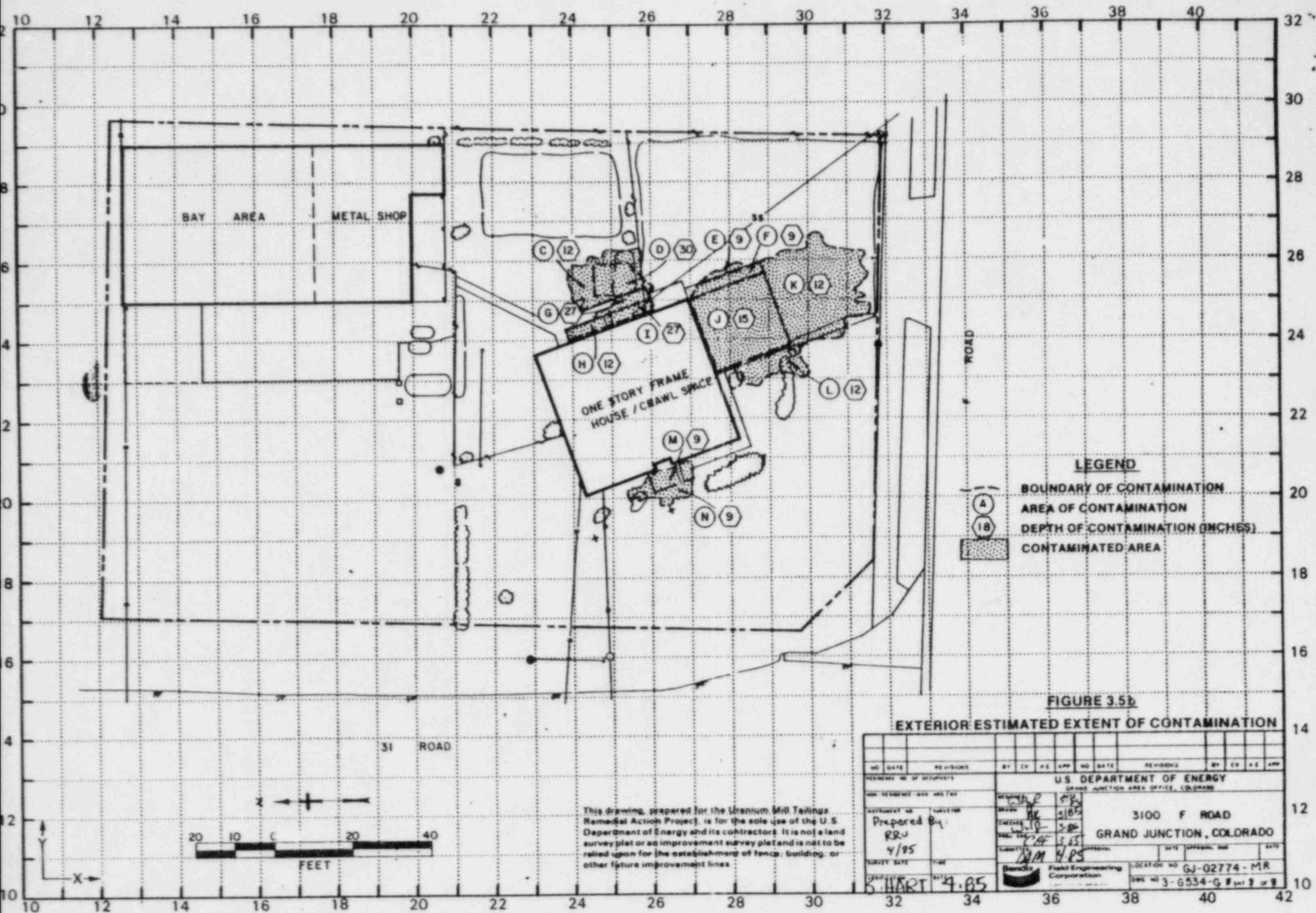
INTERIOR ESTIMATED EXTENT OF CONTAMINATION

NO. DATE										REVISIONS										BY CH A E APP NO. DATE										REVISIONS										BY CH A E APP									
DESIGNED BY																				SITE																													
DRAWN BY																				DATE																													
CHECKED BY																				DATE																													
APPROVED BY																				DATE																													
PROJECT NO.																				PROJECT NAME																													
PROJECT LOCATION																				PROJECT DESCRIPTION																													
PROJECT OWNER																				PROJECT CONTACT																													
PROJECT START DATE																				PROJECT END DATE																													
PROJECT BUDGET																				PROJECT COST																													
PROJECT STATUS																				PROJECT NOTES																													

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

3100 F ROAD
GRAND JUNCTION, COLORADO

LOCATION NO GJ-02774-MR
DWS NO 3-G534-G7 SHI 7 of 9



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

Official Survey Report

Property Address 1300 F Road
Property Owner Donald E. Arnold
Address of Owner (if different from above)
Report Prepared By Robert R. Vialpando

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 = 16 uR/hr

HOG = 266 uR/hr

Bendix

**Field Engineering
Corporation**

Grand Junction, Colorado

April 5, 1985

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

ATTN: Bud Franz
Radiation Control Division

Dear Bud:

Regarding the Technical Review concerning Department of Energy (DOE)
Identification (ID) number GJ-02774-RSMR3100 F Road) conducted on
2 April 1985. *my 5 21 85*

Since there were no comments on the folio, the assessment will
proceed.

Thank you for your time and cooperation. If you should have any
questions or comments, please feel free to contact me at 242-8621,
extension 472.

Sincerely,

Robert R. Vialpando

Robert R. Vialpando
Assistant, Field Service II

RRV:pr

INTERNAL
MEMORANDUM

Bendix Field Engineering Corporation
Grand Junction Projects Office

Date: March 13, 1985

To: Files

From: Robert Vialpando

Robert Vialpando

SH-4-85

Subject: Team Leader Notes - GJ-02774-RS MR

Owner: Donald E. Arnold

Address: 3100 F Road

Telephone: (303) 434-6697

Weather: Clear and warm

Occupancy: 2 (Mr. and Mrs. Arnold)

Team Members

D. Martz	C. Adams
K. Cary	M. Dexter
S. Larsen	P. Tuhey
V. Young	R. R. Vialpando (Team Leader)

Instruments

Scintillometers - C-1149, C-1180, C-1184, C-3502, C-3510
BFEC Delta - C-3943
PRS-1 Total Count - C-3959, C-4005, C-4006
GAD-6 Downhole Spectrometer - C-3361

Mr. Arnold was contacted by telephone in order to obtain approval for site survey, which was given.

Colorado Department of Health (CDH) and Oak Ridge National Laboratory (ORNL) data indicate areas of contamination to be in the yard, patio, and on the front step.

The Bendix team was met by Mr. Arnold. Approval for interior investigation was given.

Health and Safety provided a fan for ventilation during the surveying of the crawl space.

Mr. Arnold (homeowner) stated that there was an abandoned gas line running from the primary structure to the metal shed. He also stated that the use of mill tailings as fill were used under the front steps, the carport, driveway, and also the addition which was built in 1976.

During the Bendix survey, a scintillometer (C-1247) began showing unstable readings with minimal movements. The cord connection was taped and readings were better but still unstable. A loose connection in the cord or the crutch-mounted crystal was suspected. Previous readings were checked with another scintillometer and were confirmed to be valid.

A downhole spectrometer GAD-6 instrument C-3361 was used. Later a check showed that the Electronics Lab calibration had expired. This data has been declared invalid and will not be used in the assessment.

An interior gamma survey of the crawl space indicates mill tailings used as fill (under footing and around stem wall). Six delta measurements were taken, also two soil samples were taken to verify or deny involvement of tailings.

No elevated readings were detected on the walking scan of the ground floor of the primary structure.

On the exterior, 10-foot grids were laid out. The size of the property is approximately 246-feet by 156-feet.

An exterior gamma scan and grid point exposure rate readings were taken to verify data from CDH and ORNL. Readings taken were essentially the same as that of CDH and ORNL.

Augerholes were drilled and logged with the total count and spectrometer instruments in these locations. The water and sewer lines were also investigated in this manner.

A buried telephone line and two gas lines were investigated by depth delta measurements.

An abandoned septic tank in the east yard was investigated by auger holes and logged with a total count instrument.

Team Leader Notes

Robert Vialpando

GJ-02774-~~RS~~ MR mig *DE'S*

March 13, 1985

Page 3

A concrete core was drilled through the carport slab. The high outside gamma reading (HOG) was located at this point. Visible purple slime was sighted along with tailings.

Four soil samples were brought back for analysis.

All actions and work details were performed in a safe manner. No accidents occurred while on the site survey visit. The survey was completed and all team members were frisked with the alpha scan instrument. No contamination was discovered on personnel.

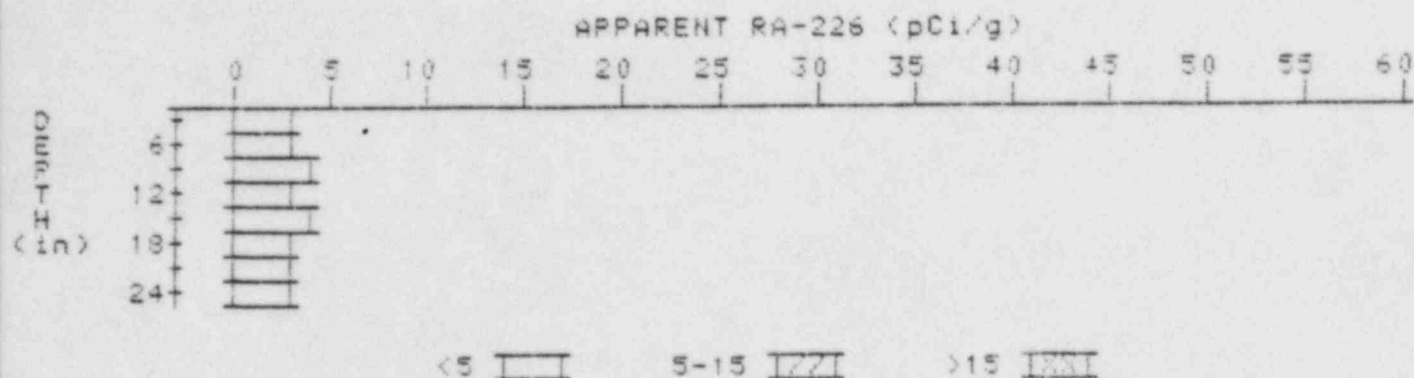
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

