

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-10342-RS
ADDRESS: 603 CHIPETA AVENUE

MAY 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION
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DATE

May 23, 1985

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-10342-RS, is a single-family residence located at 603 Chipeta Avenue, Grand Junction, Colorado.

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

1.2 Evaluation and Recommendation

The action recommended is the removal of contaminated material and restoration of the property to its original condition. The identified residual radioactive material found on this property is tailings; the estimated volume is: exterior, 68 cu. yd.; interior, 1 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$6,806. Remedial action on this property will take approximately 15 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 603 Chipeta Avenue, Grand Junction, Colorado

Zoning: Residential (RMF-64)

Lot Size: Approximately 6,250 sf (0.1 acre)

Legal Description: Lots 1 and 2, Block 61, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 1 mile northwest of the State of Colorado Tailings Repository. Appendix Figure 2.1 shows the property location relative to its surroundings.

Utilities: Utility locations are shown in Appendix Figure 2.2.

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

Bordering Properties:

North:	Chipeta Avenue
South:	Alley
East:	Single-family residence
West:	Sixth Street

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-story residence
Size:	Approximately 1,393 sf
Construction Date:	1900
Construction:	Wood-frame
Foundation:	Concrete stem wall on spread footing
Footing Depth:	Approximately 8" to bottom of footing from grade
Basement:	Yes (partial)
Crawl Space:	Yes (partial)
Condition:	Good

Other Structures:

Type:	Garage
Size:	Approximately 365 sf
Construction:	Wood-frame with dirt floor
Foundation:	None
Condition:	Poor

General Remarks: The front yard is landscaped. Structures, utilities, landscaping, and other special features of this property are included in Appendix Figure 2.2.

Historical Data:

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

Alterations to Structure: The porch located on the north side of the structure was enclosed.

Architectural Significance: None

Historical Significance: None

3.0 RADIOLOGIC SURVEY

3.1 Introduction

Radiologic data were collected by Bendix at DOE ID No. GJ-10342-RS on March 25, 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 located in the garage, the south yard, and the city sidewalk west of the primary structure.

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

3.2 Gamma Exposure-Rate Surveys

3.2.1 Exterior Findings

Background Readings: 15 to 16 uR/h
Highest Outside Gamma Reading (HOG): 92 uR/h

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

3.2.2 Interior Findings

Background Readings: 11 to 13 uR/h
Highest Inside Gamma Reading (HIG): 29 uR/h

Interior radium-concentration measurements are presented in Appendix Table 3.2. Interior gamma exposure-rate measurements are summarized in Appendix Table 3.3. Appendix Figures 3.3a and 3.3b show interior exposure rates and locations of these measurements.

3.3 Boreholes, Soil Samples, and Other Measurements

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

3.4 Radon/Radon Daughter Concentration (RDC)

Determined by CDH: 0.011 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 materials are:

- (AREA A) A small deposit in the east section of the garage is contaminated to a depth of 6 inches. The garage has a dirt floor (approximately 16 sf).
- (AREA B) A portion of the lawn, which is beside the city sidewalk west of the property line, is contaminated to a depth of 6 inches (approximately 66 sf).
- (AREA C) Approximately 30 feet north of Area B there is a deposit that is contaminated to a depth of 6 inches (approximately 84 sf).
- (AREA D) West of the city sidewalk and along the property line, there is contamination to a depth of 12 inches (approximately 290 sf).
- (AREA E) The city sidewalk that is west of the property line is underlaid with contaminated material. The contamination extends to a total depth of 12 inches. The concrete is not contaminated (approximately 725 sf).
- (AREA F) The lawn directly east of the city sidewalk is contaminated to a depth of 12 inches (approximately 369 sf).
- (AREA G) Two portions of lawn in the south yard are contaminated to a depth of 15 inches. The sidewalk that divides these two areas is not contaminated (approximately 150 sf).
- (AREA H) A deposit that surrounds a section of Area G is contaminated to a depth of 6 inches (approximately 117 sf).
- (AREA I) East of the garage there is contaminated material that extends to a depth of 6 inches (approximately 77 sf).

(AREA J) The dirt alley adjacent to the southern portion of the garage is contaminated to a total depth of 15 inches (approximately 39 sf).

(AREA K) The 4-inch-thick sidewalk in the south yard is underlaid with contaminated material. Based on the data collected in Area G, the contamination extends to a depth of 15 inches. The sidewalk is not contaminated (approximately 30 sf).

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-10342-RS, 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 \$6,806.

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 - Basement and Crawl Space
Figure 3.3b	Interior Gamma Exposure Rates and Sample Locations - Ground Floor
Figure 3.4	Exterior Sample Locations
Figure 3.5a	Interior Estimated Extent of Contamination
Figure 3.5b	Exterior Estimated Extent of Contamination
Official Survey Report	
Memo of Understanding	
Team Leader Notes	
Deconvolution Graphs (Apparent Radium-226 Concentration)	

Radium Concentrations at Exterior Locations

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Loc No.	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
3	160250	00	DS	<1.0		*	North of house Background
		00-06	SS			2.3	
		03	TC	2.8		*	DC = 0 inches
		06	TC	3.1		*	
		09	TC	3.4		*	
		12	TC	3.5		*	
		15	TC	3.5		*	
		18	TC	3.5		*	
		21	TC	3.5		*	
		24	TC	3.4		*	
		27	TC	3.5		*	
		30	TC	3.3		*	
		33	TC	3.4		*	
		36	TC	3.4		*	
		39	TC	3.5		*	
		42	TC	3.5		*	
4	175205	00	DS	4.7		*	By sidewalk west of property DC = 6 inches
		06	DS	1.5		*	
5	182259	03	TC	3.1		*	Northeast corner of house Water line
		06	TC	3.4		*	
		09	TC	3.5		*	
		12	TC	3.5		*	DC = 0 inches
		15	TC	3.5		*	
		18	TC	3.5		*	
		21	TC	3.5		*	
		24	TC	3.5		*	
		27	TC	3.6		*	
		30	TC	3.5		*	
6	200228	33	TC	3.5		*	West of foundation
		36	TC	3.6		*	
		03	TC	3.2		*	DC = 0 inches
		06	TC	3.5		*	
		09	TC	3.7		*	
		12	TC	3.8		*	
		15	TC	3.7		*	
		18	TC	3.7		*	
		21	TC	3.7		*	
		24	TC	3.8		*	
		27	TC	3.9		*	
		30	TC	3.7		*	

Radium Concentrations at Exterior Locations

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Loc No.	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
6	200228	33	TC	3.7		*	
		36	TC	3.6		*	
7	205259	00	DS	2.2		*	North of chimney
		06	DS	2.0		*	DC = 0 inches
8	210210	00-04	SS			4.3	Concrete core
		04-10	SS			42.6	Soil under
		03	TC	31.4		*	concrete sidewalk
		06	TC	40.0		*	
		09	TC	30.7		*	DC = 12 inches
		12	TC	20.0		*	Based on all
		15	TC	12.9		*	available data
		18	TC	9.3		*	
		21	TC	7.4		*	
		24	TC	6.2		*	
		27	TC	5.4		*	
		30	TC	5.0		*	
		33	TC	4.9		*	
		36	TC	4.7		*	
		39	TC	4.5		*	
		42	TC	4.5		*	
		45	TC	4.5		*	
		48	TC	4.6		*	
		51	TC	4.4		*	
		54	TC	4.4		*	
		57	TC	4.4		*	
		60	TC	4.4		*	
		63	TC	4.3		*	
		66	TC	4.1		*	
9	220260	00	DS	1.0		*	Gas line
		06	DS	1.7		*	
		18	DS	1.2		*	DC = 0 inches
10	235206	00	DS	2.3		*	West of sidewalk
		06	DS	<1.0		*	
		00-06	SS			4.7	DC = 6 inches
11	235250	03	TC	3.1		*	Sewer line
		06	TC	3.6		*	
		09	TC	3.7		*	DC = 0 inches
		12	TC	3.8		*	

Radium Concentrations at Exterior Locations

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Loc No.	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
11	235250	15	TC	4.1		*	
			TC	3.9		*	
			TC	4.2		*	
			TC	4.2		*	
			TC	4.1		*	
		30	TC	4.1		*	
		33	TC	4.0		*	
12	242245	00	DS	4.9		*	South of house
		06	DS	1.9		*	DC = 6 inches
13	250206	00	DS	5.8		*	West of sidewalk
		06	DS	6.2		*	
		00-06	SS			11.2	DC = 12 inches
		03	TC	13.1		*	Based on all
		06	TC	14.7		*	data available
		09	TC	11.5		*	
		12	TC	8.7		*	
		15	TC	6.6		*	
		18	TC	5.5		*	
		21	TC	4.9		*	
		24	TC	4.6		*	
		27	TC	4.5		*	
		30	TC	4.5		*	
		33	TC	4.5		*	
		36	TC	4.5		*	
		39	TC	4.5		*	
		42	TC	4.2		*	
		45	TC	4.2		*	
		48	TC	4.2		*	
		51	TC	4.3		*	
		54	TC	4.2		*	
		57	TC	4.3		*	
		60	TC	4.3		*	
		63	TC	4.3		*	
		66	TC	4.3		*	
14	252243	00	DS	2.8		*	Sidewalk
15	252245	03	TC	32.1		*	Backyard
		06	TC	37.8		*	South of house
		09	TC	30.4		*	

Radium Concentrations at Exterior Locations

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Loc No.	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
15	252245	12	TC	18.7		*	DC = 15 inches Based on the deconvolution graph
		15	TC	11.2		*	
		18	TC	7.6		*	
		21	TC	6.0		*	
		24	TC	5.2		*	
		27	TC	4.8		*	
		30	TC	4.6		*	
		33	TC	4.4		*	
		36	TC	4.3		*	
		39	TC	4.2		*	
		42	TC	4.2		*	
		45	TC	4.0		*	
		48	TC	4.1		*	
		51	TC	4.1		*	
		54	TC	4.7		*	
		57	TC	5.3		*	
		60	TC	4.5		*	
16	259239	03	TC	9.3		*	North of garage DC = 12 inches Based on the deconvolution graph
		06	TC	9.4		*	
		09	TC	7.5		*	
		12	TC	5.7		*	
		15	TC	4.6		*	
		18	TC	4.3		*	
		21	TC	4.0		*	
		24	TC	3.8		*	
		27	TC	3.9		*	
		30	TC	4.0		*	
		33	TC	4.0		*	
17	268263	00	DS	4.4		*	East of garage DC = 6 inches Based on all available data
		03	TC	4.3		*	
		06	TC	4.4		*	
		09	TC	4.3		*	
		12	TC	4.2		*	
		15	TC	4.1		*	
		18	TC	4.0		*	
		21	TC	4.0		*	
		24	TC	4.0		*	
		27	TC	4.0		*	
		30	TC	4.0		*	
		33	TC	3.9		*	
		36	TC	3.9		*	
		39	TC	3.8		*	

