

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-13970-MR  
ADDRESS: 2361 H ROAD

MAY 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

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## 1.0 EXECUTIVE SUMMARY

### 1.1 Introduction

The location, DOE ID No. GJ-13970-MR, is a single-family residence located at 2361 H 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 option recommended is Option No. 2 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, 270 cu. yd; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$15,518. Remedial action on this property will take approximately 21 days to complete.

### 1.3 Areas to be Excluded

Areas A, B, C, D, E, F, and G, as discussed in Section 3.5 and shown on Appendix Figure 3.5a, will not be included in this remedial action for the reasons discussed in Section 4.2.

## 2.0 PROPERTY DESCRIPTION

### 2.1 General Description

Address: 2361 H Road, Grand Junction, Colorado

Zoning: Agricultural-Forest Transition (AFT)

Lot Size: Approximately 29,400 sf (0.67 acres)

Legal Description: Beg. 855 ft west of NE corner NW4 NE4 Sec. 32  
1N 1W south 350 ft east 84 ft north 350 feet  
west to Beg., County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 10  
miles northwest of the State of Colorado  
Tailings Repository. Appendix Figure 2.1 shows  
the property location relative to its surround-  
ings.

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:	H Road
South:	Agricultural
East:	Single-family residence
West:	Single-family residence

### 2.2 Existing Facilities and Structures

Primary Structure:

Type:	One-story, single-family residence
Size:	Approximately 1,970 sf
Construction Date:	1915
Construction:	Wood-frame
Foundation:	Concrete and masonry stemwalls on concrete spread footers and isolated masonry piers on concrete pad footers at trailer section
Footing Depth:	Approximately 24" to bottom of footing from grade
Basement:	None
Crawl Space:	Full under main structure
Condition:	Fair



Other Structures:

Type:	Storage building (wood shed)
Size:	Approximately 180 sf
Construction:	Wood-frame
Foundation:	Concrete-slab and curb-on-grade
Condition:	Deteriorating
Type:	Utility storage (shed 1)
Size:	Approximately 98 sf
Construction:	Prefab metal
Foundation:	Concrete curb-on-grade
Condition:	Fair to good
Type:	Storage (shed 2)
Size:	Approximately 29 sf
Construction:	Frame with metal cladding
Foundation:	Wood-on-grade
Condition:	Deteriorating
Type:	Chicken coop and house
Size:	Approximately 63 sf and 34 sf, respectively
Construction:	Wood-frame
Foundation:	Wood-on-grade
Condition:	Deteriorating
General Remarks:	Miscellaneous stored metal and wood materials are scattered over the property and some of it is located on tailings that are designated to be removed. The yard north of the house is well maintained. 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: Four total: entry at north, 80 sf; bedrooms at east, 312 sf; trailer (kitchen and utility) at south, 365 sf; and dining room at south, 156 sf.

Architectural Significance: Minimal

Historical Significance: None known

### 3.0 RADIOLOGIC SURVEY

#### 3.1 Introduction

Radiologic data were collected by Bendix at DOE ID No. GJ-13970-MR on December 28, 1984. 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 interior contamination in the west side of the primary structure. Exterior contamination exists on the west side of the primary structure, a major portion of the south yard, in the north yard, and in the northwest yard.

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: 13 to 15 uR/h  
Highest Outside Gamma Reading (HOG): 40 uR/h

Exterior radium-concentration measurements are presented in Appendix Table 3.1. Grid-point survey results are shown in Appendix Figures 3.1a and 3.1b. Appendix Figures 3.2a and 3.2b present the ranges of elevated gamma readings and indicate areas of possible contamination.

##### 3.2.2 Interior Findings

Background Readings: 13 to 15 uR/h  
Highest Inside Gamma Reading (HIG): 52 uR/h

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

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

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

### 3.4 Radon/Radon Daughter Concentration

Radon daughter concentration (RDC):

Determined by CDH: 0.007 gross working level (WL).

No additional RDC measurements were taken by Bendix.

### 3.5 Extent of Contamination

Appendix Figures 3.5a, 3.5b, and 3.5c 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 soil in the south side of the crawl space is contaminated to a depth of 20 inches (approximately 315 sf; excluded in Option No. 2).
- (AREA B) The soil in the east side of the crawl space is contaminated to a depth of 12 inches (approximately 554 sf; excluded in Option No. 2).
- (AREA C) The soil in the west side of the crawl space is contaminated to a depth of 6 inches (approximately 534 sf; excluded in Option No. 2).
- (AREA D) The soil in the addition to the south side of the crawl space is contaminated to a depth of 12 inches (approximately 78 sf; excluded in Option No. 2).
- (AREA E) The soil under the 2-inch-thick concrete slab in the east side of the wood shed is contaminated. The total depth of contamination is 18 inches (approximately 108 sf; excluded in Option No. 2).
- (AREA F) The dirt floor of the west side of Shed 1 is contaminated to a depth of 12 inches (approximately 80 sf; excluded in Option No. 2).
- (AREA G) The dirt floor of Shed 2 is contaminated to an estimated depth of 12 inches based on information gathered in Shed 1 (approximately 30 sf; excluded in Option No. 2).
- (AREA H) The soil next to the septic tank is contaminated to a depth of 24 inches (approximately 10 sf).

- (AREA I) A portion of the gravel driveway west of the primary structure is contaminated to a depth of 18 inches (approximately 986 sf).
- (AREA J) There is contamination to a depth of 15 inches south of the addition to the south side of the primary structure (approximately 148 sf).
- (AREA K) Northwest of the primary structure there is contamination to a depth of 15 inches (approximately 77 sf).
- (AREA L) North of the primary structure there is contamination to a depth of 18 inches (approximately 49 sf).
- (AREA M) Southeast of the addition there is contamination to a depth of 12 inches (approximately 182 sf).
- (AREA N) South of the primary structure there is contamination to an estimated depth of 15 inches based on information gathered in Area J (approximately 100 sf).
- (AREA O) In the north yard there is contamination to a depth of 9 inches (approximately 474 sf).
- (AREA P) North of Area O there is contamination to a depth of 12 inches (approximately 652 sf).
- (AREA Q) Northwest of the primary structure, in the gravel driveway, there is contamination to a depth of 12 inches (approximately 144 sf).
- (AREA R) A part of the north yard east of the gravel driveway is contaminated to a depth of 12 inches (approximately 56 sf).
- (AREA S) An isolated deposit in the north yard is contaminated to an estimated depth of 9 inches based on information gathered in Area O (approximately 3 sf).
- (AREA T) Two isolated deposits in the north yard are contaminated to an estimated depth of 12 inches based on information gathered in Area R (approximately 28 sf).
- (AREA U) An isolated deposit in the northeast yard is contaminated to a depth of 12 inches based on information gathered in Area P (approximately 10 sf).
- (AREA V) In the north yard there is contamination to an estimated depth of 12 inches based on information gathered in Area P (approximately 22 sf).
- (AREA W) Southwest of Shed 1 there is contamination to a depth of 9 inches in an old leach field (approximately 600 sf).

- (AREA X) Northwest of Shed 1 there is contamination to a depth of 15 inches based on information gathered in Area J (approximately 56 sf).
- (AREA Y) A portion of the south yard which involves an old leach field is contaminated to a depth of 15 inches (approximately 1,155 sf).
- (AREA Z) South of Area Y there is contamination to a depth of 12 inches (approximately 624 sf).
- (AREA AA) In the south yard, north of the chicken coop, there is contamination to a depth of 9 inches (approximately 1,414 sf).
- (AREA BB) The soil east of the chicken coop is contaminated to a depth of 3 inches (approximately 18 sf).

(AREAS REQUIRING FURTHER INVESTIGATION DURING REMEDIAL ACTION)

The location of the sewer line exiting the south side of the primary structure should be located during remedial action to verify the absence of contamination around the line.

#### 4.0 RECOMMENDED REMEDIAL ACTION

##### 4.1 Decontamination and Restoration

Option 1: Total Decontamination and Restoration.

The remedial Option 1 for this property, DOE ID No. GJ-13970-MR, includes removal of all areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figures 3.5a, 3.5b, and 3.5c) 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 be required for this remedial action. Dislocation cost estimates are presented in Appendix Table 4.3.

Option 2: Exterior Decontamination and Restoration.

The recommended remedial Option 2 for this property, DOE ID No. GJ-13970-MR, includes removal of all areas of exterior contamination, but does not include removal of any interior contamination (as discussed in Section 3.5 and shown in Appendix Figures 3.5b and 3.5c) 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 remedial Option 2.

##### 4.2 Evaluation of Recommended Remedial Action

Option 1

Volume calculations of the areas included for remedial Option 1 are presented in Appendix Table 4.1. Cost estimates are presented in Appendix Table 4.2. The identified residual radioactive material found on this property is tailings; the estimated volume is: exterior 270 cu. yd; interior, 69 cu. yd.

Estimated cost of remedial Option 1 is \$31,936.

Estimated cost of dislocation is \$1,859.

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



### Option 2

Volume calculations of the areas included for remedial Option 2 are presented in Appendix Table 4.3. Cost estimates are presented in Appendix Table 4.4. The identified residual radioactive material found on this property is tailings; the estimated volume is: exterior 270 cu. yd.; interior, 0 cu. yd.

Estimated cost of remedial Option 2 is \$15,518. Dislocation of the occupants will not be required for remedial Option 2.

There is no owner preference with respect to remedial Option 1 or 2 and no legal or other complications are foreseen at this time.

Areas A, B, C, D, E, F, and G, as discussed in Section 3.5 and shown on Appendix Figure 3.5a, will not be included in remedial Option No. 2 for the following reasons:

1. Interior RDC working level does not exceed EPA Standard.
2. Interior gamma does not exceed EPA Standard.

## 5.0 REFERENCES

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

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

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

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

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

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

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

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

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



## 6.0 APPENDIX

This Appendix contains the following:

### Appendix Tables:

Table 3.1	Radium Concentrations at Exterior Locations
Table 3.2	Radium Concentrations at Interior Locations
Table 3.3	Summary of Interior Gamma Exposure Rates
Table 4.1	Area and Volume Calculations - Option 1
Table 4.2	Estimated Cost of Decontamination and Restoration - Option 1
Table 4.3	Dislocation Estimated Cost Summary - Option 1
Table 4.4	Area and Volume Calculations - Option 2
Table 4.5	Estimated Cost of Decontamination and Restoration - Option 2

### Appendix Figures:

Figure 2.1	Vicinity Map
Figure 2.2	Site Plan
Figure 3.1a	Exterior Grid-Point Exposure Rates
Figure 3.1b	Exterior Grid-Point Exposure Rates
Figure 3.2a	Exterior Gamma Scan
Figure 3.2b	Exterior Gamma Scan
Figure 3.3a	Interior Gamma Survey and Sample Locations - Crawl Space
Figure 3.3b	Interior Gamma Survey and Sample Locations - Ground Floor
Figure 3.4a	Exterior Sample Locations
Figure 3.4b	Exterior Sample Locations
Figure 3.5a	Interior Estimated Extent of Contamination - Crawl Space and Sheds
Figure 3.5b	Exterior Estimated Extent of Contamination
Figure 3.5c	Exterior Estimated Extent of Contamination
Official Survey Report	
Memo of Understanding	
Team Leader Notes	
Deconvolution Graphs (Apparent Radium-226 Concentration)	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
7	141278	03	TC	13.7		*	Near irrigation ditch
		06	TC	11.5		*	
		09	TC	8.0		*	
		12	TC	6.0		*	DC = 12 inches Based on the deconvolution graph
		15	TC	5.0		*	
		18	TC	4.4		*	
		21	TC	4.2		*	
		24	TC	4.2		*	
		27	TC	4.0		*	
		30	TC	3.9		*	
		33	TC	3.7		*	
		36	TC	3.6		*	
8	145265	00	DS	5.1		*	North yard
		06	DS	4.1		*	DC = 12 inches
		12	DS	2.0		*	
		02-08	SS			15.0	
9	147229	03	TC	8.9		*	East of driveway
		06	TC	7.9		*	
		09	TC	6.3		*	
		12	TC	5.3		*	DC = 12 inches Based on the deconvolution graph
		15	TC	4.6		*	
		18	TC	4.3		*	
		21	TC	4.0		*	
		24	TC	4.0		*	
		27	TC	3.9		*	
		30	TC	3.8		*	
		33	TC	3.7		*	
		36	TC	3.6		*	
10	155281	03	TC	4.9		*	North yard
		06	TC	4.7		*	
		09	TC	4.3		*	
		12	TC	4.1		*	DC = 9 inches Based on the deconvolution graph
		15	TC	4.0		*	
		18	TC	3.8		*	
		21	TC	3.8		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
10	155281	24	TC	3.6		*	
		27	TC	3.6		*	
		30	TS	3.5		*	
		33	TC	3.3		*	
		36	TC	3.2		*	
11	165265	00	DS	3.2		*	North yard
		06	DS	2.6		*	DC = >6 inches
12	184235	00	DS	1.7		*	On sidewalk
13	186250	03	TC	4.9		*	Near water line
		06	TC	6.4		*	
		09	TC	8.8		*	
		12	TC	10.9		*	
		15	TC	8.5		*	
		18	TC	6.0		*	
		21	TC	4.8		*	DC = 18 inches
		24	TC	4.2		*	Based on the
		27	TC	3.9		*	deconvolution graph
		30	TC	3.6		*	
		33	TC	3.4		*	
		36	TC	3.3		*	
		39	TC	3.2		*	
		42	TC	3.1		*	
		45	TC	3.1		*	
		48	TC	3.1		*	
		51	TC	3.2		*	
		54	TC	3.3		*	
		57	TC	3.3		*	
		60	TC	3.3		*	
		63	TC	3.3		*	
14	187222	03	TC	6.3		*	Driveway
		06	TC	7.3		*	DC = 12 inches
		09	TC	6.3		*	Based on the
		12	TC	5.2		*	deconvolution graph

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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	187222	15	TC	4.6		*	
		18	TC	4.3		*	
		21	TC	4.2		*	
		24	TC	4.0		*	
		27	TC	3.9		*	
		30	TC	3.7		*	
		33	TC	3.7		*	
		36	TC	3.6		*	
15	190290	00	DS	1.5		*	Background
		00-06	SS			2.1	
		03	TC	3.3		*	
		06	BH	3.7	1.9	*	
		09	TC	4.0		*	
		12	TC	3.9		*	
		15	TC	3.8		*	
		18	TC	3.6		*	
		21	TC	3.5		*	
		24	BH	3.4	1.4	*	
		27	TC	3.3		*	DC = 0 inches
		30	TC	3.1		*	
		33	TC	3.1		*	
		36	TC	3.0		*	
		39	TC	3.0		*	
		42	TC	2.9		*	
		45	TC	3.0		*	
		48	TC	3.2		*	
		51	TC	3.2		*	
		54	BH	3.3	1.2	*	
		57	TC	3.3		*	
		60	TC	3.2		*	
		63	TC	3.2		*	
		66	TC	3.3		*	
		69	TC	3.3		*	
16	191235	00	DS	8.0		*	North of house
		06	DS	23.8		*	
		12	DS	12.5		*	
		03	TC	14.5		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
16	191235	06	TC	21.1		*	DC = 15 inches Based on the deconvolution graph
		09	TC	22.1		*	
		12	TC	14.7		*	
		15	TC	9.1		*	
		18	TC	6.5		*	
		21	TC	5.1		*	
		24	TC	4.4		*	
		27	TC	4.1		*	
		30	TC	3.8		*	
		33	TC	3.7		*	
17	193228	03	TC	12.7		*	NW corner of house/ driveway  DC = 18 inches Based on the deconvolution graph
		06	TC	16.7		*	
		09	TC	15.2		*	
		12	TC	10.8		*	
		15	TC	7.7		*	
		18	TC	5.9		*	
		21	TC	4.9		*	
		24	TC	4.3		*	
		27	TC	4.1		*	
		30	TC	3.9		*	
18	193266	03	TC	3.6		*	NE corner of house   DC = 0 inches
		06	TC	4.3		*	
		09	TC	4.3		*	
		12	TC	3.9		*	
		15	TC	3.8		*	
		18	TC	3.6		*	
		21	TC	3.4		*	
		24	TC	3.2		*	
		27	TC	3.1		*	
		30	TC	3.0		*	
		33	TC	3.0		*	
		36	TC	2.9		*	
		39	TC	2.8		*	
		42	TC	2.9		*	
		45	TC	2.9		*	
		48	TC	3.0		*	

