

**RADIOLOGIC AND ENGINEERING ASSESSMENT**

FOR

DOE ID NO.: GJ-00491-RS  
ADDRESS: 704 GALAXY DRIVE

JUNE 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION  
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*June 14, 1985*

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REA00491:REA-35/KL

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## **1.0 EXECUTIVE SUMMARY**

### **1.1 Introduction**

The location, DOE ID No. GJ-00491-RS, is a single-family residence located at 704 Galaxy Drive, 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, 190 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$18,000. Remedial action on this property will take approximately 30 days to complete.

Contamination in the northeast and southeast corners of the crawl space (Area A) had been involved in remedial action under the GJRAP Program and is not included in this contract.

## 2.0 PROPERTY DESCRIPTION

### 2.1 General Description

Address: 704 Galaxy Drive, Grand Junction, Colorado

Zoning: Residential (R1B)

Lot Size: Approximately 19,655 sf (0.45 acres)

Legal Description: Lot 2 Blk 2 Galaxy Subdivision, Sec 35 1N 1W, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 6 miles north of the State of Colorado Tailings Repository. Appendix Figure 2.1 shows the property location relative to its surroundings.

Utilities: Utility locations are shown in Appendix Figure 2.2.

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

Bordering Properties:

North:	Single-family residence
South:	Single-family residence
East:	Single-family residence
West:	Galaxy Drive

### 2.2 Existing Facilities and Structures

Primary Structure:

Type:	Multi-level, single-family residence
Size:	Approximately 4,664 sf
Construction Date:	1964
Construction:	Brick-masonry and wood-frame
Foundation:	Concrete stemwall on concrete footer
Footing Depth:	Approximately 48" to bottom of footing from grade
Basement:	Walk out to grade on east
Crawl Space:	West side of structure
Condition:	Good/average maintenance



Other Structures:

Type:	Utility-storage shed
Size:	Approximately 97 sf
Construction:	Metal panel/utility type
Foundation:	Wood-on-grade
Condition:	Fair to 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-00491-RS on March 6, 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 that elevated gamma readings were observed in the yard east of the primary structure. Tailings were removed from the property in 1974 under the GJRA Program.

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

#### **3.2 Gamma Exposure-Rate Surveys**

##### **3.2.1 Exterior Findings**

Background Readings: 12 to 15 uR/h  
Highest Outside Gamma Reading (HOG): 272 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 15 uR/h  
Highest Inside Gamma Reading (HIG): 24 uR/h

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

### 3.3 Boreholes, Soil Samples, and Other Measurements

Areas which displayed elevated gamma levels were further investigated; these areas are shown in Appendix Figures 3.3a 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) The northeast and southeast corners of the crawl space footing have contaminated debris on them approximately 1 inch thick. This area had been involved in remedial action under the GJRAP Program (removal not included in project).
- (AREA B) A deposit in the lawn which abuts the north property line is contaminated to a depth of 12 inches (approximately 400 sf).
- (AREA C) A small portion of the yard that underlies part of the north wooden deck is contaminated to an estimated total depth of 18 inches, based on data collected in Area D (approximately 33 sf).
- (AREA D) A deposit in the lawn northeast of the primary structure is contaminated to a depth of 18 inches (approximately 140 sf).
- (AREA E) Under the north wooden deck there is a deposit of contaminated soil which extends to an estimated depth of 33 inches, based on data collected in Area I (approximately 28 sf).
- (AREA F) Under the north wooden deck, and under a possibly contaminated 4-inch-thick concrete slab, there is contamination to a total estimated depth of 33 inches, based on data collected in Area I (approximately 25 sf).
- (AREA G) A deposit in the soil northeast of the primary structure, contiguous to Area I and abutting Area D, is contaminated to a depth of 12 inches (approximately 80 sf).

- (AREA H) In the lawn east of the primary structure and abutting Area I, there is contamination to a depth of 6 inches (approximately 35 sf).
- (AREA I) Northeast and east of the north deck, there is contamination extending to a depth of 33 inches (approximately 308 sf).
- (AREA J) East of the primary structure, there is contamination to a depth of 30 inches (approximately 524 sf).
- (AREA K) A deposit that underlies the middle section of the wooden deck is contaminated to a total estimated depth of 30 inches, based on data collected in Area J (approximately 112 sf).
- (AREA L) A small area in the southeast property corner is contaminated to a depth of 9 inches (approximately 15 sf).
- (AREA M) A small section of lawn in the southeast property corner is contaminated to a depth of 12 inches (approximately 40 sf).
- (AREA N) A deposit in the southeast corner of the property is contaminated to a depth of 36 inches (approximately 108 sf).
- (AREA O) A small area east of the southern deck is contaminated to a depth of 6 inches (approximately 24 sf).
- (AREA P) East of the southeast brick sidewalk, there is contamination to a depth of 6 inches (approximately 128 sf).
- (AREA Q) There is a deposit near the southeast corner of the primary structure. The estimated depth of contamination is 12 inches, based on data collected in Area R (approximately 24 sf).
- (AREA R) A deposit which is adjacent to the southeast fence is contaminated to a depth of 12 inches (approximately 90 sf).
- (AREA S) South of Area R, there is contamination to a depth of 6 inches (approximately 60 sf).
- (AREA T) A small deposit south of Area Q is contaminated to a depth of 6 inches (approximately 18 sf).
- (AREA U) An area adjacent to the east side of the metal shed is contaminated to a depth of 12 inches (approximately 64 sf).
- (AREA V) A section of yard that abuts the south wall of the attached garage is contaminated to a depth of 39 inches (approximately 110 sf).

(AREA W) Two deposits that underlie the uncontaminated 4-inch-thick concrete driveway are contaminated to a total depth of 30 inches (approximately 159 sf).

(AREA X) An area that is adjacent to the driveway is contaminated to a depth of 30 inches (approximately 16 sf).

(AREAS REQUIRING FURTHER INVESTIGATION DURING REMEDIAL ACTION)

- Area C, E, F, and K underlie wooden decking. The depths of contamination are estimates based on surrounding areas. Because of this, the removal should be monitored carefully to ensure that only contaminated materials are removed.



#### 4.0 RECOMMENDED REMEDIAL ACTION

##### 4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-00491-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 \$18,060.

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 3.4	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

DOE ID #GJ-00491-RS

704 Galaxy Drive

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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.		
19	132195	06	DS	2.0		*	Horizontal under driveway
20	140160	00	DS	1.5		*	Background DC = 0 inches
		00-06	SS			2.4	
		03	TC	3.4		*	
		06	TC	3.9		*	
		09	TC	4.3		*	
		12	BH	4.4	<1.0	*	
		15	TC	4.3		*	
		18	TC	4.3		*	
		21	TC	4.3		*	
		24	BH	4.4	1.5	*	
		27	TC	4.4		*	
		30	TC	4.3		*	
		33	TC	4.3		*	
21	145188	03	TC	19.3		*	Front yard planter DC = 30 inches Based on the deconvolution graph
		06	TC	29.2		*	
		09	TC	48.0		*	
		12	BH	81.5	93.1	*	
		15	TC	131.2		*	
		18	TC	156.9		*	
		21	TC	146.2		*	
		24	BH	99.4	62.1	*	
		27	TC	57.2		*	
		30	TC	34.2		*	
		33	TC	22.6		*	
		36	TC	16.8		*	
		39	TC	13.4		*	
		42	TC	11.7		*	
		45	TC	10.6		*	
		48	BH	9.7	6.4	*	
		51	TC	9.2		*	
		54	TC	8.9		*	
		57	TC	8.7		*	
		60	BH	8.4	5.2	*	
		63	TC	8.6		*	
		66	TC	8.2		*	
		69	TC	8.0		*	
		72	TC	7.7		*	
		75	TC	7.4		*	
		78	TC	7.1		*	
		81	TC	6.5		*	

## 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.		
21	145188	84	BH	6.2	3.3	*	
		87	TC	6.2		*	
		90	TC	6.2		*	
		93	TC	6.8		*	
22	148194	00	DS	7.7		*	Driveway
		00-04	SS			1.4	Concrete core
		05-12	SS			31.5	Soil
		03	TC	18.2		*	DC = 30 inches
		06	TC	32.2		*	Based on the
		09	TC	55.2		*	deconvolution graph
		12	TC	94.6		*	
		15	TC	147.2		*	
		18	TC	166.7		*	
		21	TC	153.6		*	
		24	TC	117.1		*	
		27	TC	70.0		*	
		30	TC	42.0		*	
		33	TC	28.2		*	
		36	TC	19.8		*	
		39	TC	15.9		*	
		42	TC	13.9		*	
		45	TC	12.6		*	
		48	TC	11.4		*	
		51	TC	10.6		*	
		54	TC	9.8		*	
		57	TC	9.2		*	
		60	TC	8.8		*	
		63	TC	8.7		*	
		66	TC	8.4		*	
		69	TC	8.4		*	
		72	TC	8.1		*	
		75	TC	7.6		*	
		78	TC	7.0		*	
		81	TC	6.4		*	
		84	TC	6.0		*	
		87	TC	5.9		*	
		90	TC	6.1		*	
23	150250	03	TC	2.9		*	Front yard
		06	TC	3.5		*	DC = 0 inches
		09	TC	4.1		*	
		12	TC	4.2		*	

## 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.		
23	150250	15	TC	3.9		*	
		18	TC	3.7		*	
		21	TC	3.6		*	
		24	TC	3.8		*	
		27	TC	4.0		*	
		30	TC	4.2		*	
		33	TC	4.1		*	
		36	TC	4.1		*	
24	157180	06	DS	1.8		*	Horizontal under driveway
25	157208	06	DS	2.8		*	Horizontal under driveway
26	175190	00	DS	8.1		*	Driveway by garage
		00-04	SS			2.1	Core
		04-12	SS			23.2	Soil
		03	TC	41.1		*	Auger refusal
		06	TC	62.7		*	Hit footing
		09	TC	93.7		*	DC = >24 inches
		12	BH	119.1	105.1	*	
		15	TC	133.3		*	
		18	TC	133.0		*	
		21	TC	140.3		*	
		24	BH	142.1	150.2	*	
27	179184	03	TC	10.7		*	Southwest corner
		06	BH	9.7	9.3	*	of house
		09	TC	8.3		*	DC = 39 inches
		12	BH	7.7	6.2	*	Based on the
		15	TC	8.1		*	deconvolution graph
		18	TC	8.9		*	
		21	TC	10.9		*	
		24	BH	15.0	10.1	*	
		27	TC	22.7		*	
		30	TC	31.6		*	
		33	TC	39.3		*	
		36	BH	30.2	36.4	*	
		39	TC	17.4		*	
		42	TC	11.6		*	
		45	TC	8.3		*	
		48	BH	6.7	4.4	*	
		51	TC	6.1		*	

## 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.		
28	179211	03	TC	3.0		*	Water line DC = 0 inches
		06	TC	2.9		*	
		09	TC	3.1		*	
		12	TC	3.4		*	
		15	TC	3.6		*	
		18	TC	3.9		*	
		21	TC	3.9		*	
		24	TC	4.0		*	
		27	TC	3.9		*	
29	182167	00	DS	3.1		*	Near wood pile at south end of house
		06	DS	2.3		*	
30	182175	00	DS	2.7		*	Between wood piles
		06	DS	2.3		*	
31	183261	03	TC	3.6		*	Gas line DC = 0 inches
		06	TC	3.9		*	
		09	TC	4.2		*	
		12	TC	4.2		*	
		15	TC	4.4		*	
		18	TC	4.4		*	
		21	TC	4.5		*	
		24	TC	4.5		*	
		27	TC	4.5		*	
		30	TC	4.4		*	
		33	TC	4.3		*	
		36	TC	4.3		*	
		39	TC	4.2		*	
		42	TC	4.1		*	
		45	TC	4.1		*	
		48	TC	4.1		*	
		51	TC	4.1		*	
		54	TC	4.1		*	
		57	TC	4.3		*	
32	195175	60	TC	4.3		*	Under metal shed Horizontal
		63	TC	4.4		*	
		66	TC	4.4		*	
		69	TC	4.2		*	



## 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.		
33	200177	00	DS	2.3		*	East of metal
		06	DS	2.4		*	shed
		12	DS	2.5		*	DC = 12 inches
		03	TC	5.0		*	Based on the
		06	TC	5.6		*	deconvolution graph
		09	TC	5.4		*	
		12	TC	4.8		*	
		15	TC	4.9		*	
		18	TC	4.5		*	
		21	TC	4.5		*	
		24	TC	4.7		*	
		27	TC	4.6		*	
		30	TC	4.6		*	
		33	TC	4.6		*	
34	200290	00	DS	1.5		*	By chain link fence
							North of house
35	206294	00	DS	4.2		*	North side by
		06	DS	4.0		*	gate
		12	DS	1.6		*	DC = 12 inches
36	209261	03	TC	3.8		*	Sewer line
		06	TC	3.9		*	DC = 0 inches
		09	TC	4.0		*	
		12	TC	4.1		*	
		15	TC	4.1		*	
		18	TC	4.1		*	
		21	TC	4.0		*	
		24	TC	4.1		*	
		27	TC	4.0		*	
		30	TC	3.9		*	
		33	TC	3.9		*	
		36	TC	3.9		*	
		39	TC	4.0		*	
		42	TC	4.0		*	
		45	TC	4.0		*	
		48	TC	4.0		*	
		51	TC	4.0		*	
		54	TC	3.9		*	
		57	TC	4.0		*	
		60	TC	3.9		*	
		63	TC	3.8		*	

## 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.		
36	209261	66	TC	3.8		*	
		69	TC	3.6		*	
		72	TC	3.6		*	
37	212300	00	DS	8.6		*	Between fences North of house
38	212303	00	DS	1.7		*	Between fences North of house
39	220295	03	TC	5.9		*	DC = 12 inches Based on the deconvolution graph
		06	TC	5.9		*	
		09	TC	5.3		*	
		12	TC	5.0		*	
		15	TC	4.7		*	
		18	TC	4.6		*	
		21	TC	4.5		*	
		24	TC	4.5		*	
		27	TC	4.4		*	
		30	TC	4.4		*	
		33	TC	4.3		*	
		36	TC	4.2		*	
		39	TC	4.3		*	
		42	TC	4.2		*	
		45	TC	4.3		*	
		48	TC	4.3		*	
		51	TC	4.3		*	
		54	TC	4.2		*	
		57	TC	4.4		*	
		60	TC	4.4		*	
		63	TC	4.3		*	
		66	TC	4.3		*	
		69	TC	4.3		*	
		72	TC	4.4		*	
		75	TC	4.4		*	
		78	TC	4.3		*	
		81	TC	4.2		*	
		84	TC	4.1		*	
		87	TC	4.0		*	
		90	TC	4.1		*	
		93	TC	4.1		*	
		96	TC	4.0		*	
40	223240	00	DS	1.5		*	Wood deck

## Radium Concentrations at Exterior Locations

DOE ID #GJ-00491-RS

704 Galaxy Drive

Page 7 of 12

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
41	223260	00	DS	<1.0		*	Back patio
42	224192	03	TC	3.7		*	Southeast corner of house DC = 0 inches
		06	TC	3.9		*	
		09	TC	3.9		*	
		12	TC	4.0		*	
		15	TC	3.9		*	
		18	TC	3.9		*	
		21	TC	4.1		*	
		24	TC	4.1		*	
		27	TC	4.1		*	
		30	TC	4.0		*	
43	226205	00	DS	1.5		*	
44	226270	00	DS	3.6		*	Northeast of house DC = 18 inches
		06	DS	4.6		*	
		12	DS	3.0		*	
		18	DS	<1.0		*	
45	230230	00	DS	2.3		*	Back patio
46	230240	00	DS	3.7		*	
47	230285	00	DS	4.4		*	Northeast of house West of fence DC = 12 inches
		06	DS	3.6		*	
		12	DS	1.9		*	
48	232178	00	DS	2.1		*	Southeast of house
49	232275	00	DS	1.9		*	North of house
50	232300	00	DS	6.2		*	North of property DC = 54 inches Based on the deconvolution graph
		06	DS	5.1		*	
		12	DS	7.3		*	
		03	TC	6.0		*	
		06	TC	6.7		*	
		09	TC	7.6		*	
		12	TC	8.9		*	
		15	TC	10.5		*	
		18	TC	12.8		*	
		21	TC	15.7		*	
		24	TC	17.8		*	
		27	TC	17.5		*	