Radium Concentrations at Exterior Locations

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Loc No.	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
18	269222	03	TC	3.3		*	West of garage DC = 0 inches
		06	TC	3.6		*	
		09	TC	3.7		*	
		12	TC	3.9		*	
		15	TC	4.0		*	
		18	TC	4.0		*	
		21	TC	4.0		*	
		24	TC	4.0		*	
		27	TC	4.0		*	
		30	TC	4.1		*	
		33	TC	4.0		*	
		36	TC	4.0		*	
19	273255	00	DS	2.7		*	Southeast area of property
		00-06	SS			5.3	
20	282233	03	TC	13.5		*	South of garage DC = 15 inches Based on the deconvolution graph
		06	TC	15.0		*	
		09	TC	12.5		*	
		12	TC	9.5		*	
		15	TC	6.8		*	
		18	TC	5.5		*	
		21	TC	4.9		*	
		24	TC	5.1		*	
		27	TC	4.2		*	
		30	TC	4.3		*	

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 = 03-25-85
Team Leader = CH

Radium Concentrations at Interior Locations

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Loc No.	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
1		00	DS	7.0		*	Inside garage
		00-06	SS			7.1	
		03	TC	4.9		*	DC = 6 inches
		06	TC	4.7		*	Based on all
		09	TC	4.5		*	data available
		12	TC	4.2		*	
		15	TC	4.1		*	
		18	TC	4.0		*	
		21	TC	4.2		*	
		24	TC	4.0		*	
		27	TC	4.0		*	
		30	TC	4.0		*	
		33	TC	4.0		*	
		36	TC	4.0		*	
2		00	DS	2.7		*	Inside garage
		06	DS	1.1		*	South wall
		00-06	SS			2.1	DC = 0 inches

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

Notes: DC = Depth of Contamination
 * = No Soil Sample Taken
 [n] = Reading Taken n-Inches
 Above Floor or Ground
 Date of Survey = 03-25-85
 Team Leader = CH

Table 3.3

Summary of Interior Gamma Exposure Rates

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Location *	Number of Readings Taken at Waist Level	Range at Waist Level (uR/h)	Mean at Waist Level (uR/h)	Number of Readings Taken at Surface	Range at Surface (uR/h)	Mean Surface (uR/h)
BASEMENT	*	*	*	*	13-15	*
GROUND FLOOR	*	*	*	*	10-13	*
GARAGE	09	12-17	14	09	12-29	18

* The CDH and ORNL data indicates the absence of interior contamination in the primary structure. This information was investigated by performing a walking gamma scan in the basement and ground floor. These areas and the ranges of gamma measurements are shown in Appendix Figures 3.3a and 3.3b. Exposure rates in the garage are shown in Appendix Figure 3.3b.

Table 4.1
Area and Volume Calculations
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<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
INTERIOR					
TAILINGS					
A	4 x 4 =	16	x 0.5 =	8	
TOTAL VOLUME - INTERIOR				8 =	8/27 1
EXTERIOR					
CONCRETE					
E	145 x 5 =	725	x 0.3 =	218	
K	15 x 2 =	30	x 0.3 =	9	
VOLUME OF CONCRETE				= 227 =	227/27 = 8
TAILINGS					
B	33 x 2 =	66	x 0.5 =	33	
C	42 x 2 =	84	x 0.5 =	42	
D	145 x 2 =	290	x 1.0 =	290	
E	145 x 5 =	725	x 0.7 =	508	
F	123 x 3 =	369	x 1.0 =	369	
G	20 x 9 =	180			
Minus Area K		= (30)			
		150	x 1.3 =	195	
H	13 x 9 =	117	x 0.5 =	59	
I	7 x 11 =	77	x 0.5 =	39	

Table 4.1
Area and Volume Calculations
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<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
J	3 x 13 =	39	x 1.3 =	51	
K	15 x 2 =	30	x 1.0 =	30	
VOLUME OF TAILINGS				= <u>1,616</u>	= 1,616/27 = 60
TOTAL VOLUME - EXTERIOR					= <u>68</u>

See Appendix Figure 3.5a and 3.5b For Areas

=====

INTERIOR

Remove identified residual radioactive material 1 cy @ \$44/cy (interior-manual)	\$ 44
Replace compacted roadbase 1 cy @ \$11.50/cy	12
TOTAL INTERIOR	\$ <u>56</u>

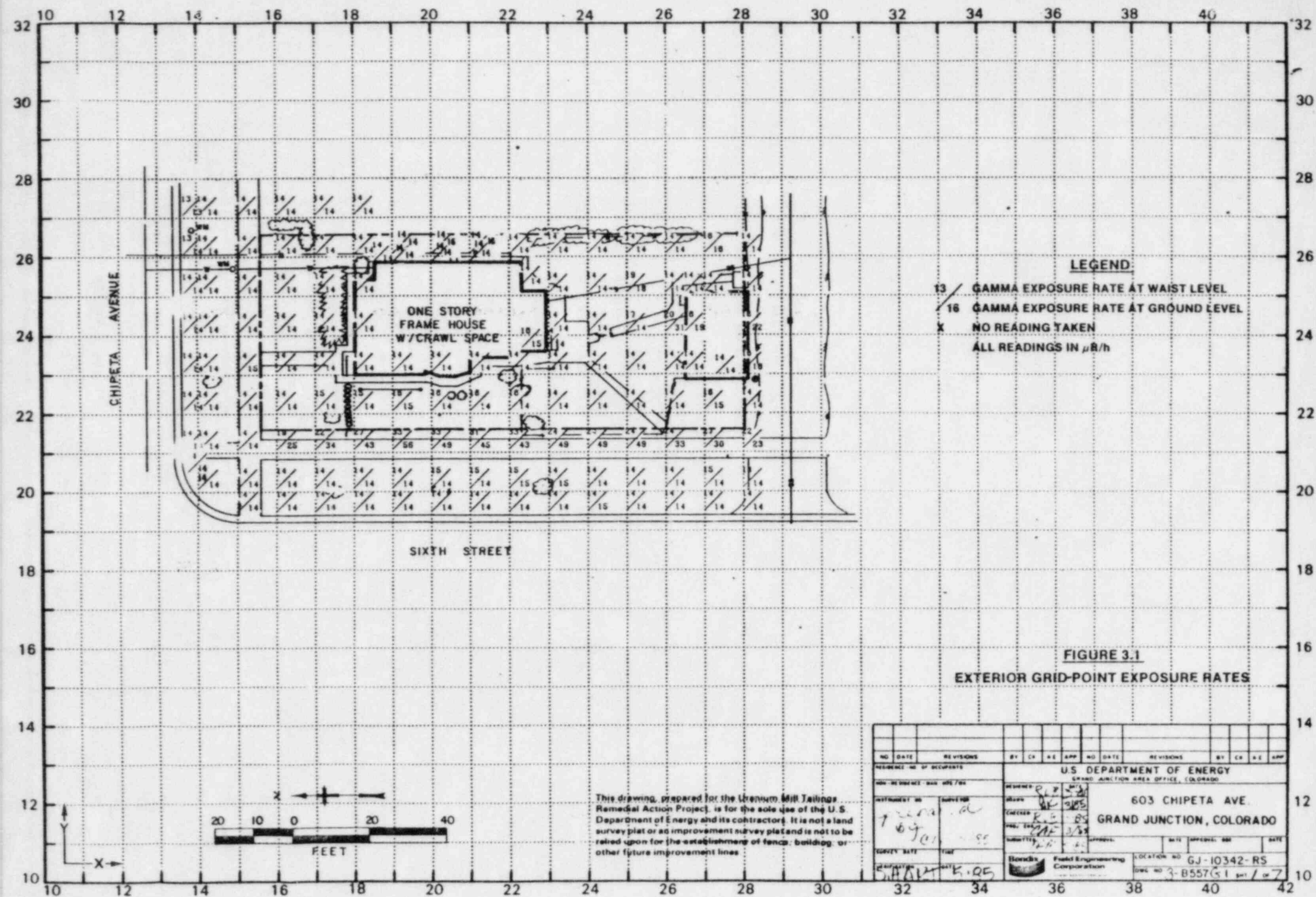
EXTERIOR

Remove identified residual radioactive material 52 cy @ \$14.50/cy (machine-open)	\$ 754
8 cy @ \$44/cy (manual-open)	352
Remove/replace concrete 755 sf @ \$3/sf	2,265
Replace water-settled topsoil 38 cy @ \$9.50/cy	361
Replace compacted roadbase 22 cy @ \$11.50/cy	253
Replace sod 1,079 sf @ \$.30/sf	324
Remove/replace fence (wood split rail) 40 lf @ \$3/lf	120
TOTAL EXTERIOR	\$ <u>4,429</u>

TOTAL EXTERIOR	\$	4,429
TOTAL INTERIOR		56
ACCESS CONTROL		250
		<hr/>
SUBTOTAL	\$	4,735
CONTINGENCY @ 15%		710
		<hr/>
SUBTOTAL	\$	5,445
CONTRACTOR OVERHEAD & PROFIT @ 25%		1,361
		<hr/>
GRAND TOTAL	\$	6,806