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
18	193266	51	TC	3.2		*	
		54	TC	3.4		*	
		57	TC	3.3		*	
		60	TC	3.3		*	
19	213223	03	TC	14.1		*	Driveway
		06	TC	14.9		*	
		09	TC	11.7		*	
		12	TC	8.5		*	
		15	TC	6.9		*	
		18	TC	6.0		*	DC = 18 inches
		21	TC	5.5		*	Based on the
		24	TC	5.1		*	deconvolution graph
		27	TC	4.7		*	
		30	TC	4.4		*	
		33	TC	4.3		*	
		36	TC	4.1		*	
20	214265	00	DS	<1.0		*	Above gas line
		06	DS	1.1		*	DC = 0 inches
		12	DS	<1.0		*	
		17	DS	<1.0		*	On gas line
21	217215	03	TC	3.0		*	West of driveway
		06	TC	3.6		*	
		09	TC	3.8		*	
		12	TC	3.9		*	
		15	TC	3.9		*	
		18	TC	3.8		*	DC = 0 inches
		21	TC	3.8		*	
		24	TC	3.7		*	
		27	TC	3.6		*	
		30	TC	3.4		*	
		33	TC	3.2		*	
		36	TC	3.1		*	

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
22	230229	03	TC	9.1		*	SW corner of house
		06	TC	12.1		*	
		09	TC	12.0		*	
		12	TC	9.5		*	
		15	TC	7.3		*	
		18	TC	6.0		*	
		21	TC	5.3		*	
		24	TC	4.6		*	
		27	TC	4.4		*	
		30	TC	4.0		*	DC = 18 inches Based on the deconvolution graph
		33	TC	3.7		*	
		36	TC	3.4		*	
		39	TC	3.2		*	
		42	TC	3.1		*	
		45	TC	3.0		*	
		48	TC	3.0		*	
		51	TC	3.1		*	
		54	TC	3.0		*	
		57	TC	3.1		*	
		60	TC	3.0		*	
23	236232	03	TC	6.8		*	Beside septic tank
		06	TC	9.5		*	
		09	TC	11.7		*	
		12	TC	11.2		*	
		15	TC	9.2		*	
		18	TC	7.3		*	
		21	TC	6.0		*	
		24	TC	5.2		*	
		27	TC	4.8		*	DC = 24 inches Based on the deconvolution graph
		30	TC	4.5		*	
		33	TC	4.3		*	
		36	TC	4.1		*	
		39	TC	3.8		*	
		42	TC	3.7		*	
		45	TC	3.5		*	
		48	TC	3.4		*	
		51	TC	3.4		*	
		54	TC	3.3		*	
		57	TC	3.3		*	
		60	TC	3.2		*	

=====

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
23	236232	63	TC	3.2		*	
		66	TC	3.0		*	
		69	TC	3.0		*	
24	240267	03	TC	5.5		*	East side of addition
		06	TC	6.5		*	
		09	TC	5.6		*	
		12	TC	4.7		*	
		15	TC	4.1		*	
		18	TC	3.7		*	
		21	TC	3.5		*	
		24	TC	3.4		*	
		27	TC	3.3		*	
		30	TC	3.1		*	DC = 12 inches Based on the deconvolution graph
		33	TC	3.0		*	
		36	TC	3.0		*	
		39	TC	3.1		*	
		42	TC	3.1		*	
		45	TC	3.3		*	
		48	TC	3.2		*	
		51	TC	3.2		*	
		54	TC	3.2		*	
		57	TC	3.3		*	
		60	TC	3.3		*	
25	250260	03	TC	6.4		*	9" S of addition
		06	TC	7.0		*	
		09	TC	6.9		*	
		12	TC	6.0		*	
		15	TC	5.0		*	
		18	TC	4.5		*	DC = 15 inches Based on the deconvolution graph
		21	TC	4.2		*	
		24	TC	3.8		*	
		27	TC	3.6		*	
		30	TC	3.5		*	
		33	TC	3.3		*	
		36	TC	3.3		*	

=====



Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
26	290265	03	TC	7.8		*	Possible leach field area
		06	TC	7.0		*	
		09	TC	5.5		*	
		12	TC	4.6		*	
		15	TC	4.1		*	
		18	TC	3.7		*	DC = 9 inches Based on the deconvolution graph
		21	TC	3.7		*	
		24	TC	3.6		*	
		27	TC	3.5		*	
		30	TC	3.5		*	
		33	TC	3.6		*	
		36	TC	3.5		*	
27	300240	03	TC	7.6		*	SE corner of wood shed
		06	TC	8.7		*	
		09	TC	8.0		*	
		12	TC	6.4		*	
		15	TC	5.3		*	
		18	TC	4.6		*	DC = 15 inches Based on the deconvolution graph
		21	TC	4.1		*	
		24	TC	3.8		*	
		27	TC	3.6		*	
		30	TC	3.5		*	
		33	TC	3.4		*	
		36	TC	3.4		*	
28	300275	03	TC	4.9		*	East of possible leach field
		06	TC	5.2		*	
		09	TC	4.5		*	
		12	TC	4.1		*	
		15	TC	3.8		*	DC = 9 inches Based on the deconvolution graph
		18	TC	3.6		*	
		21	TC	3.4		*	
		24	TC	3.3		*	
		27	TC	3.3		*	
		30	TC	3.3		*	
		33	TC	3.3		*	

=====

Table 3.1

## Radium Concentrations at Exterior Locations

DOE ID #GJ-13970-MR

2361 H Road

Page 9 of 11

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
29	310255	03	TC	8.8		*	Possible leach field area
		06	TC	10.8		*	
		09	TC	10.5		*	
		12	TC	7.9		*	DC = 15 inches Based on the deconvolution graph
		15	TC	5.6		*	
		18	TC	4.4		*	
		21	TC	3.9		*	
		24	TC	3.6		*	
		27	TC	3.5		*	
30	315230	03	TC	6.1		*	South of wood shed
		06	TC	6.6		*	
		09	TC	6.2		*	
		12	TC	5.0		*	DC = 12 inches Based on the deconvolution graph
		15	TC	4.3		*	
		18	TC	3.9		*	
		21	TC	3.5		*	
		24	TC	3.3		*	
		27	TC	3.1		*	
		30	TC	3.1		*	
		33	TC	3.0		*	
		36	TC	3.0		*	
31	335240	03	TC	12.8		*	Possible leach field area
		06	TC	10.6		*	
		09	TC	7.3		*	
		12	TC	5.6		*	DC = 9 inches Based on the deconvolution graph
		15	TC	4.6		*	
		18	TC	4.1		*	
		21	TC	3.7		*	
		24	TC	3.5		*	
		27	TC	3.3		*	
		30	TC	3.2		*	
		33	TC	3.2		*	
		36	TC	3.2		*	
32	355250	03	TC	4.6		*	Possible leach field area
		06	TC	4.8		*	
		09	TC	4.3		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
32	355250	12	TC	3.9		*	
		15	TC	3.6		*	
		18	TC	3.4		*	
		21	TC	3.2		*	DC = 0 inches
		24	TC	3.1		*	
		27	TC	3.0		*	
		30	TC	3.1		*	
33	251235(b)	03	TC	5.0		*	NE corner of
		06	TC	4.8		*	chicken coop
		09	TC	4.5		*	
		12	TC	4.1		*	
		15	TC	3.9		*	
		18	TC	3.8		*	DC = 3 inches
		21	TC	3.6		*	Based on the
		24	TC	3.5		*	deconvolution graph
		27	TC	3.4		*	
		30	TC	3.3		*	
		33	TC	3.3		*	
34	300240(b)	03	TC	3.1		*	S of leach field
		06	TC	3.5		*	next to 3' concrete
		09	TC	3.7		*	irrigation pipe
		12	TC	3.7		*	
		15	TC	3.7		*	
		18	TC	3.6		*	
		21	TC	3.5		*	
		24	TC	3.4		*	
		27	TC	3.4		*	
		30	TC	3.4		*	DC = 0 inches
		33	TC	3.4		*	
		36	TC	3.4		*	
		39	TC	3.3		*	
		42	TC	3.3		*	
		45	TC	3.4		*	
		48	TC	3.4		*	
		51	TC	3.4		*	
		54	TC	3.3		*	
		57	TC	3.4		*	

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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.		
34	300240(b)	60	TC	3.4		*	
		63	TC	3.3		*	
		66	TC	3.4		*	
		69	TC	3.4		*	
		72	TC	3.4		*	
		75	TC	3.4		*	
		78	TC	3.3		*	
		81	TC	3.4		*	
		84	TC	3.4		*	
		87	TC	3.6		*	
		90	TC	3.6		*	
		93	TC	3.4		*	
		96	TC	3.1		*	
		99	TC	3.2		*	

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

Notes: DC = Depth of Contamination  
 \* = No Soil Sample Taken  
 (b) = This Sample Location Is  
 Shown On Figure 3.4b  
 Date of Survey = 12-27-84  
 Team Leader = R2

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
1		00	DS	4.6		*	
		06	DS	8.3		*	
		12	DS	13.6		*	DC = 20 inches
		17	DS	6.1		*	
		20	DS	2.5		*	
2		00	DS	13.3		*	
		06	DS	4.9		*	DC = 12 inches
		12	DS	1.7		*	
3		00	DS	25.5		*	
		06	DS	2.2		*	DC = 6 inches
4		00	DS	5.5		*	Back addition
		06	DS	4.9		*	
		12	DS	1.0		*	DC = 12 inches
5		00-02	SS			1.1	Concrete core
		03	TC	5.5		*	Wood shed
		06	TC	7.0		*	
		09	TC	7.7		*	
		12	TC	8.1		*	DC = 18 inches
		15	TC	6.8		*	Based on the
		18	TC	5.3		*	deconvolution graph
		21	TC	4.5		*	
		24	TC	3.9		*	
		27	TC	3.7		*	
		30	TC	3.5		*	
		33	TC	3.4		*	
6		00	DS	4.0		*	Shed 1
		06	DS	2.6		*	DC = 12 inches
		12	DS	<1.0		*	

=====

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

Notes: DC = Depth of Contamination  
 \* = No Soil Sample Taken

Date of Survey = 12-27-84  
 Team Leader = R2

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)
ROOM A	05	15-17	16	05	15-17	16
ROOM B	05	14-16	15	05	15-17	16
ROOM C	05	13-15	14	05	15-16	15
ROOM D	06	13-16	15	06	13-16	15
ROOM E	05	15-17	16	05	15-17	16
ROOM F	13	16-29	23	13	17-35	25
ROOM G	04	18-25	20	04	21-28	23
ROOM H	06	15-18	17	06	16-19	17
ROOM I	05	25-30	27	05	28-37	32
ROOM J	05	26-29	27	05	30-37	33
ROOM K	02	24-26	25	02	28-30	29
ROOM L	03	19-21	20	03	21-23	22
CRAWL SPACE	00	-	--	29	13-52	28
WOOD SHED	05	14-17	16	05	14-16	15
SHED 1	03	15-17	16	03	15-17	16
SHED 2	00	-	--	00	-	--
CHICKEN COOP	06	15-16	16	06	16-16	16

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\*Exposure Rates and Room Locations Shown in Appendix Figures 3.3a and 3.3b.

Table 4.1  
Area and Volume Calculations - Option 1  
DOE ID No. GJ-13970-MR

Page 1 of 3

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
INTERIOR					
Concrete					
C	36 x 0.7 =	25			
	36 x 2.0 =	72			
		<u>97</u>	x 1.7 =	165	
E	9 x 12 =	108	x 0.2 =	22	
Volume of Concrete				= <u>187</u>	= 187/27 = 7
Contaminated Fill					
A	35 x 9 =	315	x 1.7 =	536	
B	18 x 28 =	504			
	5 x 10 =	50			
		<u>554</u>	x 1.0 =	554	
C	18 x 28 =	504			
	6 x 5 =	30			
		<u>534</u>	x 0.5 =	267	
D	6 x 13 =	78	x 1.0 =	78	
E	9 x 12 =	108	x 1.3 =	140	
F	8 x 10 =	80	x 1.0 =	80	
G	5 x 6 =	30	x 1.0 =	30	
Volume of Fill				= <u>1,685</u>	= 1,685/27 = 62
TOTAL VOLUME - INTERIOR					= <u>69</u>

Table 4.1  
Area and Volume Calculations - Option 1  
DOE ID No. GJ-13970-MR

Page 2 of 3

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
EXTERIOR					
	Contaminated Fill				
H	2 x 5 =	10	x 2.0 =	20	
I	58 x 17 =	986	x 1.5 =	1,479	
J	9 x 11 =	99			
	2 x 12 =	24			
	5 x 5 =	25			
		<u>148</u>	x 1.3 =	192	
K	8 x 7 =	56			
	3 x 7 =	21			
		<u>77</u>	x 1.3 =	100	
L	7 x 7 =	49	x 1.5 =	74	
M	11 x 12 =	132			
	5 x 10 =	50			
		<u>182</u>	x 1.0 =	182	
N	10 x 10 =	100	x 1.3 =	130	
O	10 x 7 =	70			
	8 x 34 =	272			
	4 x 8 =	32			
	10 x 10 =	100			
		<u>474</u>	x 0.8 =	379	
P	16 x 37 =	592			
	5 x 12 =	60			
		<u>652</u>	x 1.0 =	652	
Q	8 x 18 =	144	x 1.0 =	144	
R	4 x 14 =	56	x 1.0 =	56	
S	1 x 3 =	3	x 0.8 =	2	



Table 4.1  
Area and Volume Calculations - Option 1  
DOE ID No. GJ-13970-MR

Page 3 of 3

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
T	4 x 4	= 16			
	3 x 4	= 12			
		= <u>28</u>	x 1.0 =	28	
U	2 x 5	= 10	x 1.0 =	10	
V	11 x 2	= 22	x 1.0 =	22	
W	30 x 20	= 600	x 0.8 =	480	
X	8 x 7	= 56	x 1.3 =	73	
Y	21 x 55	= 1,155	x 1.3 =	1,502	
Z	13 x 48	= 624	x 1.0 =	624	
AA	30 x 10	= 300			
	5 x 21	= 105			
	11 x 39	= 429			
	20 x 29	= 580			
		= <u>1,414</u>	x 0.8 =	1,131	
BB	9 x 2	= 18	x 0.3 =	5	
TOTAL VOLUME - EXTERIOR				= 7,285 = 7,285/27 =	270
TOTAL VOLUME - INTERIOR				=	69
TOTAL VOLUME				=	<u>339</u>

See Appendix Figures 3.5a, 3.5b, and 3.5c For Areas

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INTERIOR/MAIN STRUCTURE

Remove west concrete stemwall and footer (including north foundation to west wall of entry addition) 6 cy @ \$100.00/cy	\$ 600
Remove identified residual radioactive material 53 cy @ \$44.00/cy (manual)	2,332
Restore/replace west concrete stemwall and footer 8 cy @ \$175.00/cy	1,400
Incorporate code required foundation venting (allowance)	200
Restore/replace bearing via concrete mix below interior footings/north and east footings 18 cy @ \$175.00/cy	3,150
Restore/replace fill material 53 cy @ \$9.50/cy	504

INTERIOR/WOOD SHED

Support structure (allowance)	500
Cut and remove concrete-slab floor including perimeter material 135 sf @ \$3.00/sf	405
Remove identified residual radioactive material 5 cy @ \$44.00/cy (manual)	220
Restore/replace fill material - 3/4" crushed 5 cy @ \$13.50/cy	68
Restore/replace concrete slab/full 180 sf @ \$2.25/sf	405

INTERIOR/SHED 1 & 2

Relocate units on concrete curbs/clean area (allowance)	500
Remove identified residual radioactive material 4 cy @ \$44.00/cy (manual)	176
Replace/restore fill (pit run) 4 cy @ \$9.00/cy	36

TOTAL INTERIOR	\$ 10,496
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EXTERIOR

Remove identified residual radioactive material	
240 cy @ \$14.50/cy (machine)	\$ 3,480
30 cy @ \$65.00/cy (manual)	1,950
Hand excavate four large trees within contaminated areas	
4 @ \$100.00 each	400
Restore/replace gravel driveway - 3/4" washed	
18 cy @ \$15.00/cy	270
Restore/replace backfill material (pit run)	
245 cy @ \$9.00/cy	2,205
Restore/replace water-settled topsoil	
17 cy @ \$10.50/cy	180
Restore/replace landscaping - sod	
1,400 sf @ \$0.40/sf	560
Restore/replace landscaping - plantings (allowance)	750
Clean-up (allowance)	500
Protection (allowance)	250

TOTAL EXTERIOR \$ 10,545

TOTAL INTERIOR 10,496

ACCESS CONTROL 250

SUBTOTAL \$ 21,291

CONTINGENCY @ 20% 4,258

SUBTOTAL \$ 25,549

CONTRACTOR OVERHEAD & PROFIT @ 25% 6,387

SUBTOTAL \$ 31,936

TOTAL COST OF DISLOCATION (From Table 4.3) 1,859

GRAND TOTAL \$ 33,795

Table 4.3  
DISLOCATION ESTIMATED COST SUMMARY - OPTION 1  
(Residential)