## Radium Concentrations at Exterior Locations

DOE ID #GJ-00491-RS

704 Galaxy Drive

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.		
50	232300	30	TC	15.4		*	
		33	TC	13.7		*	
		36	TC	12.7		*	
		39	TC	13.9		*	
		42	TC	16.8		*	
		45	TC	19.1		*	
		48	TC	17.7		*	
		51	TC	14.1		*	
		54	TC	11.2		*	
		57	TC	9.9		*	
		60	TC	8.7		*	
		63	TC	7.6		*	
51	232303	00	DS	15.4		*	Off property
52	234184	00	DS	3.7		*	Backyard
		06	DS	2.7		*	
53	234258	00	DS	3.6		*	Wood patio
54	235225	00	DS	1.4		*	Back patio
55	235235	00	DS	10.2		*	Wood patio
56	236267	18	DS	4.3		*	Horizontal under deck
57	237215	00	DS	2.8		*	Backyard 2 ft
		06	DS	1.3		*	from patio
58	237296	00	DS	3.4		*	Near north property line
59	237257	06	DS	3.7		*	Under patio
60	238288	00	DS	1.7		*	North by fence
61	240280	00	DS	<1.0		*	Northeast of house
62	240296	00	DS	<1.0		*	
63	241262	03	TC	103.0		*	Next to wood deck
		06	TC	128.2		*	
		09	TC	137.5		*	

## Radium Concentrations at Exterior Locations

DOE ID #GJ-00491-RS

704 Galaxy Drive

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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.		
63	241262	12	TC	136.0		*	DC = 33 inches Based on the deconvolution graph
		15	TC	125.7		*	
		18	TC	113.5		*	
		21	TC	102.0		*	
		24	TC	92.8		*	
		27	TC	76.4		*	
		30	TC	52.7		*	
		33	TC	29.1		*	
		36	TC	16.6		*	
		39	TC	10.7		*	
		42	TC	8.3		*	
		45	TC	6.5		*	
		48	TC	6.1		*	
		51	TC	5.9		*	
		54	TC	6.2		*	
		57	TC	6.1		*	
		60	TC	6.3		*	
		63	TC	6.4		*	
		66	TC	7.1		*	
64	242208	00	DS	4.4		*	Backyard 10 ft from patio
		06	DS	1.7		*	
65	243184	00	DS	4.4		*	Southeast of house Backyard DC = 12 inches Based on the deconvolution graph
		03	TC	6.5		*	
		06	TC	6.3		*	
		09	TC	5.8		*	
		12	TC	5.3		*	
		15	TC	4.9		*	
		18	TC	4.7		*	
		21	TC	4.5		*	
		24	TC	4.4		*	
		27	TC	4.4		*	
		30	TC	4.3		*	
		33	TC	4.4		*	
		36	TC	4.4		*	
		39	TC	4.3		*	
		42	TC	4.3		*	
		45	TC	4.3		*	
		48	TC	4.4		*	
		51	TC	4.3		*	
		54	TC	4.3		*	
		57	TC	4.2		*	
		60	TC	4.2		*	
		63	TC	4.1		*	

## Radium Concentrations at Exterior Locations

DOE ID #GJ-00491-RS

704 Galaxy Drive

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.		
65	243184	66	TC	4.1		*	
		69	TC	4.0		*	
		72	TC	4.0		*	
		75	TC	4.0		*	
		78	TC	4.0		*	
		81	TC	3.9		*	
		84	TC	3.9		*	
		87	TC	3.9		*	
		90	TC	3.9		*	
		93	TC	3.9		*	
66	244239	03	TC	83.4		*	Next to wood deck DC = 30 inches Based on the deconvolution graph
		06	TC	105.5		*	
		09	TC	116.9		*	
		12	BH	123.2	126.0	*	
		15	TC	120.3		*	
		18	BH	112.4	128.9	*	
		21	TC	103.2		*	
		24	TC	82.4		*	
		27	TC	55.4		*	
		30	BH	37.1	51.6	*	
		33	TC	23.1		*	
		36	TC	16.3		*	
		39	TC	12.0		*	
		42	TC	10.3		*	
		45	TC	9.0		*	
		48	TC	8.2		*	
		51	TC	7.6		*	
		54	TC	7.1		*	
		57	TC	7.0		*	
		60	BH	6.8	6.0	*	
		63	TC	7.0		*	
		66	TC	7.3		*	
		69	TC	7.2		*	
		72	TC	7.6		*	
67	245197	00	DS	2.3		*	Fence east of house
68	249218	03	TC	6.1		*	Backyard DC = 30 inches Based on the deconvolution graph
		06	BH	6.2	3.9	*	
		09	TC	6.3		*	
		12	TC	6.1		*	
		15	TC	6.1		*	



## Radium Concentrations at Exterior Locations

DOE ID #GJ-00491-RS

704 Galaxy Drive

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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.		
68	249218	18	TC	6.1		*	
		21	TC	6.1		*	
		24	BH	5.8	4.5	*	
		27	TC	5.6		*	
		30	TC	5.4		*	
		33	TC	5.3		*	
		36	TC	5.1		*	
		39	TC	5.0		*	
		42	TC	4.9		*	
		45	TC	4.8		*	
		48	TC	4.7		*	
		51	TC	4.5		*	
		54	TC	4.4		*	
		57	TC	4.3		*	
		60	TC	4.3		*	
		63	TC	4.3		*	
		66	TC	3.8		*	
		69	TC	4.2		*	
		72	TC	4.2		*	
69	250163	00	DS	4.0		*	By fence east of
		06	DS	1.2		*	house
70	250175	00	DS	2.3		*	Along back fence
		06	DS	2.1		*	
71	250273	00	DS	5.2		*	Backyard
		06	DS	3.6		*	
		12	DS	2.2		*	
72	255209	03	TC	21.6		*	Backyard
		06	TC	31.3		*	DC = 36 inches
		09	TC	50.9		*	Based on the
		12	BH	87.3	116.3	*	deconvolution graph
		15	TC	124.3		*	
		18	TC	149.4		*	
		21	TC	157.3		*	
		24	BH	150.3	147.2	*	
		27	TC	129.3		*	
		30	TC	89.6		*	
		33	TC	54.9		*	
		36	BH	30.6	19.5	*	
		39	TC	19.7		*	
		42	TC	13.3		*	

## Radium Concentrations at Exterior Locations

DOE ID #GJ-00491-RS

704 Galaxy Drive

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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.		
72	255209	45	TC	10.5		*	
		48	TC	8.4		*	
		51	TC	7.2		*	
		54	TC	6.5		*	
		57	TC	6.1		*	
		60	BH	5.6	3.4	*	
		63	TC	5.6		*	
		66	TC	5.1		*	
		69	TC	4.8		*	
		72	TC	4.5		*	
		75	TC	4.4		*	
73	260260	00	DS	2.6		*	Backyard
		06	DS	1.3		*	
74	261220	00	DS	1.5		*	Backyard
75	262252	00	DS	<1.0		*	Backyard
76	268205	00	DS	3.0		*	Backyard 17 ft from
		06	DS	5.4		*	corner of fence
		12	DS	1.0		*	
77	268210	00	DS	3.5		*	East of house
		06	DS	5.2		*	DC = 9 inches
		03	TC	5.4		*	Based on the
		06	TC	5.6		*	deconvolution graph
		09	TC	5.0		*	
		12	TC	4.4		*	
		15	TC	4.0		*	
		18	TC	3.7		*	
		21	TC	3.7		*	
		24	TC	3.5		*	
		27	TC	3.4		*	
		30	TC	3.5		*	
		33	TC	3.6		*	
		36	TC	3.7		*	

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 = 03-06-85  
 Team Leader = TRU

## Radium Concentrations at Interior Locations

DOE ID #GJ-00491-RS

704 Galaxy Drive

Page i of 2

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
1		[12]	DS	<1.0		*	On cinder block wall
2		[10]	DS	1.7		*	Concrete footing
		[10-11]	SS			2.1	Concrete chips and dust
3		[10]	DS	3.7		*	Wood storage bin
		[10-11]	SS			3.6	Concrete chips and dust
4		[10]	DS	<1.0		*	Approx. 7.5/ft from storage bin on footing
5		[10]	DS	<1.0		*	Under stairwell On footing
6		[10]	DS	<1.0		*	Between entrance & south wall
7		[10]	DS	8.1		*	Footing
		[10-11]	SS			106.7	Concrete chips and dust
8		[10]	DS	<1.0		*	South wall
9		[10]	DS	<1.0		*	On footing
10		[10]	DS	<1.0		*	East wall On footing
11		[10]	DS	<1.0		*	Middle east wall On footing
12		[10]	DS	<1.0		*	Middle east wall On footing
13		[10]	DS	<1.0		*	On footing
14		[10]	DS	1.5		*	On footing
15		00	DS	1.3		*	Between concrete pads 5 and 6

## Radium Concentrations at Interior Locations

DOE ID #GJ-00491-RS

704 Galaxy Drive

Page 2 of 2

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
16		00	DS	1.6		*	4th concrete pad by south wall
17		00	DS	2.1		*	In front entrance
18		00	DS	1.9		*	1st concrete pad/south wall

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 = 03-06-85  
Team Leader = TRU

Table 3.3  
Summary of Interior Gamma Exposure Rates  
DOE ID #GJ-00491-RS      704 Galaxy Drive      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	00	-	-	24	14-24	16
GROUND LEVEL	*	*	*	*	12-15	*
GARAGE	*	*	*	*	12-14	*
METAL SHED	*	*	*	*	14-14	*

=====

\* The CDH and ORNL data indicated the absence of interior contamination at this property. This information was investigated by performing a walking gamma scan in the primary structure, garage, and shed. These areas and the ranges of gamma measurements are shown in in Appendix Figure 3.3b. Exposure rates in the crawl space are shown in Appendix Figure 3.3a.

Table 4.1  
Area and Volume Calculations  
DOE ID No. GJ-00491-RS

Page 1 of 2

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

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EXTERIOR

Concrete

W	28 x 44	=	1,232						
	-8 x 12	=	-96						
			1,136	x	0.3	=	341		
	Volume of Concrete					=	341	=	341/27 = 13

Contaminated Fill

B	10 x 40	=	400	x	1.0	=	400		
C	3 x 11	=	33	x	1.5	=	50		
D	7 x 20	=	140	x	1.5	=	210		
E	4 x 7	=	28	x	2.8	=	78		
F	5 x 5	=	25	x	2.8	=	70		
G	5 x 16	=	80	x	1.0	=	80		
H	5 x 7	=	35	x	0.5	=	18		
I	14 x 22	=	308	x	2.8	=	862		
J	13 x 20	=	260						
	12 x 7	=	84						
	10 x 18	=	180						
			524	x	2.5	=	1,310		
K	8 x 14	=	112	x	2.5	=	280		
L	6 x 2.5	=	15	x	0.8	=	12		
M	10 x 4	=	40	x	1.0	=	40		
N	12 x 9	=	108	x	3.0	=	324		
O	8 x 3	=	24	x	0.5	=	12		
P	8 x 16	=	128	x	0.5	=	64		



Table 4.1  
Area and Volume Calculations  
DOE ID No. GJ-00491-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>
Q	4 x 6 =	24	x 1.0 =	24	
R	10 x 9 =	90	x 1.0 =	90	
S	3 x 20 =	60	x 0.5 =	30	
T	6 x 3 =	18	x 0.5 =	9	
U	4 x 16 =	64	x 1.0 =	64	
V	10 x 11 =	110	x 3.3 =	363	
W	12 x 5 =	60			
	3 x 13 =	39			
	10 x 6 =	60			
		<u>159</u>	x 2.2 =	350	
X	8 x 2 =	16	x 2.5 =	40	
Volume of Contaminated Fill				= <u>4,780</u>	= 4,780/27 = <u>177</u>
TOTAL VOLUME - EXTERIOR					= <u>190</u>

See Appendix Figures 3.5a and 3.5b For Areas

=====

Table 4.2  
Estimated Cost of Decontamination and Restoration  
DOE ID No. GJ-00491-RS

Page 1 of 1

<b>EXTERIOR</b>		
Remove concrete paving		
1,136 sf @ \$1.48/sf	\$	1,681
Remove identified residual radioactive material		
142 cy @ \$14.50/cy (machine)		2,059
35 cy @ \$65/cy (manual)		2,275
Hand excavate three large trees within contaminated areas		
3 ea @ \$100/ea		300
Restore/replace concrete driveways		
1,136 sf @ \$1.50/sf		1,704
Restore/replace backfill material		
132 cy @ \$9/cy		1,188
Restore/replace water-settled topsoil		
45 cy @ \$10.50/cy		473
Restore/replace landscaping - sod		
1,900 sf @ \$.40/sf		760
Restore/replace landscaping - plantings (allowance)		600
Clean up (allowance)		500
Protection (allowance)		250
	TOTAL EXTERIOR	\$ 11,790
	TOTAL INTERIOR	0
	ACCESS CONTROL	250
	SUBTOTAL	\$ 12,040
	CONTINGENCY @ 20%	2,408
	SUBTOTAL	\$ 14,448
	CONTRACTOR OVERHEAD & PROFIT @ 25%	3,612
	GRAND TOTAL	\$ 18,060

=====

GV/061285  
REA00491.KL:KL009:MJP

DOE ID #  
00491

704 GALAXY DR.



Tailings Pile

FIGURE 2.1 VICINITY MAP



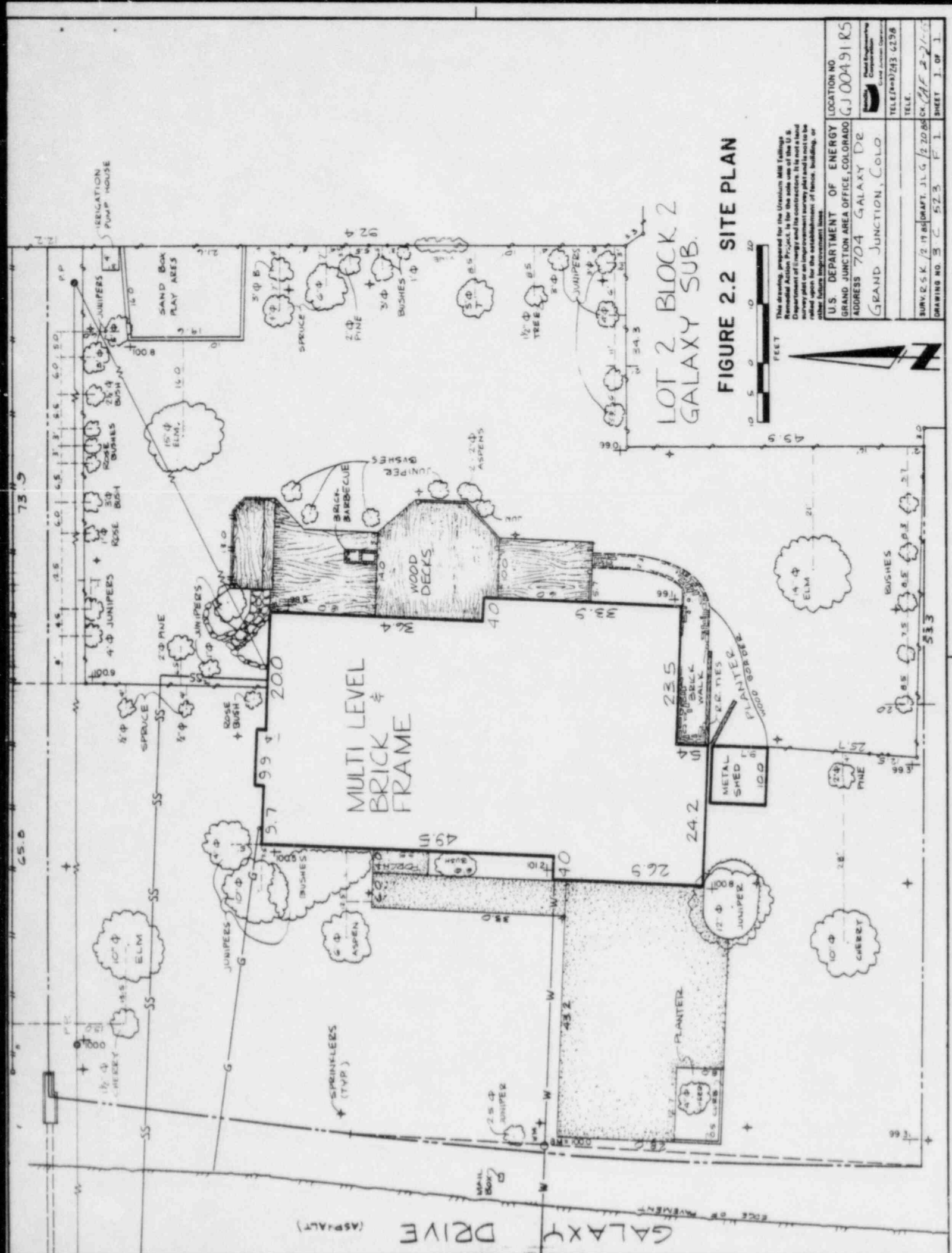
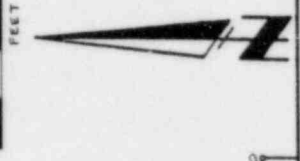