=====

LR052085
REA10342/REA-506/LAJ



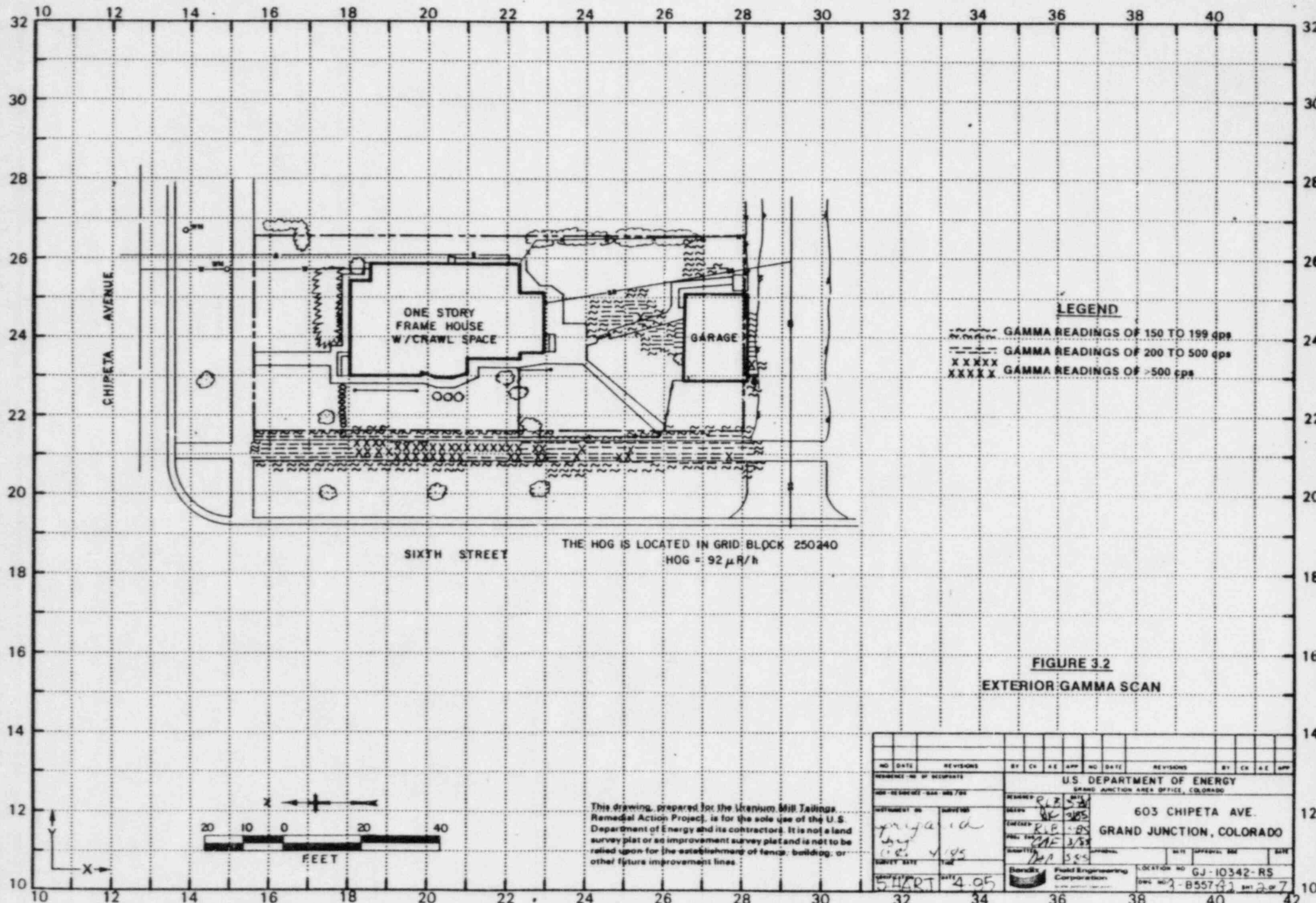
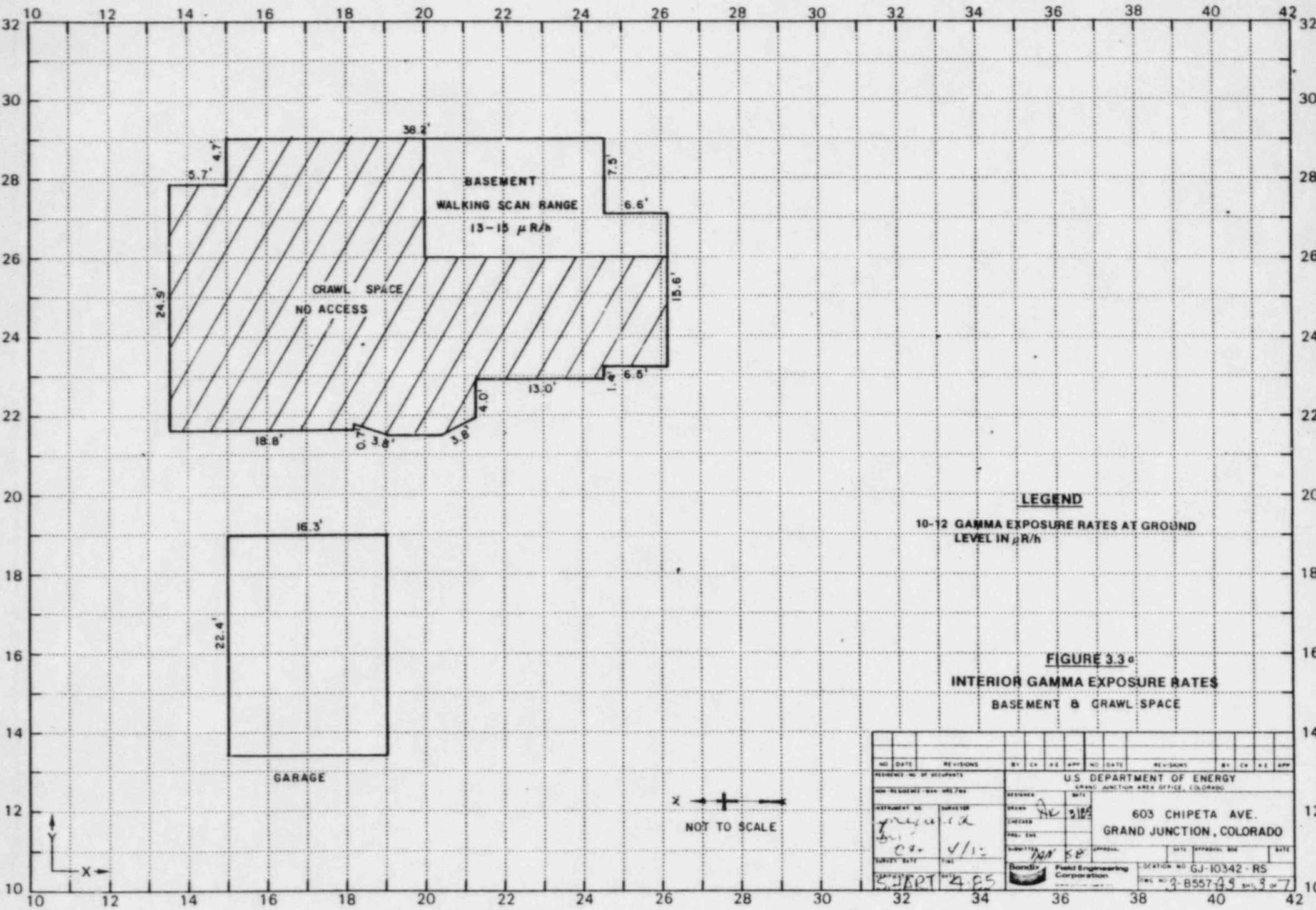


FIGURE 3.2
EXTERIOR GAMMA SCAN

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

NO. DATE REVISIONS BY CH A.E. APP NO. DATE REVISIONS BY CH A.E. APP									
RESIDENCE NO. OF OCCUPANTS									
GMA - RESOURCES - GMA AND / OR									
DESIGNED BY <i>R. J. S. 5/85</i>					U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO				
DRAWN BY <i>R. J. S. 5/85</i>					603 CHIPETA AVE.				
CHECKED BY <i>R. J. S. 5/85</i>					GRAND JUNCTION, COLORADO				
SURVEY DATE <i>4.05</i>					DATE				
DRAWN BY <i>CHART 4.05</i>					DATE				
FOLD ENGINEERING CORPORATION					LOCATION NO. GJ-10342-R5				
DRAWING NO. 3-B557-43					SHEET 2 OF 7				