Page 1 of 1

DOE ID No. : GJ-13970-MR  
Address : 2361 H Road, Grand Junction, Colorado

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Duration of Dislocation	: Construction Schedule 1 month. Move-out and move-back 1 month. Total: 2 months.		
Shelter Costs	: Monthly rent \$400 x 2 months.	TOTAL	\$ 800
Utility Costs	: Water: Initiate service \$8 ea. on and off. Usage per month \$35 x 2 months. Sewer: Included with water. Gas: Initiate service \$15 on \$8 off. Usage per month \$25 x 2 months. Electric: Initiate service \$15 on \$8 off. Usage per month \$50 x 2 months.	TOTAL	\$ 282
Telephone Transfer Cost	: Transfer service out and back. \$62 each way.	TOTAL	\$ 124
Cable T.V. Transfer Cost	: Transfer service out and back. \$15 one way + \$18 one way.	TOTAL	\$ 33
Moving Costs	: Packing and unpacking. \$150 each way.	TOTAL	\$ 300
Storage Costs	: Items to be stored: Appliances Cost per month \$60 x 2 months.	TOTAL	\$ 120
Special Dislocation Items	: Special Items: Transportation to schools at 25 miles/day Cost per month \$100 x 2 months.	TOTAL	\$ 200
			ESTIMATED TOTAL COST FOR DISLOCATION
			\$1,859

Table 4.4  
Area and Volume Calculations - Option 2  
DOE ID No. GJ-13970-MR

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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INTERIOR

Areas A through G are not acted on in remedial Option 2

EXTERIOR

Contaminated Fill

H	2 x 5	=	10	x	2.0	=	20
I	58 x 17	=	986	x	1.5	=	1,479
J	9 x 11	=	99				
	2 x 12	=	24				
	5 x 5	=	25				
		=	148	x	1.3	=	192
K	8 x 7	=	56				
	3 x 7	=	21				
		=	77	x	1.3	=	100
L	7 x 7	=	49	x	1.5	=	74
M	11 x 12	=	132				
	5 x 10	=	50				
		=	182	x	1.0	=	182
N	10 x 10	=	100	x	1.3	=	130
O	10 x 7	=	70				
	8 x 34	=	272				
	4 x 8	=	32				
	10 x 10	=	100				
		=	474	x	0.8	=	379
P	16 x 37	=	592				
	5 x 12	=	60				
		=	652	x	1.0	=	652
Q	8 x 18	=	144	x	1.0	=	144

Table 4.4  
Area and Volume Calculations - Option 2  
DOE ID No. GJ-13970-MR

Page 2 of 2

<u>AREA</u>	<u>CALCULATIONS(ft.)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARD</u>
R	4 x 14 =	56	x 1.0 =	56	
S	1 x 3 =	3	x 0.8 =	2	
T	4 x 4 =	16			
	3 x 4 =	12			
		<u>28</u>	x 1.0 =	28	
U	2 x 5 =	10	x 1.0 =	10	
V	11 x 2 =	22	x 1.0 =	22	
W	30 x 20 =	600	x 0.8 =	480	
X	8 x 7 =	56	x 1.3 =	73	
Y	21 x 55 =	1,155	x 1.3 =	1,502	
Z	13 x 48 =	624	x 1.0 =	624	
AA	30 x 10 =	300			
	5 x 21 =	105			
	11 x 39 =	429			
	20 x 29 =	580			
		<u>1,414</u>	x 0.8 =	1,131	
BB	9 x 2 =	18	x 0.3 =	5	
TOTAL VOLUME - EXTERIOR				= 7,285	= 7,285/27 = 270
TOTAL VOLUME - INTERIOR					= 0
TOTAL VOLUME					= 270

See Appendix Figures 3.5b and 3.5c For Areas

=====

EXTERIOR

Remove identified residual radioactive material	
240 cy @ \$14.50/cy (machine)	\$ 3,480
30 cy @ \$65.00/cy (manual)	1,950
Hand excavate four large trees within contaminated areas	
4 ea @ \$100.00/each	400
Restore/replace gravel driveway - 3/4" washed	
18 cy @ \$15.00/cy	270
Restore/replace backfill material (pit run)	
245 cy @ \$9.00/cy	2,205
Restore/replace water-settled topsoil	
17 cy @ \$10.50/cy	180
Restore/replace landscaping - sod	
1,400 sf @ \$0.40/sf	560
Restore/replace landscaping - plantings (allowance)	750
Clean-up (allowance)	500
Protection (allowance)	250
TOTAL EXTERIOR	\$ 10,545
ACCESS CONTROL	250
SUBTOTAL	\$ 10,795
CONTINGENCY @ 15%	1,619
SUBTOTAL	\$ 12,414
CONTRACTOR OVERHEAD & PROFIT @ 25%	3,104
GRAND TOTAL	\$ 15,518

=====

GV060485  
REAL3970:REAKL002:LAJ



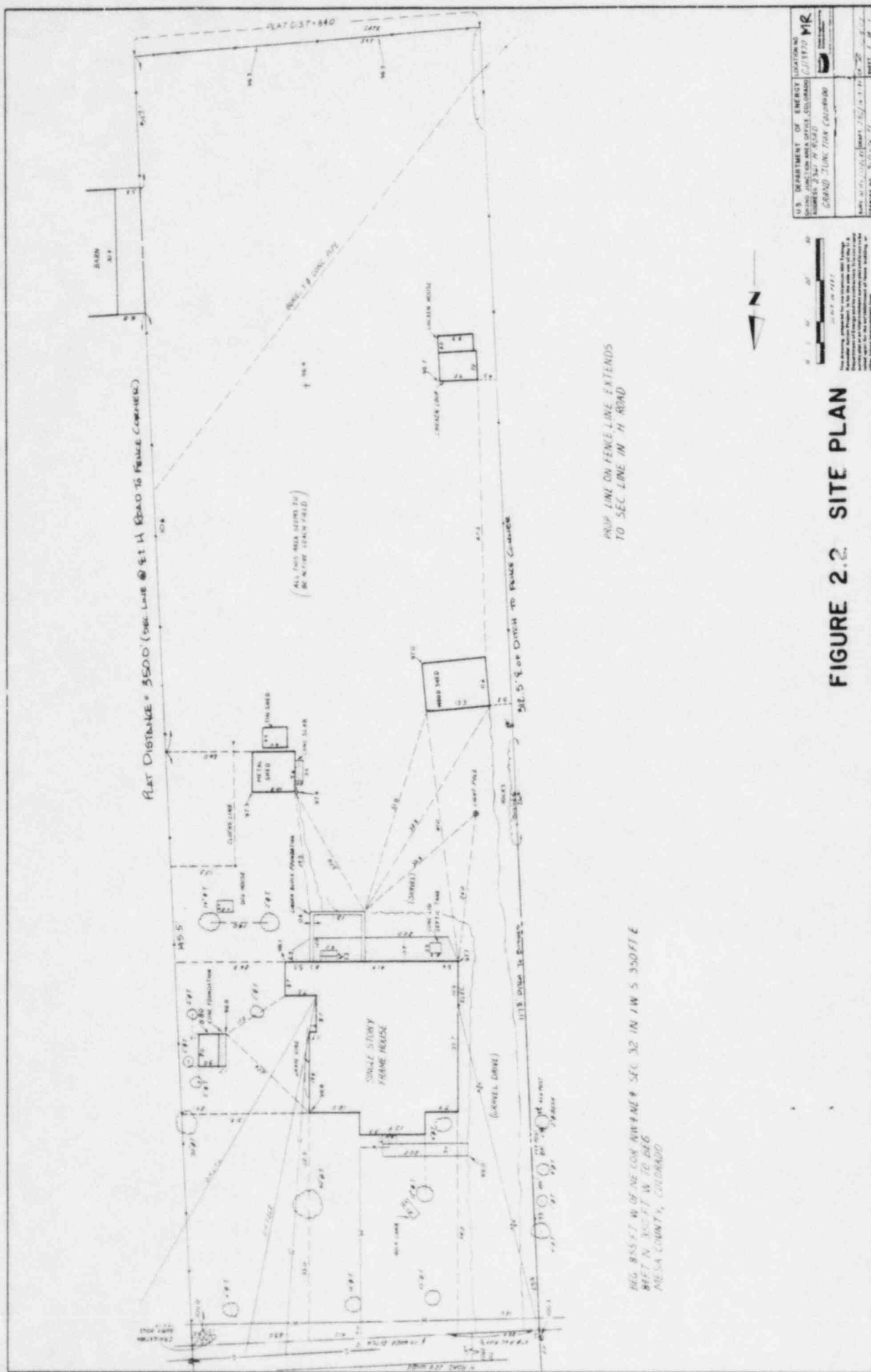


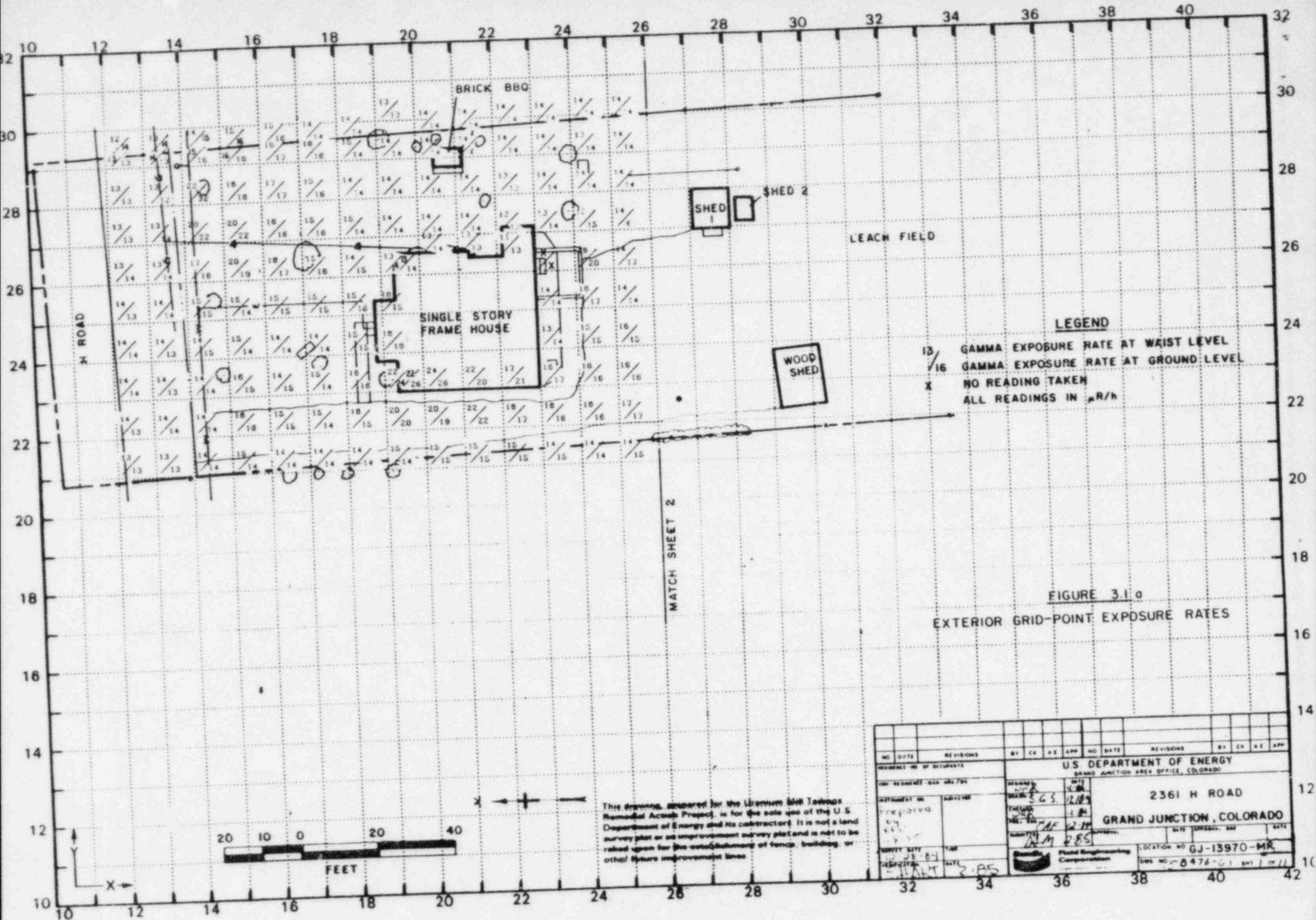
**LOCATION #**  
**13970**

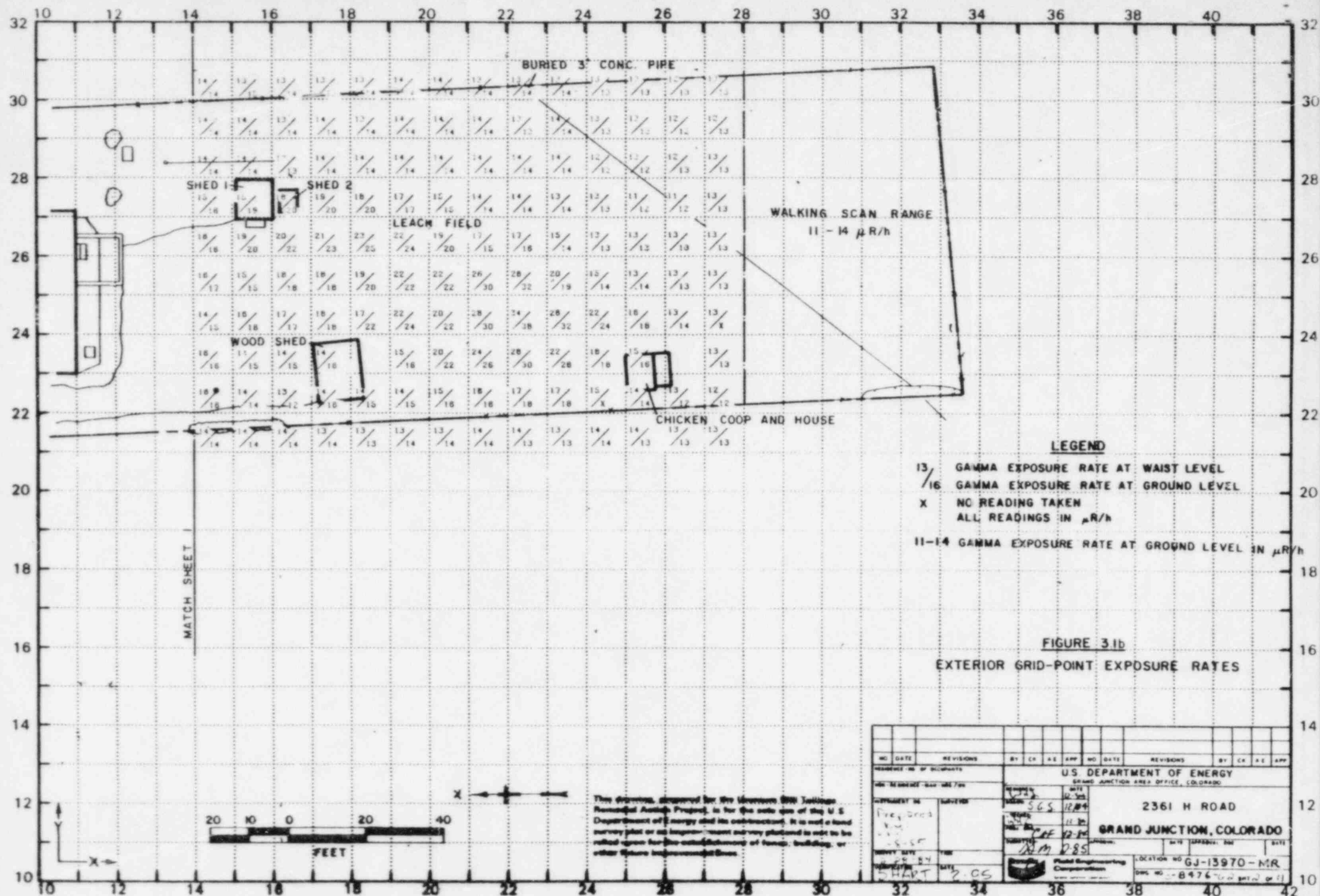
2361 H RD.