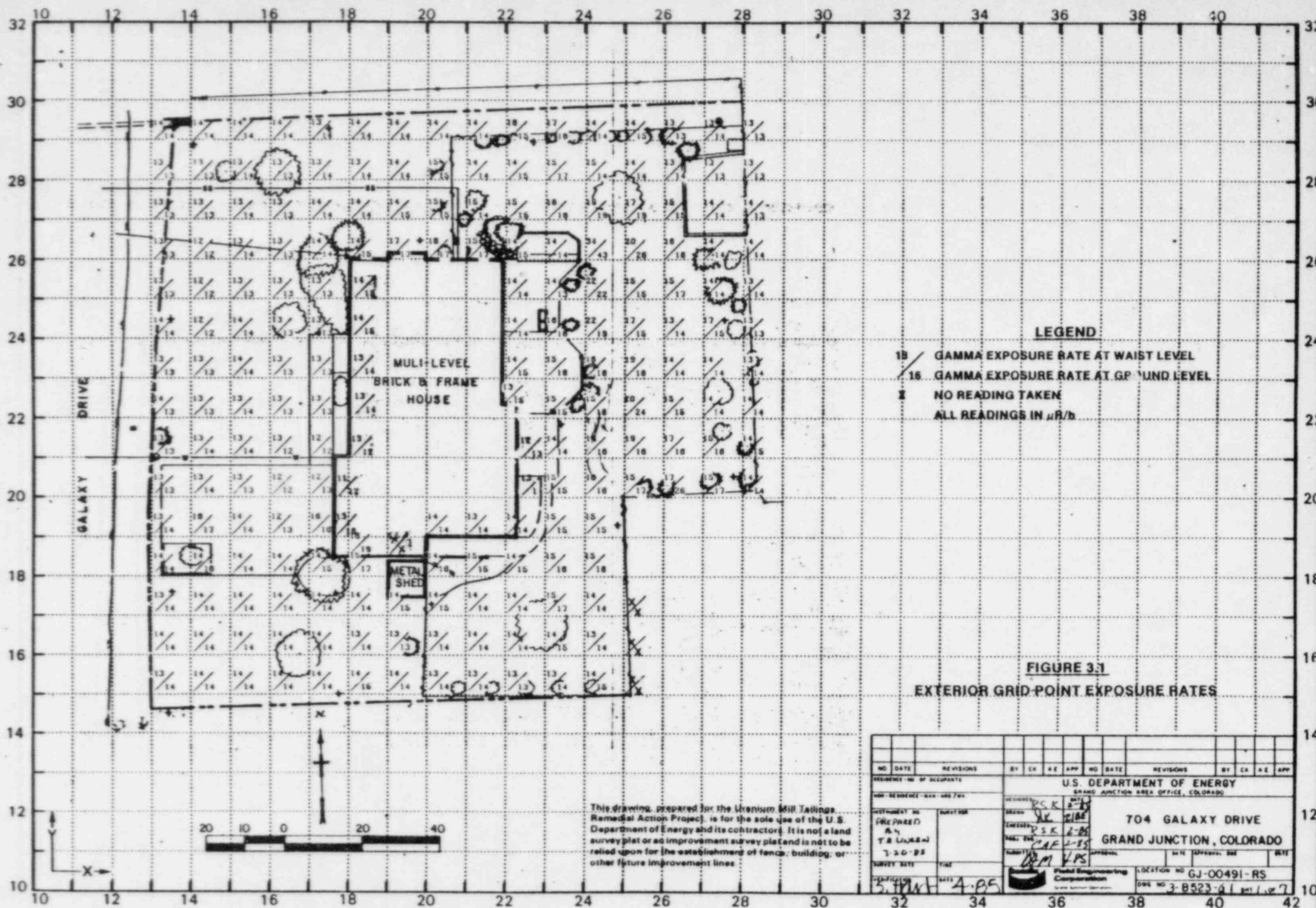
FIGURE 2.2 SITE PLAN

This drawing, prepared for the Utah State Office Building  
Remedial Action Project, is for the use of the U.S.  
Department of Energy and its contractors. It is not a land  
survey plan or an engineering drawing. It is not to be  
relied upon for the establishment of fence, building, or  
other future improvement lines.

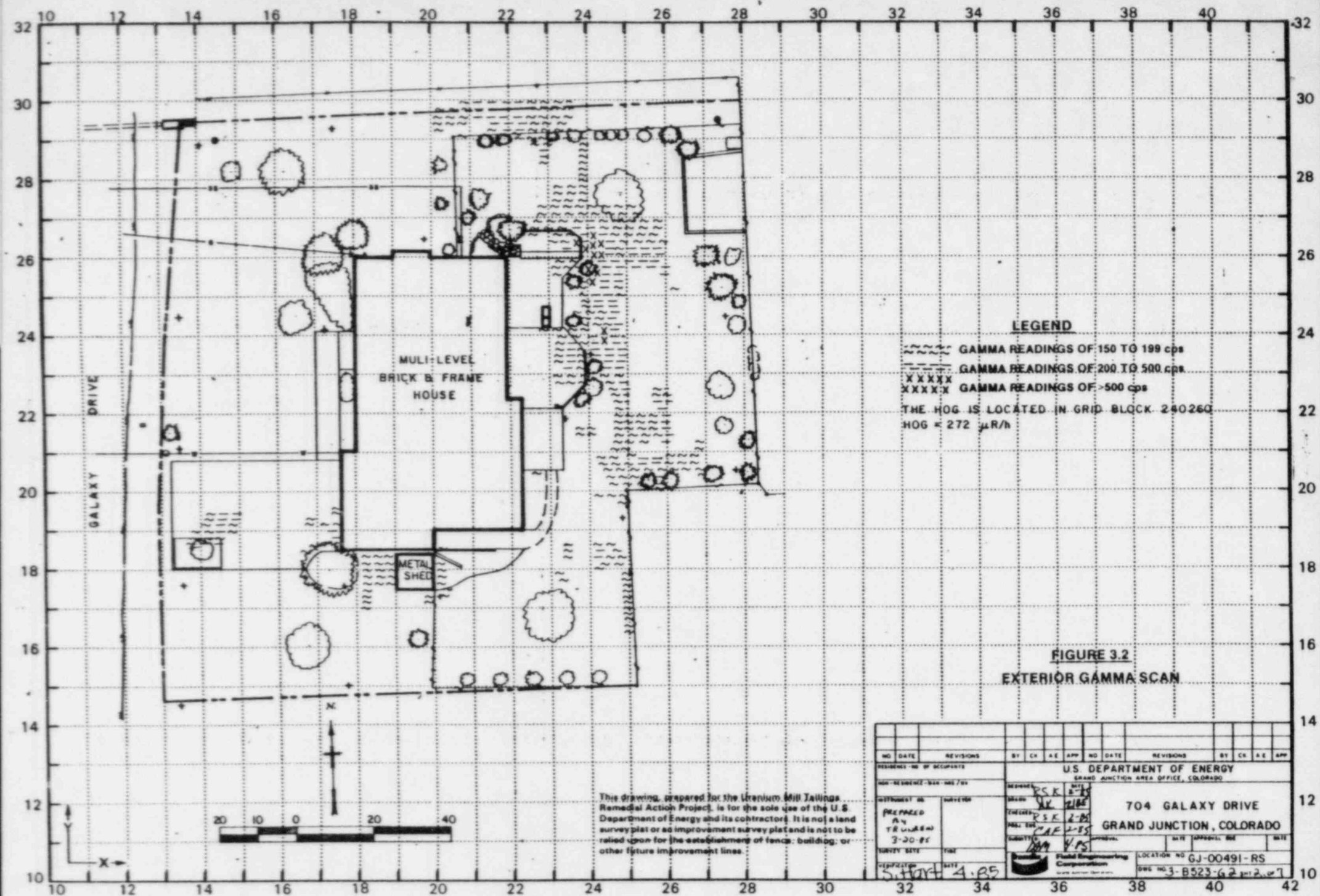


U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO ADDRESS 704 GALAXY DR GRAND JUNCTION, COLO.	LOCATION NO. GJ 00491 RS
TELE (303) 243 6298	TELE.
SURV. R. S. K. / 2 17 80 DRAFT. J. L. G. / 2 20 80	DATE
DRAWING NO. 3 C 523 F 1	SHEET 1 OF 1