8

PROPERTY NUMBER: GJ-02774-MR

HOLE NUMBER: 8

LOCATION: 210200



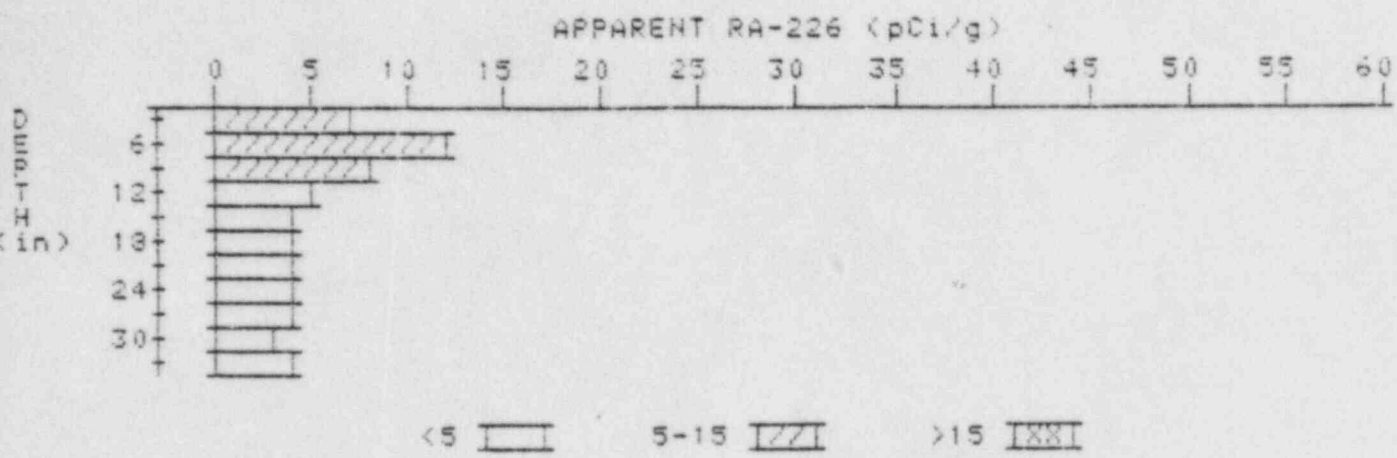
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.2	3.2
9	3.4	3.8
12	3.4	3.2
15	3.5	3.9
18	3.4	3.2
21	3.4	3.4
24	3.4	3.4

APPARENT RADIUM-226 CONCENTRATION

DECONVOLUTION GRAPH

9

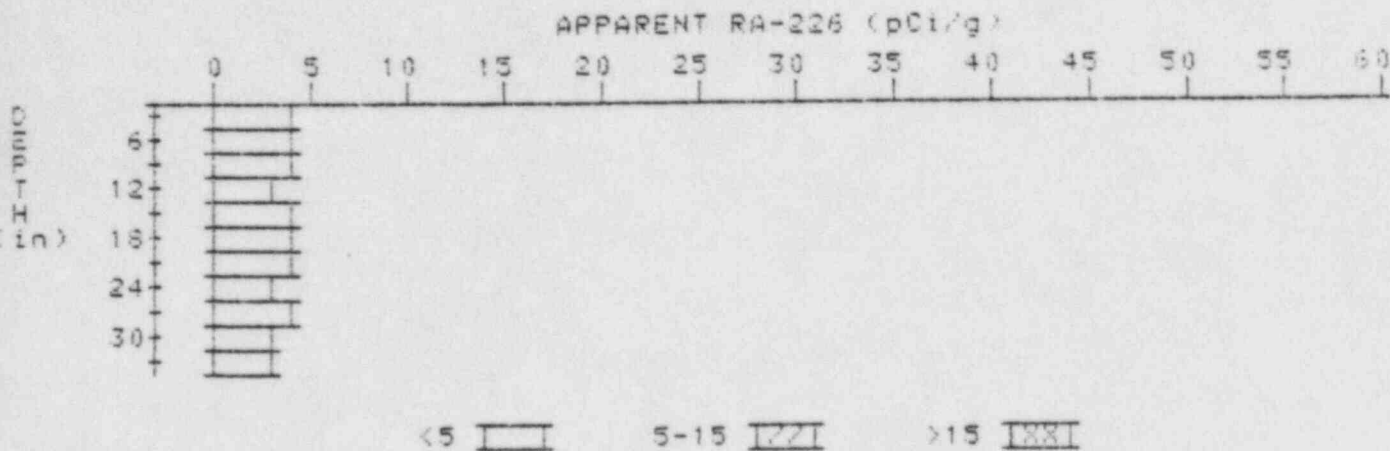
PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 9
LOCATION: 240242



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.8	6.8
6	8.2	12.3
9	7.3	8.4
12	5.8	4.7
15	4.9	4.2
18	4.4	4.0
21	4.1	3.7
24	4.0	4.2
27	3.8	3.8
30	3.6	3.2
33	3.6	3.6

APPARENT RADIUM-226 CONCENTRATION 10 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 10
LOCATION: 240250

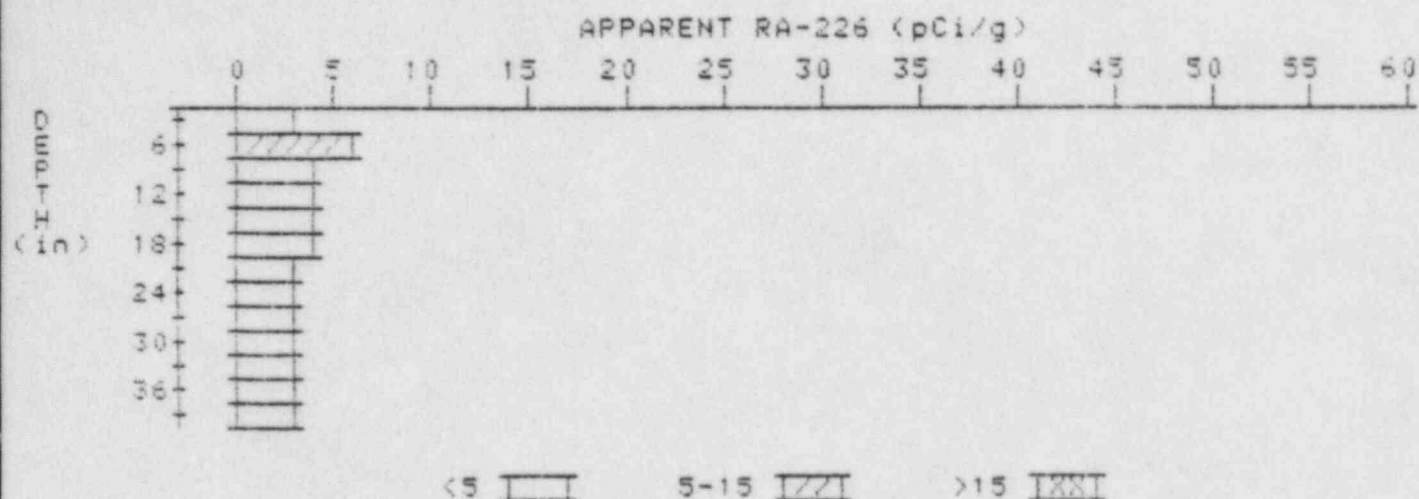


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.5	3.5
6	3.7	4.1
9	3.7	3.9
12	3.6	3.4
15	3.6	3.6
18	3.6	3.8
21	3.5	3.5
24	3.4	3.2
27	3.4	3.6
30	3.3	3.3
33	3.2	3.2

APPARENT RADIUM-226 CONCENTRATION 11

DECONVOLUTION GRAPH

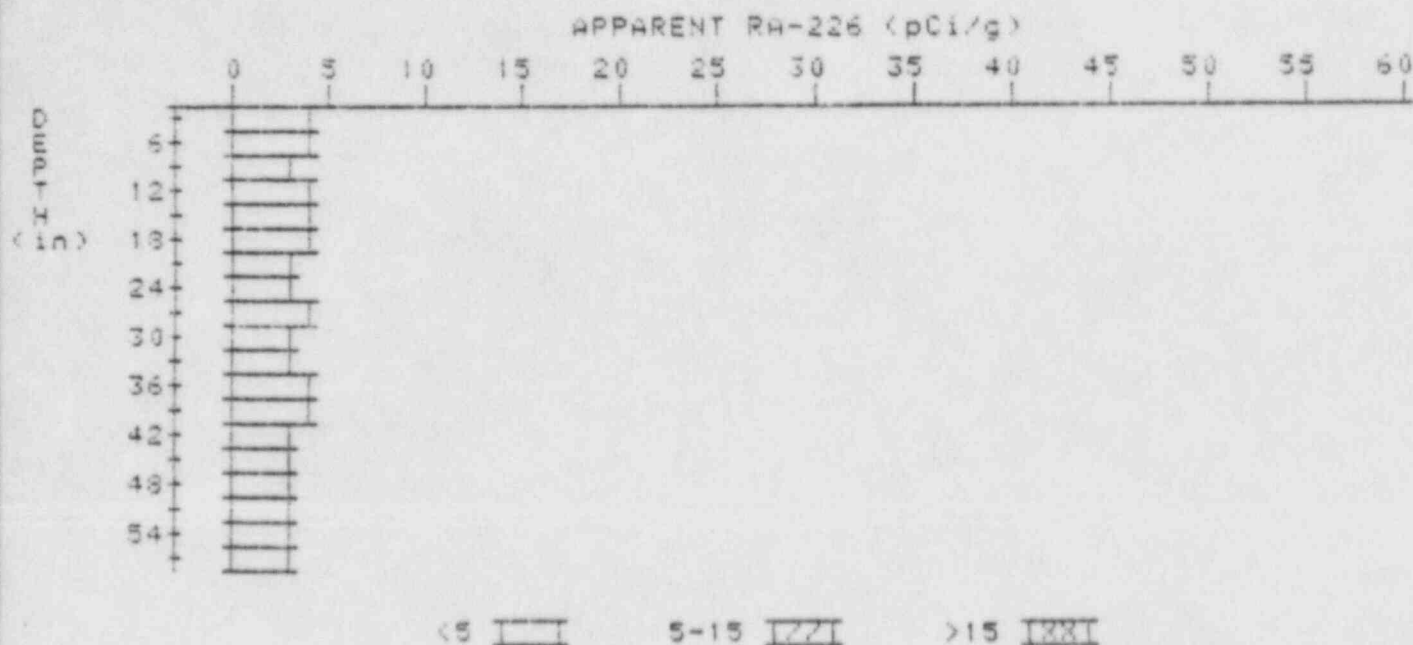
PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 11
LOCATION: 240260



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.4	3.4
6	4.2	5.8
9	4.1	4.3
12	3.9	3.7
15	3.8	3.8
18	3.7	3.9
21	3.5	3.3
24	3.4	3.2
27	3.4	3.4
30	3.4	3.4
33	3.4	3.4
36	3.4	3.4
39	3.4	3.4