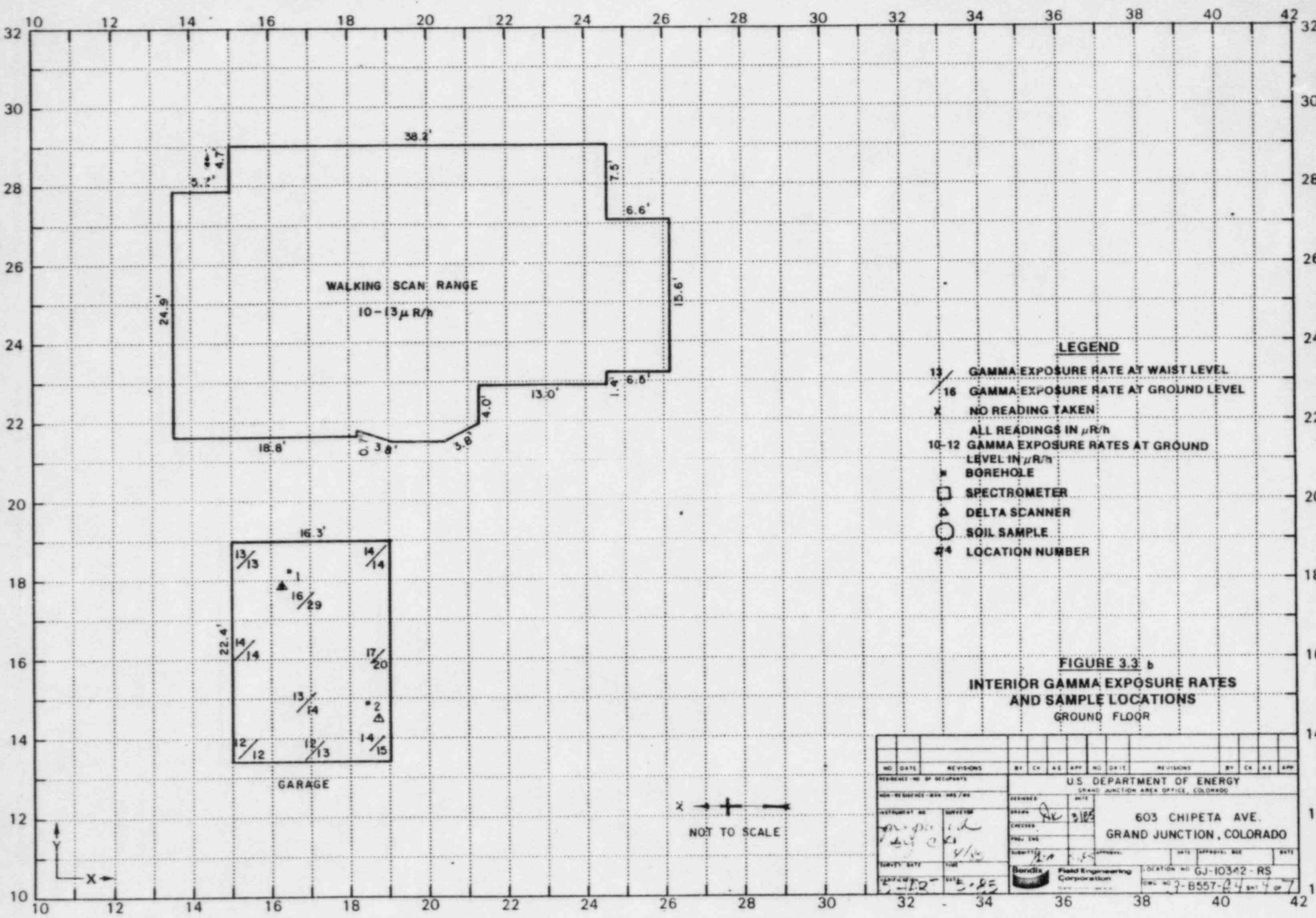


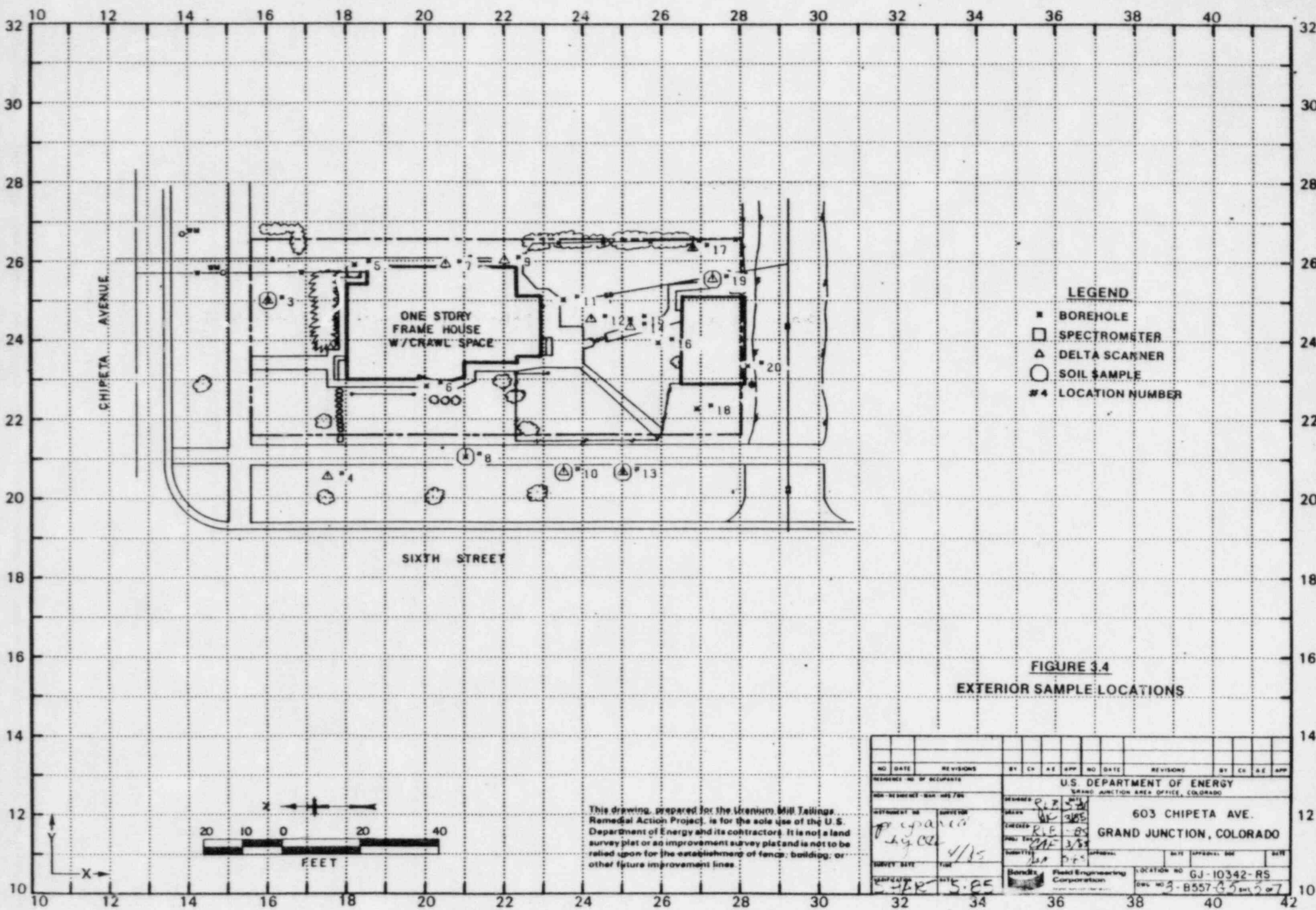
LEGEND

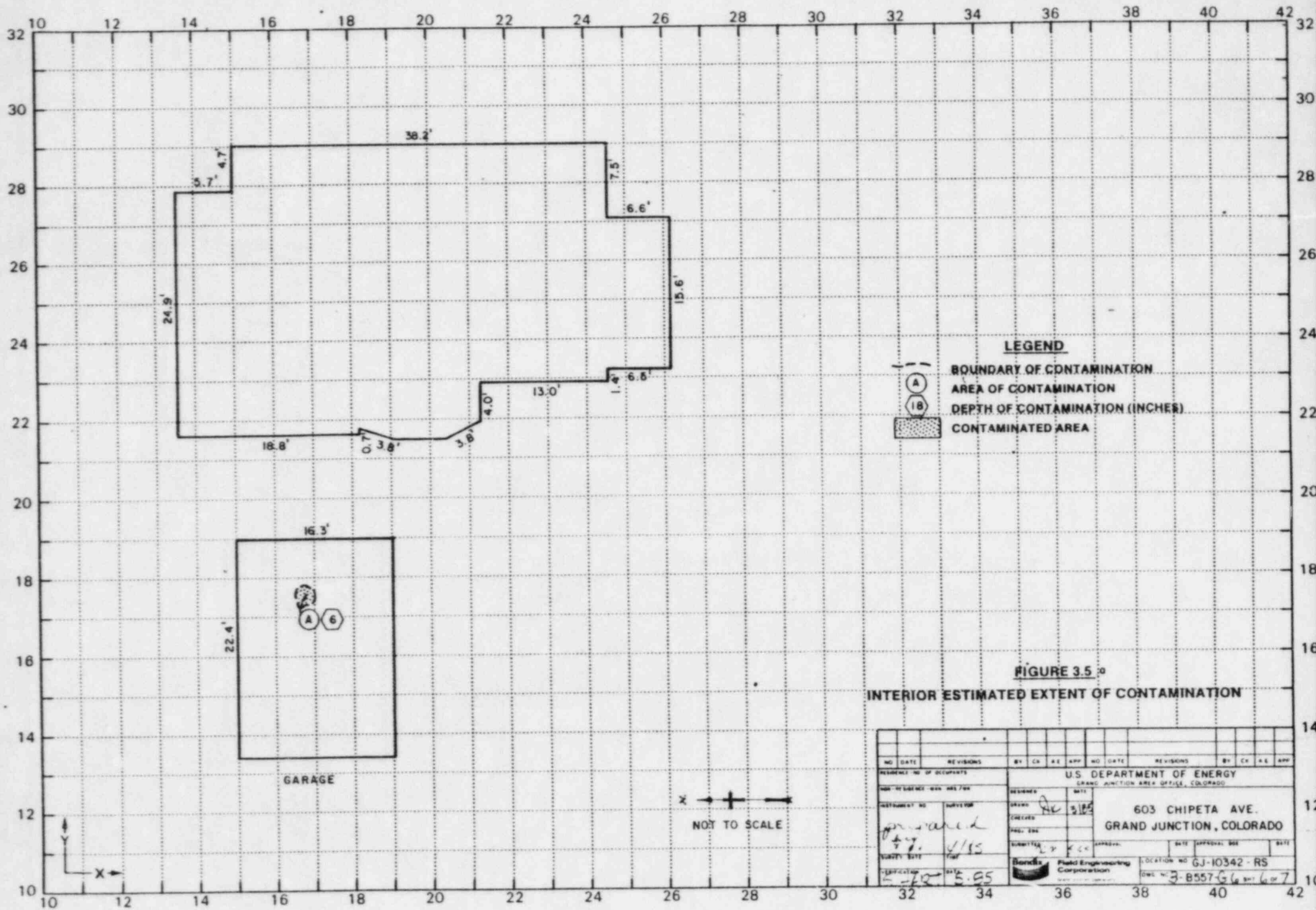
10-12 GAMMA EXPOSURE RATES AT GROUND LEVEL IN $\mu R/h$