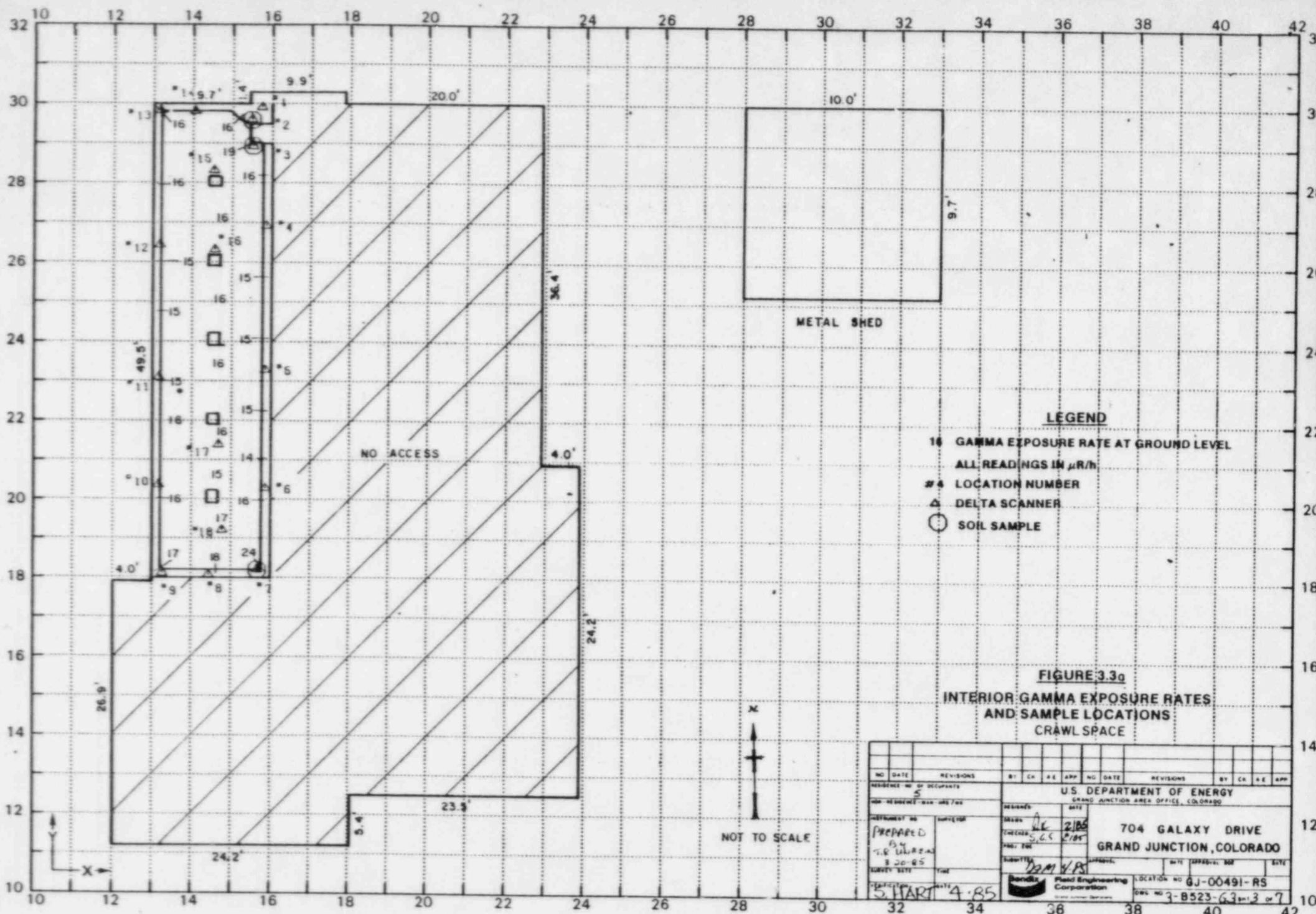


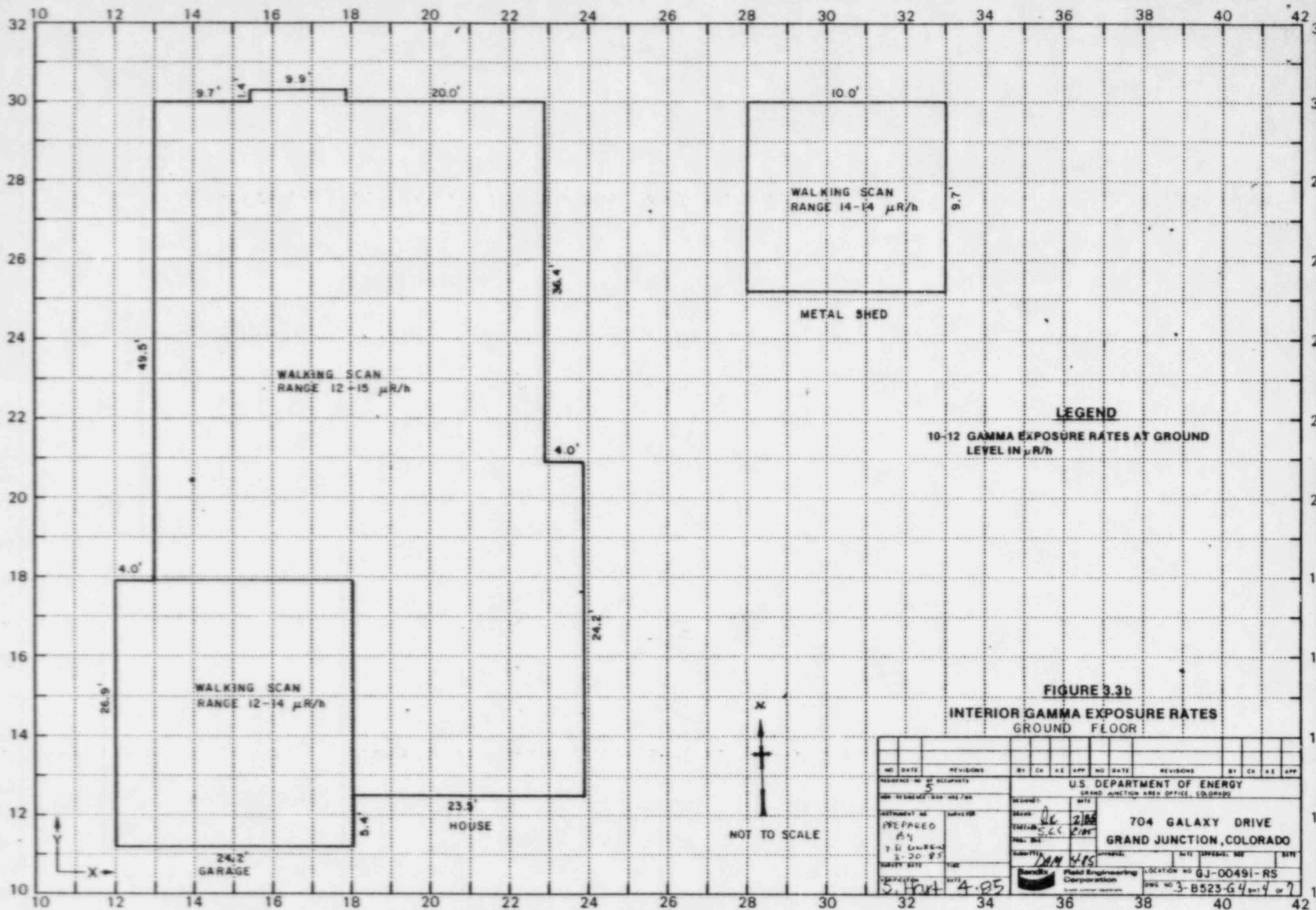


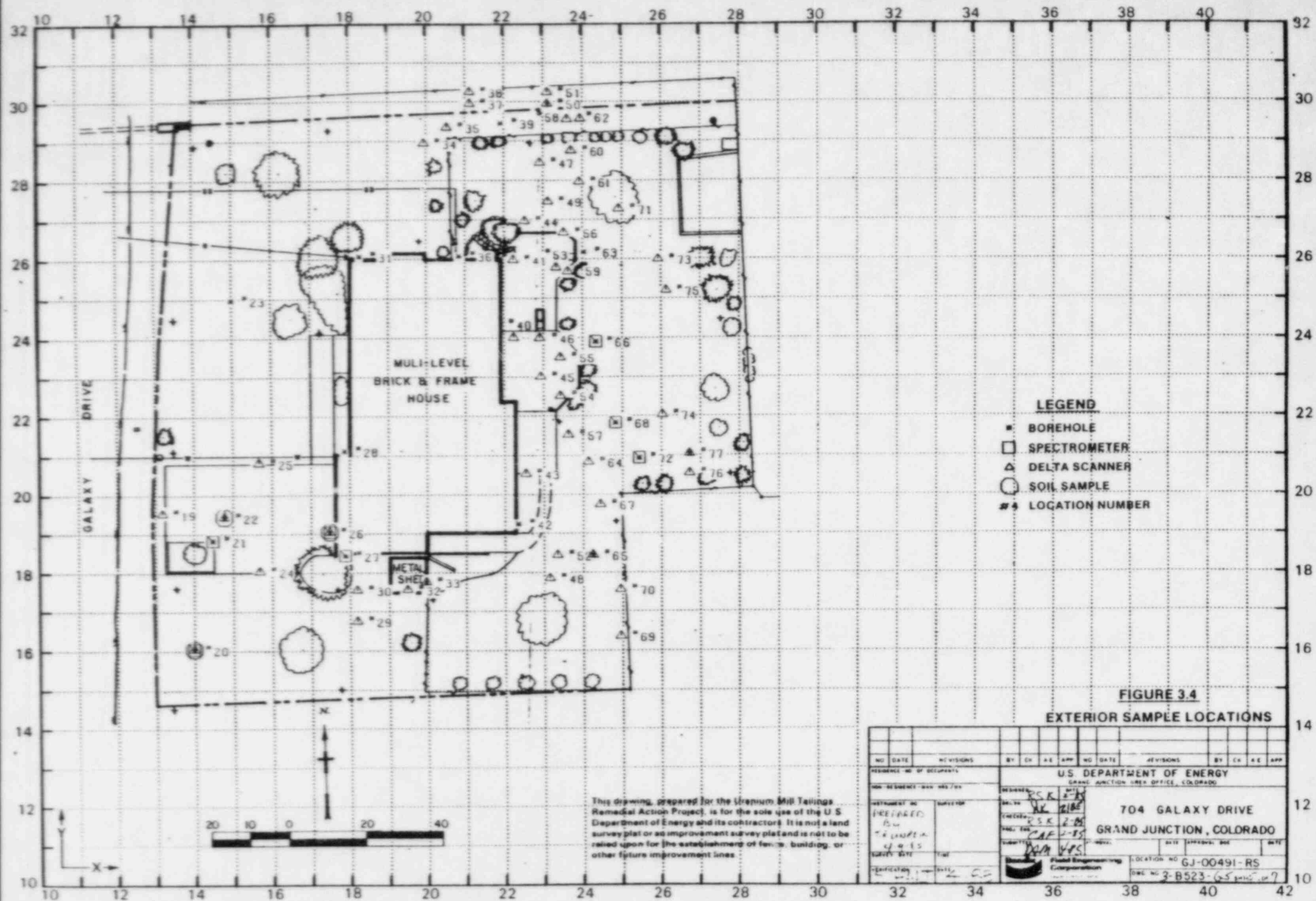
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U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO															
704 GALAXY DRIVE GRAND JUNCTION, COLORADO															
LOCATION NO. GJ-00491-RS															
DATE NO. 3-8523-01															

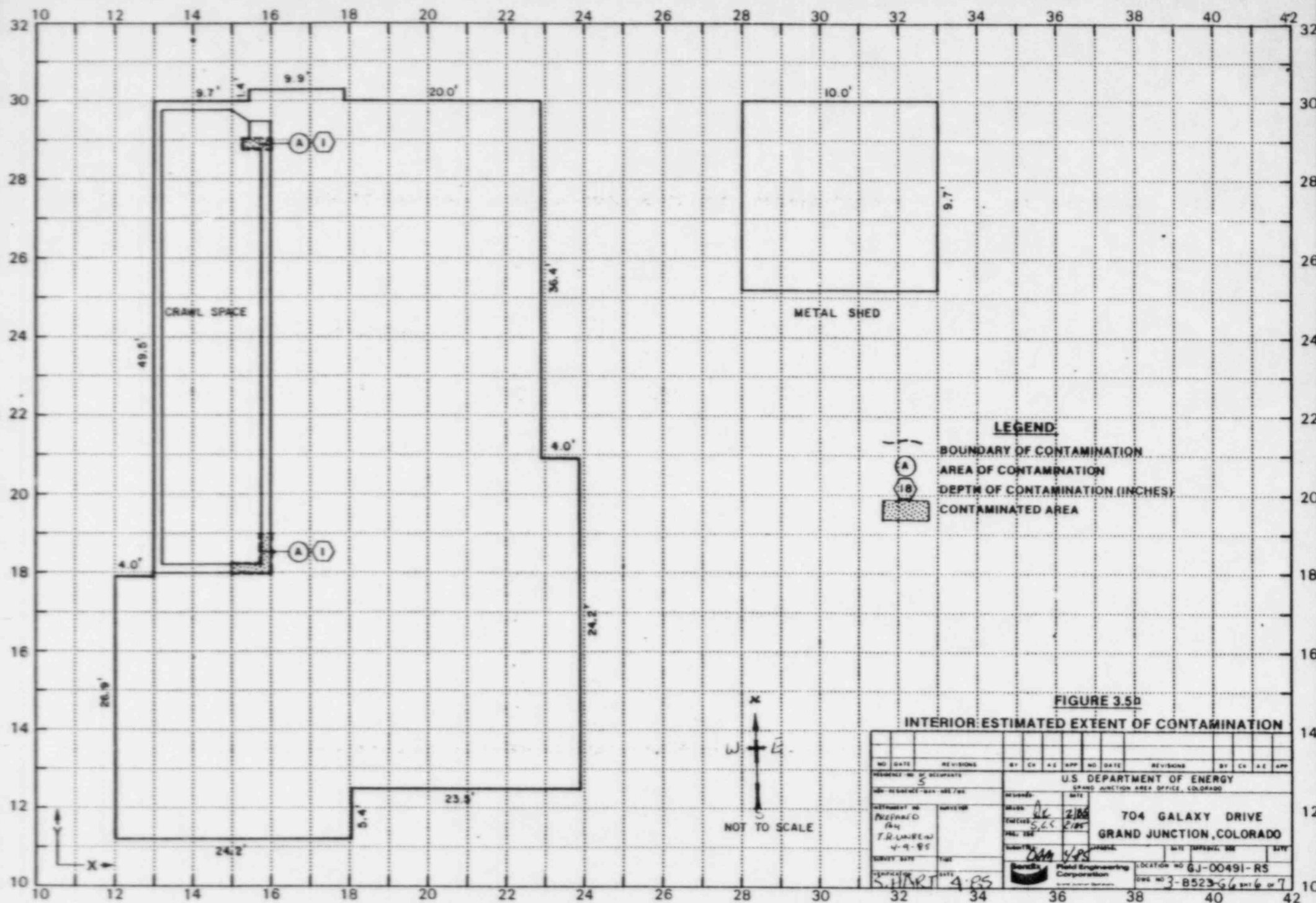




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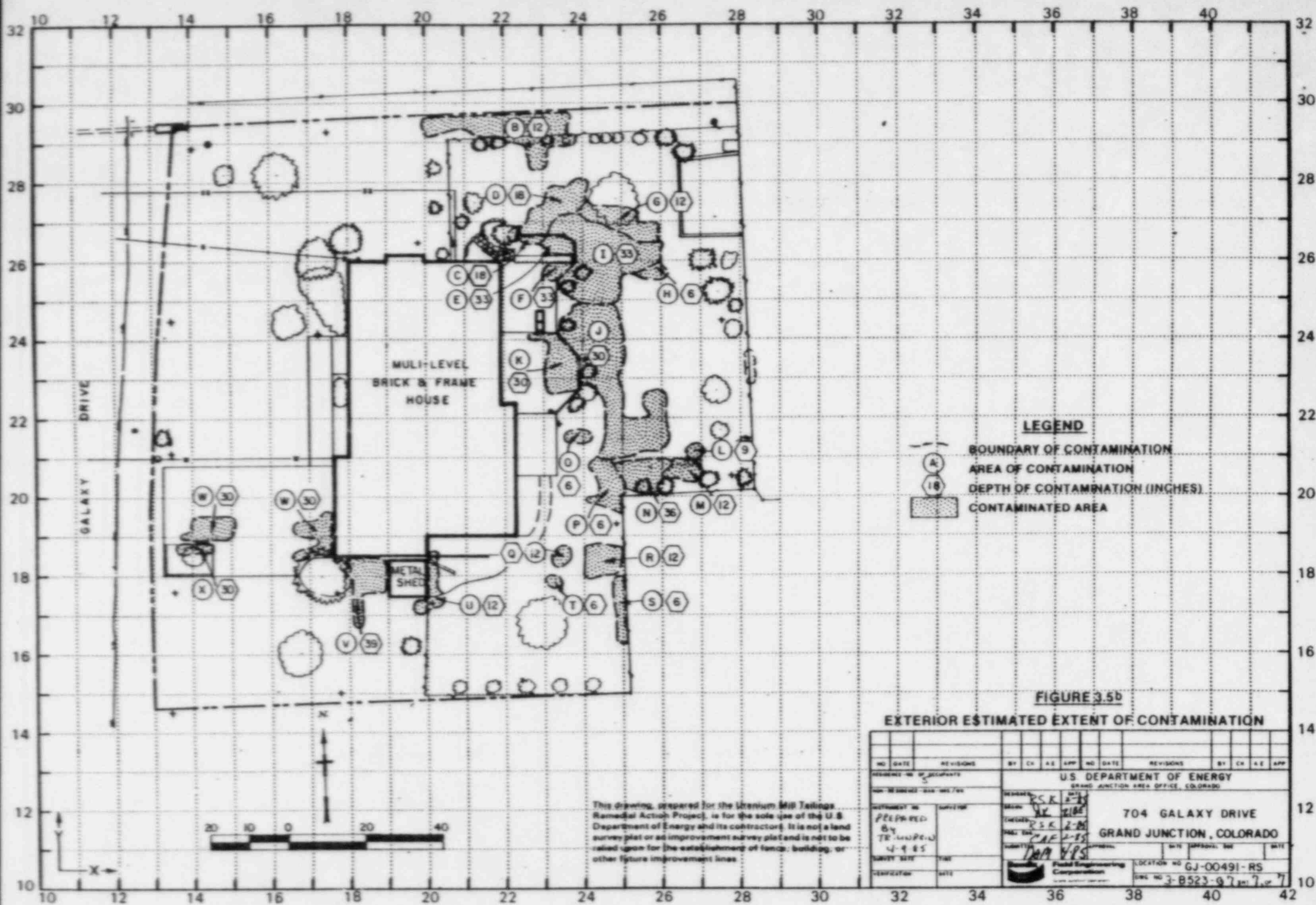


**FIGURE 3.5b**

INTERIOR: ESTIMATED EXTENT OF CONTAMINATION

INTERIM ESTIMATED EXTENT OF CONTAMINATION											
NO		DATE		REVISIONS		BY		CK		A/E APP	
NO		DATE		REVISIONS		BY		CK		A/E APP	
RESUME NO. OF OCCUPANTS				U.S. DEPARTMENT OF ENERGY							
ADD. RESUME - MAX. AND MIN.				GRAND JUNCTION AREA OFFICE, COLORADO							
RESUME NO.		REVISION		RECORDS		DATE		704 GALAXY DRIVE GRAND JUNCTION, COLORADO			
PREPARED BY				SEARCH		DATE					
T.R. UNBEN				INDEXED		DATE					
4-9-85				FILED		DATE					
SURVEY DATE		TIME		SUBMITTER		RECEIVED		SITE ADDRESS, BOX		STATE	
S. HART		4-85		Bureau		Point Engineering Corporation		LOCATION NO.		6J-00491-RS	
						Local government boundaries		ONE NO. 3-B523-66		NORTH OR SOUTH	





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

Official Survey Report

Property Address 704 Galaxy Drive  
Property Owner Judith Snodgrass  
Address of Owner (if different from above) NA  
Report Prepared By T.R. Unrein

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 = 24 uR/h  
HOG = 272 uR/h



**Bendix**

**Field Engineering  
Corporation**

April 5, 1985

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

ATTN: Bud Franz  
Radiation Control Division

SUBJECT: GJ-00491-RS

Dear Bud:

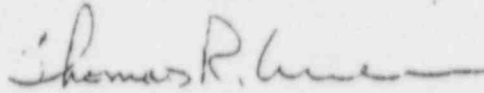
The following is in response to your questions and comments during the Technical Review concerning Department of Energy (DOE) Identification (ID) number GJ-00491-RS.

1. I would agree that these conditions could exist. While monitoring the augering of holes on this property, I noticed on several of them that we were getting into a sandy material.
2. Additional boreholes were taken at location number's 23, 28 and 31 which covered the west and northwest yard and footing areas. The data received from those holes were negative.
3. Yes it could, the way that the areas of contamination lay in the backyard would indicate that this is a definite possibility.
4. That's a possibility. I beleive that the elevated gamma readings are coming from a material that was found in the north and south part of the crawlspace. I am recommending that this material be removed during remedial action and that the crawlspace should be re-scanned. If elevated gamma readings are still present in the north part of the crawlspace, I would conclude that is was the brick.
5. I reviewed the CDH data and it indicated a concrete patio was originally in place. Since that time it has been overlayed with a wooden deck which extends almost the entire length ot the house. There is no concrete under the rest of the deck.

**Bendix**

Thank you for your time and cooperation. If you should have additional questions or comments, please contact me at 242-8621, extension 418.

Sincerely,



Thomas R. Unrein  
Radiologic Survey Team

TRU:dk

INTERNAL  
MEMORANDUM

Bendix Field Engineering Corporation  
Grand Junction Projects Office

Date: April 3, 1985  
To: Files  
From: Thomas Unrein  
Subject: Team Leader Notes - GJ-00491-RS

---

Owner: J. Snodgrass

Address: 704 Galaxy Drive

Weather: Warm, sunny, and windy.

Team Members

T. Unrein (Team Leader)	C. Adams
S. Southern	R. Beltz
D. Bell	M. Dexter
N. Wallace	D. Fossey
S. Larsen	P. Hardy

Instruments

Scintillometers - C-1196, C-1127, C-1208, C-1149, C-1185, C-1205  
Downhole Spectrometer - C-0498  
Delta Scintillometer - C-3937, C-3935, C-3941  
Total Count - C-1062, C-3959

Date: March 6, 1985

Team members arrived on the property at 8:45 A.M. and met with the homeowner (Mr. Snodgrass).

Gridding proceeded with a little difficulty because of property sloping and a numerous amount of trees.

The crawl space entry was opened for ventilation. After 20 minutes the crawl space appeared to be well ventilated.

D. Mackler, Supervisor, requested that the personnel read the procedures manual before each phase of the survey and to note any changes that should be made.

Health and Safety arrived on the property at 10:15 A.M. The crawl space was checked and Health and Safety agreed that the it appeared to be well ventilated.

Noise level in relation to the Little Beaver was also monitored.

Remedial action has already been performed on the interior of this property, however, elevated readings in the crawl space were obtained.

The elevated readings of the exterior are over a larger area than Oak Ridge National Laboratory (ORNL) had stated.

The team members received elevated readings spilling over the property line onto the adjacent property just north of this property. The necessary spillover paper work will be completed.

While scanning the crawl space, it was discovered that the fill dirt and concrete showed normal background readings and the elevated readings were coming from the southeast corner, where mortar chips and a dust substance were found, which might account for the elevated readings. A sample of the mortar chips and dust was collected. The other elevated reading was coming from the brick and the firewood storage bin. High thorium content in the brick would explain this.

All personnel were frisked and returned to the compound.

Revisit

Team Members

D. Herrera  
T. Unrein

D. Fossey

Instruments

Total Count - C-1062  
Scintillometer - C-1184  
Delta Scintillometer - C-3942

Date: March 8, 1985

The survey initiated on March 6, 1985, was completed during the revisit.

All personnel were frisked and returned to the compound.

Revisit

Team Members

T. Unrein

Instruments

Delta Scintillometer - C-3942

Date: March 13, 1985

This revisit was to collect delta data under the storage shed.

Revisit

Team Members

T. Unrein  
V. Rothman

M. Dexter

Instruments

Delta Scintillometers - C-3942, C-3940, C-3937

Date: March 28, 1985

The team members returned to the property to collect more delta readings.

The driveway will be recommended for further investigation during remedial action. There could be more contamination under the slab than indicated on the depth of contamination map. Also, the wooden deck area in the backyard should be recommended for further investigation since it was built over a concrete pad.

As previously mentioned, the contamination extends over onto the adjacent property north of this property, but it will not be included on the depth of contamination map.

This is an unusual property, it appears that the contamination is layered in some areas. Small slopes were encountered. The chemical data also reveals that this property has a higher than usual thorium content.