**N**  
**FIGURE 2.1 VICINITY MAP**



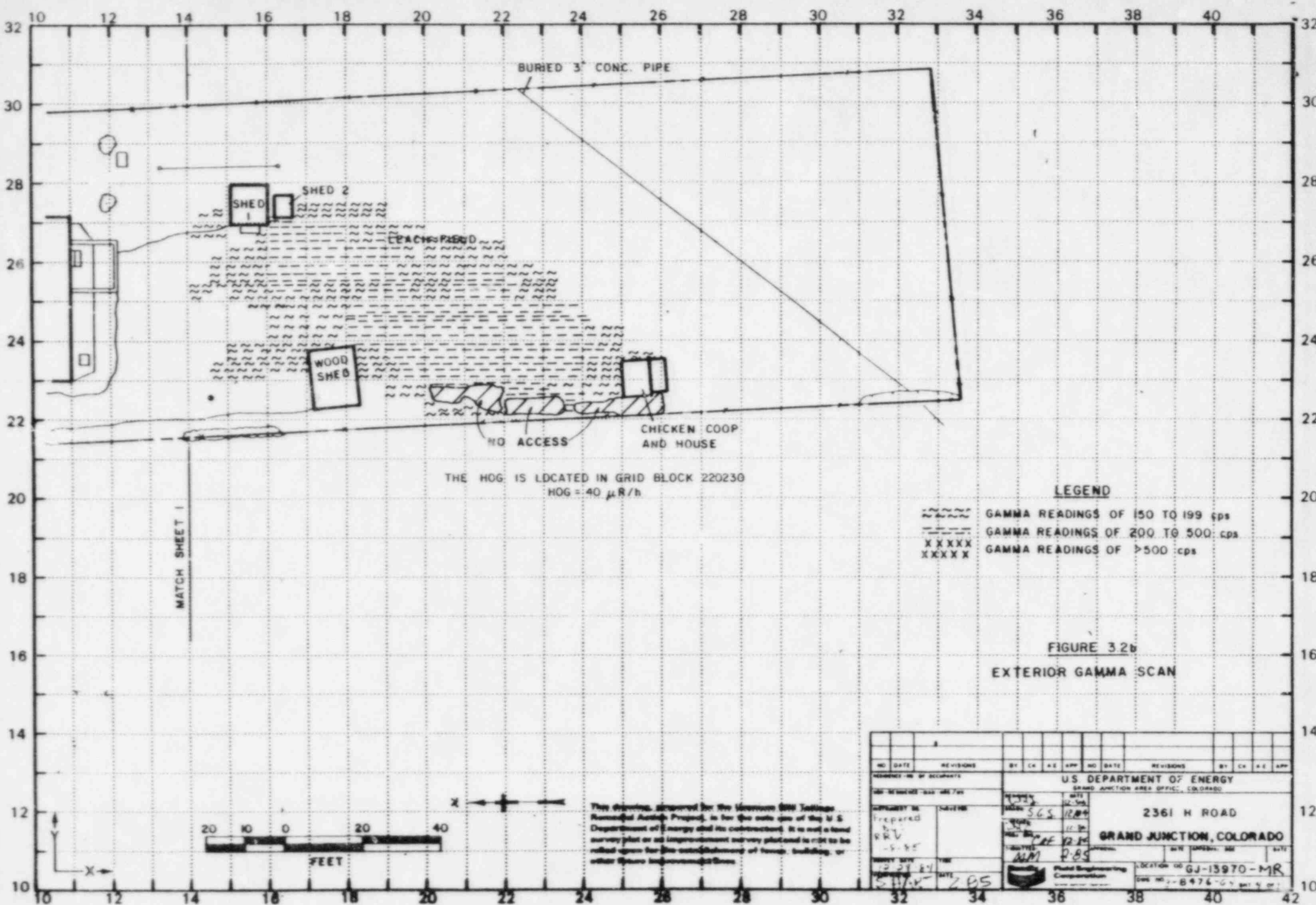










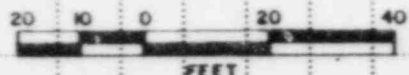


**LEGEND**

- GAMMA READINGS OF 150 TO 199 cps
- GAMMA READINGS OF 200 TO 500 cps
- XXXXX GAMMA READINGS OF >500 cps

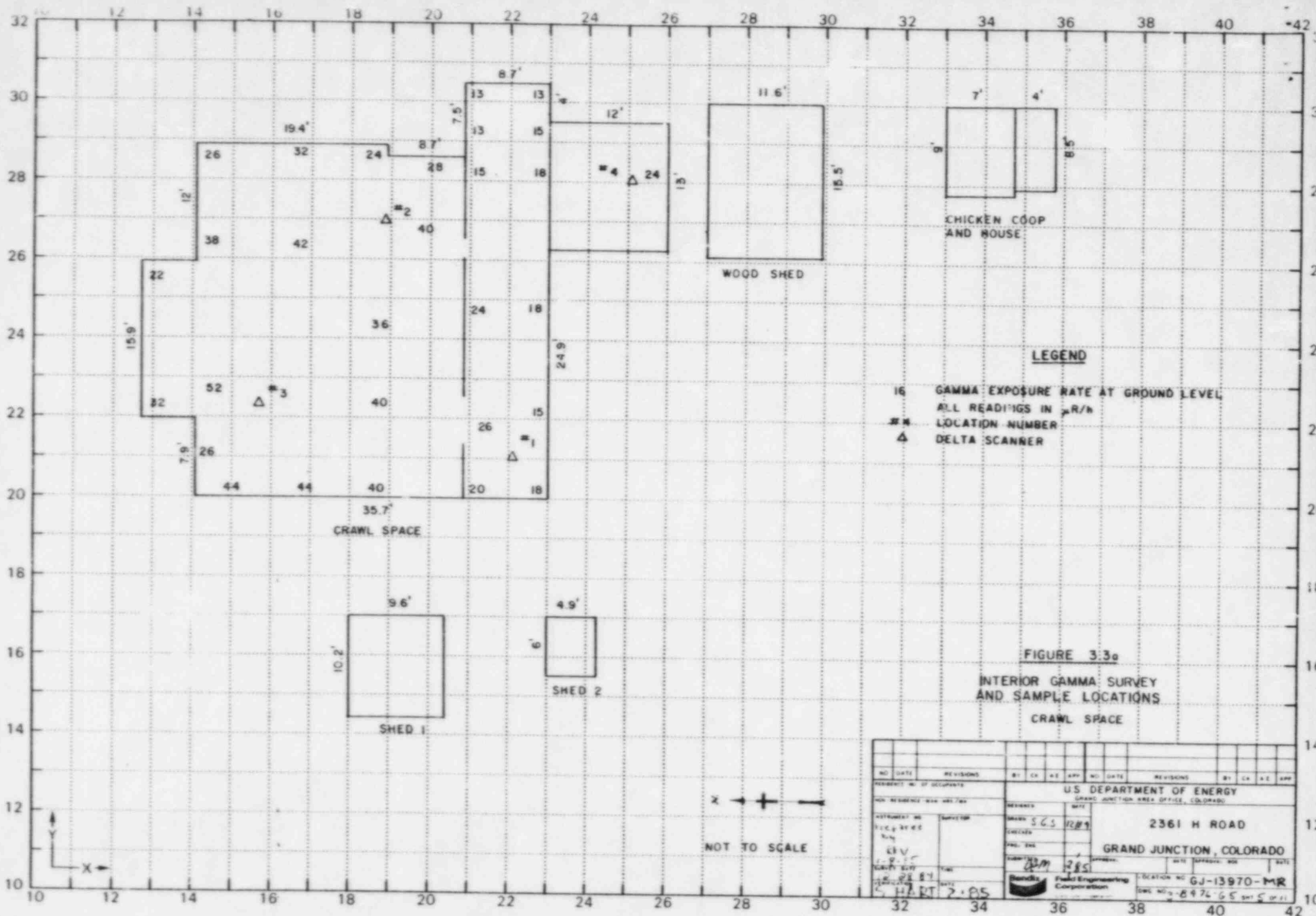
**FIGURE 3.2b**

**EXTERIOR GAMMA SCAN**

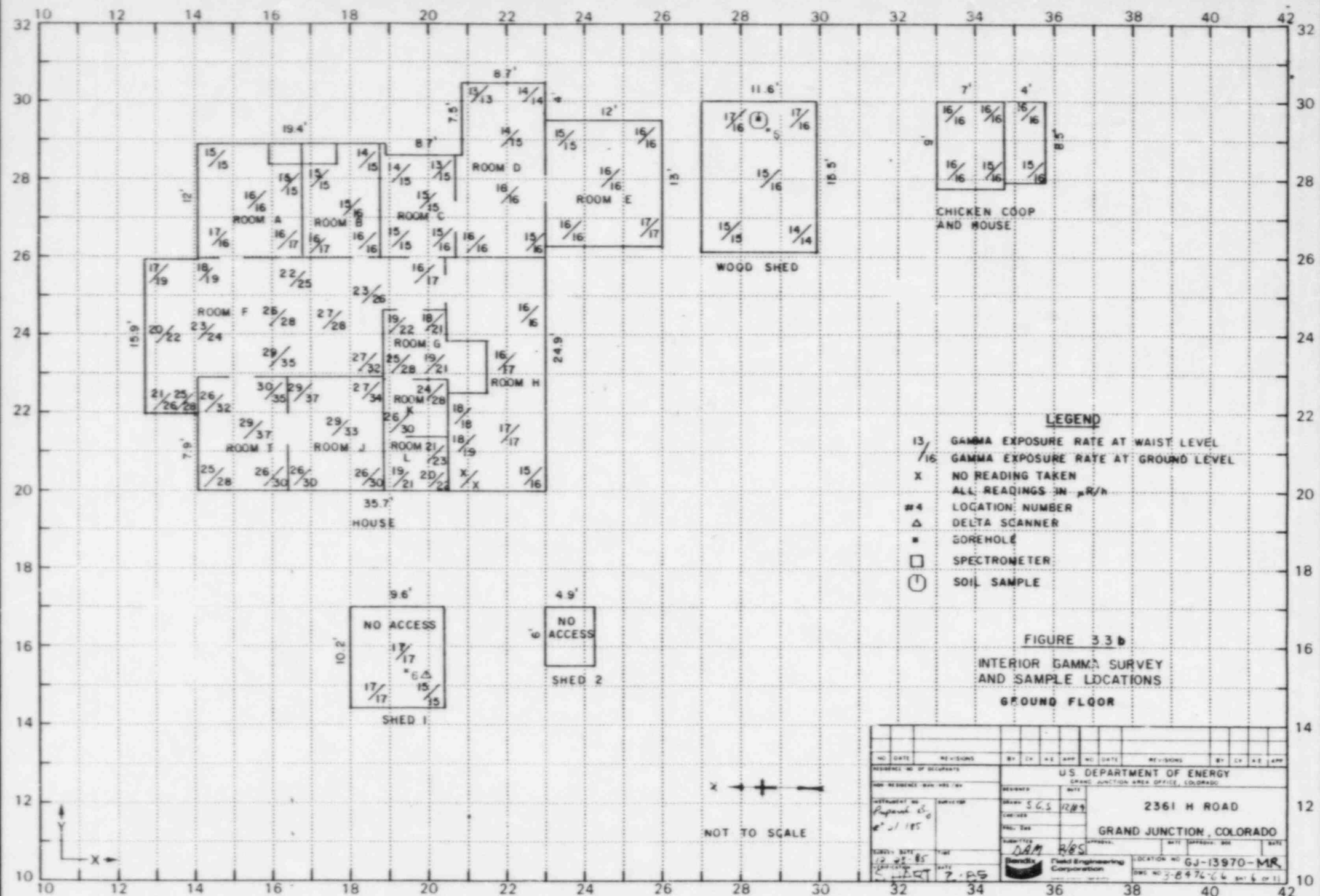


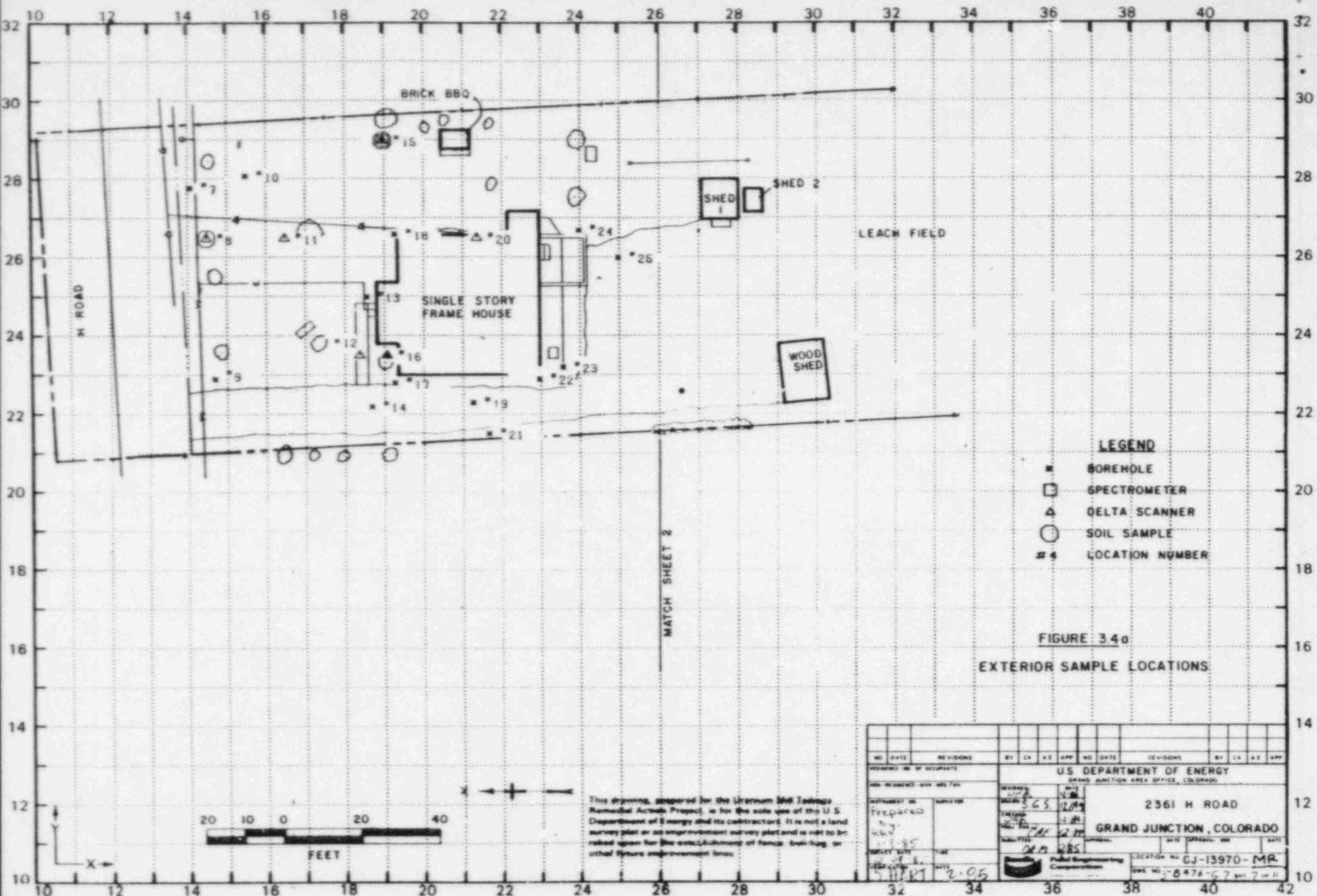
This drawing, prepared for the Missouri SW Test Range Remedial Action Project, is for the sole use of the U.S. Department of Energy and its contractors. It is not a land survey plot or an improvement survey plot and is not to be relied upon for the establishment of fence, building, or other feature boundaries.