APPARENT RADIUM-226 CONCENTRATION 13 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 13
LOCATION: 249201

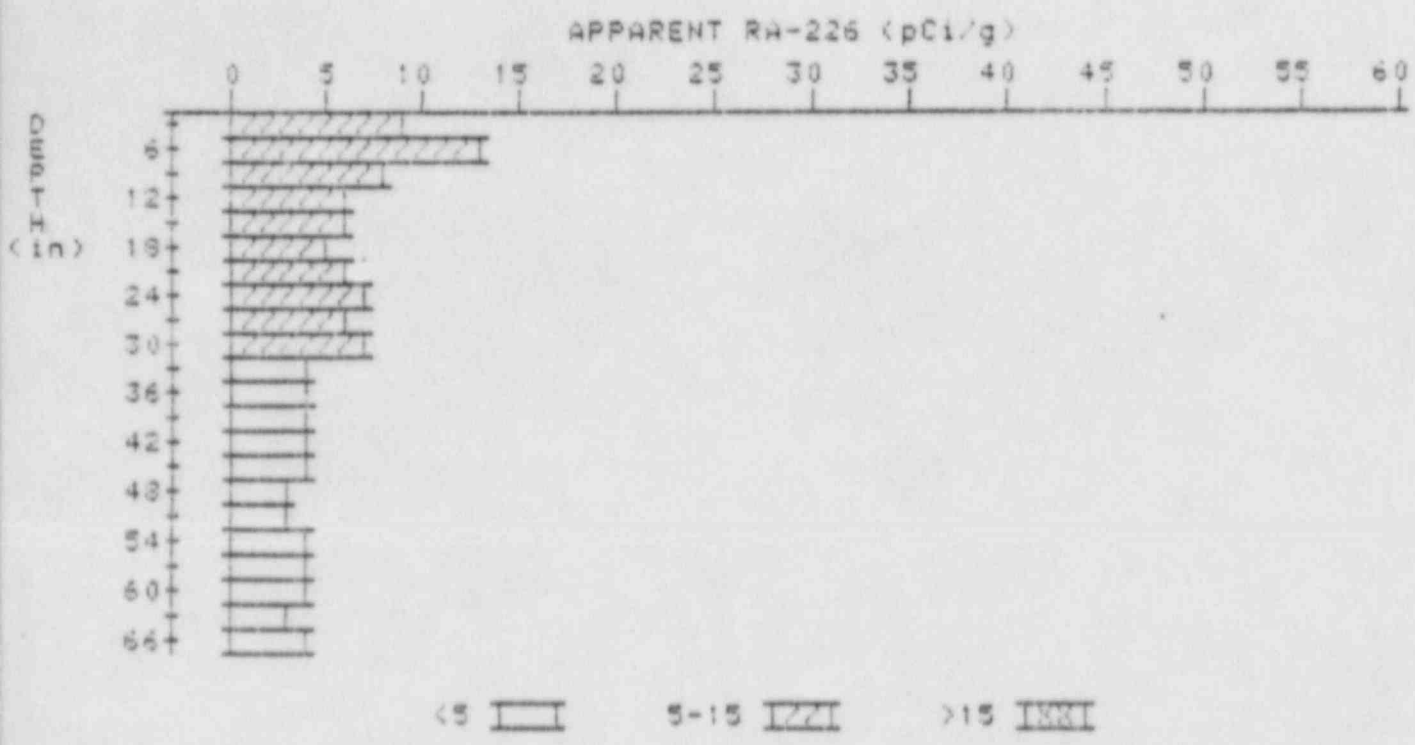


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
=====	=====	=====
3	3.5	3.5
6	3.5	3.7
9	3.4	3.0
12	3.5	3.7
15	3.5	3.5
18	3.5	3.7
21	3.4	3.4
24	3.3	2.9
27	3.4	3.0
30	3.3	3.1
33	3.3	3.1
36	3.4	3.6
39	3.4	3.6
42	3.3	3.1
45	3.3	3.3
48	3.3	3.3
51	3.3	3.3
54	3.3	3.1

APPARENT RADIUM-226 CONCENTRATION 14

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 14
LOCATION: 250251



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	9.0	9.0
6	9.5	12.9
9	8.1	7.6
12	7.0	6.3
15	6.3	5.6
18	6.0	5.5
21	6.0	5.6
24	6.2	6.9
27	6.0	6.4
30	5.6	6.7
33	4.6	4.8
36	4.2	4.0
39	3.9	3.7
42	3.7	3.8
45	3.6	3.6
48	3.5	3.3

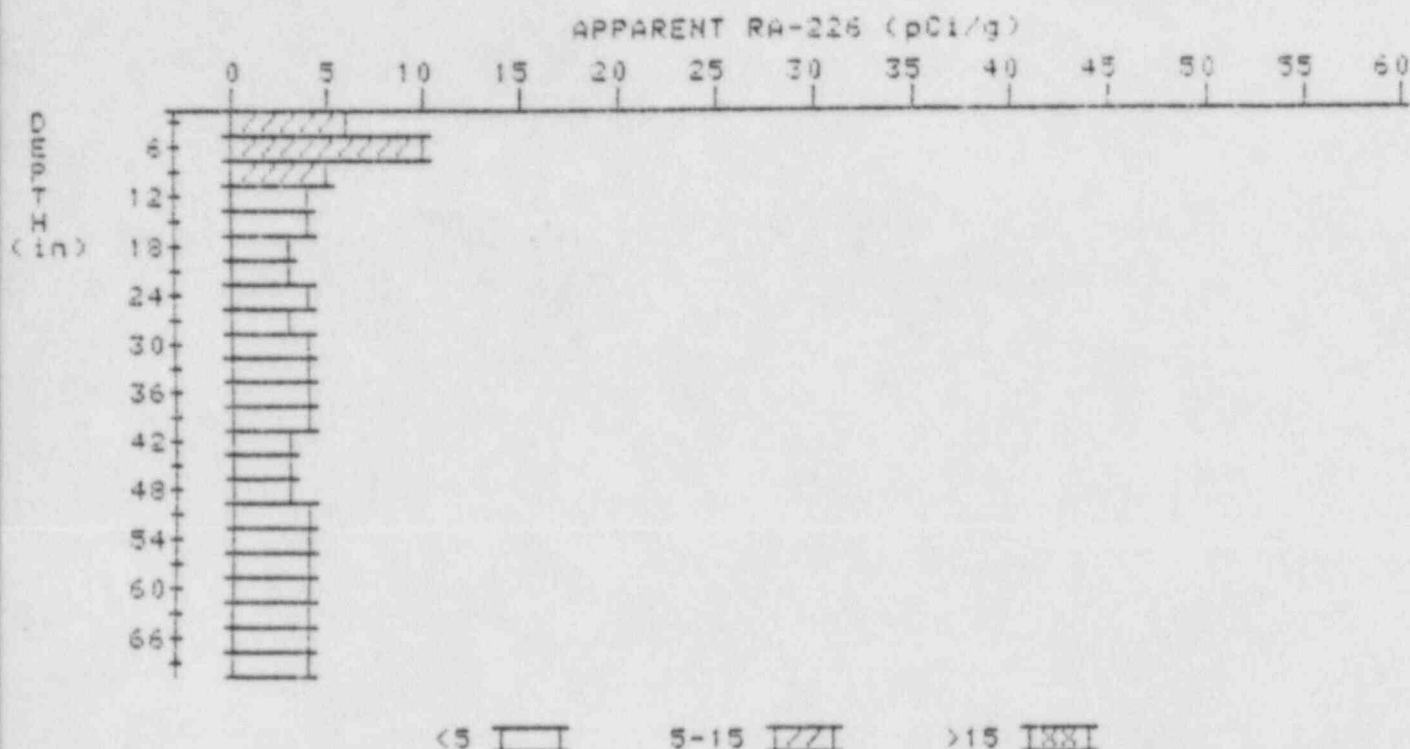
APPARENT RADIUM-226 CONCENTRATION 15

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02774-MR

HOLE NUMBER: 15

LOCATION: 250260



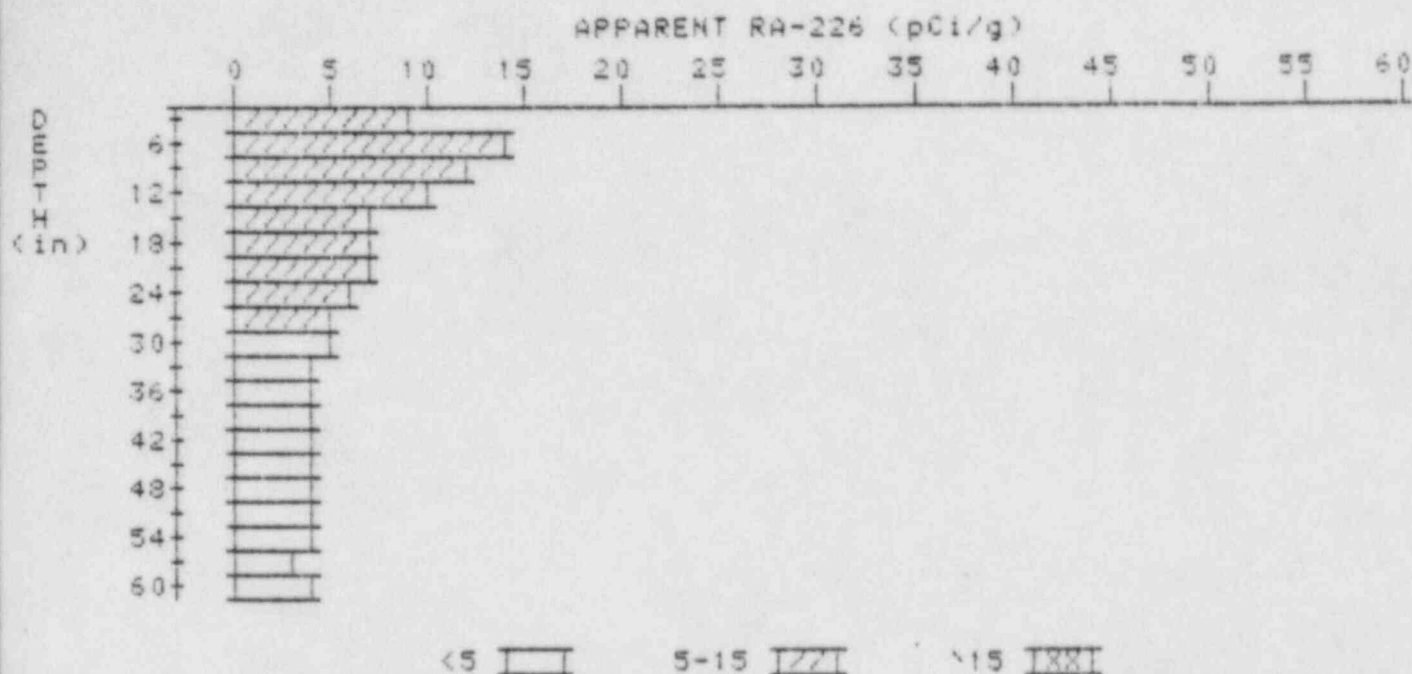
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparant Radium-226 (pCi/g) Deconvolved
3	6.0	6.0
6	6.7	9.9
9	5.6	5.2
12	4.7	4.0
15	4.2	4.0
18	3.8	3.4
21	3.6	3.4
24	3.5	3.5
27	3.4	3.0
30	3.5	3.7
33	3.5	3.5
36	3.5	3.5
39	3	3.9
42	3	3.1
45	3.2	3.0