Team Leader Notes  
Thomas Unrein  
GJ-00491-RS  
April 3, 1985  
Page 5

Revisit

Team Members

D. Herrera

T. Flores

Instruments

Total Count - C-3573

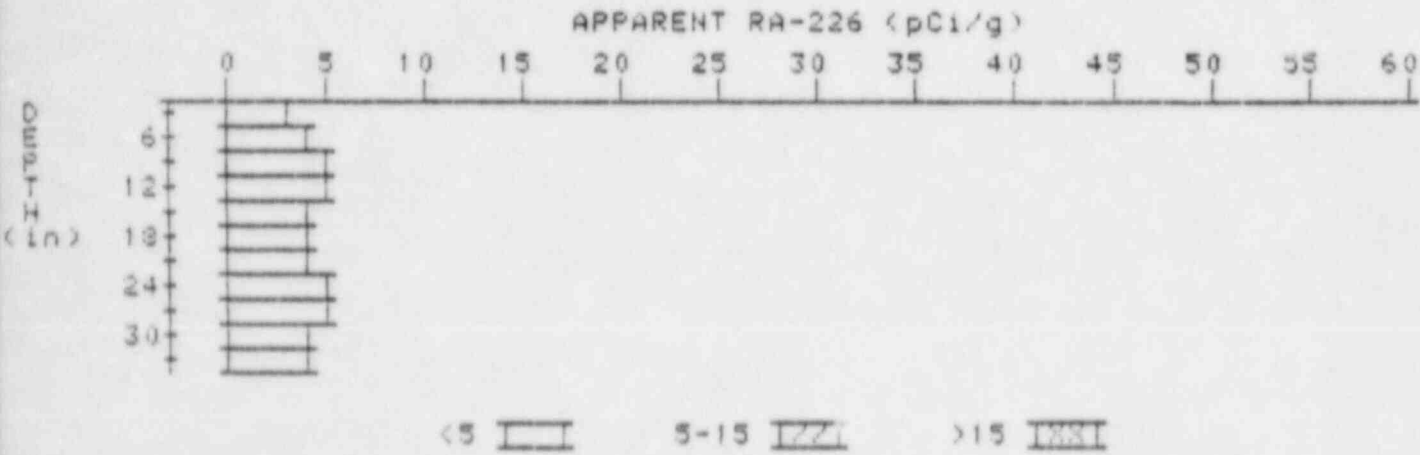
Date: April 3, 1985

Colorado Department of Health (CDH) suggested an additional auger hole be drilled for negative data in the front yard. This was performed and the negative data was obtained.

# APPARENT RADIUM-226 CONCENTRATION 20

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R  
HOLE NUMBER: 20  
LOCATION: 140160

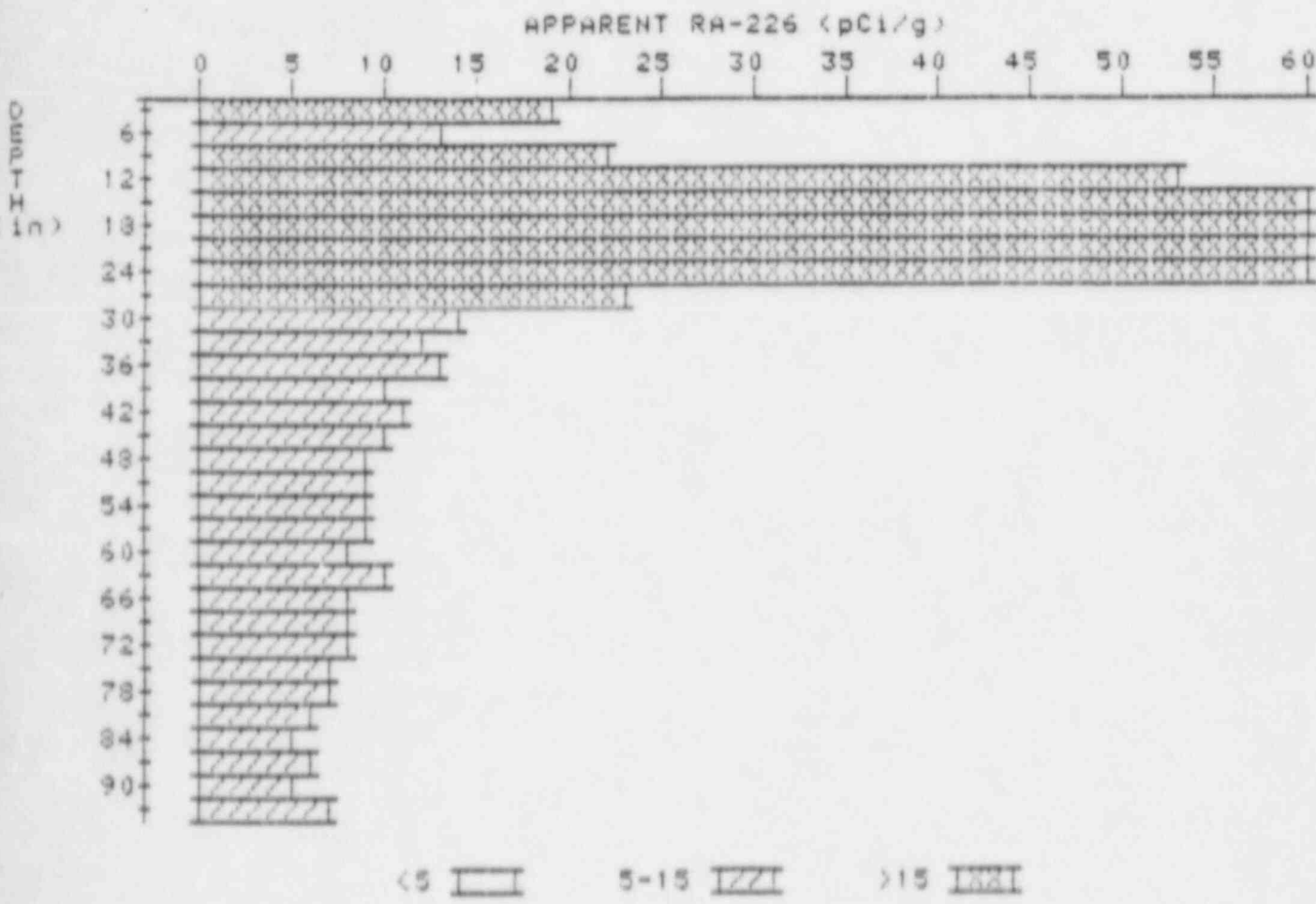


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.4	3.4
6	3.9	4.1
9	4.3	4.8
12	4.4	4.8
15	4.3	4.1
18	4.3	4.3
21	4.3	4.1
24	4.4	4.6
27	4.4	4.6
30	4.3	4.1
33	4.3	4.3

# APPARENT RADIUM-226 CONCENTRATION 21

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R  
HOLE NUMBER: 21  
LOCATION: 145188



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	19.3	19.3
6	29.2	13.4
9	48.0	21.9
12	81.5	52.7
15	131.2	173.9
18	156.9	221.6
21	146.2	210.4
24	99.4	91.2
27	57.2	23.1

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6.8

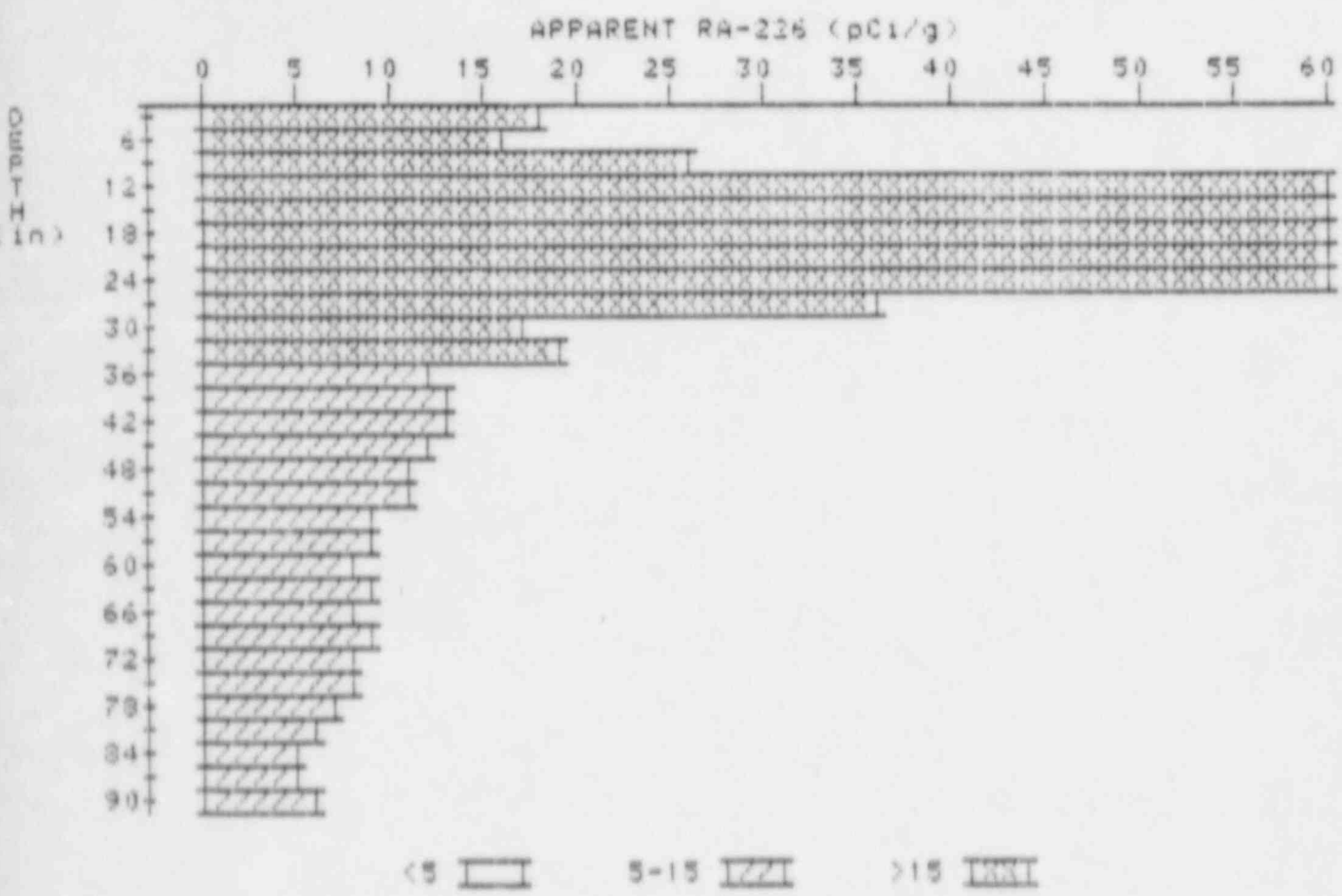
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APPARENT RADIUM-226 CONCENTRATION

DECONVOLUTION GRAPH

22

PROPERTY NUMBER: GJ-00491-R  
HOLE NUMBER: 22  
LOCATION: 148194



Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	18.2	18.2
6	32.2	16.2
9	55.2	26.0
12	94.6	71.1
15	147.2	206.0
18	166.7	224.7
21	153.6	195.2
24	117.1	125.9
27	70.0	36.0
30	42.0	16.8

33	28.2	18.6
36	19.9	11.8
39	15.9	12.5
42	13.9	12.7
45	12.6	12.4
48	11.4	10.7
51	10.6	10.6
54	9.8	9.4
57	9.2	8.8
60	8.8	8.3
63	8.7	9.1
66	8.4	7.9
69	8.4	8.9
72	8.1	8.8
75	7.8	7.8
78	7.0	7.0
81	6.4	6.0
84	6.0	5.8
87	5.9	5.4
90	5.1	5.1

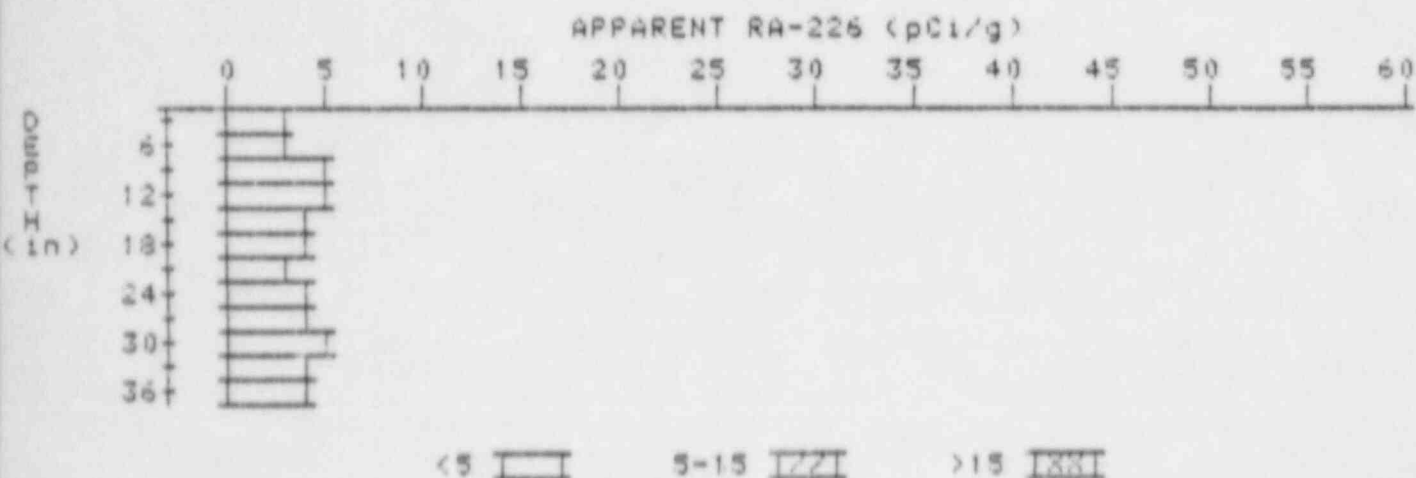


# APPARENT RADIUM-226 CONCENTRATION      23 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R

HOLE NUMBER: 23

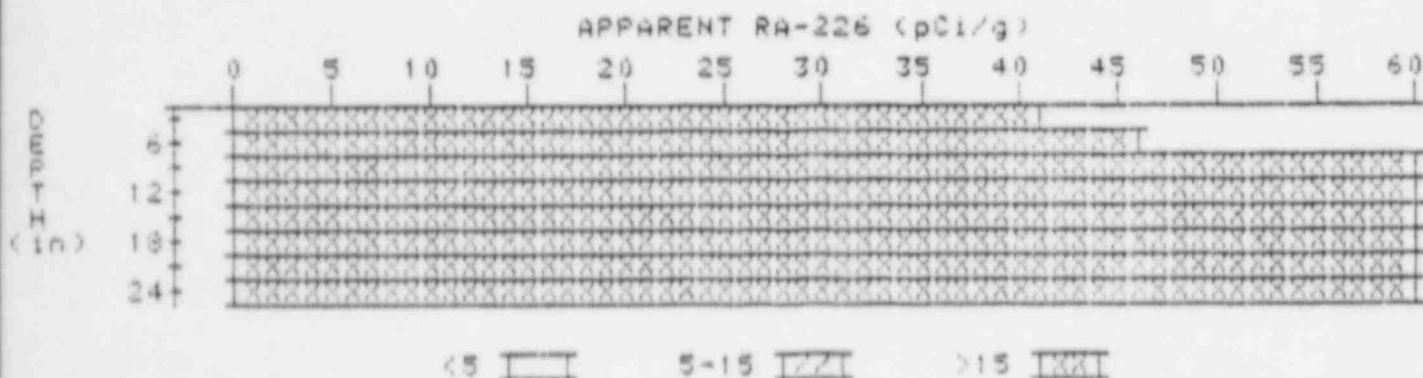
LOCATION: 150250



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.9	2.9
6	3.5	3.5
9	4.1	5.0
12	4.2	4.9
15	3.9	3.7
18	3.7	3.5
21	3.6	3.1
24	3.8	3.8
27	4.0	4.0
30	4.2	4.7
33	4.1	3.9
36	4.1	4.1

# APPARENT RADIUM-226 CONCENTRATION      26 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R  
HOLE NUMBER: 26  
LOCATION: 175190