<table border="1"> <tr> <td>NO.</td> <td>DATE</td> <td>REVISIONS</td> <td>BY</td> <td>CK</td> <td>A.E.</td> <td>APP.</td> <td>NO.</td> <td>DATE</td> <td>REVISIONS</td> <td>BY</td> <td>CK</td> <td>A.E.</td> <td>APP.</td> </tr> <tr> <td colspan="14">                 NO. REVISIONS: 000-000-000             </td> </tr> </table>										NO.	DATE	REVISIONS	BY	CK	A.E.	APP.	NO.	DATE	REVISIONS	BY	CK	A.E.	APP.	NO. REVISIONS: 000-000-000													
NO.	DATE	REVISIONS	BY	CK	A.E.	APP.	NO.	DATE	REVISIONS	BY	CK	A.E.	APP.																								
NO. REVISIONS: 000-000-000																																					
U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO										2361 N. ROAD <b>GRAND JUNCTION, COLORADO</b>																											
PROJECT NO. 10-00-000 PREPARED BY: RRV DATE: 5-85 DRAWN BY: J. J. J. DATE: 2-85										LOCATION: GJ-13970-MR SCALE: 1"=40'																											

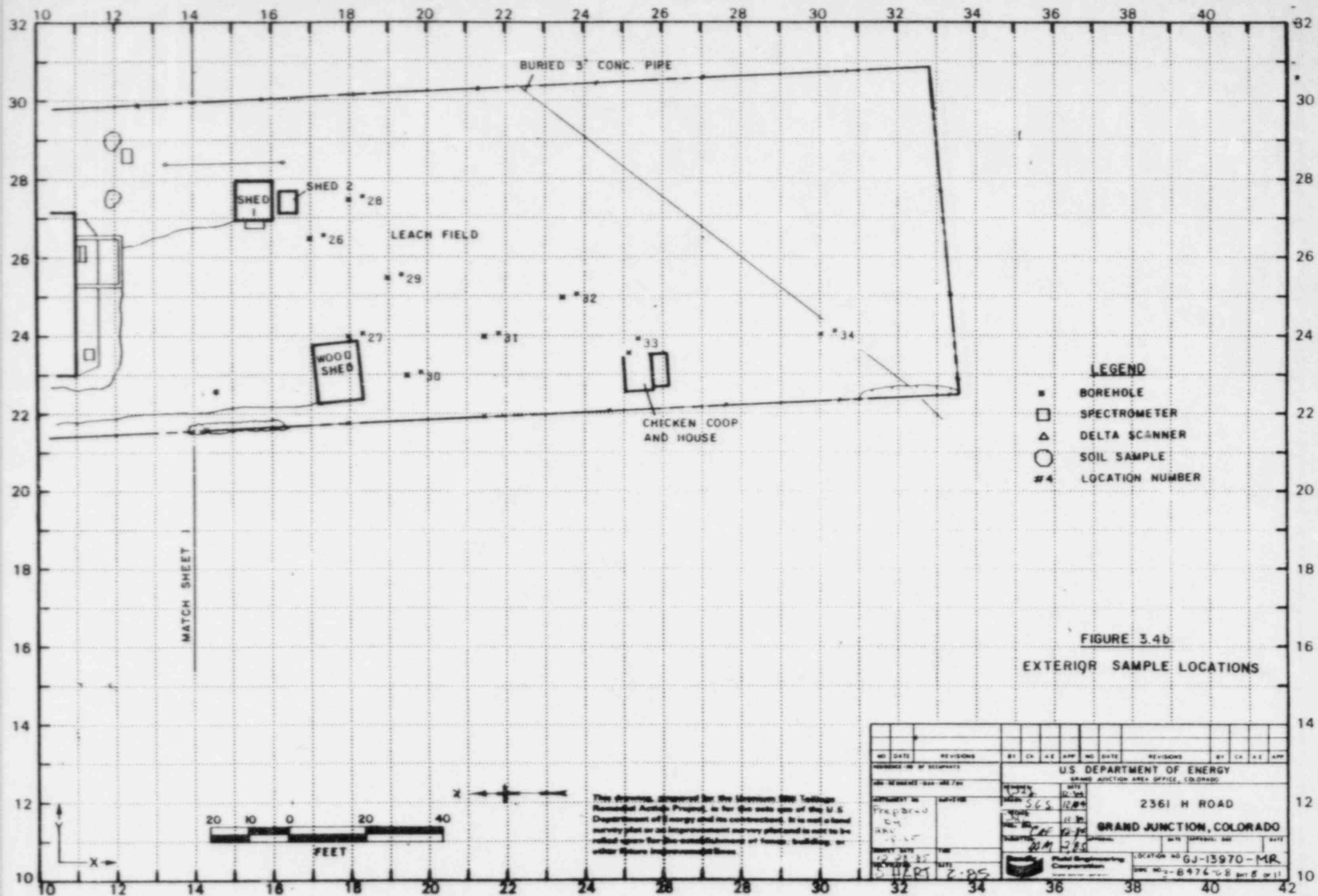


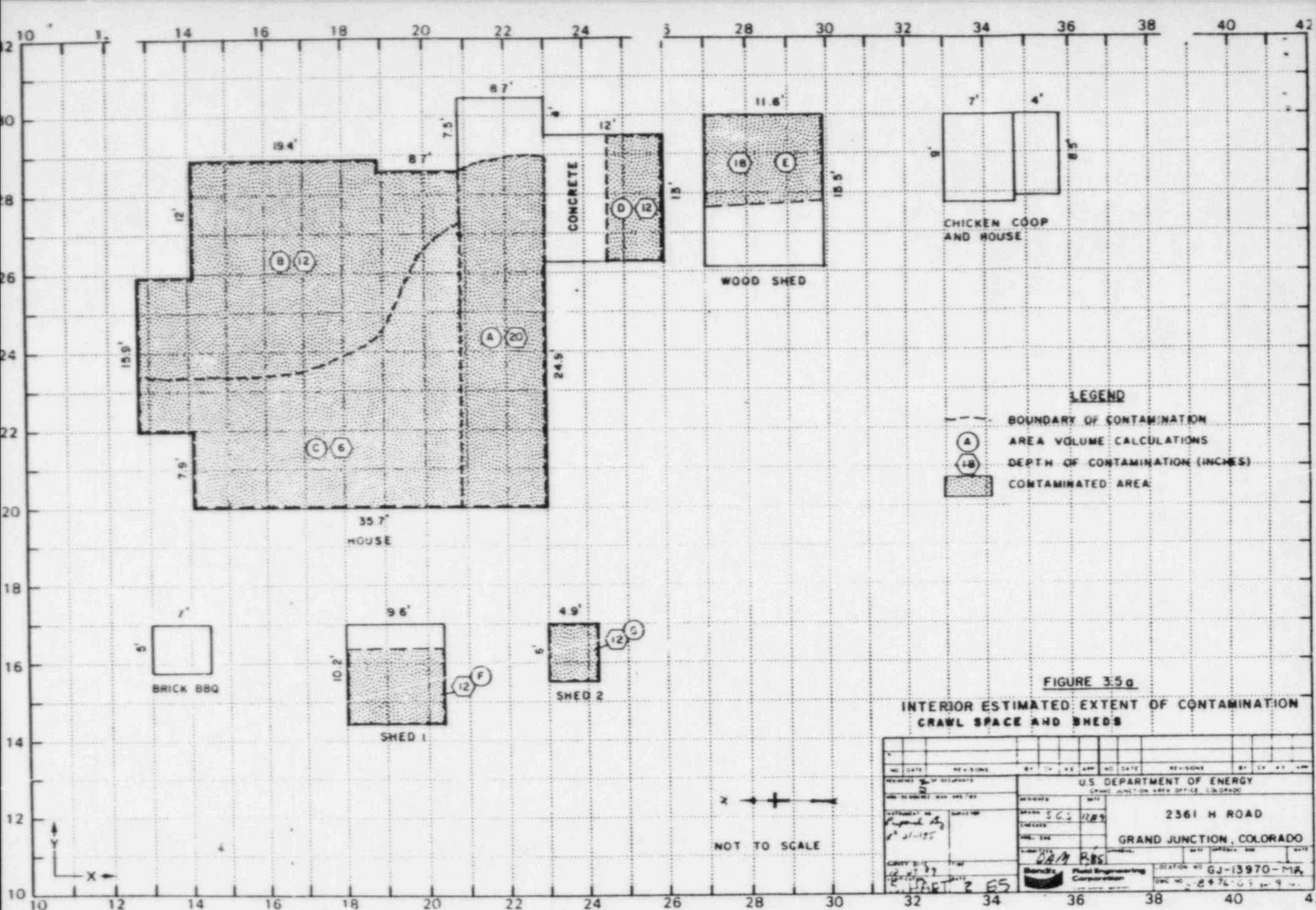
NO.	DATE	REVISIONS	BY	CHK	A.E.	APP.	NO.	DATE	REVISIONS	BY	CHK	A.E.	APP.
PERMIT NO. OF OCCUPANTS							U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO						
NON-RESIDENTIAL WORK AREA / WORK							2361 H ROAD GRAND JUNCTION, COLORADO						
INSTRUMENT NO. 1111111111							DESIGNED BY S.C.S. 12/89						
ELEVATION 1000							CHECKED BY J.P.S.						
DATE 12/89							APPROVED BY J.P.S.						
DRAWN BY HART							FIELD ENGINEERING CORPORATION						
DATE 12/89							LOCATION NO. GJ-13970-MR						
							SHEET NO. 8476-65 SHEET 5 OF 11						

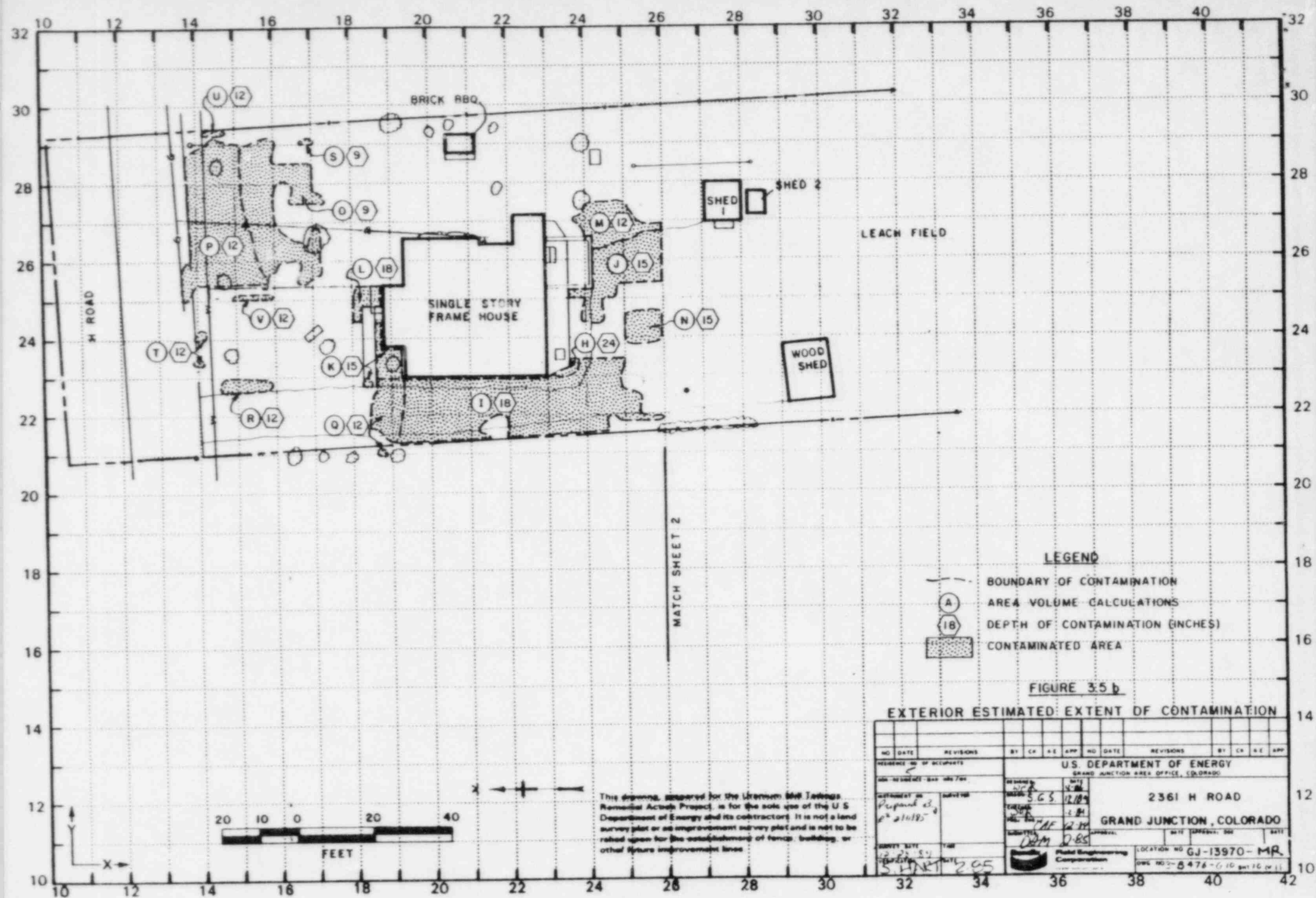


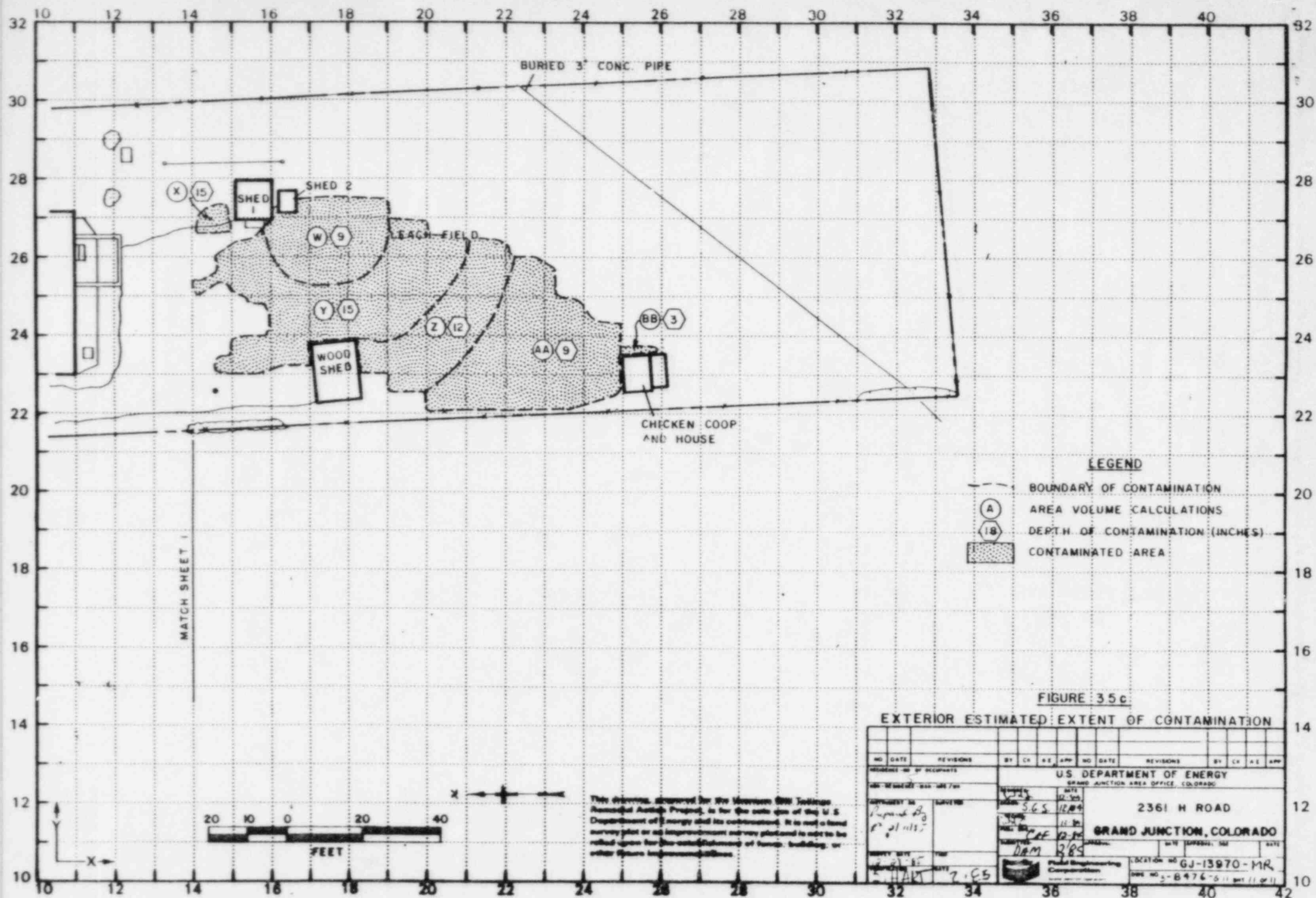












**LEGEND**

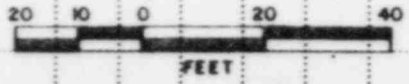
- BOUNDARY OF CONTAMINATION
- (A) AREA VOLUME CALCULATIONS
- (18) DEPTH OF CONTAMINATION (INCHES)
- [SHADING] CONTAMINATED AREA

**FIGURE 35c**

**EXTERIOR ESTIMATED EXTENT OF CONTAMINATION**

NO. DATE REVISIONS BY CH. R.E. APP. NO. DATE REVISIONS BY CH. R.E. APP.									
RESIDENCE OF OCCUPANTS									
ABL. REMARKS: SEE ABL. 7/81									
CONTAMINATED BY: <i>Report By 8/21/85</i>									
SURVEY DATE: <i>7/85</i>									
DATE: <i>7/85</i>									
U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO 2361 H ROAD GRAND JUNCTION, COLORADO PROJECT ENGINEERING COMMUNICATIONS LOCATION NO. GJ-13970-MR DWS NO. 5-B476-5 (1 of 1)									

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 final survey plot or an improvement and may be placed to suit the needs of the contractor for the construction of fence, building, or other future improvements.