APPARENT RADIUM-226 CONCENTRATION 16 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02774-MR

HOLE NUMBER: 16

LOCATION: 254246



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	9.3	9.3
6	10.7	13.5
9	10.5	12.1
12	9.4	9.9
15	8.0	7.1
18	7.1	6.6
21	6.5	6.5
24	5.9	5.7
27	5.4	5.4
30	4.9	4.9
33	4.4	4.0
36	4.1	3.7
39	4.0	4.0
42	3.9	3.9
45	3.8	3.6
48	3.8	4.0
51	3.7	3.5
54	3.7	3.9

57
60

3.6
3.6

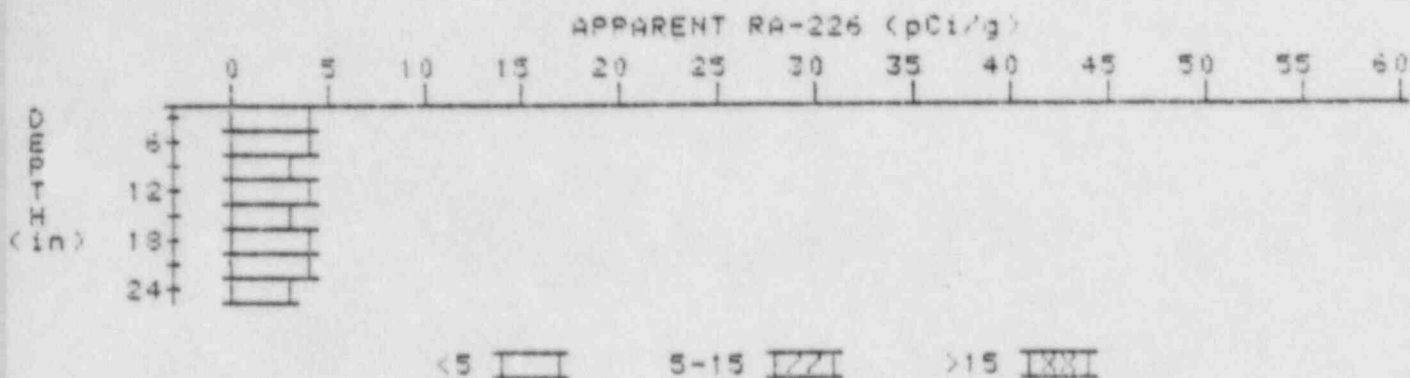
3.4
3.6

APPARENT RADIUM-226 CONCENTRATION 17 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02774-MR

HOLE NUMBER: 17

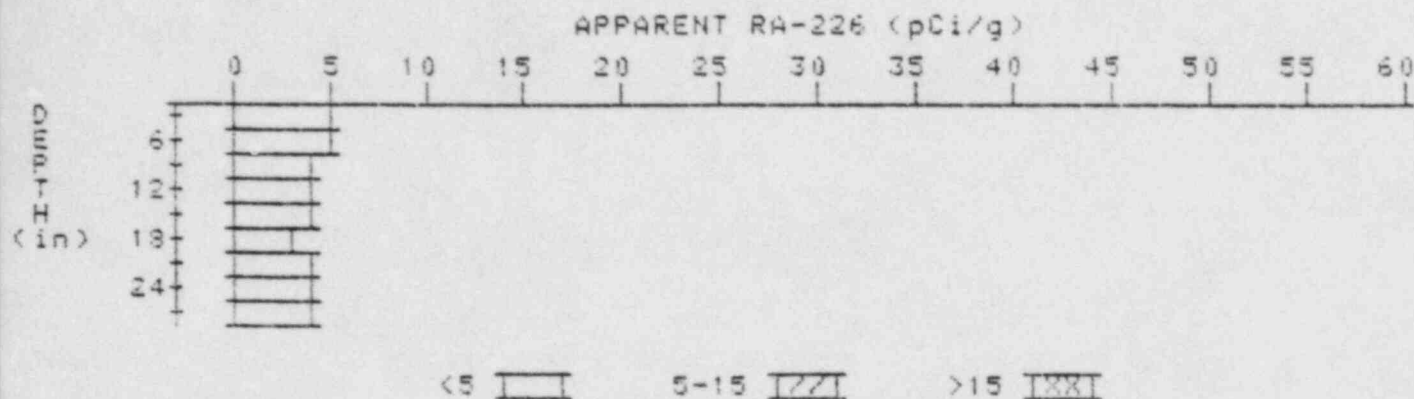
LOCATION: 257204



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.9	3.9
6	3.7	3.5
9	3.6	3.4
12	3.6	3.8
15	3.5	3.3
18	3.5	3.5
21	3.5	3.7
24	3.4	3.4

APPARENT RADIUM-226 CONCENTRATION 18 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 18
LOCATION: 260199



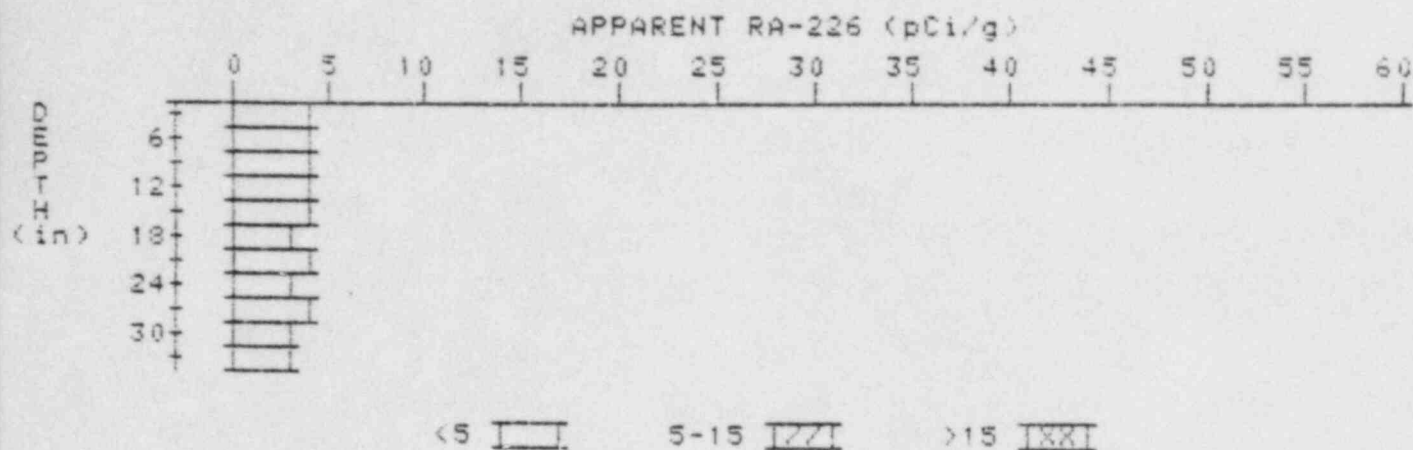
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.7	4.7
6	4.5	4.9
9	4.1	3.7
12	3.9	3.9
15	3.7	3.5
18	3.6	3.4
21	3.6	3.6
24	3.6	3.6
27	3.6	3.6

APPARENT RADIUM-226 CONCENTRATION 19 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02774-MR

HOLE NUMBER: 19

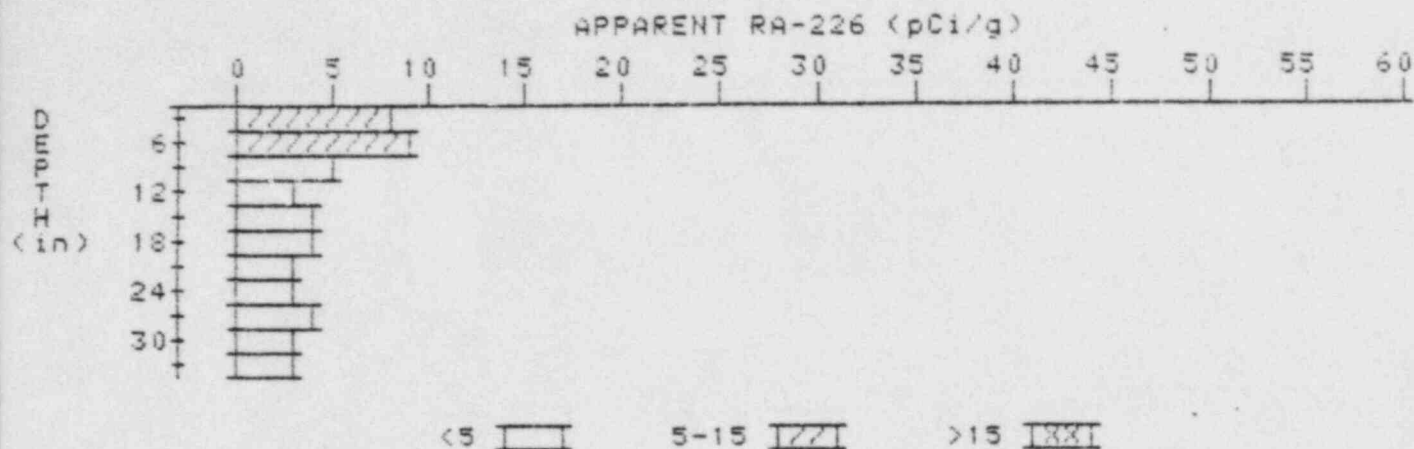
LOCATION: 260256



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.0	4.0
6	3.8	3.6
9	3.7	3.5
12	3.7	3.9
15	3.6	3.6
18	3.5	3.3
21	3.5	3.7
24	3.4	3.2
27	3.4	3.6
30	3.3	3.1
33	3.3	3.3