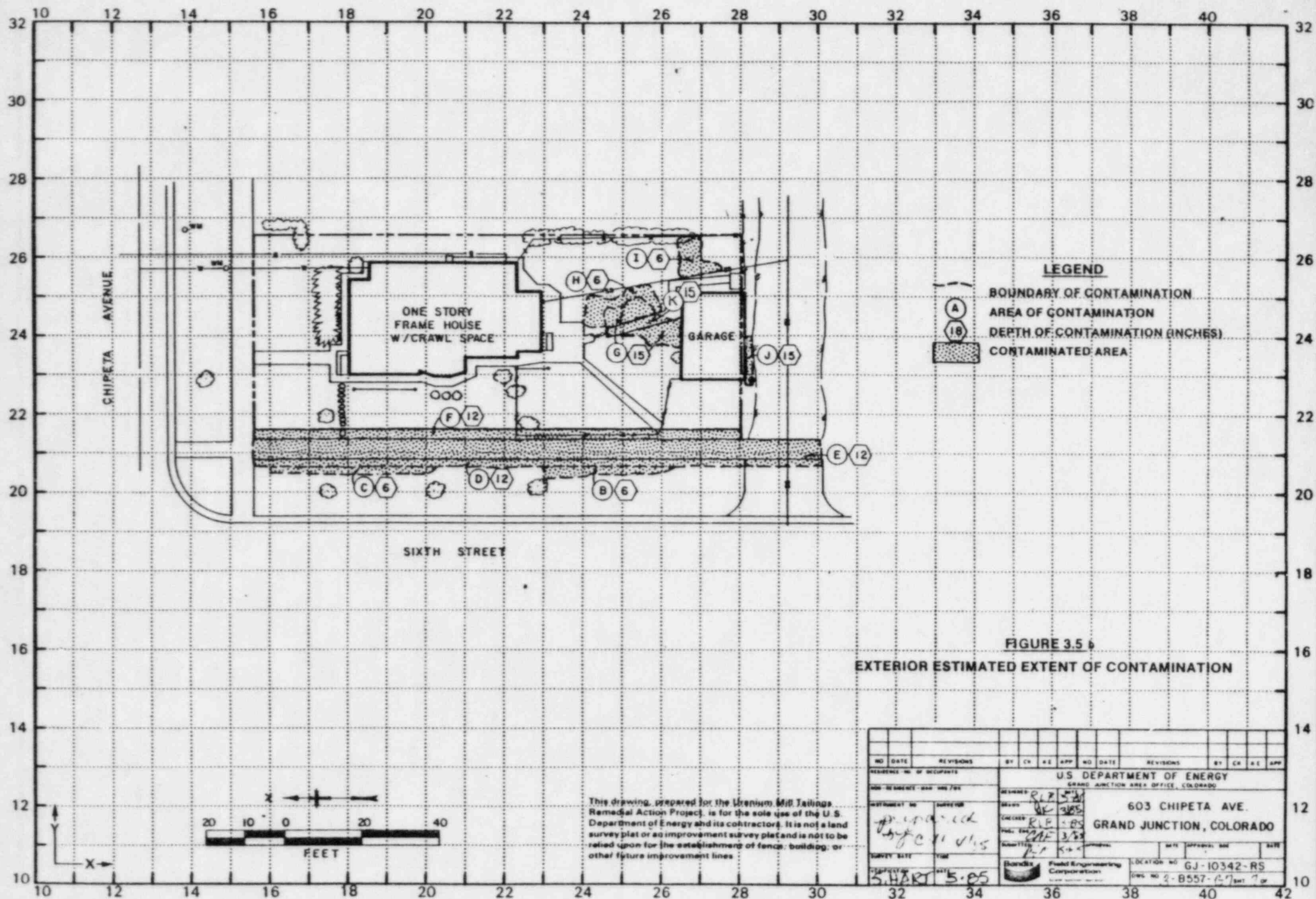
FIGURE 3.30
INTERIOR GAMMA EXPOSURE RATES
BASEMENT & CRAWL SPACE

NO. DATE		REVISIONS		BY	CH	AE	APP	NO. DATE	REVISIONS		BY	CH	AE	APP
RESIDENCE NO. OF OCCUPANTS														
NON-RESIDENT: DAY, MO, YR DESIGNER: <i>[Signature]</i> DATE: <i>2/1/85</i> DRAWN: <i>[Signature]</i> CHECKED: <i>[Signature]</i> PROJ. ENG. SUBMITTER: <i>[Signature]</i> APPROVED: <i>[Signature]</i> DATE: <i>2/1/85</i> PROJECT: <i>[Signature]</i> FIELD ENGINEERING CORPORATION LOCATION NO. GJ-10342-RS FILE NO. 3-B557-49 Sht. 3 of 7														









3/85

DOE ID NO. GJ-10342-RS Date 4-24-85

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

Official Survey Report

Property Address 603 Chipeta Avenue
Property Owner Wilford Carson
Address of Owner (if different from above) 605 Chipeta Avenue
Report Prepared By Carol Holmes

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

1 No evidence of residual radioactive material on surveyed property.

1 XX Residual radioactive materials found at the following locations:

1 XX In open areas.

1 Under or around exterior improvements.

1 XX Under or around a typically nonoccupied structure.

1 Under or around a typically occupied structure.

II. RESULTS OF RADIOLOGIC ASSESSMENT

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

1 XX 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 = 29 uR/h
HOG = 92 uR/h

April 24, 1985

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

ATTN: Coleen Campbell

Dear Coleen:

The following is in response to your questions and comments during the Technical Review concerning Department of Energy (DOE) Identification (ID) number GJ-10342-RS (603 Chipeta Avenue) conducted on 18 April 1985.

1. The project gross working level has been noted as 0.011.
2. An interior extent of contamination map of the garage is enclosed.
3. The contamination is beneath the sidewalk at grid location number 252243. We both agreed during the Technical Review that it appeared the area was filled with tailings before the sidewalk was laid. The area of contamination is to a depth of 12-inches on each side of the sidewalk.
4. At grid location number 273255, the area of contamination has been defined but the depth of contamination is at question. Therefore, it will be suggested the depth be monitored during remedial action.

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

Yours truly,

Carol Holmes
RSD Survey Team

Enclosure

CDHLETTERS.GJ-10342.CH:PR

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado

Date: March 25, 1985

To: Files

From: Carol Holmes

Subject: Team Leader Notes - GJ-10342-RS

Address: 603 Chipeta Avenue

Owner: Wilford H. Carson

Tenant: J. Brown

Team Members

C. Holmes (Team Leader)	N. Wallace
B. Wilkins	D. Dow
T. Ciocco	J. Johnson
R. Schouten	S. Southern
M. Heronema	

Instruments

Scintillometer - C-1181, C-1205, C-1036, C-1149
Delta Scintillometer - C-3935, C-3937
Total Count - C-3956

Mr. J. Brown, the tenant, was present during the survey. The owner W. Carson, lives adjacent to the property but was not present.

Areas of contamination were found in the backyard (south of the property) and along the city sidewalk (west of the property).

There was also an area south of the garage in the alley with a reading of 600 cps. Therefore, a delta was taken on the inside of the garage and a soil sample was also obtained.

The basement measured 11-feet by 16-feet, the remainder was a crawl space. No elevated readings in the house or basement were noted.

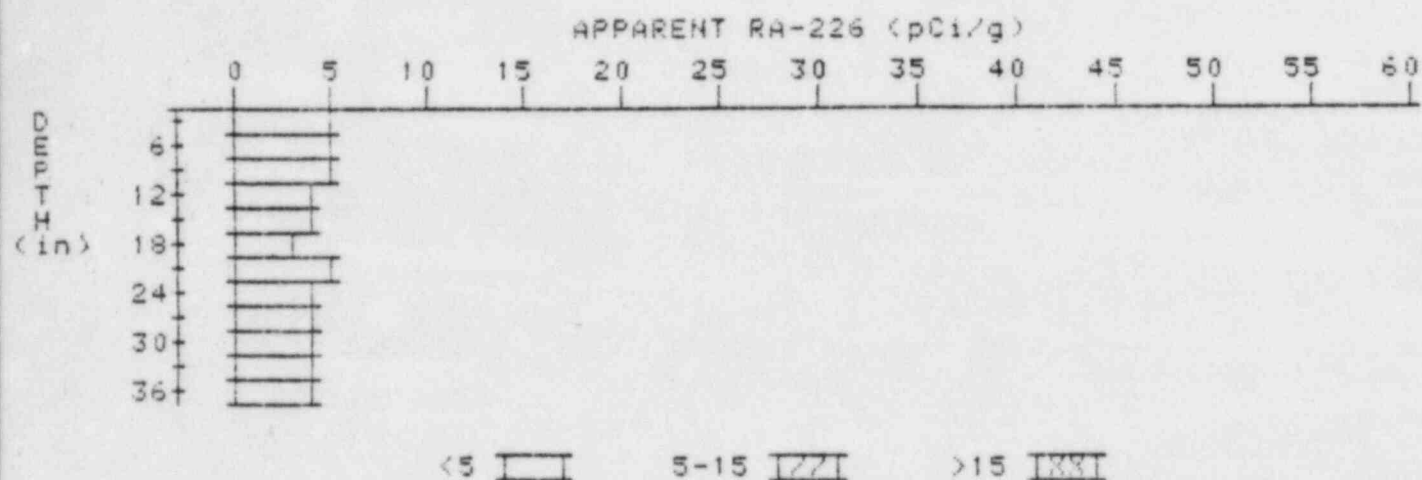
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

1

PROPERTY NUMBER: GJ-10342-RS

HOLE NUMBER: 1

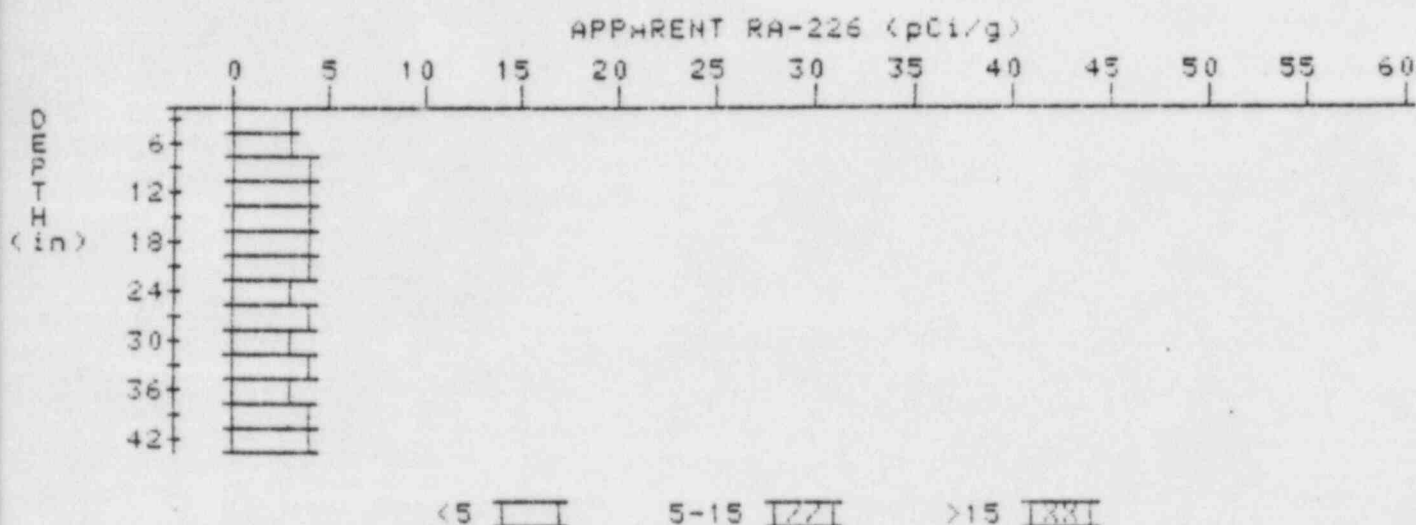
LOCATION:



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.9	4.9
6	4.7	4.7
9	4.5	4.7
12	4.2	3.8
15	4.1	4.1
18	4.0	3.5
21	4.2	4.9
24	4.0	3.6
27	4.0	4.0
30	4.0	4.0
33	4.0	4.0
36	4.0	4.0

APPARENT RADIUM-226 CONCENTRATION 3 DECONVOLUTION GRAPH

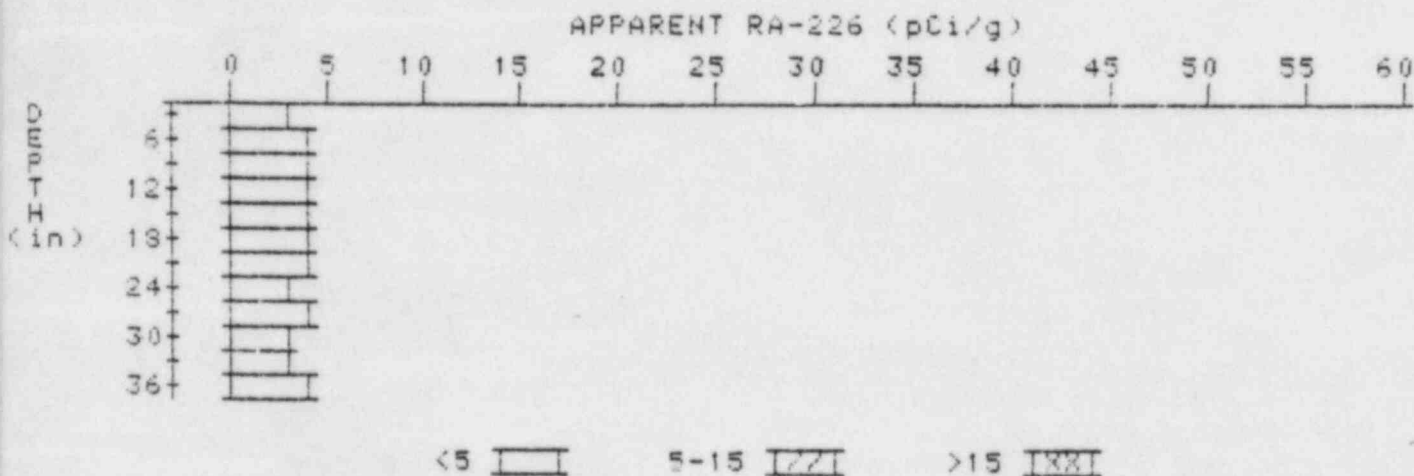
PROPERTY NUMBER: GJ-10342-RS
HOLE NUMBER: 3
LOCATION: 160250



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.8	2.8
6	3.1	3.1
9	3.4	3.8
12	3.5	3.7
15	3.5	3.5
18	3.5	3.5
21	3.5	3.7
24	3.4	3.0
27	3.5	4.0
30	3.5	2.8
33	3.4	3.6
36	3.4	3.2
39	3.5	3.7
42	3.5	3.5

APPARENT RADIUM-226 CONCENTRATION 5 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-10342-R3
HOLE NUMBER: 5
LOCATION: 182259



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	3.7
12	3.5	3.5
15	3.5	3.5
18	3.5	3.5
21	3.5	3.5
24	3.5	3.3
27	3.6	4.0
30	3.5	3.3
33	3.5	3.3
36	3.6	3.6

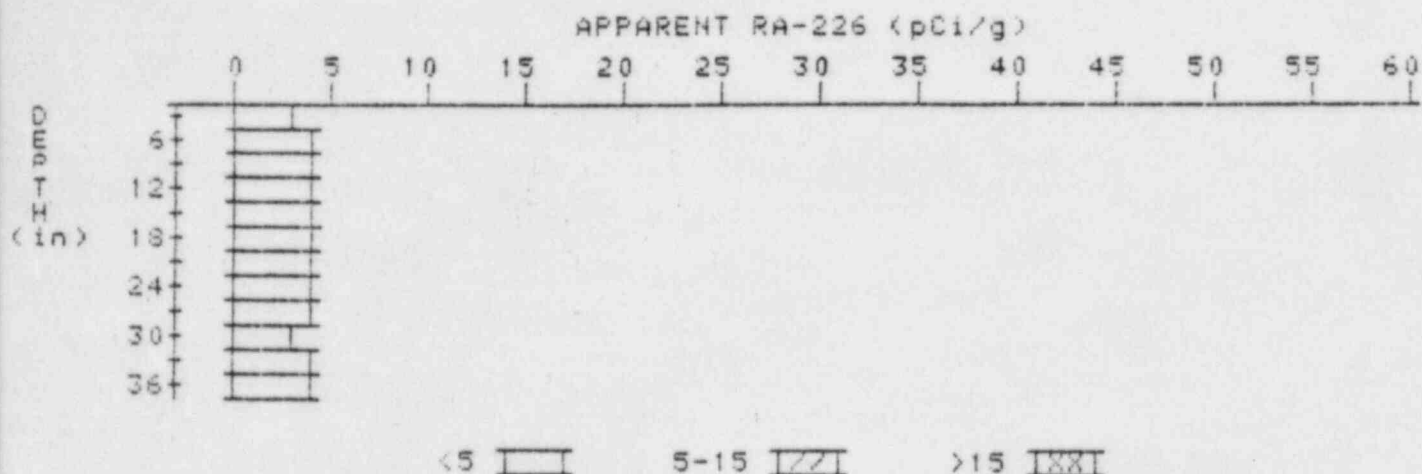
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

6

PROPERTY NUMBER: GJ-10342-RS

HOLE NUMBER: 6

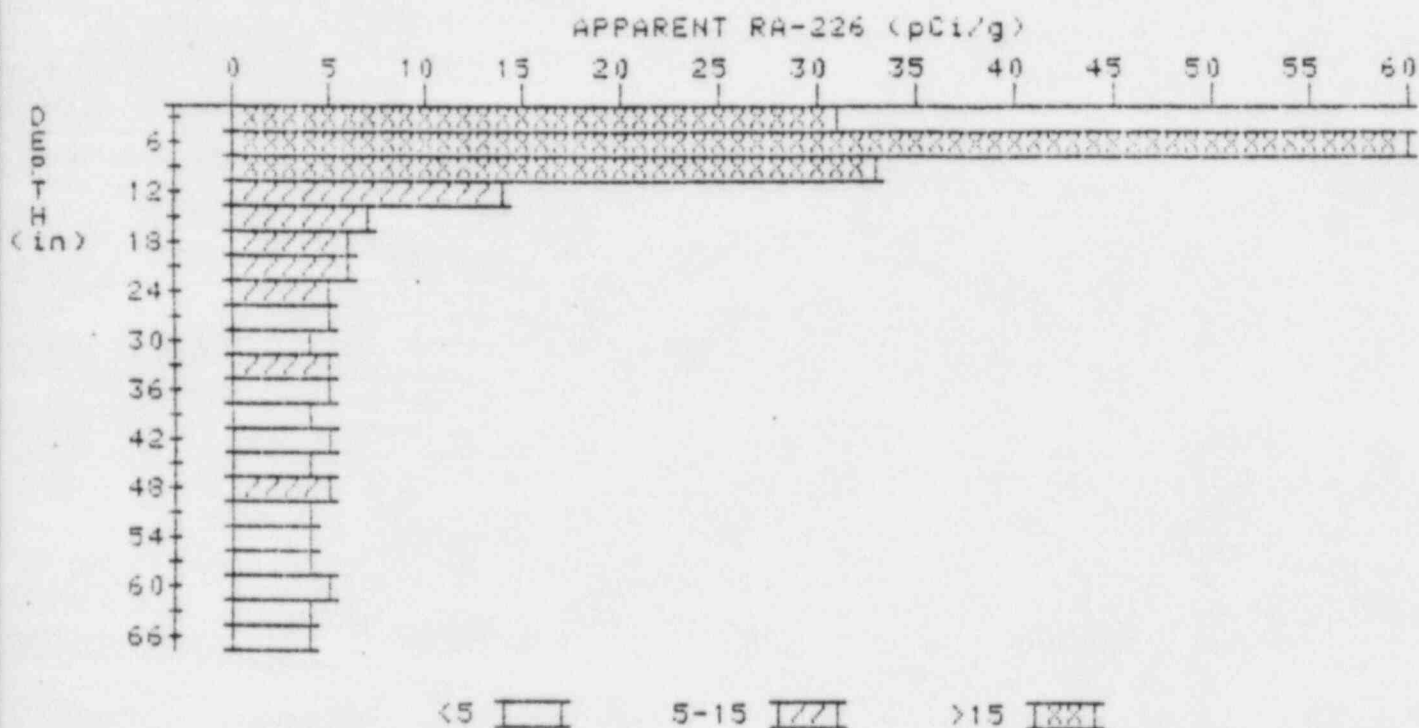
LOCATION: 200228



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	4.2
15	3.7	3.5
18	3.7	3.7
21	3.7	3.5
24	3.8	3.8
27	3.9	4.4
30	3.7	3.3
33	3.7	3.9
36	3.6	3.6

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-10342-R3
HOLE NUMBER: 8
LOCATION: 210210



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	31.4	31.4
6	40.0	71.3
9	30.7	33.2
12	20.0	13.6
15	12.9	6.7
18	9.3	6.3
21	7.4	6.2
24	6.2	5.5
27	5.4	4.7
30	5.0	4.5
33	4.9	5.1
36	4.7	4.7
39	4.5	4.1
42	4.5	4.5
45	4.5	4.3
48	4.6	5.1