Location No. GJ-13970-MRDate Feb. 13, 1985

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

Official Survey Report

Property Address 2361 H RoadProperty Owner William E. and Anna Higgs

Address of Owner (if different from above) \_\_\_\_\_

Report Prepared By R. Ryan

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 = 52 uR/hr

HOG = 40 uR/hr

## Bendix

### Field Engineering Corporation

P.O. Box 1569  
Grand Junction, CO 81502  
Tel (303) 242-8621

A Subsidiary of  
The Bendix Corporation

February 8, 1985

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

ATTN: Jon Luellen

Dear Jon:

This letter is in follow-up of the Technical Review on property number GJ-13970-~~RS~~ (2361 H Road).  
MA 98

The areas that require additional field work or comments are as follows:

1. The two sheds near grid block 270270 were labeled Shed 1 and Shed 2 on all of the final maps. Shed 1 was investigated with depth deltas and found to have contamination to a depth of 12-inches. This interior area was included in the Estimated Extent of Contamination map, Figure 3.5a. Shed 2 was not accessible but assumed to have interior contamination also because of the exterior contamination adjacent to the building.
2. The small structure to the east of the house is a brick Bar-B-Que, not a shed. This label was changed on all of the final maps.
3. The location of the sewer line south of the house is not known. This will be addressed in the section, Areas Requiring Further Investigation During Remedial Action.
4. The shed southwest of the house was labeled "wood shed" on all of the final maps. This shed was further investigated with a core and borehole. Contamination was found to a depth of 18-inches. This interior area was included in the Estimated Extent of Contamination map, Figure 3.5a.

Jon Luellen  
Colorado Department of Health  
February 8, 1985  
Page 2



Thank you for your time and cooperation. If you have any additional questions or comments, please contact me at 242-8621, extension 298.

Sincerely,

A handwritten signature in cursive script, reading "Rick M. Ryan".

Rick Ryan  
RAD Tech Team Leader

RR:pr

12-27-84

Location: GJ 13970 RS MR PB

Address: 2361 H Rd.

owner: Higgs, William E

phone (303) 243-4715

Owner was contacted by phone  
12-26-84 by Rick Ryan.

Approval for visit and survey  
was given.

CDH and ORNL data indicate  
area of contamination to be  
around and under the one-  
story Trailer Built into house.  
also in South yard which  
has a leach field, and North  
yard.

occupancy: 5 people



G 13470

12-27-84

9 A.M.

Cold, Cloudy

W. Higgs gave verbal approval  
to site survey

Lot was gridded. Boreholes  
around 4 corners of house with  
Auger was done, also along  
water lines and Gas lines. 12-27-84  
Delta was taken along Gas meter  
to sub surface level of 17".  
Background hole was surfaced.  
Deltaed, Soil Sample taken  
then augered. All Boreholes were  
logged with T.C. PRS-1

Grid point Readings were taken  
Delta's in Crawlspace were  
needed, Health and Safety were  
there to provide fans for Vent-  
ilation, No Respirators needed.

G 13470

1200 - all members washed  
then frisked with alpha scanner.  
No contamination found on  
persons, went to lunch...  
Returned

Raining, all but 3 members  
returned to base.  
Continued Delta's in Crawl  
Space.

#### Team Members

Rick Ryan T.H.

P. Egidio

V. Young

T. Coley

P. Tukey

M. Duran

D. Bell

C. Adams

J. Garcia

R. Valpando T.H. (traiver)

G 13470

### Instruments

Alpha Scan 5-06956  
Scintillometer C-1149 C-1180  
Delta's BFEC C-3937  
C-3936

PRS 1 T.C. C-3573  
Downhole Spectrometer GAD-6  
C-0385

!.  
all instruments were  
post operationally checked.

Robert R. Dickson  
12-27-84

G 13470

### Revisit

12-28-84

830 AM  
foggy, cold ... later Rain PM

finished Grid pts., Grid scan  
of lot done. found elevated  
Reading around beach field,  
along Drive way and around  
house also front yard.

Auger holes done in these  
areas. All Boreholes logged  
with PRS 1 T.C.

A Depth Delta was taken  
in Crawlspace of the  
addition (which was being  
worked on, during the time  
of our Survey.)

G 13970

## Team members

Rick Ryan T.L.

J. Garcia

P. Tuhey

P. Egidi

I. Caley

M. Durab

D. Bell

C. Adams

R. Vialpando T.H. (trainee)

V. Young

## Instruments

BFEC Delta's

C-3936

C-3937

## Scintillometers

C-1149

C-1180

C-1247

C-1178

C-1184

PRS 1 T.C.

C-3956

C-3573

## Downhole Spectrometer

C-0385

G 13970

All Team members washed  
and Frisked with alpha Scan  
No contamination on persons  
found.

Instruments were Post  
operationally checked

Robert R. Vialpando  
12-28-84

G13970  
Tech. Review 1-29-85

1. Further investigation of  
The two sheds in grid  
blocks 270270 and 280270  
(Fig. 3.5 b)
2. The location of the sewer  
line leading to the apparent  
leach field in the South yard  
should be determined and  
documented as to potential  
contaminated involvement.
3. The wood shed (Fig. 3.3 b)  
on grid Block 180230 should  
be explored for possible  
contamination under concrete  
slab.
4. identify structure in Fig. 3.2a



G 13970

1-29-85

Follow up from  
Tech Review

Instruments

PRS 1 C-3956

BFEC DS C-3943

SC C-1128

Team Members

J. Garcia

R. Vialpando T.L

To Gather more information

300 PM (Partly cloudy & warm)

talked to Anna Higgs, She  
gave me a key to work shed.

She also stated that the loc-  
ation of the sewer line to  
the apparent leach field was  
unknown to her, Mr Higgs was  
not at home, so no further  
investigation of sewer line  
was done.

G13970

a core, and TC readings were done (with a PRS 1) on the work shed on grid Block 180230 (Fig. 3.3b) elevated reading at 12" - 3"

Delta's were taken at Surface, 6" Below Surface & 12" Below Surface to investigate the possibility of tailing being under shed on grid Block 270270.

The shed on grid Block 280270 was inaccessible (do to it being full of coal)

The structure on Fig. 3.2a is a BBQ Pit.

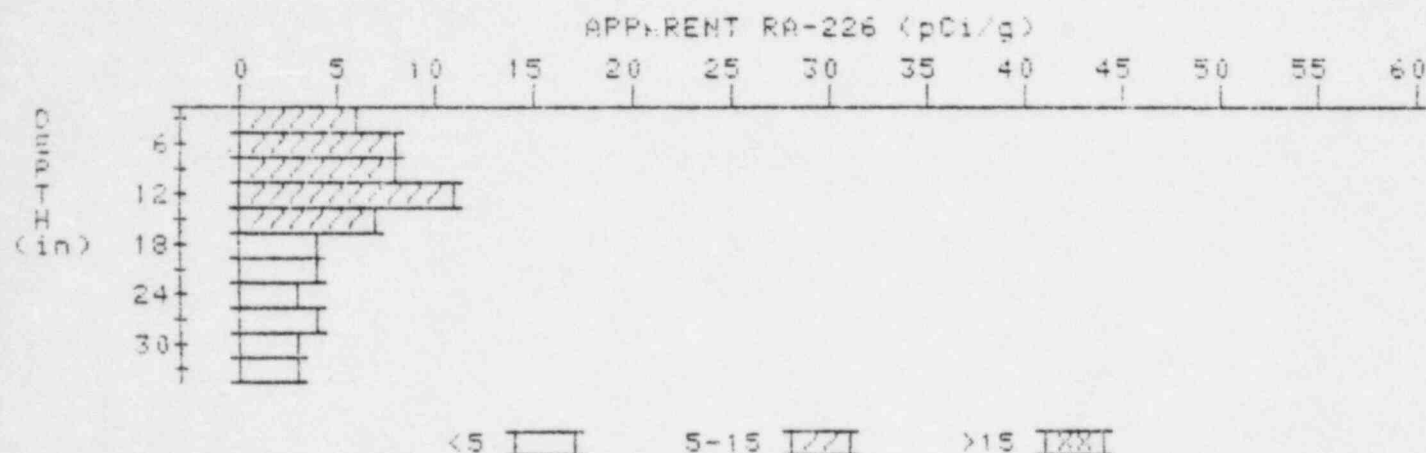
# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

5

PROPERTY NUMBER: GJ-13970-MR

HOLE NUMBER: 5

LOCATION:



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.5	5.5
6	7.0	8.4
9	7.7	8.2
12	8.1	11.1
15	6.8	7.2
18	5.3	4.1
21	4.5	4.1
24	3.9	3.2
27	3.7	3.7
30	3.5	3.3
33	3.4	3.4

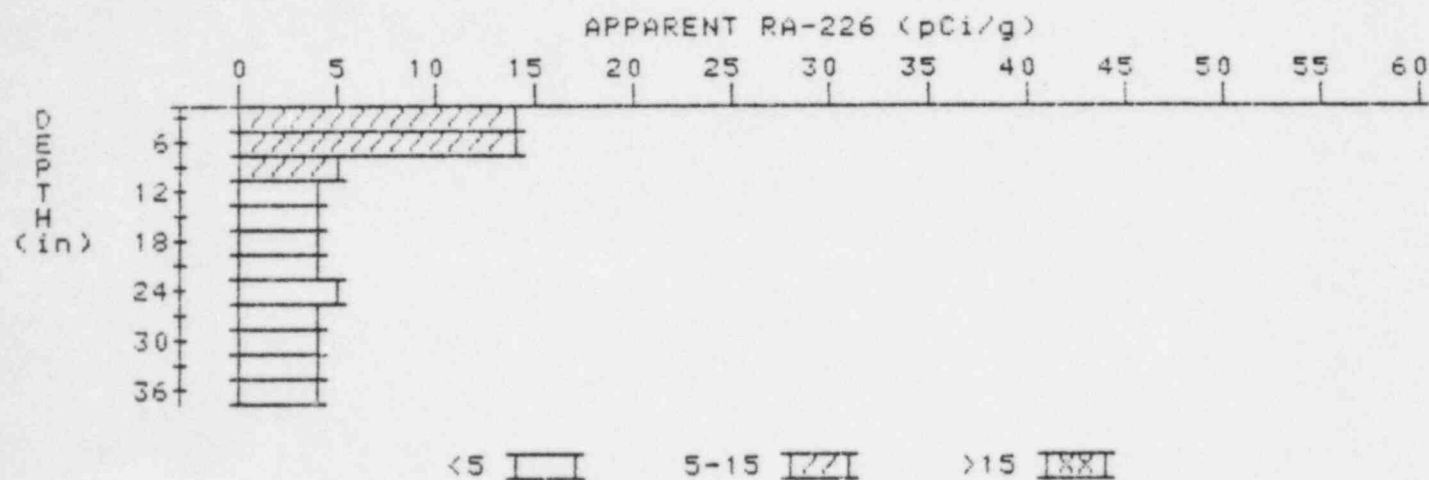
# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

7

PROPERTY NUMBER: GJ-13970-MK

HOLE NUMBER: 7

LOCATION: 141278



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	13.7	13.7
6	11.5	13.8
9	8.0	5.3
12	6.0	4.2
15	5.0	4.3
18	4.4	3.7
21	4.2	3.8
24	4.2	4.6
27	4.0	3.8
30	3.9	4.1
33	3.7	3.5
36	3.6	3.6



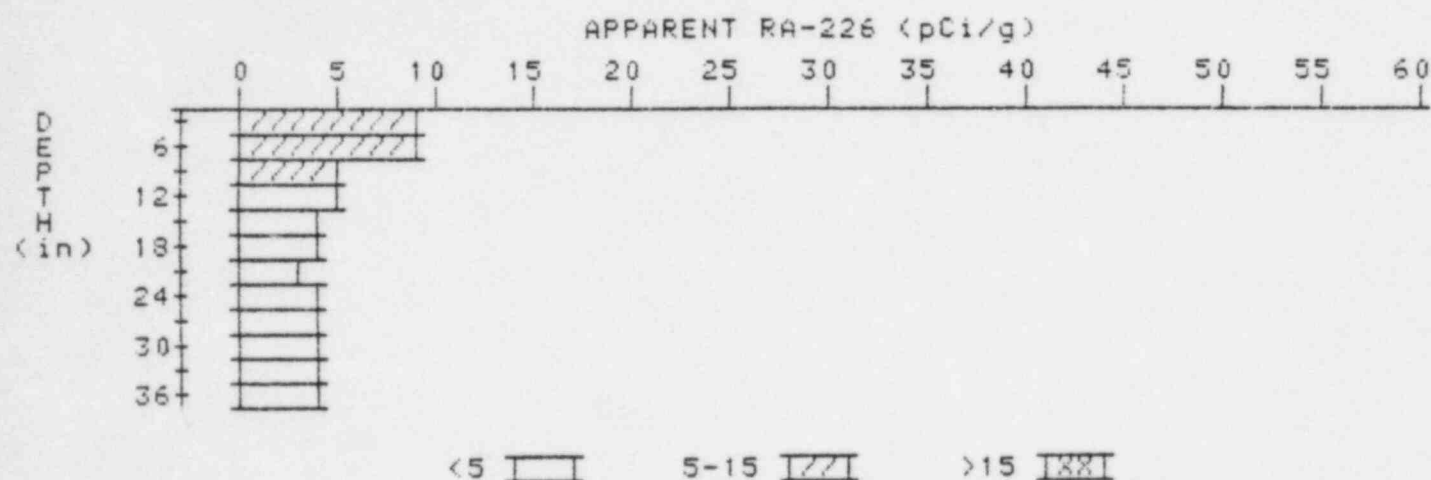
# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

9

PROPERTY NUMBER: GJ-13970-MR

HOLE NUMBER: 9

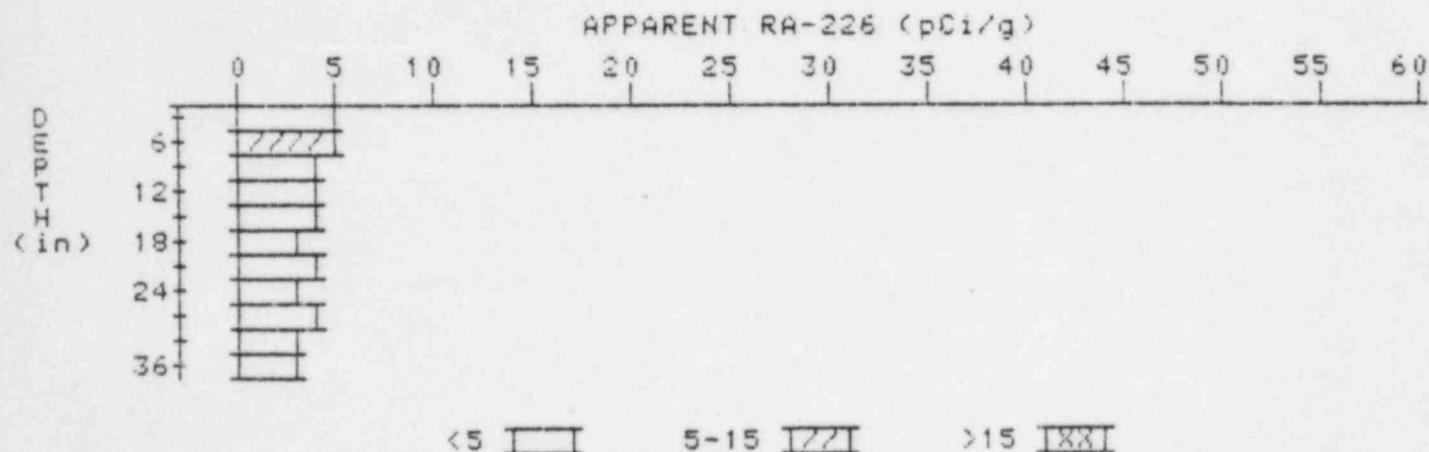
LOCATION: 147229



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	8.9	8.9
6	7.9	9.0
9	6.3	5.2
12	5.3	4.8
15	4.6	3.9
18	4.3	4.3
21	4.0	3.5
24	4.0	4.2
27	3.9	3.9
30	3.8	3.8
33	3.7	3.7
36	3.6	3.6