APPARENT RADIUM-226 CONCENTRATION 21 DECONVOLUTION GRAPH

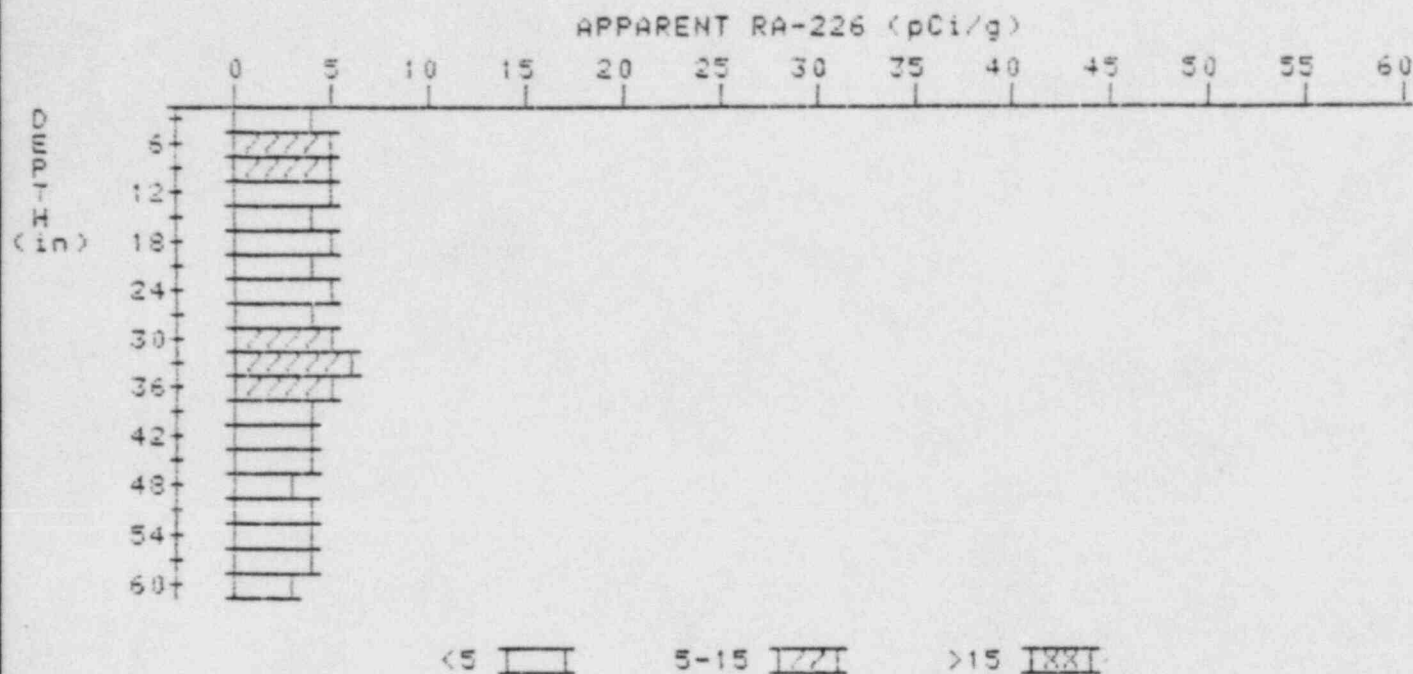
PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 21
LOCATION: 268203



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	8.4	8.4
6	7.6	9.4
9	5.8	4.7
12	4.6	3.4
15	4.1	3.7
18	3.8	3.6
21	3.6	3.4
24	3.5	3.3
27	3.5	3.7
30	3.4	3.2
33	3.4	3.4

APPARENT RADIUM-226 CONCENTRATION 22 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 22
LOCATION: 270255



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.0	4.0
6	4.5	5.0
9	4.7	5.2
12	4.6	4.8
15	4.4	3.9
18	4.5	4.7
21	4.5	4.3
24	4.6	4.6
27	4.7	4.3
30	5.0	5.2
33	5.2	6.1
36	4.3	5.3
39	4.4	4.0
42	4.1	3.9
45	3.9	3.9
48	3.7	3.3
51	3.7	3.9
54	3.6	3.6

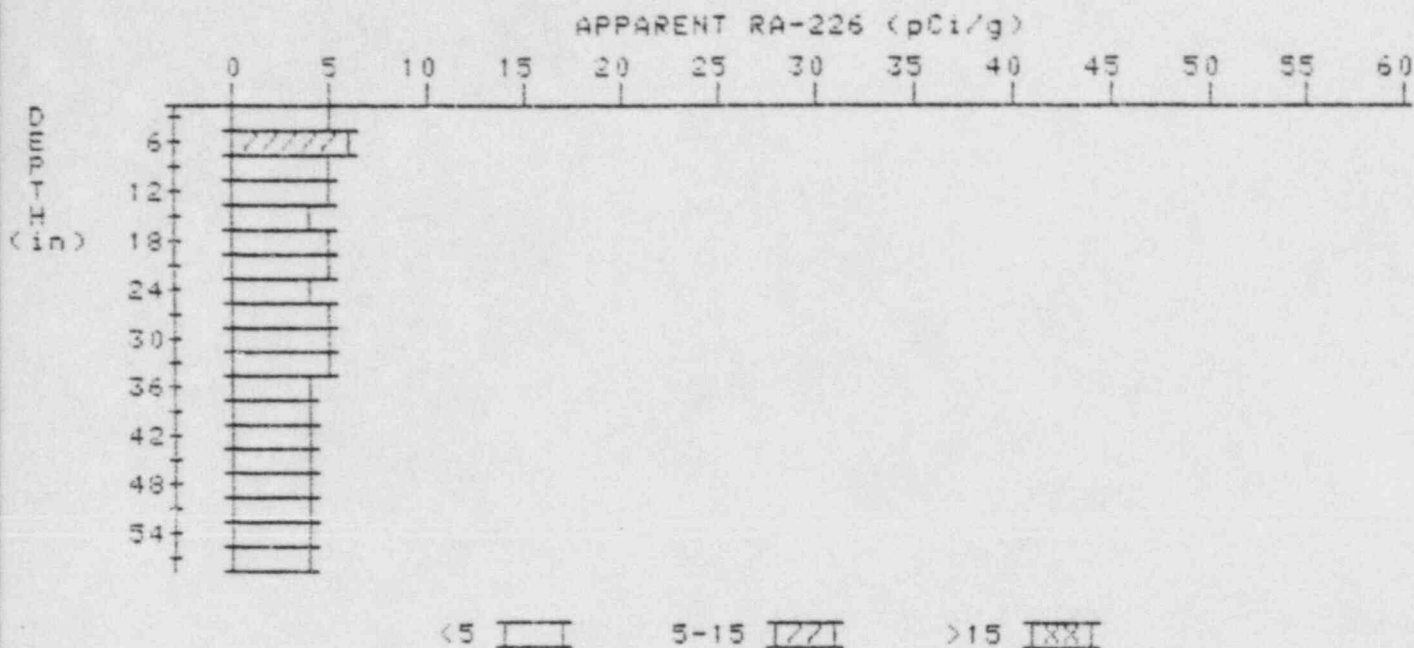
57
60

3.5
3.3

3.7
3.3

APPARENT RADIUM-226 CONCENTRATION 25 DECONVOLUTION GRAPH

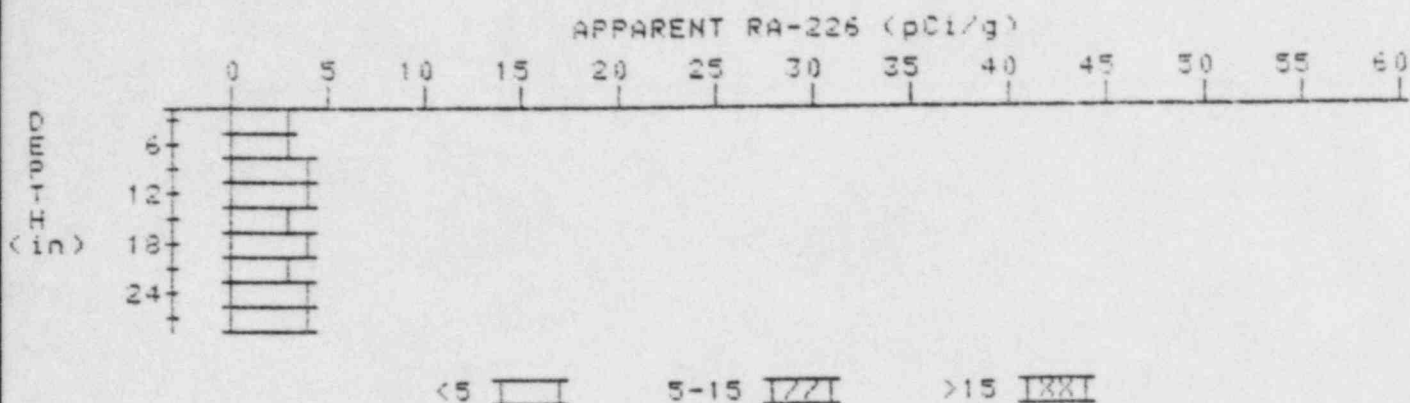
PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 25
LOCATION: 280258



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.8	4.8
6	5.1	6.2
9	4.8	4.6
12	4.6	4.6
15	4.4	3.9
18	4.5	4.7
21	4.5	4.5
24	4.5	4.3
27	4.6	4.8
30	4.6	4.8
33	4.5	4.7
36	4.3	4.1
39	4.2	4.2
42	4.1	4.1
45	4.0	4.0
48	3.9	3.9
51	3.8	3.8
54	3.7	3.7