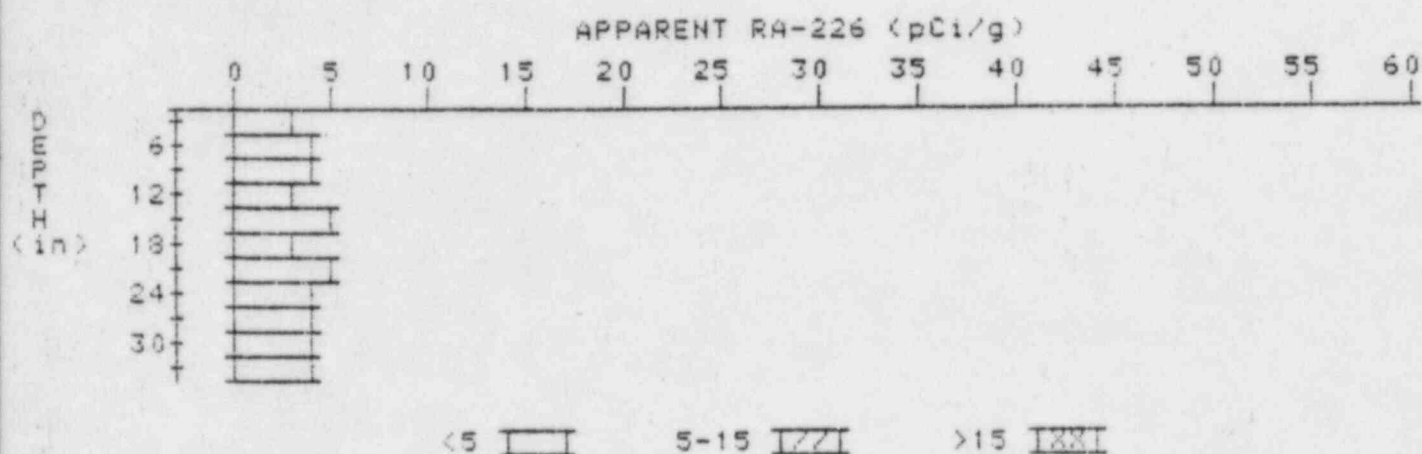
51
54
57
60
63
66

4.4
4.4
4.4
4.4
4.3
4.1

4.0
4.4
4.4
4.6
4.5
4.1

APPARENT RADIUM-226 CONCENTRATION 11 DECONVOLUTION GRAPH

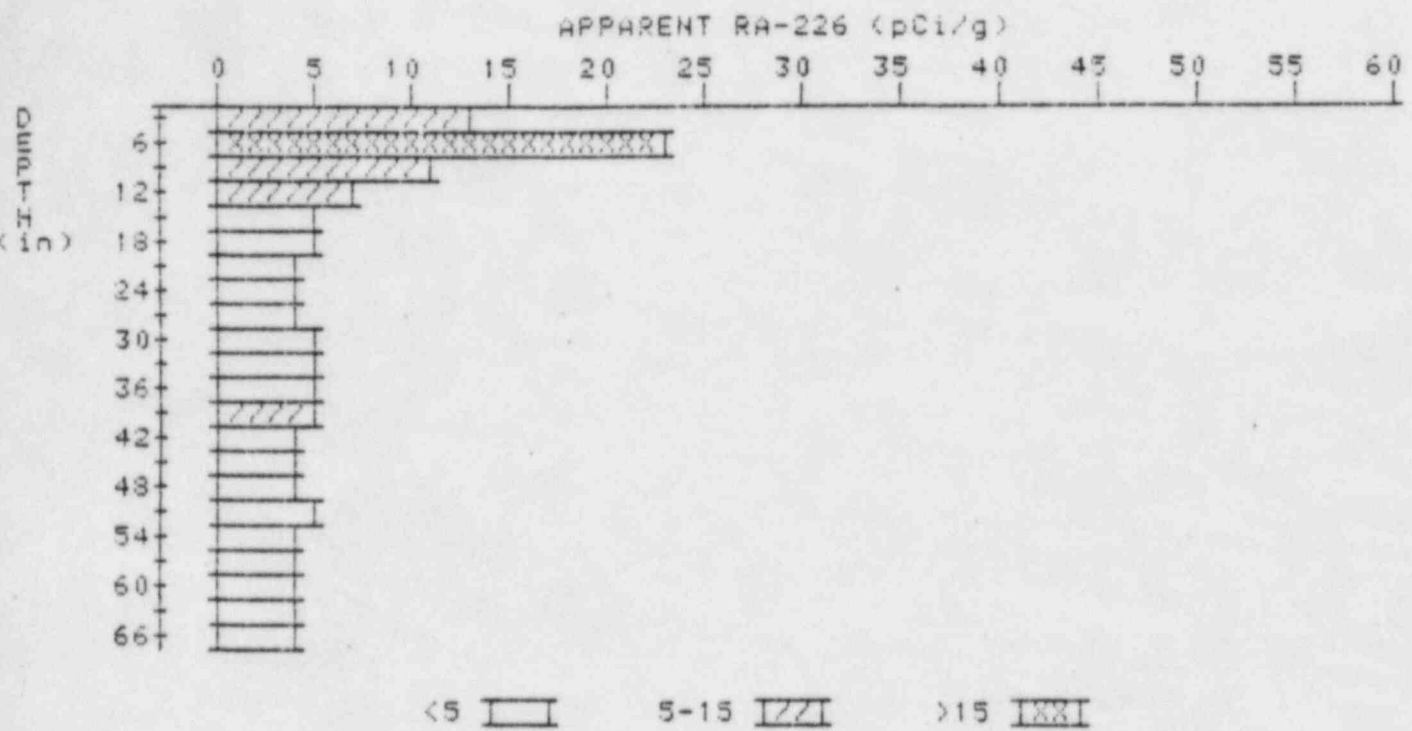
PROPERTY NUMBER: GJ-10342-RS
HOLE NUMBER: 11
LOCATION: 235250



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.1	3.1
6	3.6	4.3
9	3.7	3.7
12	3.8	3.4
15	4.1	5.0
18	3.9	3.0
21	4.2	4.7
24	4.2	4.4
27	4.1	3.9
30	4.1	4.3
33	4.0	4.0

APPARENT RADIUM-226 CONCENTRATION 13 DECONVOLUTION GRAPH

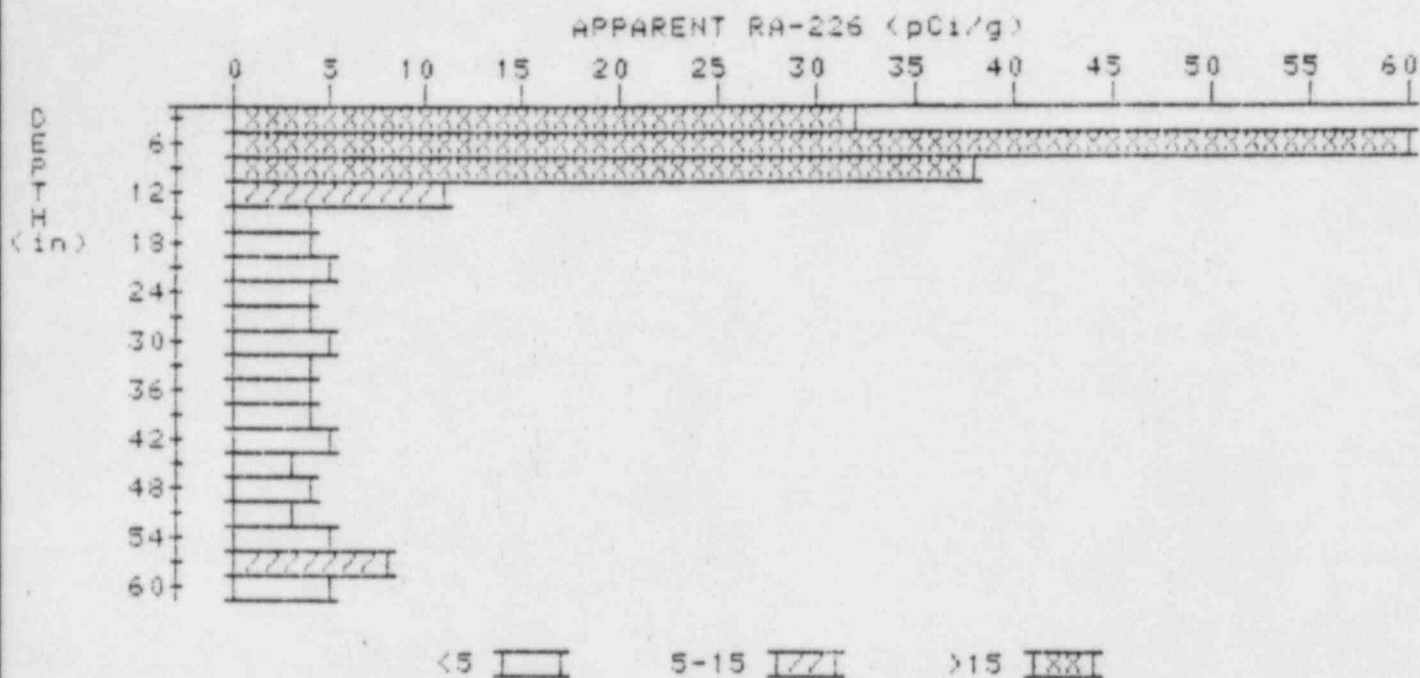
PROPERTY NUMBER: GJ-10342-RS
HOLE NUMBER: 13
LOCATION: 250206



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	13.1	13.1
6	14.7	23.2
9	11.5	10.8
12	8.7	7.5
15	6.6	4.8
18	5.5	4.6
21	4.9	4.4
24	4.6	4.2
27	4.5	4.3
30	4.5	4.5
33	4.5	4.5
36	4.5	4.5
39	4.5	5.0
42	4.2	3.7
45	4.2	4.2
48	4.2	4.0

APPARENT RADIUM-226 CONCENTRATION 15 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-10342-R6
HOLE NUMBER: 15
LOCATION: 252245



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	32.1	32.1
6	37.8	61.1
9	30.4	38.0
12	18.7	11.2
15	11.2	4.3
18	7.6	4.0
21	6.0	4.6
24	5.2	4.5
27	4.8	4.4
30	4.6	4.6
33	4.4	4.2
36	4.3	4.3
39	4.2	4.0
42	4.2	4.6
45	4.0	3.5
48	4.1	4.3
51	4.1	3.0
54	4.7	4.7