# APPARENT RADIUM-226 CONCENTRATION 10 DECONVOLUTION GRAPH

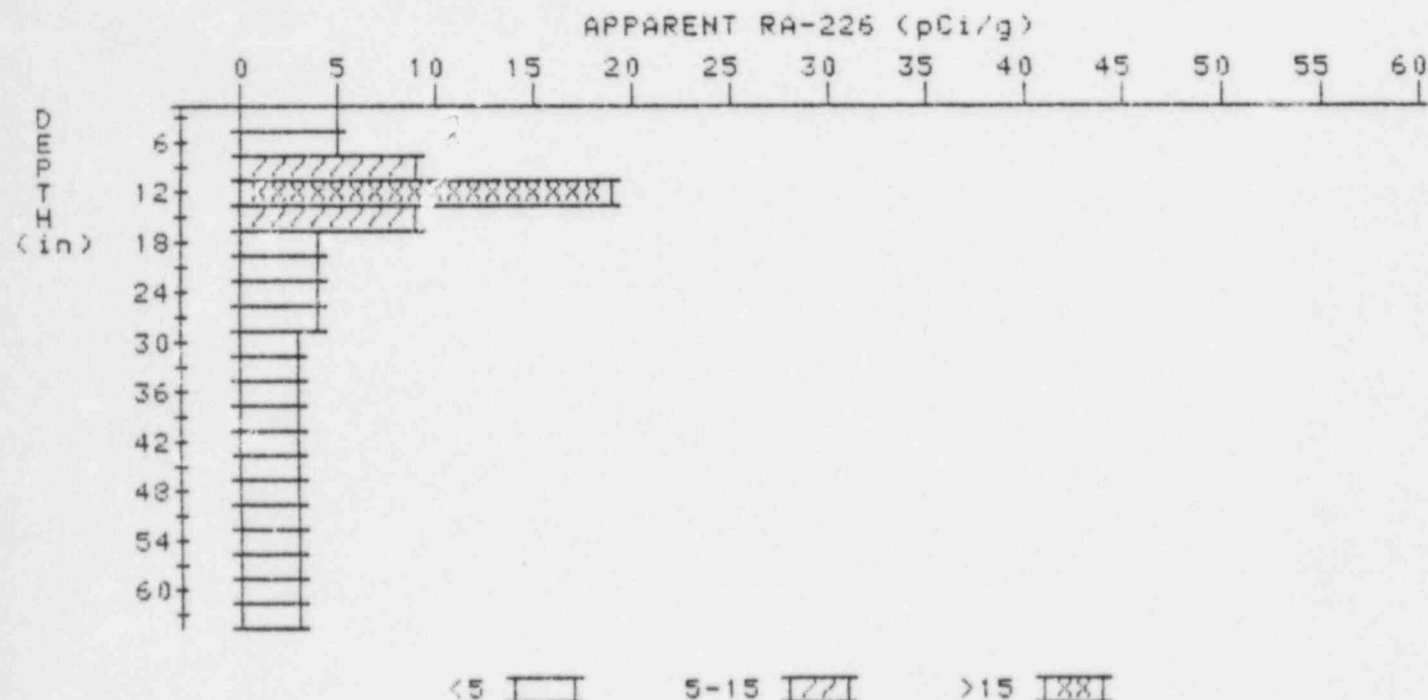
PROPERTY NUMBER: GJ-13970-MR  
HOLE NUMBER: 10  
LOCATION: 155281



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.9	4.9
6	4.7	5.1
9	4.3	3.9
12	4.1	3.9
15	4.0	4.2
18	3.8	3.4
21	3.8	4.2
24	3.6	3.2
27	3.6	4.1
33	3.3	2.9
36	3.2	3.2

# APPARENT RADIUM-226 CONCENTRATION 13 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13970-MR  
HOLE NUMBER: 13  
LOCATION: 186250



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.9	4.9
6	6.4	4.8
9	8.8	9.3
12	10.9	18.9
15	8.5	8.7
18	6.0	3.7
21	4.8	3.7
24	4.2	3.7
27	3.9	3.9
30	3.6	3.4
33	3.4	3.2
36	3.3	3.5
39	3.2	3.2
42	3.1	2.9
45	3.1	3.1
48	3.1	2.9
51	3.2	3.2

54  
57  
60  
63

3.3  
3.3  
3.3  
3.3

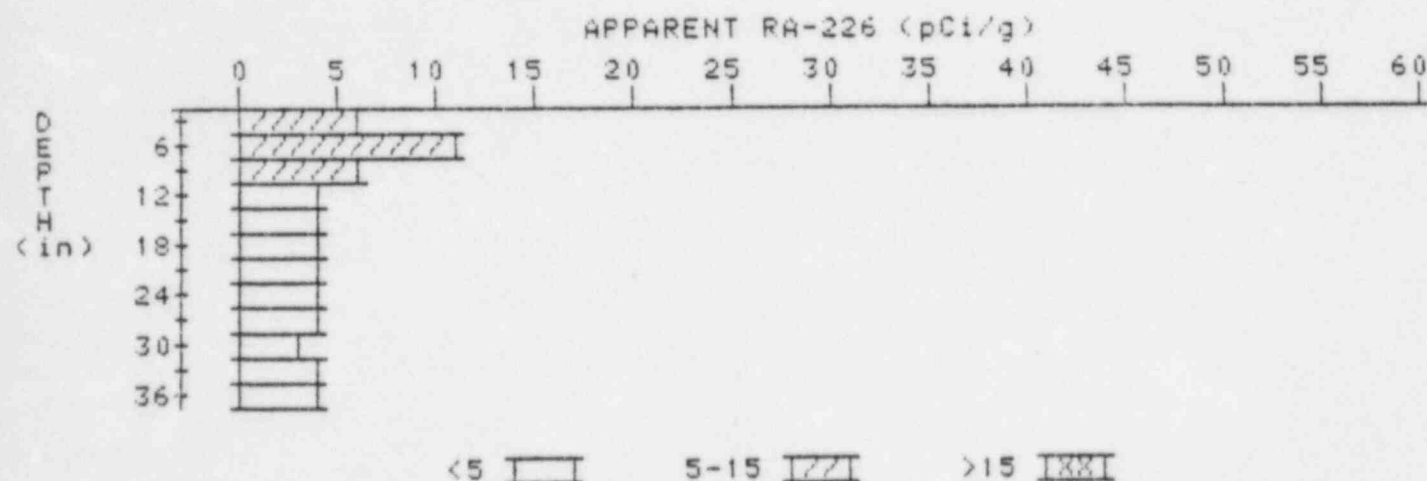
3.3  
3.3  
3.3  
3.3

# APPARENT RADIUM-226 CONCENTRATION 14 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13970-MR

HOLE NUMBER: 14

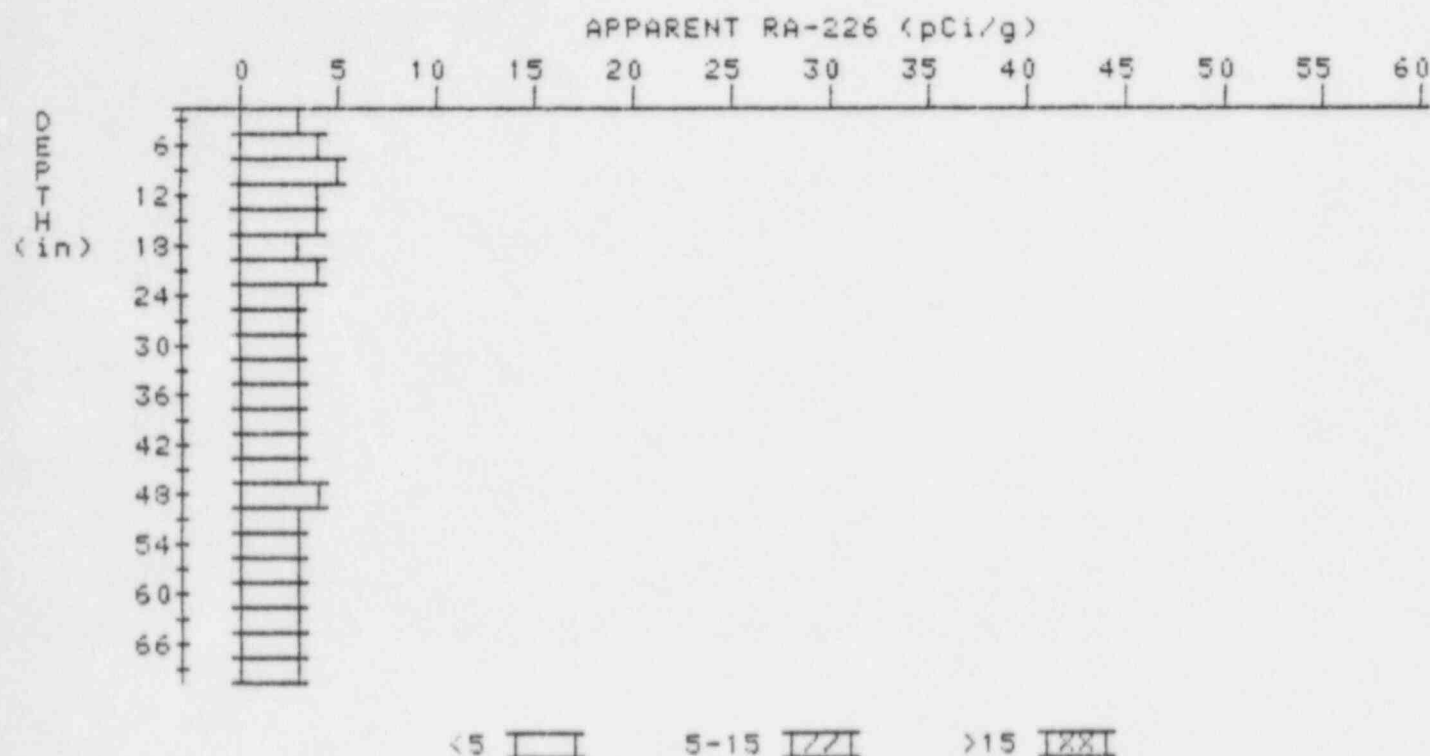
LOCATION: 187222



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.3	6.3
6	7.3	10.9
9	6.3	6.5
12	5.2	4.3
15	4.6	4.1
18	4.3	3.9
21	4.2	4.4
24	4.0	3.8
27	3.9	4.1
30	3.7	3.3
33	3.7	3.9
36	3.6	3.6

# APPARENT RADIUM-226 CONCENTRATION 15 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13970-MR  
HOLE NUMBER: 15  
LOCATION: 190290



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.7	3.9
9	4.0	4.7
12	3.9	3.9
15	3.8	4.0
18	3.6	3.4
21	3.5	3.5
24	3.4	3.4
27	3.3	3.5
30	3.1	2.7
33	3.1	3.3
36	3.0	2.8
39	3.0	3.2
42	2.9	3.5
45	3.0	3.0

48  
51  
54  
57  
60  
63  
66  
69

3.2  
3.2  
3.3  
3.3  
3.2  
3.2  
3.3  
3.3

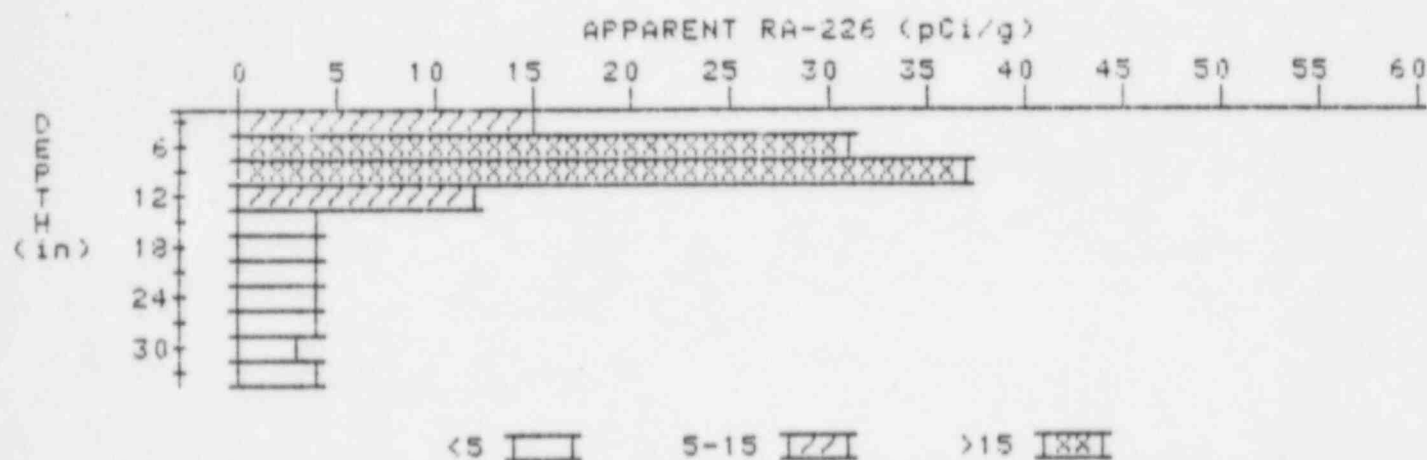
3.5  
3.0  
3.5  
3.5  
3.0  
3.0  
3.5  
3.3

# APPARENT RADIUM-226 CONCENTRATION 16 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13970-MR

HOLE NUMBER: 16

LOCATION: 191235

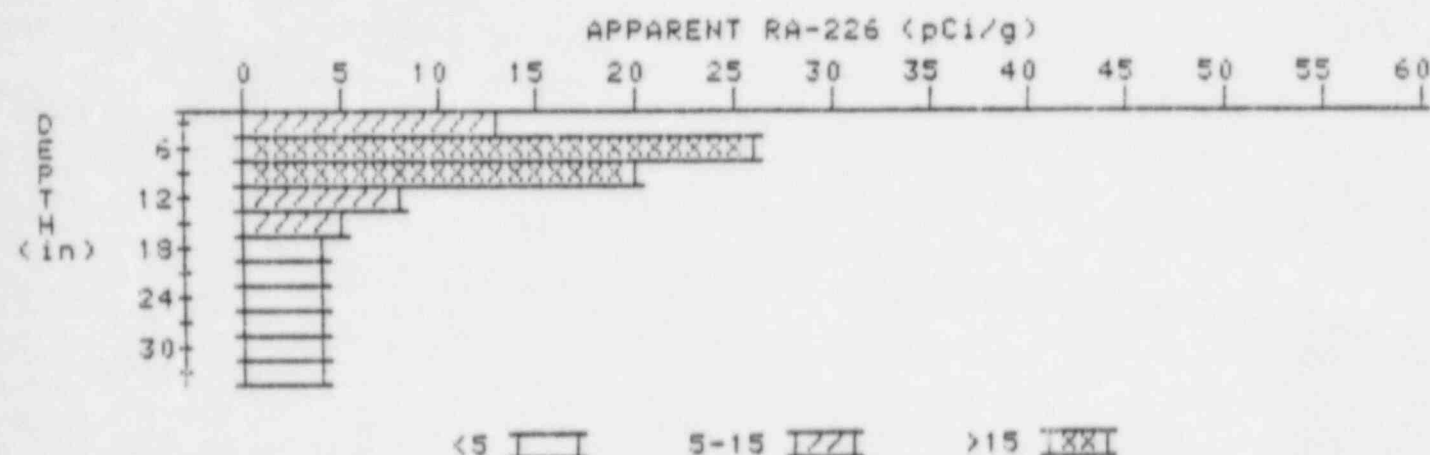


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	14.5	14.5
6	21.1	31.1
9	22.1	37.0
12	14.7	11.5
15	9.1	3.8
18	6.5	4.4
21	5.1	3.9
24	4.4	3.7
27	4.1	4.1
30	3.8	3.4
33	3.7	3.7



# APPARENT RADIUM-226 CONCENTRATION 17 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13970-ma  
HOLE NUMBER: 17  
LOCATION: 193229