APPARENT RADIUM-226 CONCENTRATION 26 DECONVOLUTION GRAPH

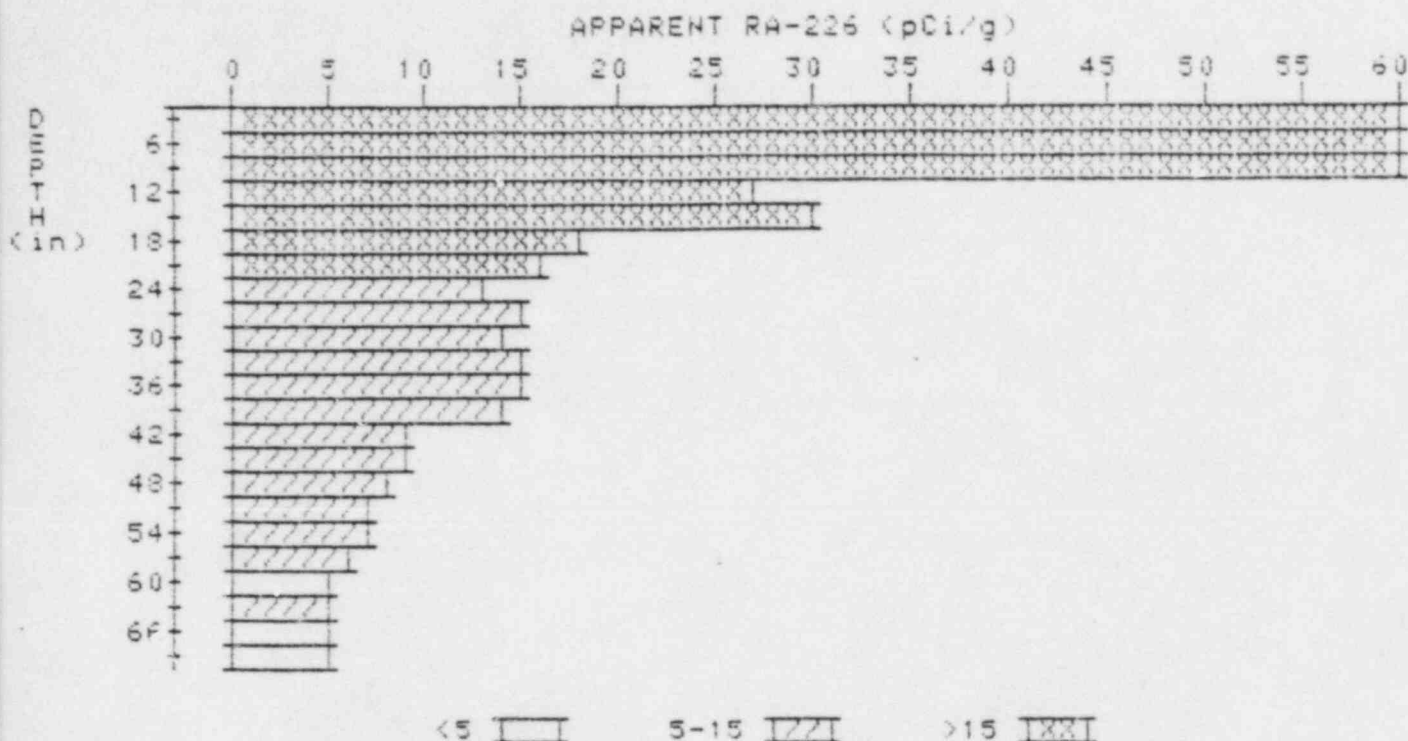
PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 26
LOCATION: 290230



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.4	3.4
9	3.5	3.7
12	3.5	3.5
15	3.5	3.3
18	3.6	4.0
21	3.5	3.1
24	3.6	4.0
27	3.5	3.5

APPARENT RADIUM-226 CONCENTRATION 27 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 27
LOCATION: 290240



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	181.4	181.4
6	201.7	314.4
9	158.6	205.4
12	89.2	26.8
15	54.9	29.7
18	34.8	17.6
21	24.4	15.9
24	18.8	12.9
27	16.5	14.7
30	15.2	14.0
33	14.6	15.0
36	13.8	14.7
39	12.5	14.1
42	10.3	8.5
45	9.1	8.7

48
51
54
57
60
63
66
69

8.1
7.4
6.7
6.0
5.4
5.2
4.9
4.8

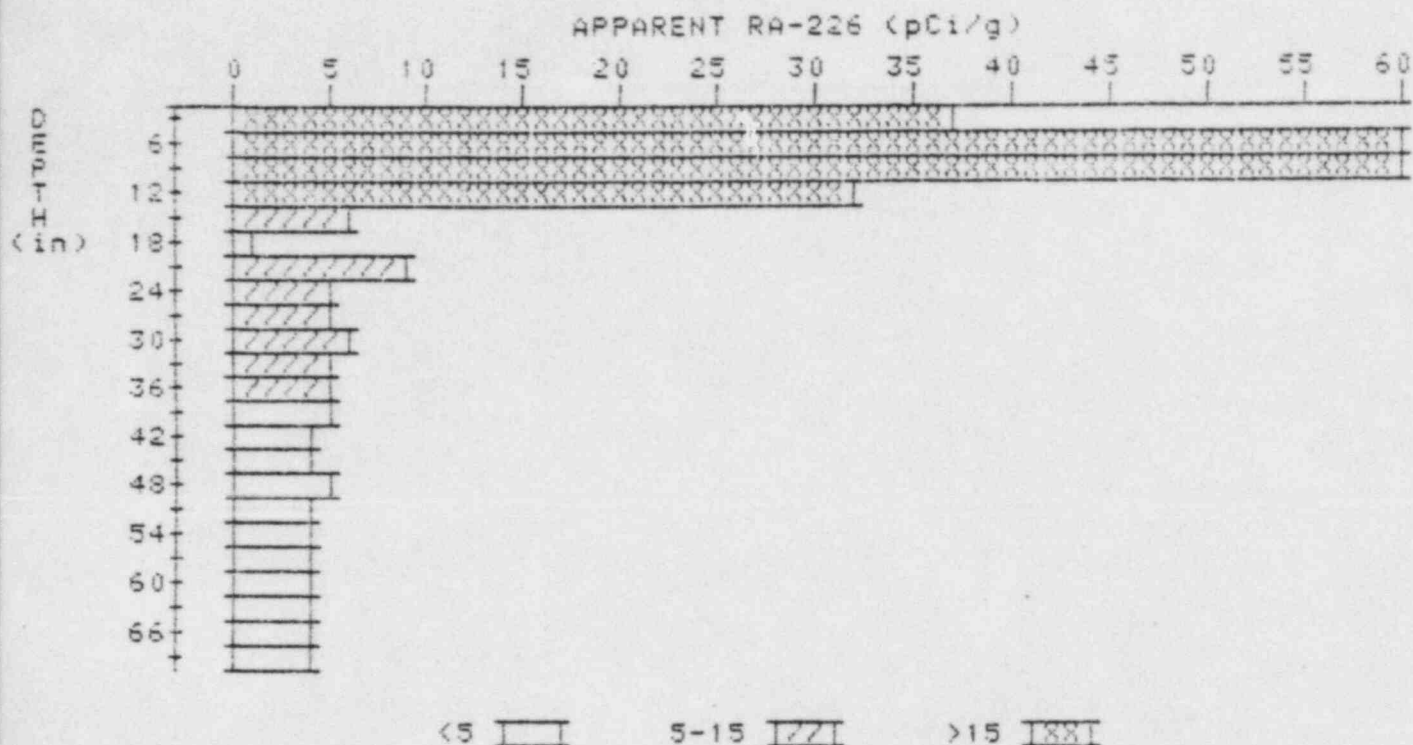
7.6
7.4
6.7
5.8
4.7
5.4
4.5
4.3

APPARENT RADIUM-226 CONCENTRATION 28 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02774-MR

HOLE NUMBER: 28

LOCATION: 290256



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	36.5	36.5
6	67.0	113.6
9	71.3	127.1
12	44.2	32.1
15	23.9	6.3
18	13.5	.9
21	10.2	0.0
24	7.7	5.4
27	6.5	5.4
30	5.9	5.5
33	5.5	5.3
36	5.2	5.2
39	4.9	4.9
42	4.6	4.4
45	4.4	4.0

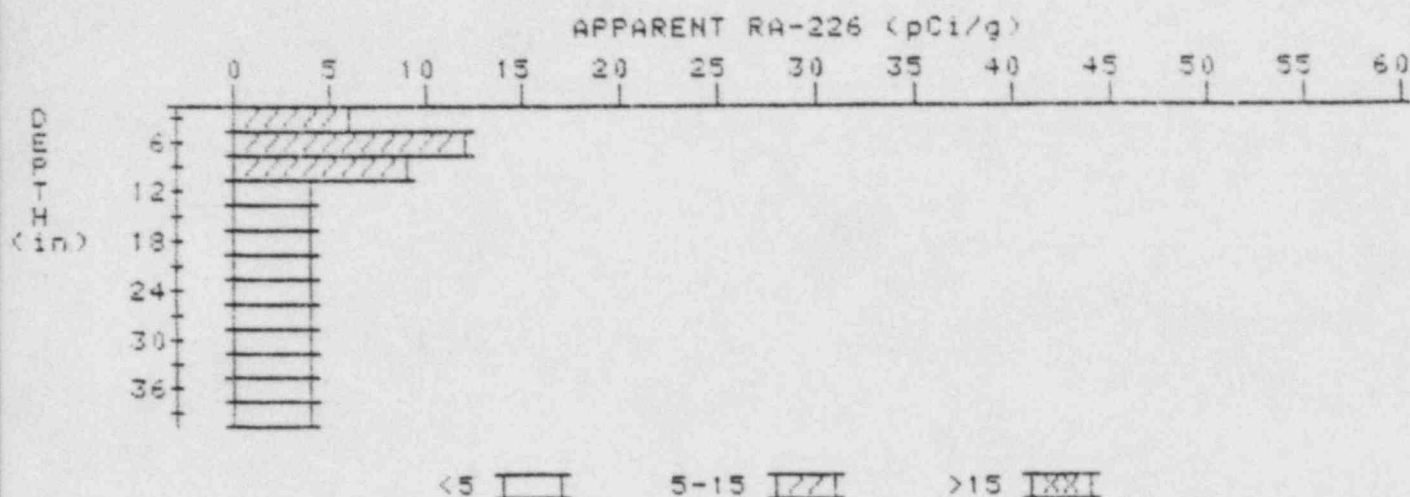
48
51
54
57
60
63
66
69

4.4
4.2
4.1
4.0
3.9
3.9
4.0
3.9

4.9
4.0
4.1
4.0
3.7
3.7
4.4
3.9

APPARENT RADIUM-226 CONCENTRATION 29 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 29
LOCATION: 290260



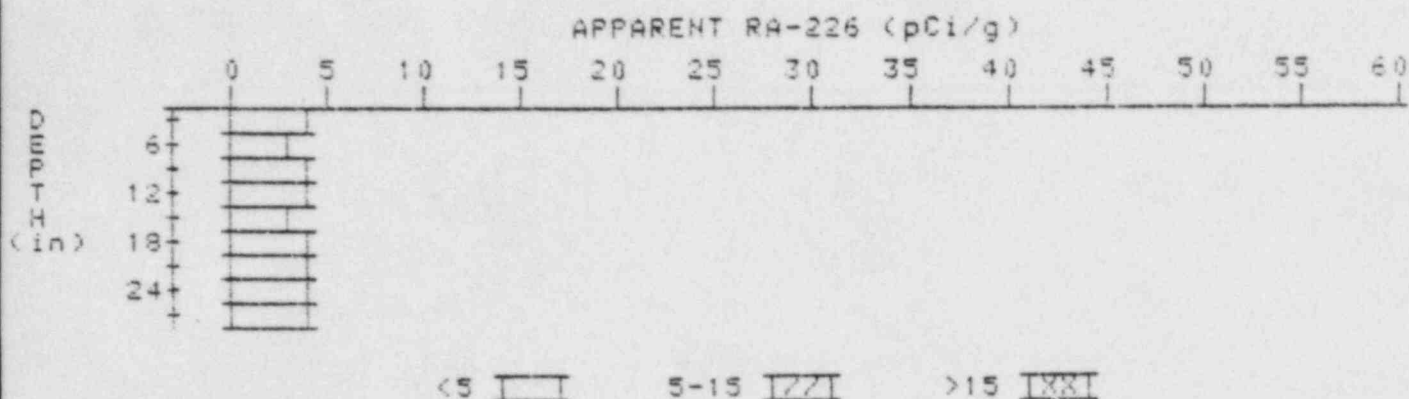
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.3	6.3
6	7.9	12.0
9	7.2	8.6
12	5.7	4.5
15	4.9	4.4
18	4.4	3.9
21	4.2	4.0
24	4.1	3.9
27	4.1	4.5
30	3.9	3.5
33	3.9	3.7
36	4.0	4.4
39	3.9	3.9