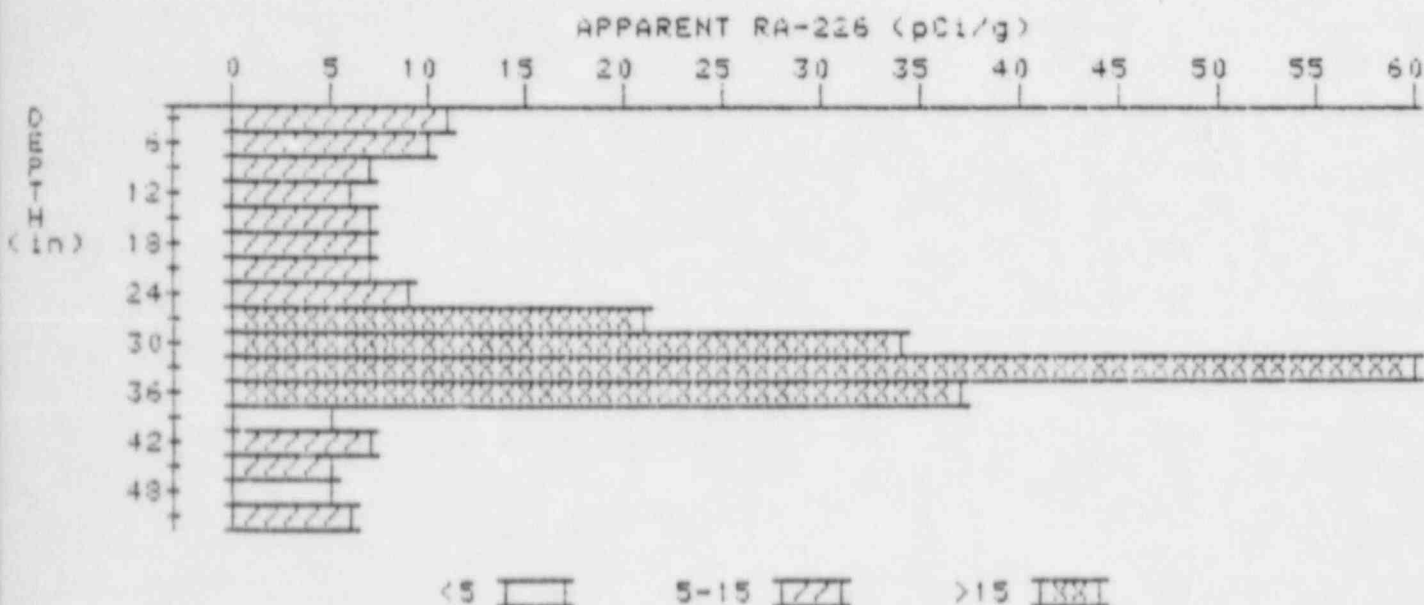


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	41.1	41.1
6	62.7	46.0
9	93.7	103.7
12	119.1	139.0
15	133.3	159.1
18	133.0	119.5
21	140.3	150.1
24	142.1	142.1

# APPARENT RADIUM-226 CONCENTRATION 27

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R  
HOLE NUMBER: 27  
LOCATION: 179184

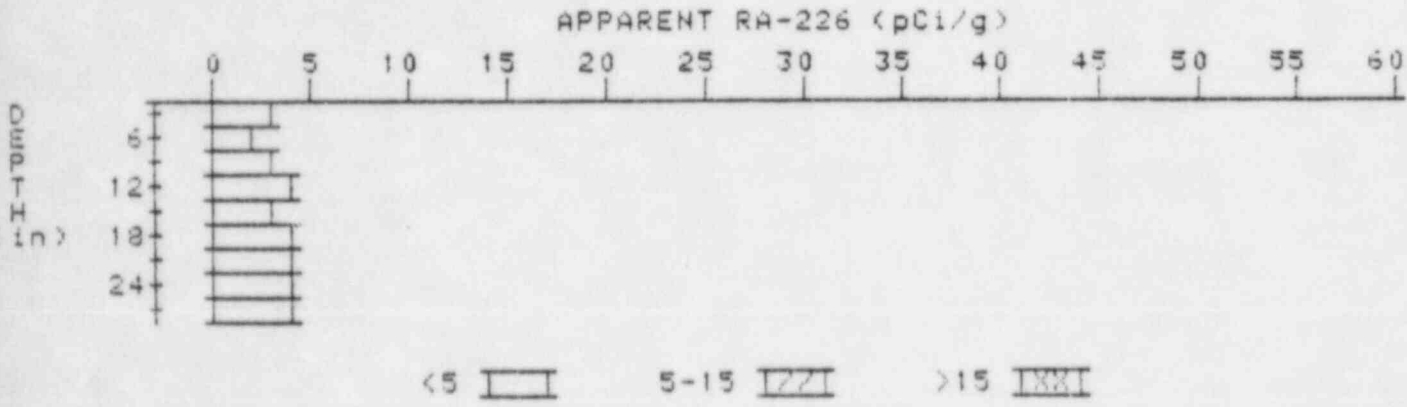


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	10.7	10.7
6	9.7	10.4
9	8.3	6.9
12	7.7	5.9
15	8.1	7.4
18	8.9	6.8
21	10.9	7.2
24	15.0	8.6
27	22.7	20.6
30	31.6	33.7
33	39.3	64.2
36	30.2	36.8
39	17.4	5.0
42	11.6	7.2
45	8.3	5.3
48	6.7	4.9
51	6.1	6.1

# APPARENT RADIUM-226 CONCENTRATION 28

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R  
HOLE NUMBER: 28  
LOCATION: 179211



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	2.9	2.4
9	3.1	2.9
12	3.4	3.6
15	3.6	3.4
18	3.9	4.4
21	3.9	3.7
24	4.0	4.4
27	3.9	3.9

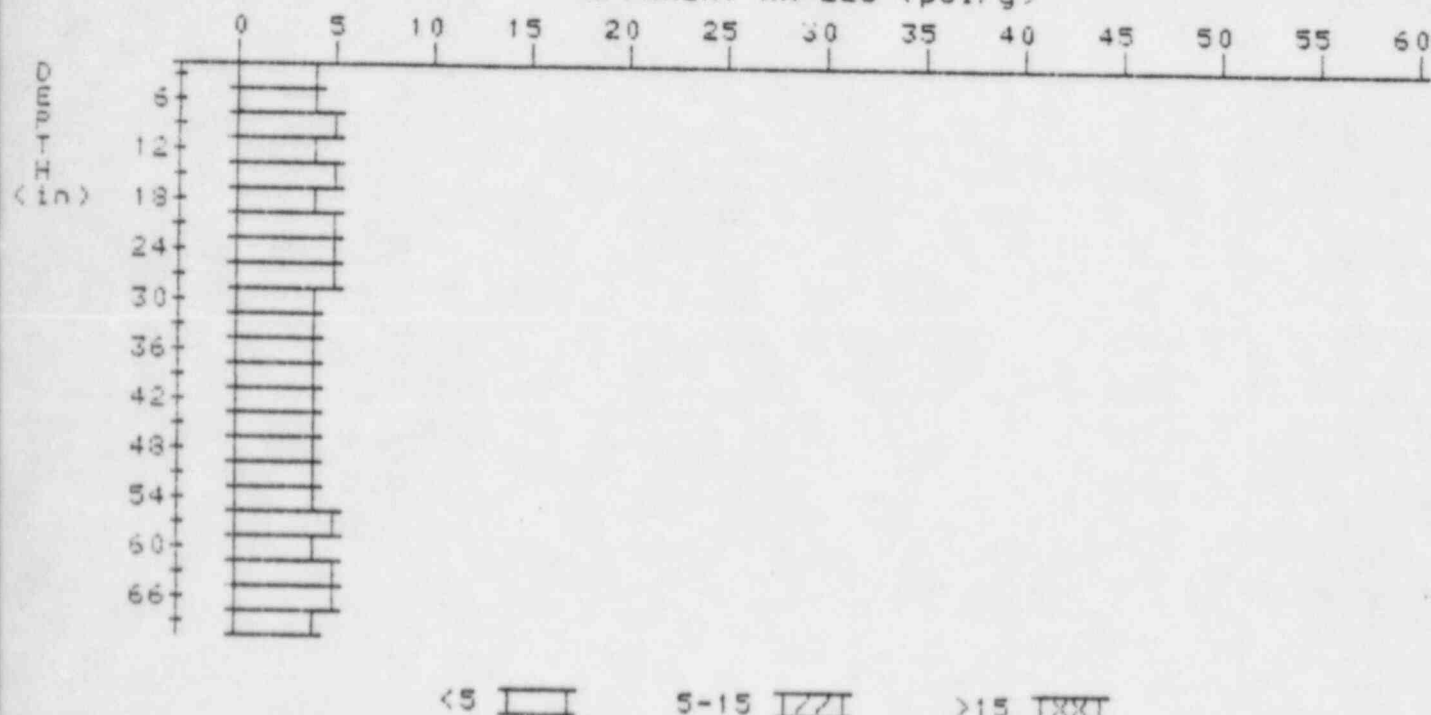
# APPARENT RADIUM-226 CONCENTRATION 31 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R

HOLE NUMBER: 31

LOCATION: 183261

APPARENT RA-226 (pCi/g)



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.6	3.6
6	3.9	3.9
9	4.2	4.7
12	4.2	3.8
15	4.4	4.8
18	4.4	4.2
21	4.8	4.7
24	4.8	4.8
27	4.8	4.7
30	4.4	4.4
33	4.3	4.1
36	4.3	4.5
39	4.2	4.2
42	4.1	3.9
45	4.1	4.1

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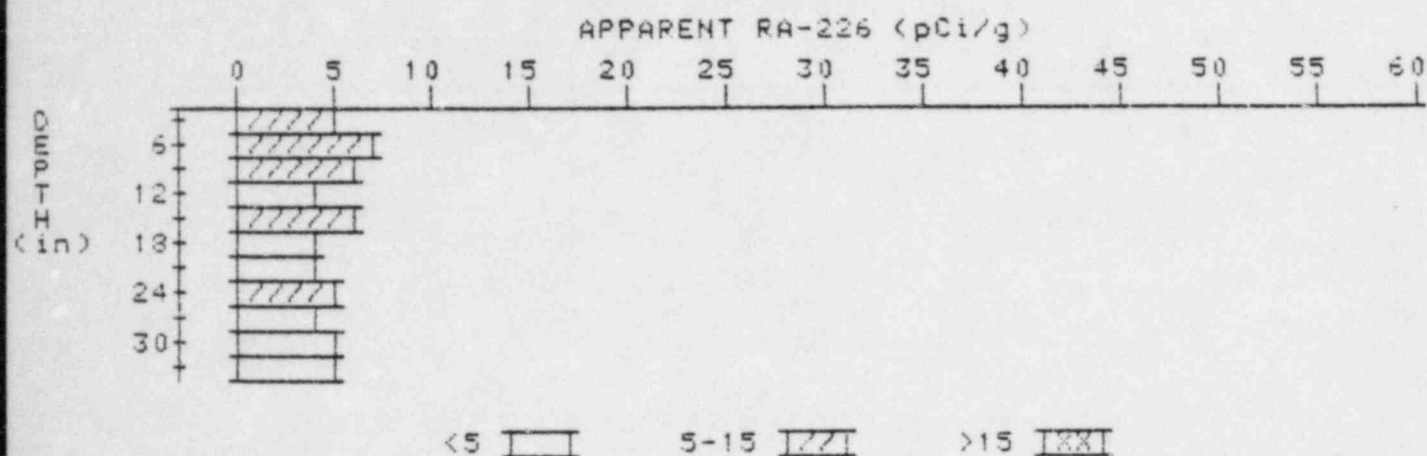
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# APPARENT RADIUM-226 CONCENTRATION 33

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R  
HOLE NUMBER: 33  
LOCATION: 200177



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.0	5.0
6	5.6	7.0
9	5.4	6.1
12	4.8	3.6
15	4.9	5.8
18	4.5	3.8
21	4.5	4.1
24	4.7	5.2
27	4.6	4.4
30	4.6	4.6
33	4.6	4.6

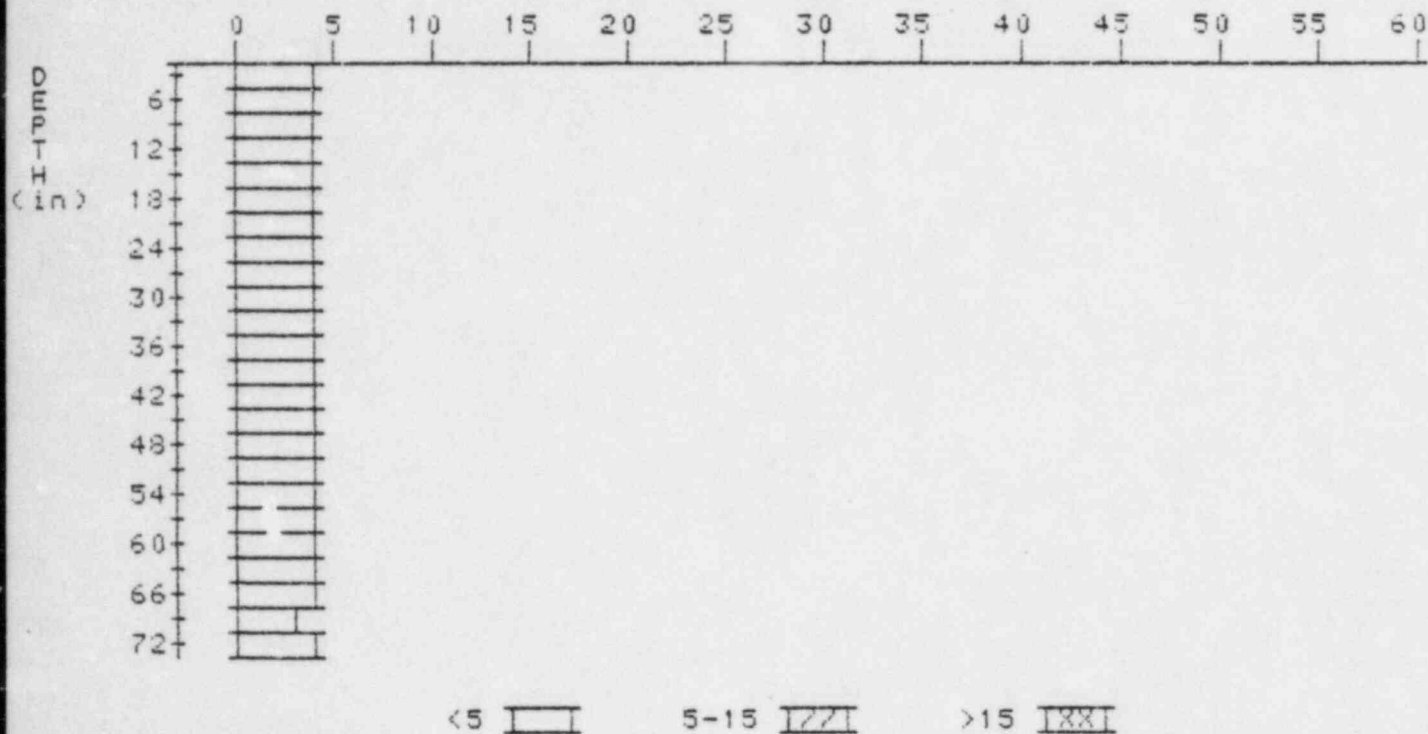


# APPARENT RADIUM-226 CONCENTRATION 36

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R  
HOLE NUMBER: 36  
LOCATION: 209261

APPARENT RA-226 (pCi/g)



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.8	3.8
6	3.9	3.9
9	4.0	4.0
12	4.1	4.3
15	4.1	4.1
18	4.1	4.3
21	4.0	3.6
24	4.1	4.5
27	4.0	4.0
30	3.9	3.7
33	3.9	3.9
36	3.9	3.7
39	4.0	4.2
42	4.0	4.0
45	4.0	4.0

48	4.0	4.0
51	4.0	4.2
54	3.9	3.5
57	4.0	4.4
60	3.9	3.9
63	3.8	3.6
66	3.8	4.2
69	3.6	3.2
72	3.6	3.6