57
60

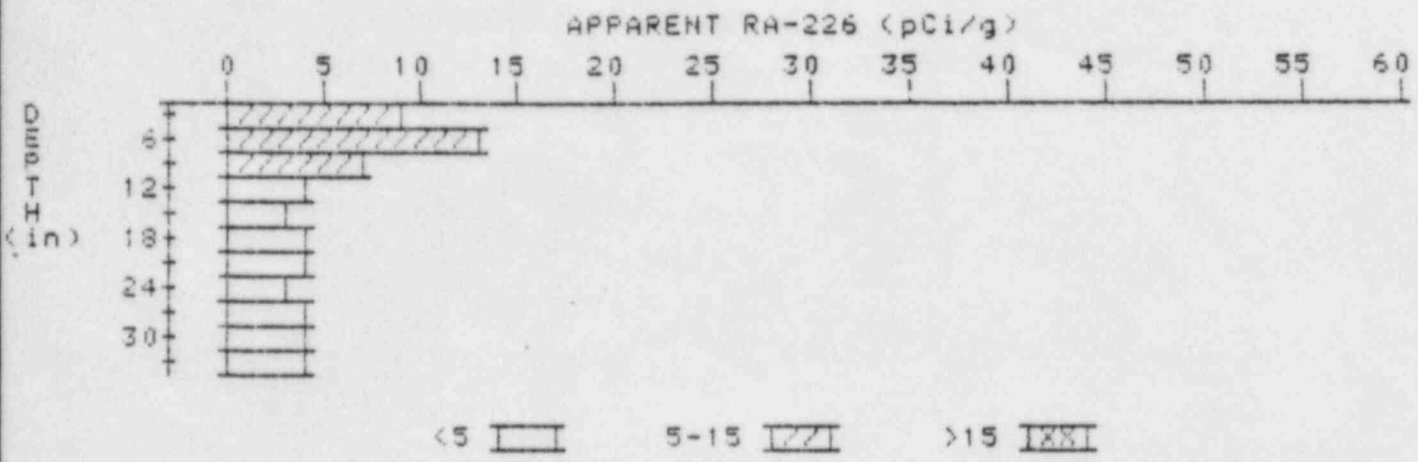
5.3
4.5

7.3
4.5

APPARENT RADIUM-226 CONCENTRATION 16

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-10342-RS
HOLE NUMBER: 16
LOCATION: 259239



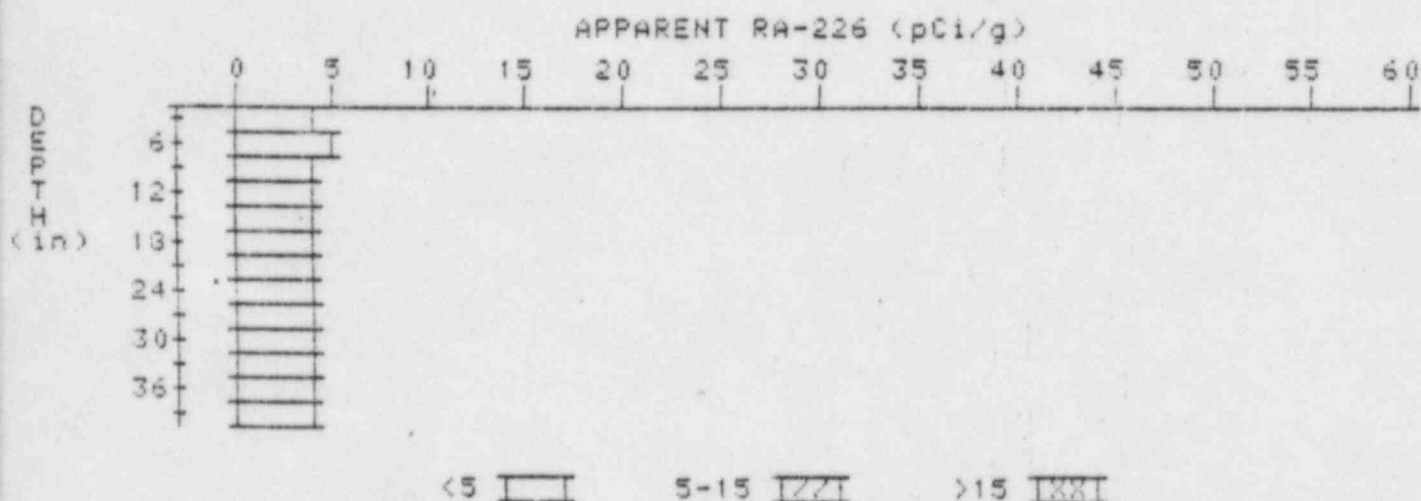
Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	9.3	9.3
6	9.4	13.0
9	7.5	7.3
12	5.7	4.5
15	4.6	3.2
18	4.3	4.3
21	4.0	3.8
24	3.8	3.3
27	3.9	3.9
30	4.0	4.2
33	4.0	4.0

APPARENT RADIUM-226 CONCENTRATION 17 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-10342-RS

HOLE NUMBER: 17

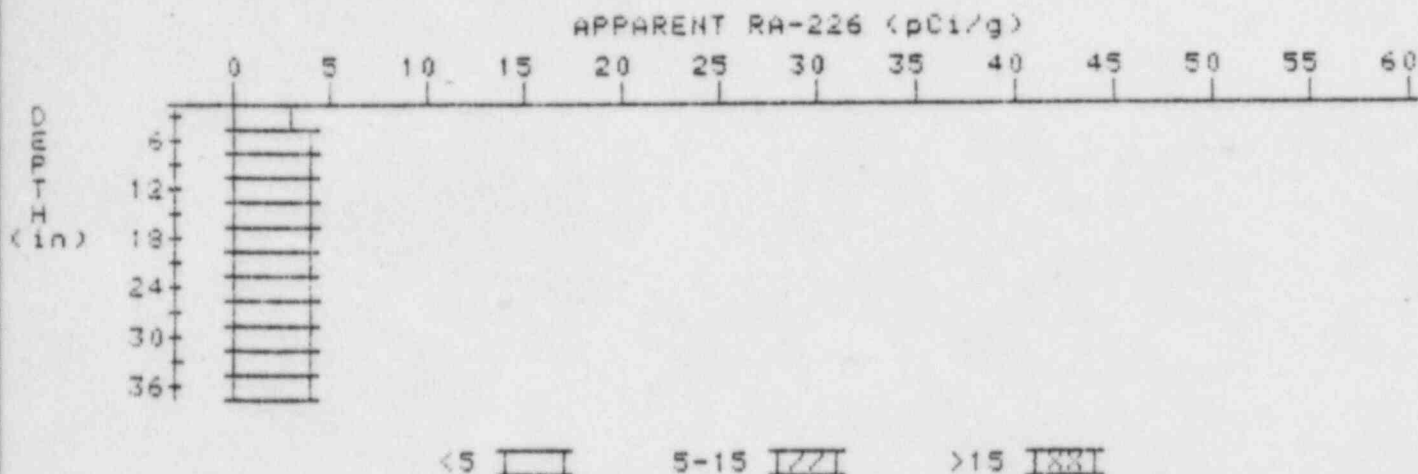
LOCATION: 268263



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.3	4.3
6	4.4	4.8
9	4.3	4.3
12	4.2	4.2
15	4.1	4.1
18	4.0	3.8
21	4.0	4.0
24	4.0	4.0
27	4.0	4.0
30	4.0	4.2
33	3.9	3.7
36	3.9	4.1
39	3.8	3.8

APPARENT RADIUM-226 CONCENTRATION 18 DECONVOLUTION GRAPH

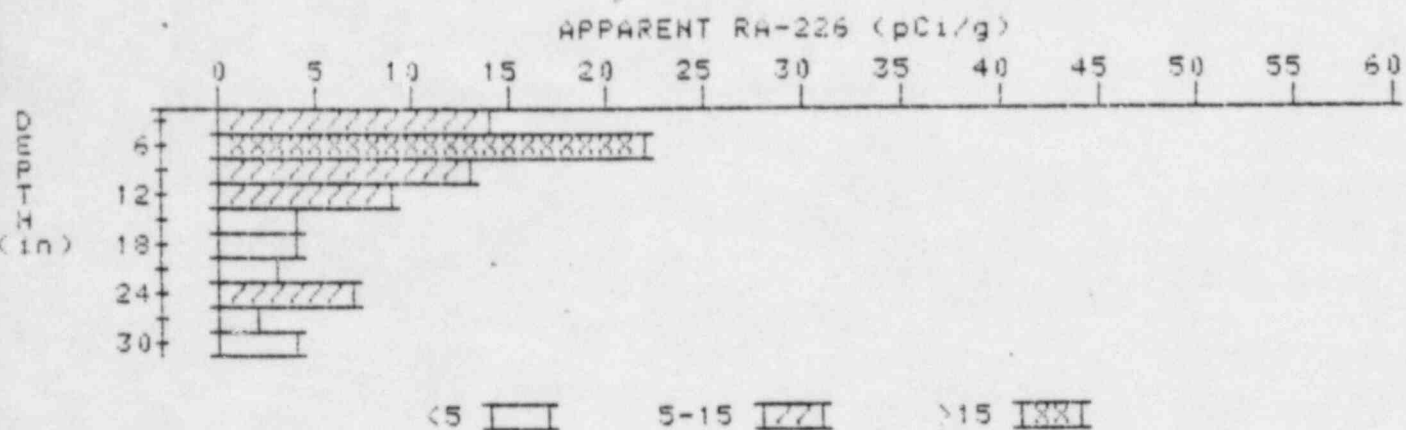
PROPERTY NUMBER: GJ-10342-RS
HOLE NUMBER: 18
LOCATION: 269222



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.6	4.0
9	3.7	3.5
12	3.9	4.1
15	4.0	4.2
18	4.0	4.0
21	4.0	4.0
24	4.0	4.0
27	4.0	3.8
30	4.1	4.5
33	4.0	3.8
36	4.0	4.0

APPARENT RADIUM-226 CONCENTRATION 20 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-10342-RS
 HOLE NUMBER: 20
 LOCATION: 282233



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	13.5	13.5
6	15.0	22.1
9	12.5	13.4
12	9.5	9.0
15	6.8	4.3
18	5.5	4.3
21	4.9	3.5
24	5.1	7.1
27	4.2	2.4
30	4.3	4.3