APPARENT RADIUM-226 CONCENTRATION 30 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02774-MR

HOLE NUMBER: 30

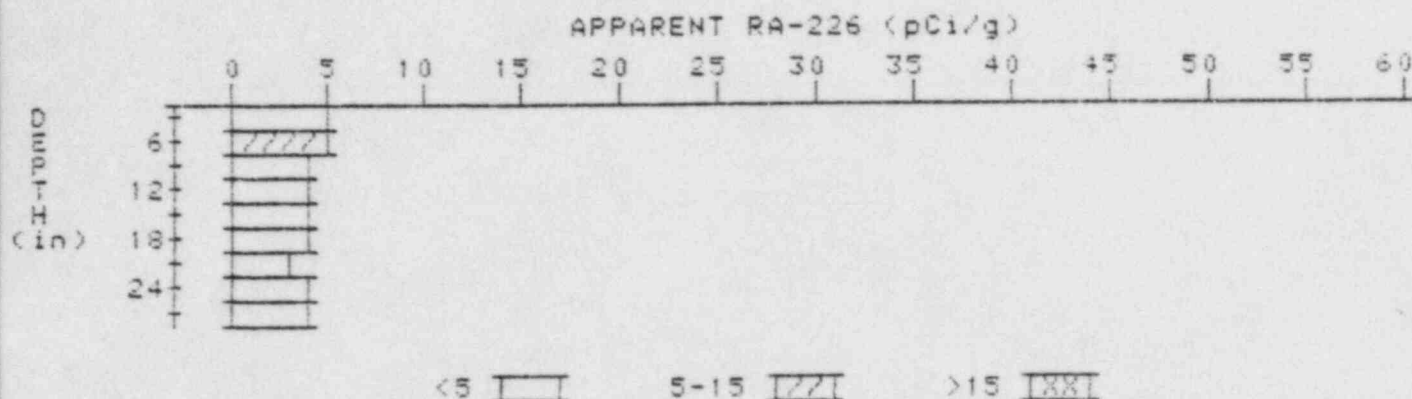
LOCATION: 300230



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.5	3.5
6	3.4	3.0
9	3.5	3.5
12	3.6	4.0
15	3.5	3.3
18	3.5	3.5
21	3.5	3.5
24	3.5	3.5
27	3.5	3.5

APPARENT RADIUM-226 CONCENTRATION 31 DECONVOLUTION GRAPH

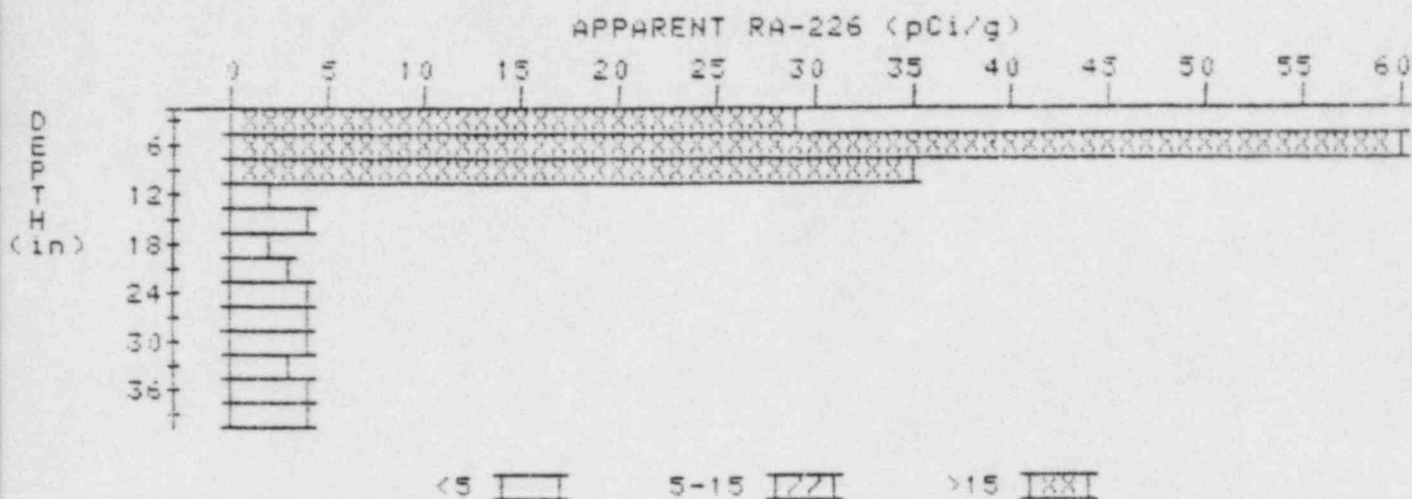
PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 31
LOCATION: 300238



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.6	4.6
6	4.7	5.4
9	4.4	4.4
12	4.1	3.9
15	3.9	3.7
18	3.8	3.8
21	3.7	3.3
24	3.8	4.2
27	3.7	3.7

APPARENT RADIUM-226 CONCENTRATION 32 DECONVOLUTION GRAPH

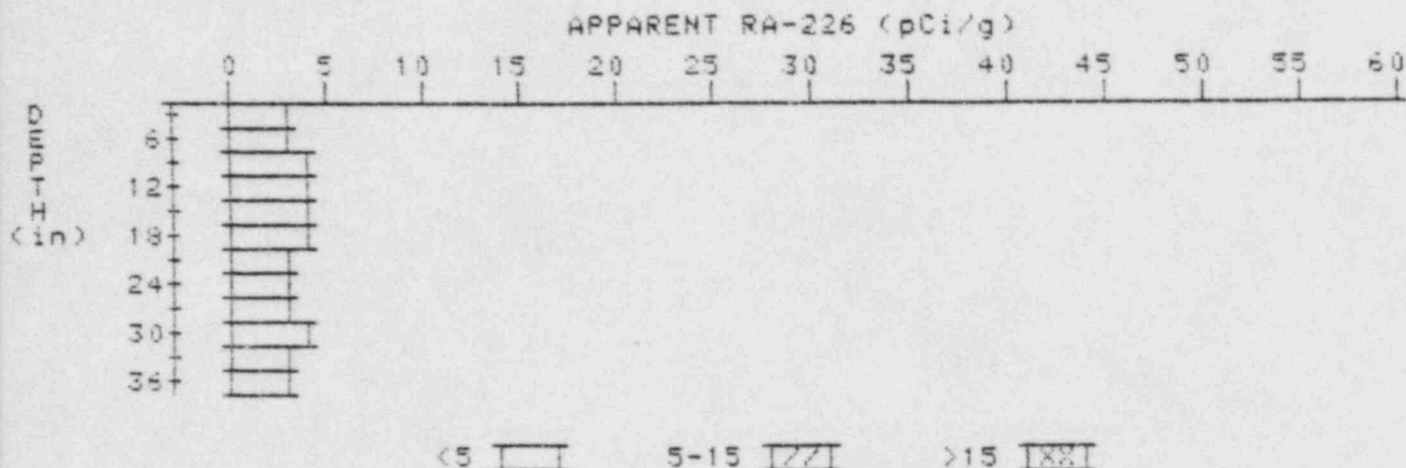
PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 32
LOCATION: 300254



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	28.6	28.6
6	48.6	111.0
9	33.5	35.3
12	17.4	1.6
15	10.2	4.2
18	6.4	2.1
21	5.0	3.4
24	4.5	4.1
27	4.2	3.8
30	4.1	4.3
33	3.9	3.4
36	4.0	4.4
39	3.9	3.9

APPARENT RADIUM-226 CONCENTRATION 33 DECONVOLUTION GRAPH

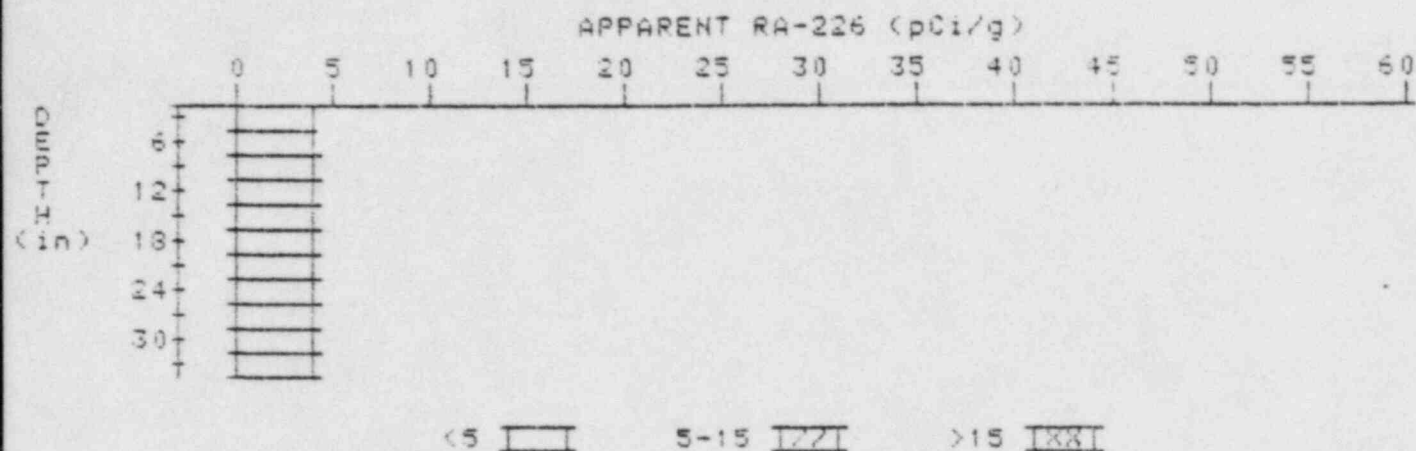
PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 33
LOCATION: 300267



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.9	2.9
6	3.2	3.4
9	3.4	3.6
12	3.5	3.7
15	3.5	3.5
18	3.5	3.7
21	3.4	3.2
24	3.4	3.4
27	3.4	3.4
30	3.4	3.8
33	3.2	3.0
36	3.1	3.1