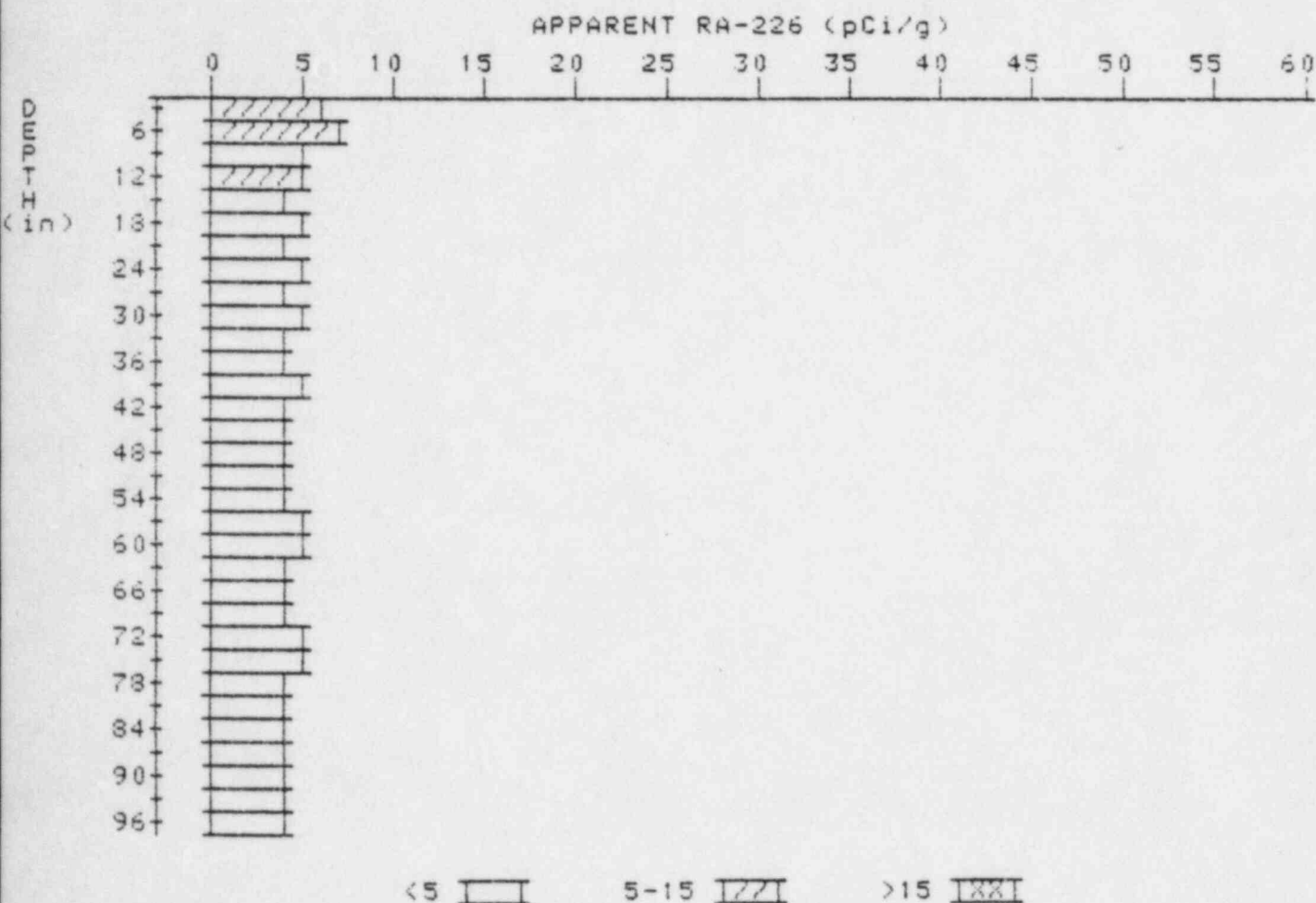
# APPARENT RADIUM-226 CONCENTRATION 39

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R

HOLE NUMBER: 39

LOCATION: 220295



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.9	5.9
6	5.9	7.0
9	5.3	4.8
12	5.0	5.0
15	4.7	4.3
18	4.6	4.6
21	4.5	4.3
24	4.5	4.7
27	4.4	4.2

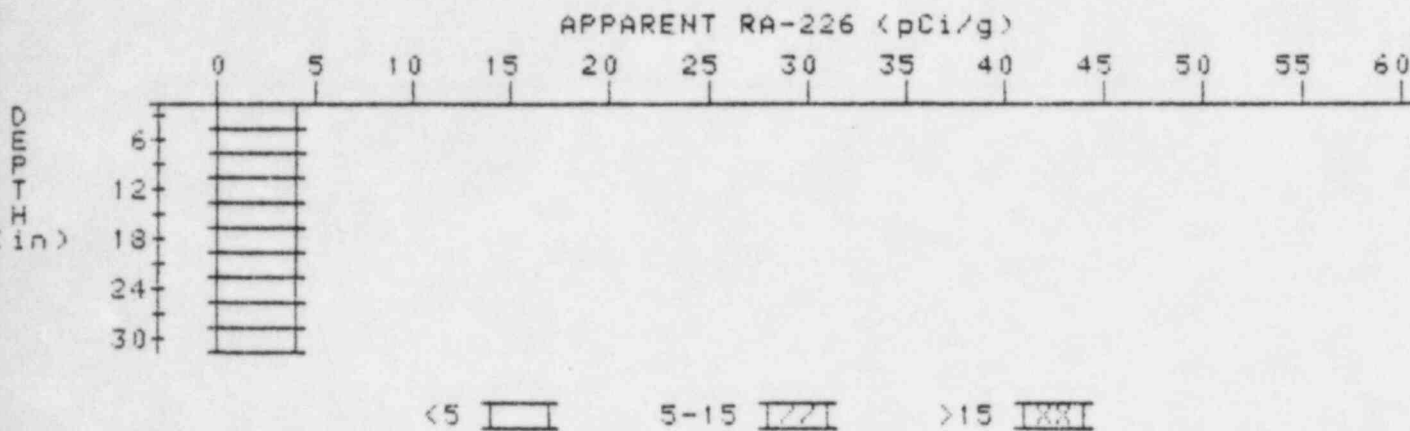
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33	4.3	4.3
36	4.2	3.6
39	4.3	4.7
42	4.2	3.6
45	4.3	4.6
48	4.3	4.3
51	4.3	4.5
54	4.2	3.7
57	4.4	4.6
60	4.4	4.6
63	4.3	4.1
66	4.3	4.3
69	4.3	4.1
72	4.4	4.6
75	4.4	4.6
78	4.3	4.3
81	4.2	4.2
84	4.1	4.1
87	4.0	3.6
90	4.1	4.3
93	4.1	4.3
96	4.0	4.0

APPARENT RADIUM-226 CONCENTRATION

DECONVOLUTION GRAPH

42

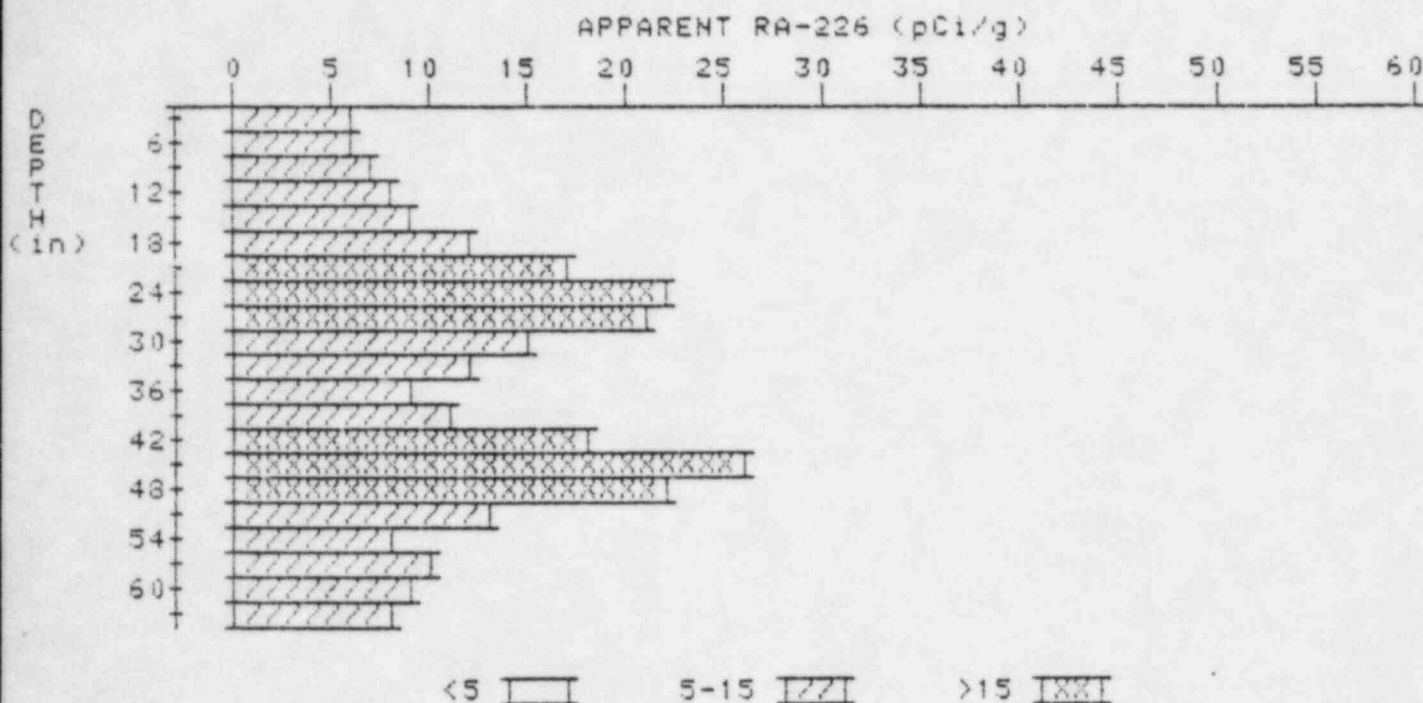
PROPERTY NUMBER: GJ-00491-R  
HOLE NUMBER: 42  
LOCATION: 224192



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.7	3.7
6	3.9	4.3
9	3.9	3.7
12	4.0	4.4
15	3.9	3.7
18	3.9	3.5
21	4.1	4.5
24	4.1	4.1
27	4.1	4.3
30	4.0	4.0

# APPARENT RADIUM-226 CONCENTRATION      50 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R  
HOLE NUMBER: 50  
LOCATION: 232300



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.0	6.0
6	6.7	6.3
9	7.6	6.9
12	8.9	8.4
15	10.5	9.3
18	12.8	11.7
21	15.7	17.1
24	17.8	22.1
27	17.5	20.7
30	15.4	14.7
33	13.7	12.5
36	12.7	8.8
39	13.9	10.9
42	16.8	17.9
45	19.1	25.7
48	17.7	21.6
51	14.1	12.9



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63

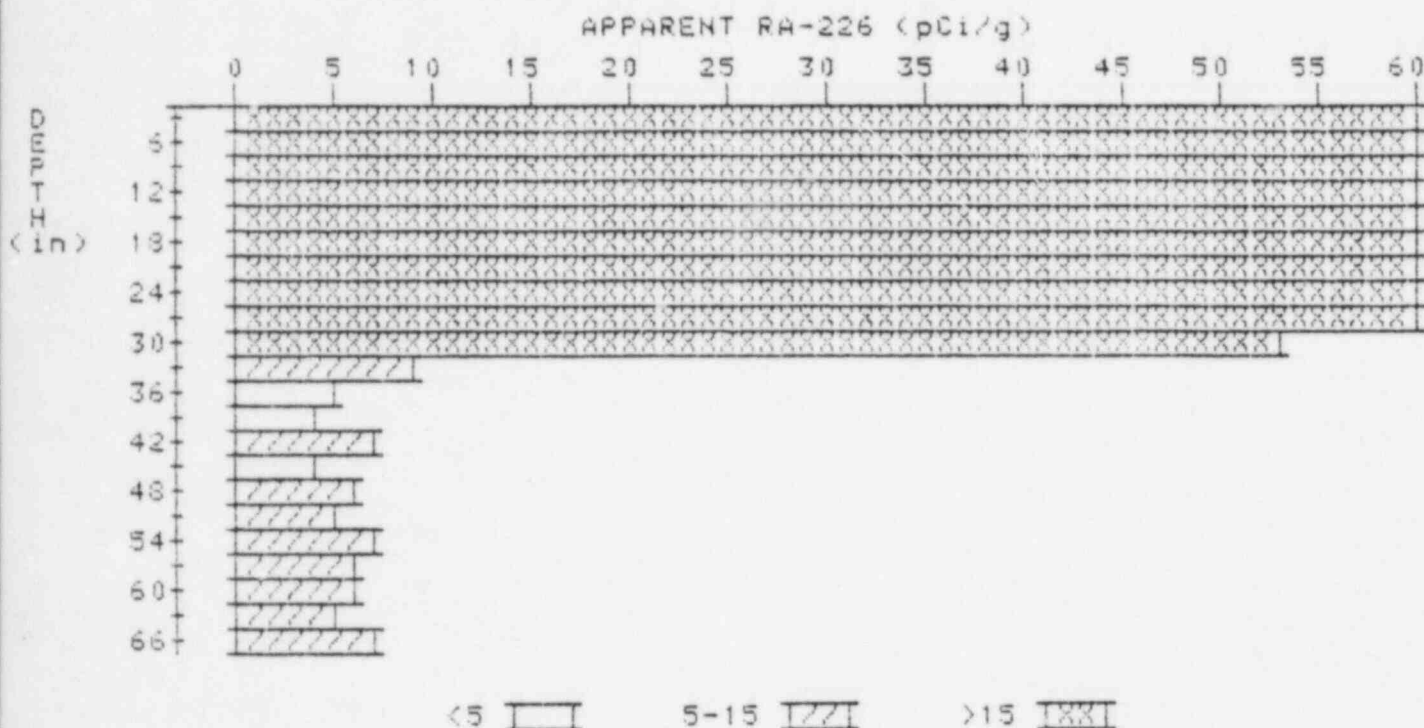
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# APPARENT RADIUM-226 CONCENTRATION 63

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R  
HOLE NUMBER: 63  
LOCATION: 241262



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	103.0	103.0
6	128.2	156.5
9	137.5	156.7
12	136.0	151.6
15	125.7	129.1
18	113.5	112.3
21	102.0	97.9
24	92.8	105.6
27	76.4	89.4
30	52.7	52.5
33	29.1	9.4
36	16.6	4.9
39	10.7	4.5
42	8.3	7.2
45	6.5	4.0
48	6.1	5.7

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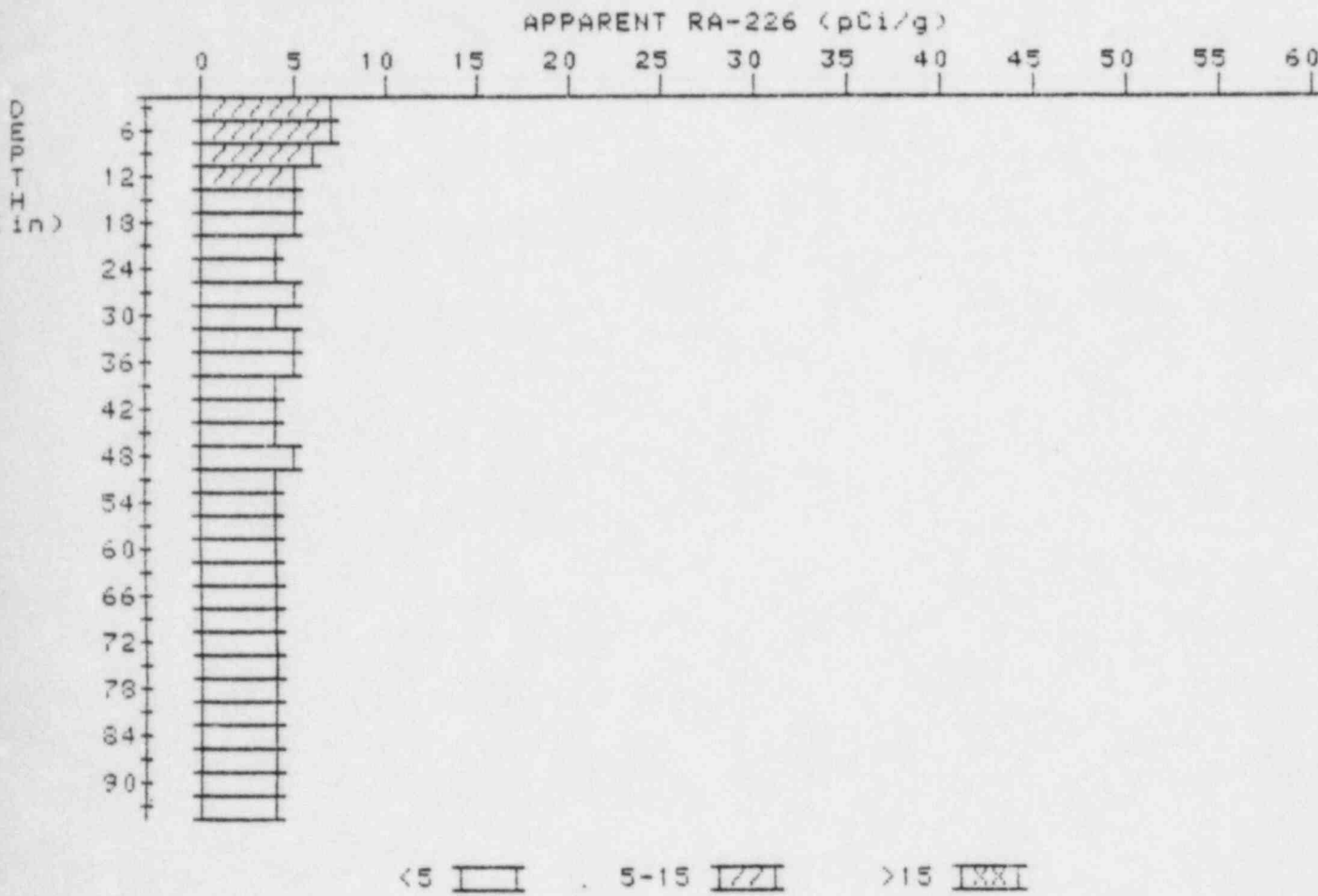
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6.3  
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6.9  
5.6  
6.5  
5.3  
7.1

# APPARENT RADIUM-226 CONCENTRATION 65

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R  
HOLE NUMBER: 65  
LOCATION: 243184



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.5	6.5
6	6.3	6.3
9	5.8	5.8
12	5.3	5.1
15	4.9	4.5
18	4.7	4.7
21	4.5	4.3
24	4.4	4.2
27	4.4	4.6

30	4.3	3.9
33	4.4	4.6
36	4.4	4.6
39	4.3	4.1
42	4.3	4.3
45	4.3	4.1
48	4.4	4.8
51	4.3	4.1
54	4.3	4.5
57	4.2	4.0
60	4.2	4.4
63	4.1	3.9
66	4.1	4.3
69	4.0	3.8
72	4.0	4.0
75	4.0	4.0
78	4.0	4.2
81	3.9	3.7
84	3.9	3.9
87	3.9	3.9
90	3.9	3.9
93	3.9	3.9

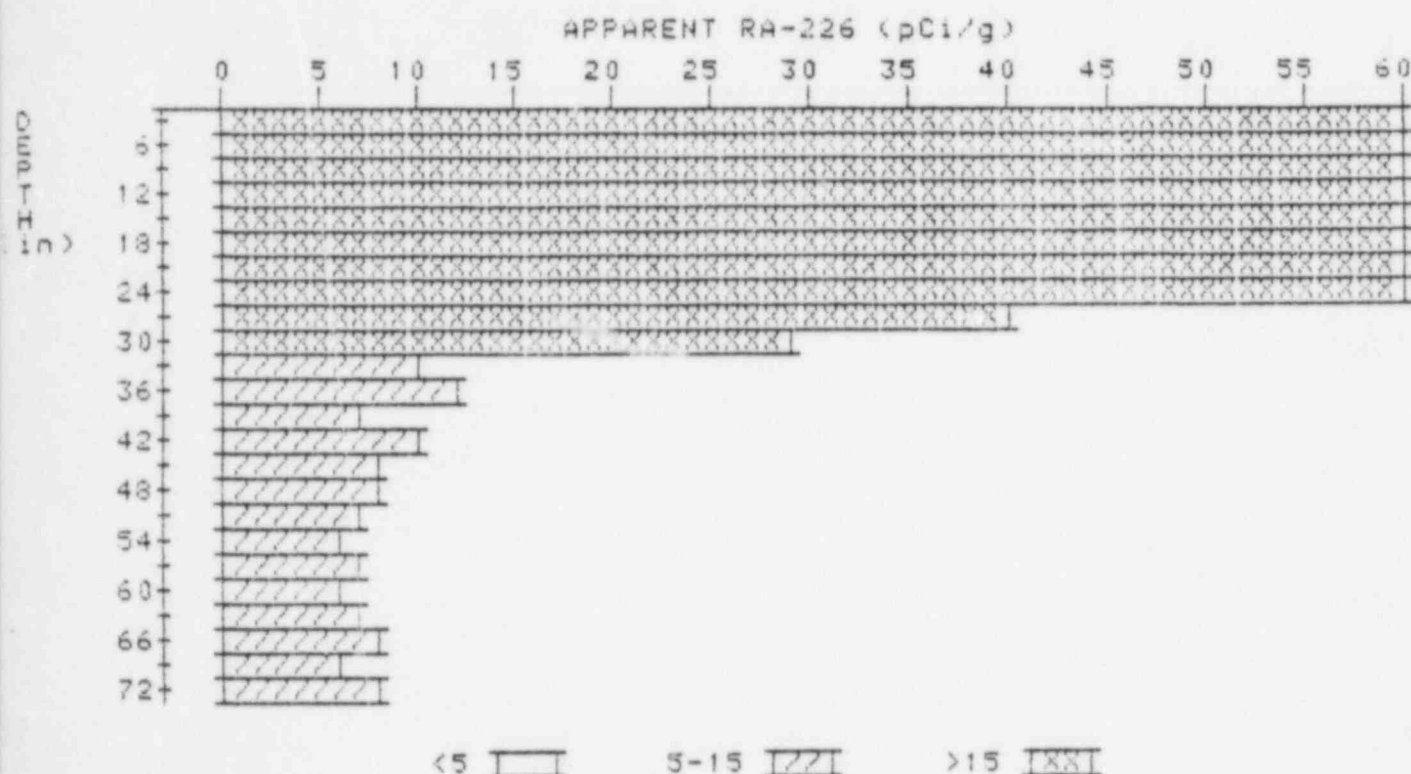
# APPARENT RADIUM-226 CONCENTRATION 66

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R

HOLE NUMBER: 66

LOCATION: 244239



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	83.4	83.4
6	105.5	124.5
9	116.9	126.0
12	123.2	139.6
15	120.3	129.2
18	112.4	114.7
21	103.2	123.8
24	82.4	93.4
27	55.4	39.9
30	37.1	29.5
33	23.1	10.3
36	16.3	11.9
39	12.0	7.4
42	10.3	9.6
45	9.0	8.1

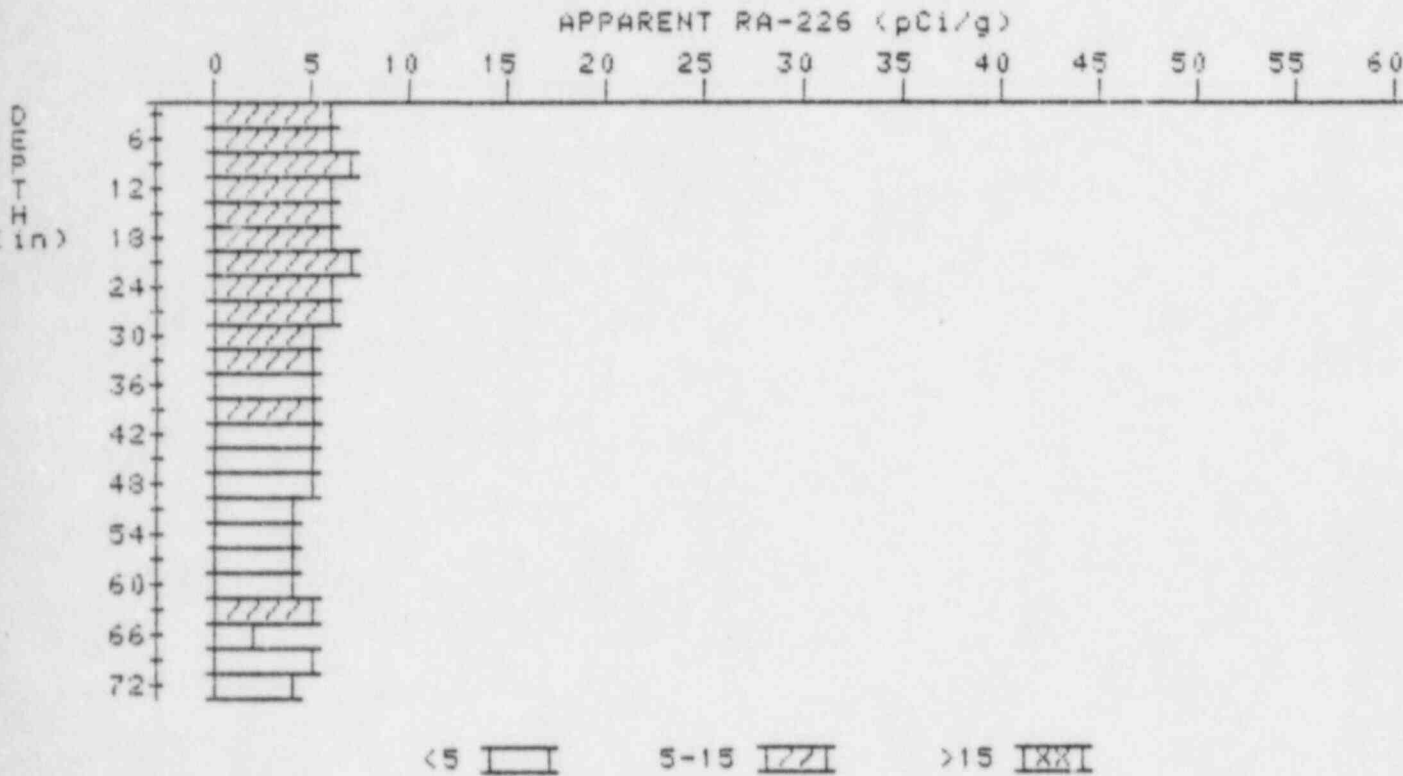


48	8.2	7.8
51	7.6	7.4
54	7.1	6.4
57	7.0	7.2
60	6.8	6.1
63	7.0	6.8
66	7.3	8.0
69	7.2	6.3
72	7.6	7.6

# APPARENT RADIUM-226 CONCENTRATION 68

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R  
HOLE NUMBER: 68  
LOCATION: 249213



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.1	6.1
6	6.2	6.2
9	6.3	6.3
12	6.1	5.7
15	6.1	6.1
18	6.1	6.1
21	6.1	6.6
24	5.6	5.6
27	5.6	5.6
30	5.4	5.2
33	5.3	5.5
36	5.1	4.9
39	5.0	5.0
42	4.9	4.9
45	4.8	4.8

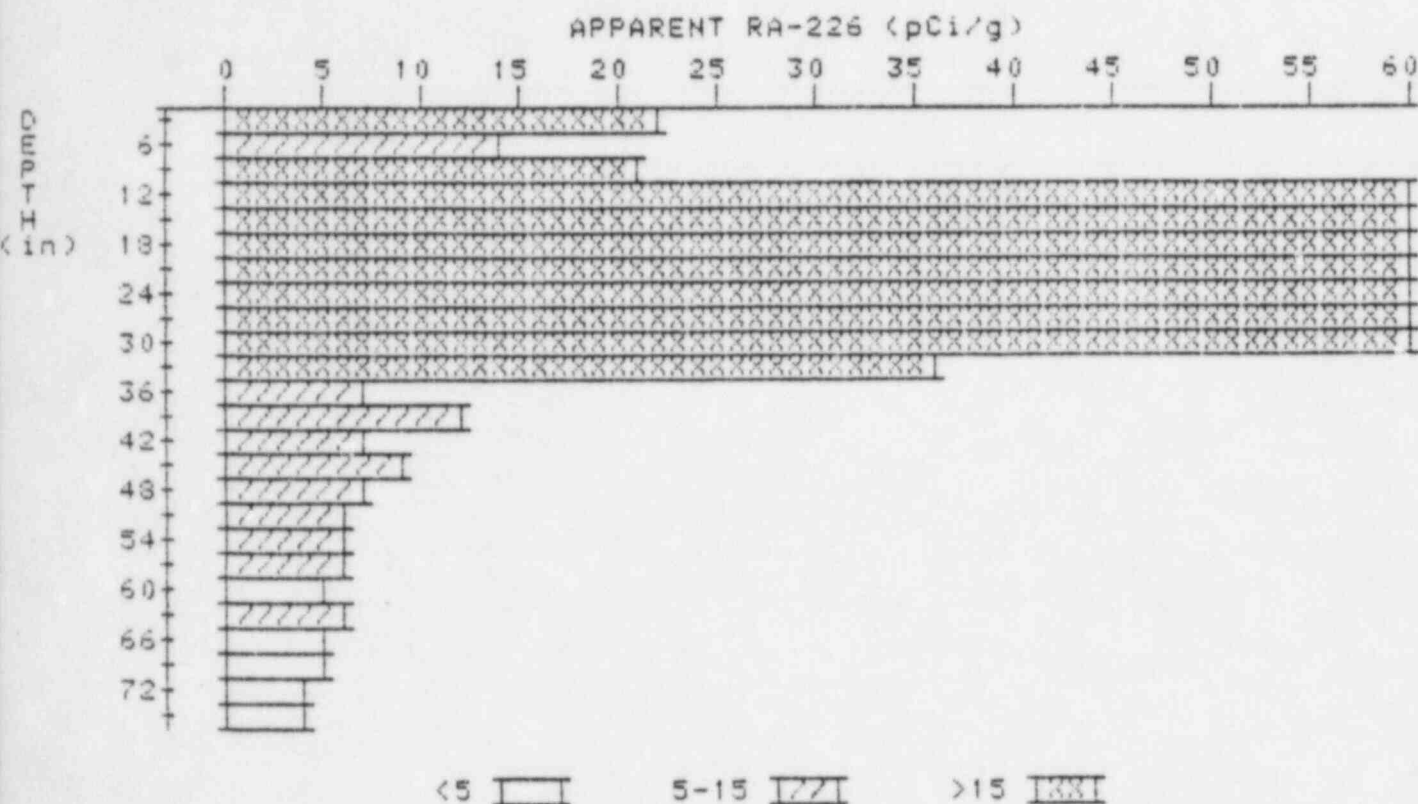
43  
51  
54  
57  
60  
63  
66  
69  
72

4.7  
4.8  
4.4  
4.3  
4.3  
4.3  
3.8  
4.2  
4.2

4.9  
4.3  
4.4  
4.1  
4.3  
5.2  
2.2  
4.9  
4.2

# APPARENT RADIUM-226 CONCENTRATION 72 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R  
HOLE NUMBER: 72  
LOCATION: 255209



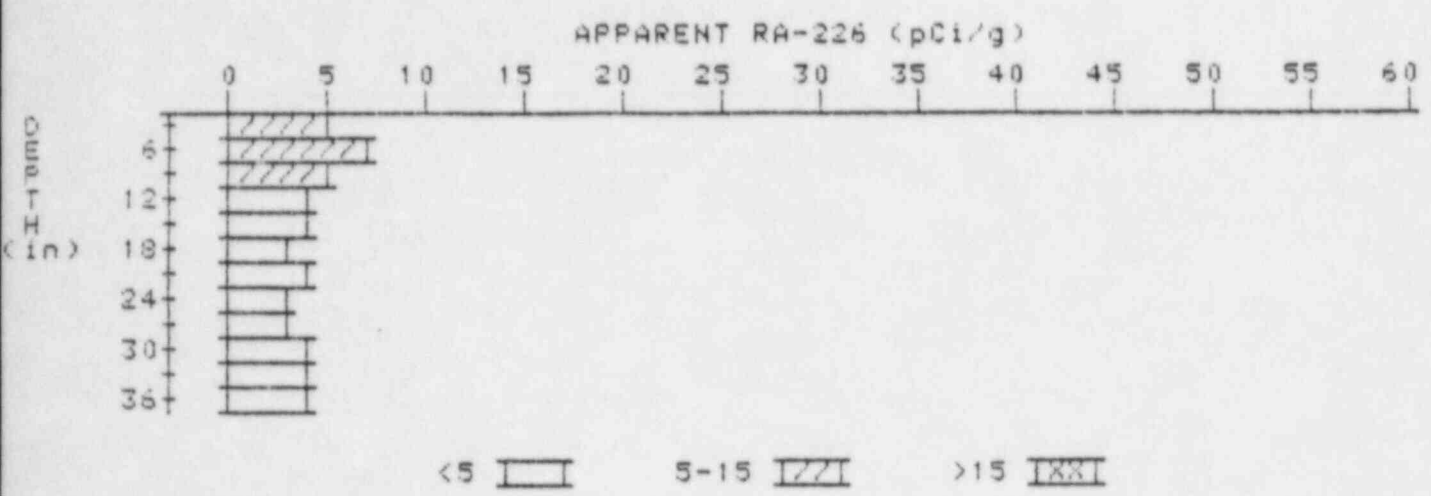
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	21.6	21.6
6	31.3	13.7
9	50.9	21.0
12	87.3	86.2
15	124.3	145.5
18	149.4	180.0
21	157.3	183.8
24	150.3	175.2
27	129.3	162.5
30	89.6	80.7
33	54.9	36.4
36	30.6	6.8
39	19.7	11.7
42	13.3	6.9

45	10.5	9.3
48	8.4	6.8
51	7.2	6.3
54	6.5	6.0
57	6.1	6.3
60	5.6	4.7
63	5.6	6.5
66	5.1	4.7
69	4.8	4.8
72	4.5	4.1
75	4.4	4.4

# APPARENT RADIUM-226 CONCENTRATION 77

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00491-R  
HOLE NUMBER: 77  
LOCATION: 268210



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.4	5.4
6	5.6	7.0
9	5.0	5.0
12	4.4	4.0
15	4.0	3.8
18	3.7	3.2
21	3.7	4.1
24	3.5	3.3
27	3.4	3.0
30	3.5	3.5
33	3.6	3.6
36	3.7	3.7