APPARENT RADIUM-226 CONCENTRATION 34 DECONVOLUTION GRAPH

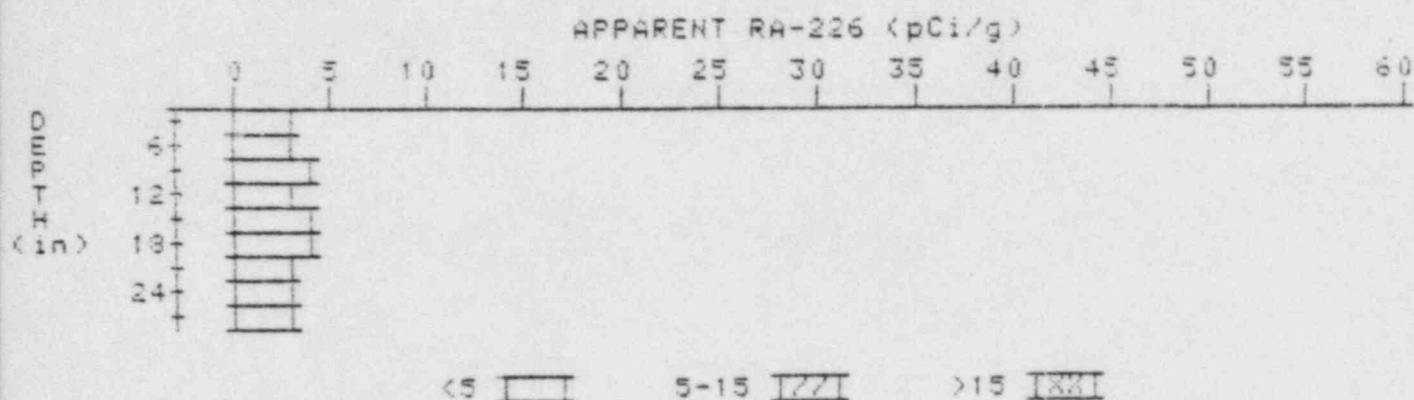
PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 34
LOCATION: 395265



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.9	3.9
6	3.9	4.1
9	3.8	3.6
12	3.8	3.8
15	3.8	3.8
18	3.8	4.0
21	3.7	3.5
24	3.7	3.7
27	3.7	3.9
30	3.6	3.6
33	3.5	3.5

APPARENT RADIUM-226 CONCENTRATION 35 DECONVOLUTION GRAPH

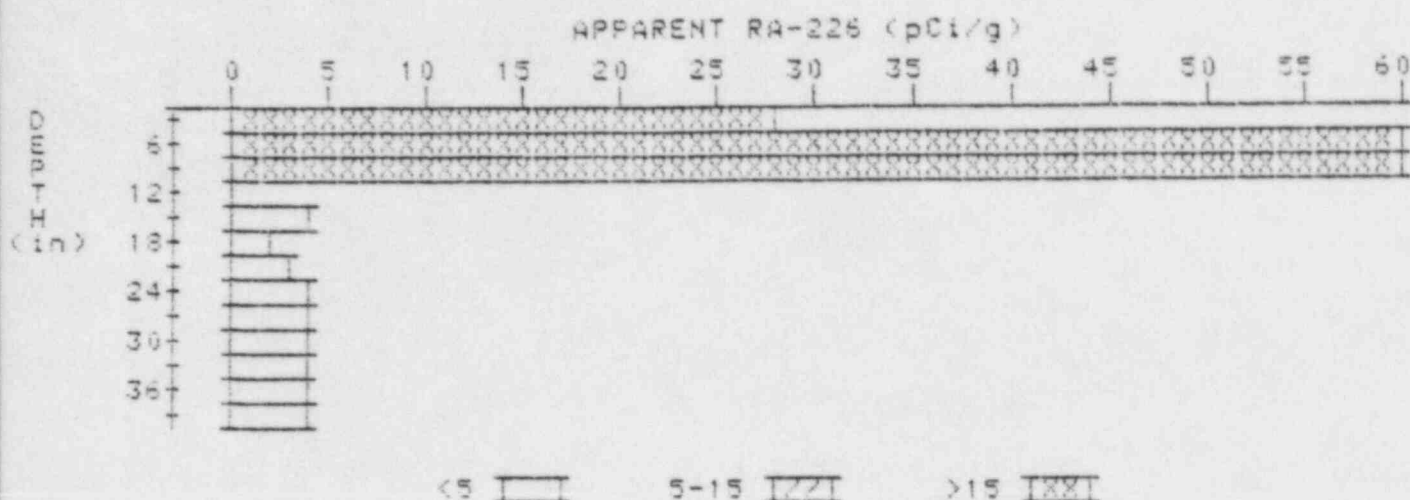
PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 35
LOCATION: 310240



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.1	3.1
6	3.3	3.3
9	3.5	4.0
12	3.4	3.0
15	3.5	3.7
18	3.5	3.7
21	3.4	3.2
24	3.4	3.4
27	3.4	3.4

APPARENT RADIUM-226 CONCENTRATION 36 DECONVOLUTION GRAPH

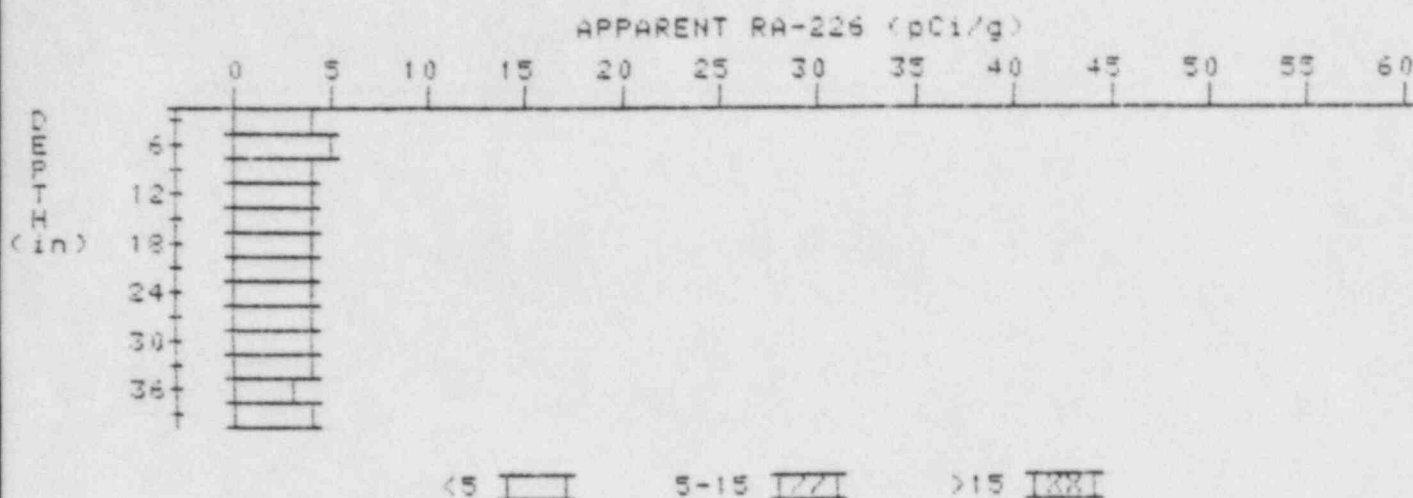
PROPERTY NUMBER: GJ-02774-MP
HOLE NUMBER: 36
LOCATION: 310250



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	27.5	27.5
6	48.5	100.1
9	40.5	62.2
12	20.3	.2
15	11.4	3.6
18	6.9	1.9
21	5.2	3.4
24	4.5	3.8
27	4.2	3.8
30	4.1	4.3
33	3.9	3.7
36	3.8	3.8
39	3.7	3.7

APPARENT RADIUM-226 CONCENTRATION 37 DECONVOLUTION GRAPH

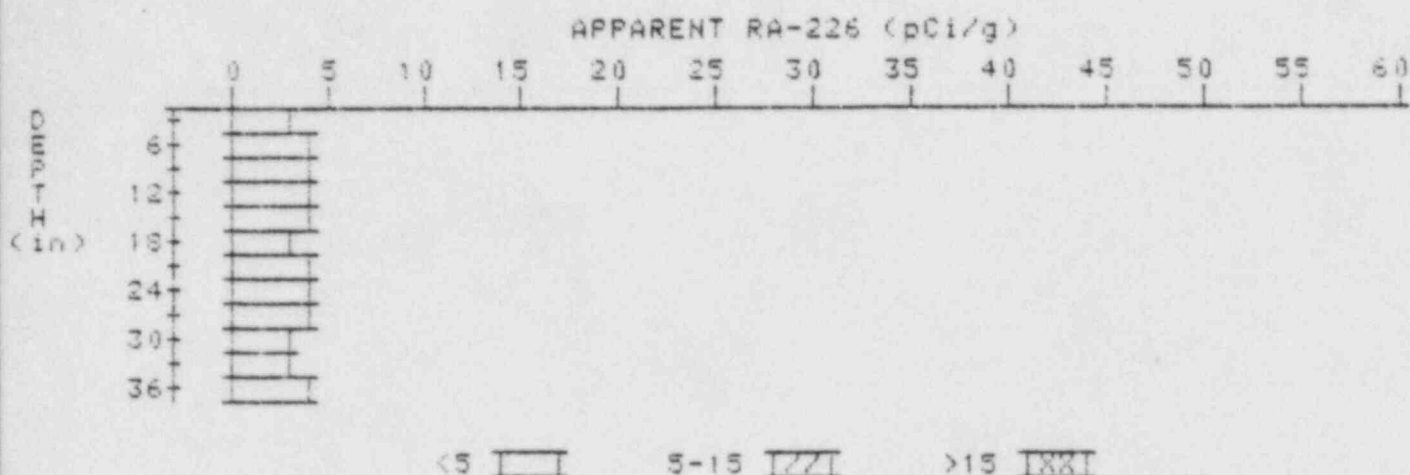
PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 37
LOCATION: 315260



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.9	3.9
6	4.1	4.0
9	3.9	3.5
12	3.9	4.1
15	3.8	3.6
18	3.8	3.8
21	3.8	3.8
24	3.8	3.8
27	3.8	4.0
30	3.7	3.7
33	3.6	3.6
36	3.5	3.1
39	3.6	3.6

APPARENT RADIUM-226 CONCENTRATION 38 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02774-MR
HOLE NUMBER: 38
LOCATION: 316246



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.1	3.1
6	3.4	3.8
9	3.5	3.5
12	3.6	3.8
15	3.6	3.8
18	3.5	3.3
21	3.5	3.5
24	3.5	3.5
27	3.5	3.7
30	3.4	3.2
33	3.4	3.2
36	3.5	3.5