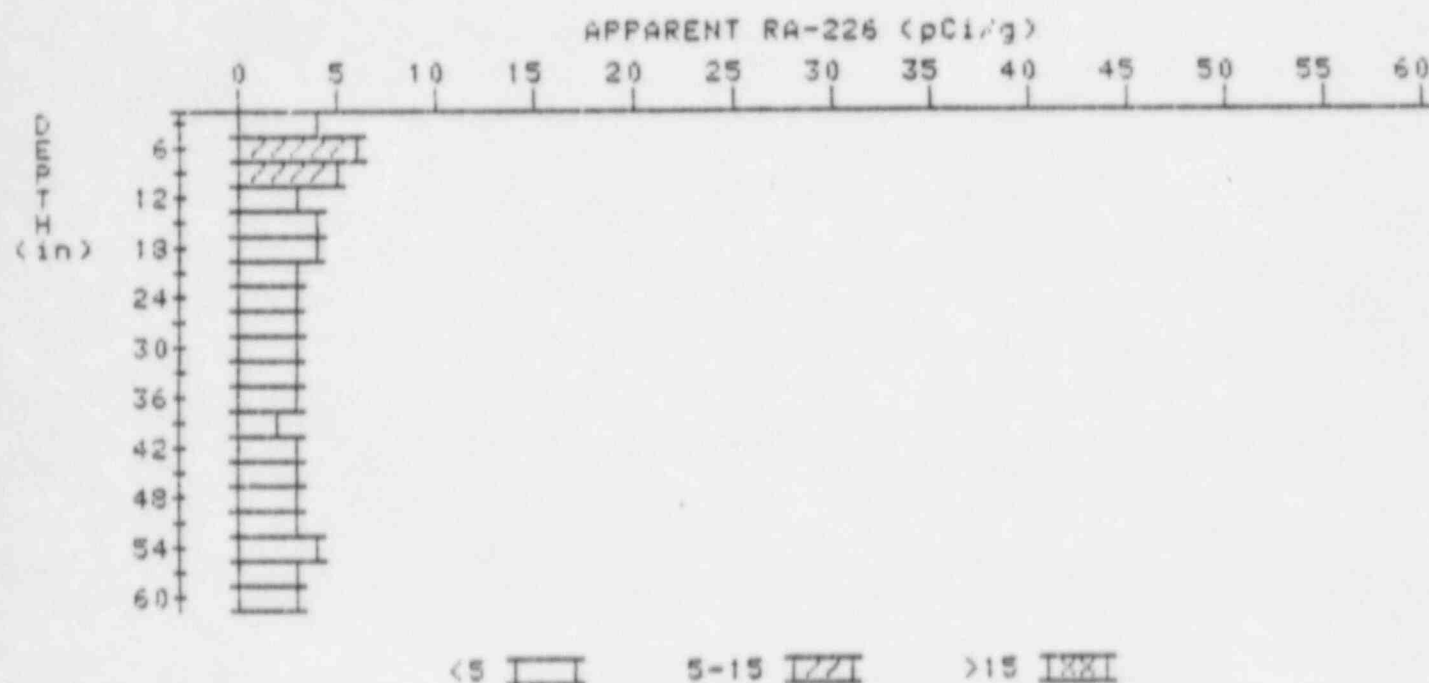
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	12.7	12.7
6	16.7	26.5
9	15.2	20.4
12	10.8	8.5
15	7.7	5.4
18	5.9	4.5
21	4.9	4.2
24	4.3	3.6
27	4.1	4.1
30	3.9	3.5
33	3.9	3.9

# APPARENT RADIUM-226 CONCENTRATION 18 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13970-MR

HOLE NUMBER: 18

LOCATION: 193266



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.6	3.6
6	4.3	5.5
9	4.3	5.0
12	3.9	3.4
15	3.8	4.0
18	3.6	3.6
21	3.4	3.4
24	3.2	3.0
27	3.1	3.1
30	3.0	2.8
33	3.0	3.2
36	2.9	2.9
39	2.8	2.4
42	2.9	3.1
45	2.9	2.7
48	3.0	2.8
51	3.2	3.2
54	3.4	3.9

57  
60

3.3  
3.3

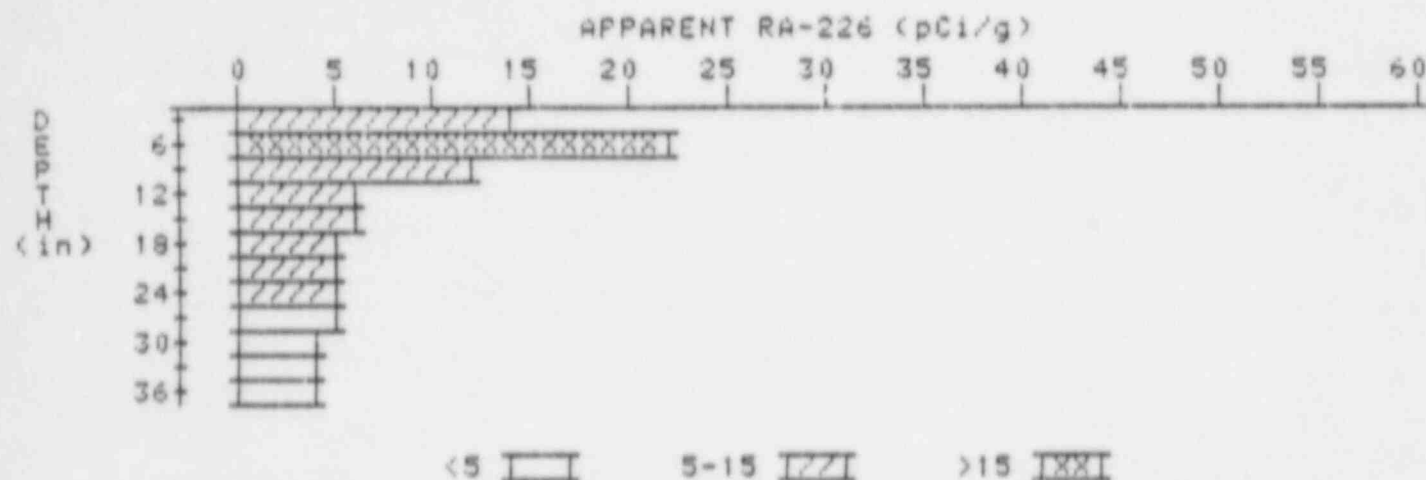
3.1  
3.3

# APPARENT RADIUM-226 CONCENTRATION 19 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13970-WA

HOLE NUMBER: 19

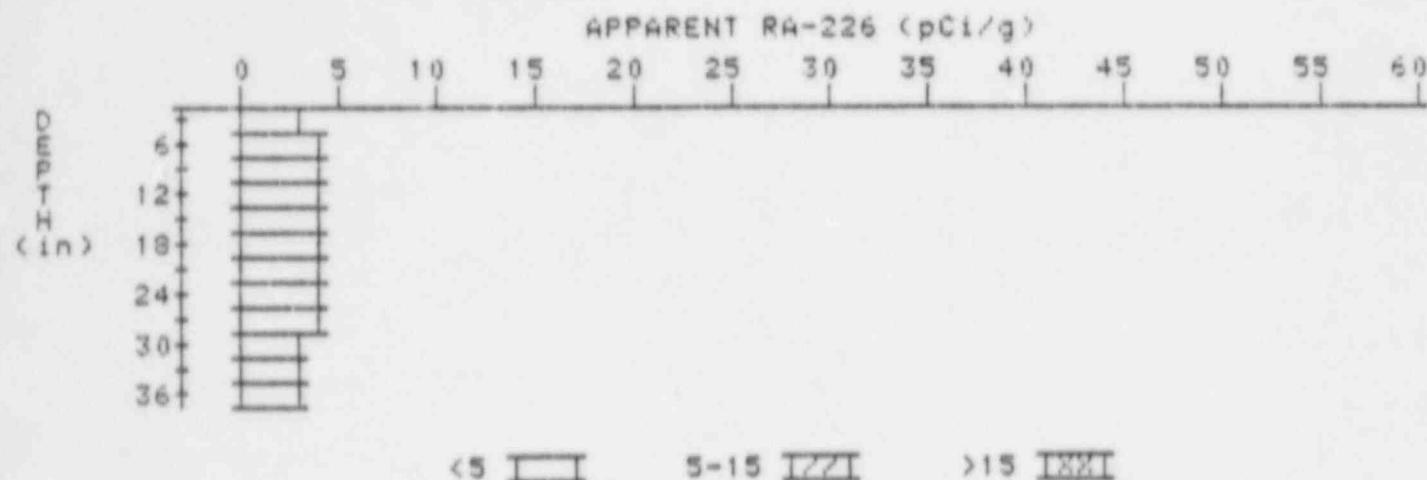
LOCATION: 213223



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	14.1	14.1
6	14.9	22.0
9	11.7	11.7
12	8.5	5.7
15	6.9	5.7
18	6.0	5.3
21	5.5	5.3
24	5.1	5.1
27	4.7	4.5
30	4.4	4.0
33	4.3	4.5
36	4.1	4.1

# APPARENT RADIUM-226 CONCENTRATION 21 DECONVOLUTION GRAPH

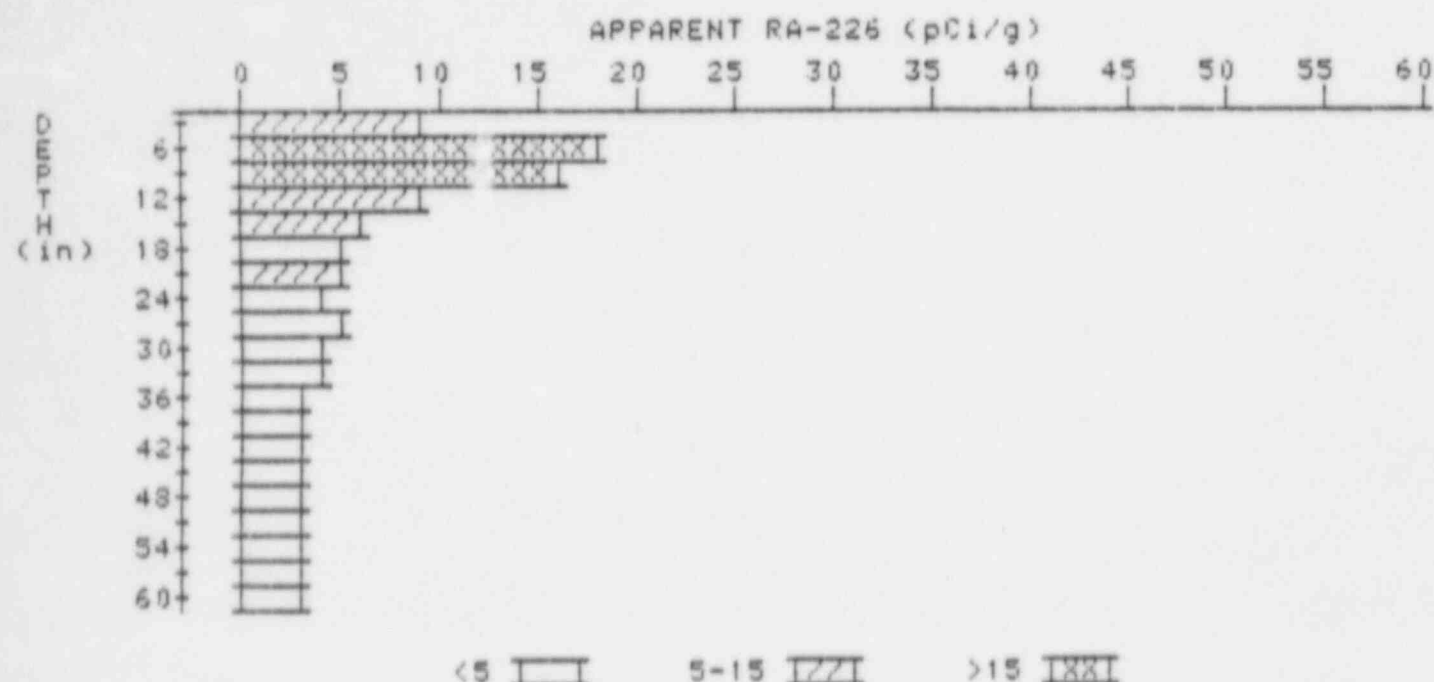
PROPERTY NUMBER: GJ-13970-mR  
HOLE NUMBER: 21  
LOCATION: 217215



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.6	4.3
9	3.8	4.0
12	3.9	4.1
15	3.9	4.1
18	3.8	3.6
21	3.8	4.0
24	3.7	3.7
27	3.6	3.8
30	3.4	3.4
33	3.2	3.0
36	3.1	3.1

# APPARENT RADIUM-226 CONCENTRATION 22 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13970-Mx  
HOLE NUMBER: 22  
LOCATION: 230229



Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	9.1	9.1
6	12.1	17.6
9	12.0	16.3
12	9.5	9.0
15	7.3	5.7
18	6.0	4.9
21	5.3	5.3
24	4.6	3.7
27	4.4	4.0
30	4.0	3.8
33	3.7	3.7
36	3.4	3.2
39	3.2	3.0
42	3.1	3.1
45	3.0	2.8
48	3.0	2.8
51	3.1	3.5
54	3.0	2.6



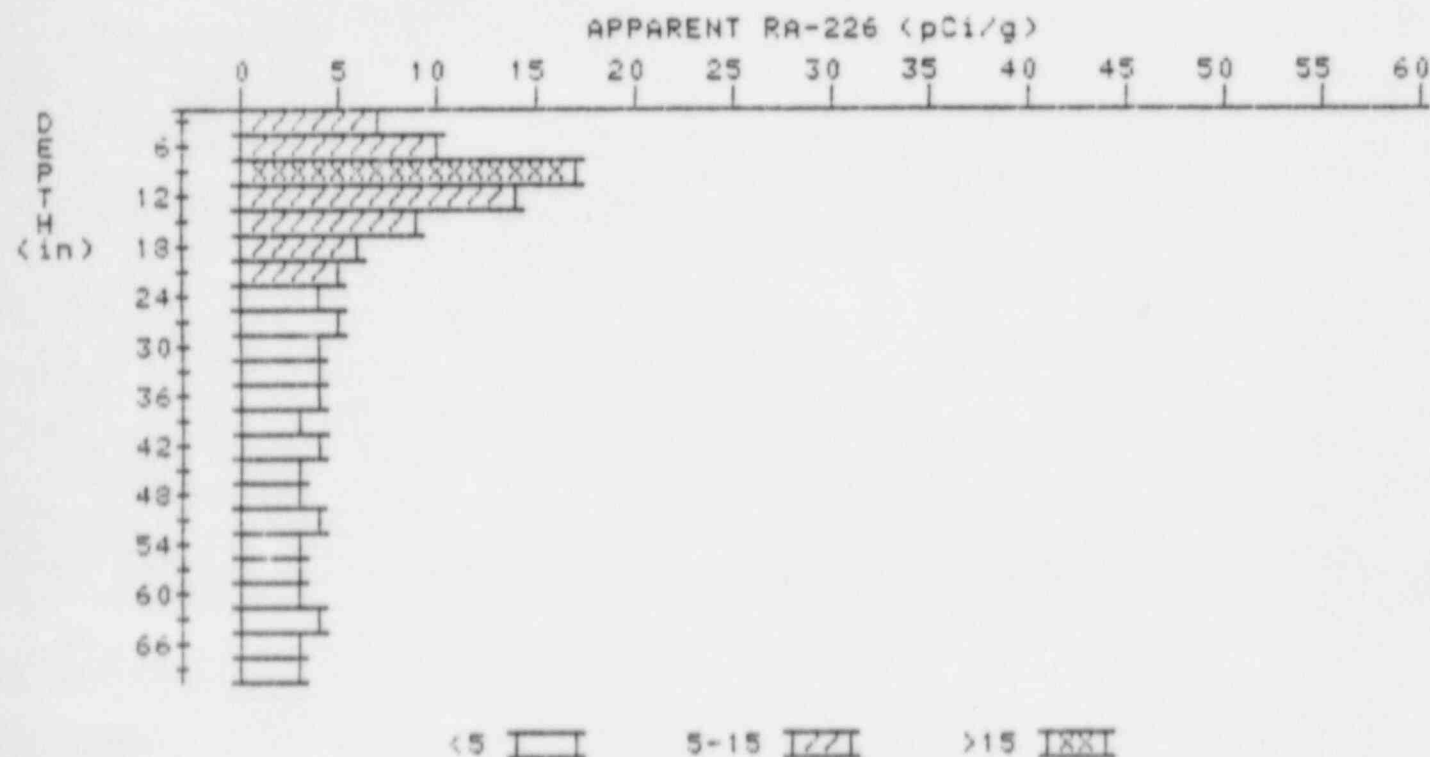
57  
60

3.1  
3.0

3.5  
3.0

# APPARENT RADIUM-226 CONCENTRATION 23 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13970-MK  
HOLE NUMBER: 23  
LOCATION: 236232



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.8	6.8
6	9.5	10.4
9	11.7	16.5
12	11.2	13.9
15	9.2	9.0
18	7.3	6.2
21	6.0	5.1
24	5.2	4.5
27	4.8	4.6
30	4.5	4.3
33	4.3	4.3
36	4.1	4.3
39	3.8	3.4
42	3.7	3.9
45	3.5	3.3

48  
51  
54  
57  
60  
63  
66  
69

3.4  
3.4  
3.3  
3.3  
3.2  
3.2  
3.0  
3.0

3.2  
3.6  
3.1  
3.5  
3.0  
3.6  
2.6  
3.0

# APPARENT RADIUM-226 CONCENTRATION 24 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13970-MA

HOLE NUMBER: 24

LOCATION: 240267



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.5	5.5
6	6.5	9.9
9	5.6	5.6
12	4.7	4.2
15	4.1	3.7
18	3.7	3.3
21	3.5	3.3
24	3.4	3.4
27	3.3	3.5
30	3.1	2.9
33	3.0	2.8
36	3.0	2.8
39	3.1	3.3
42	3.1	2.7
45	3.3	3.8
48	3.2	3.0
51	3.2	3.2
54	3.2	3.0

57  
60

3.3  
3.3

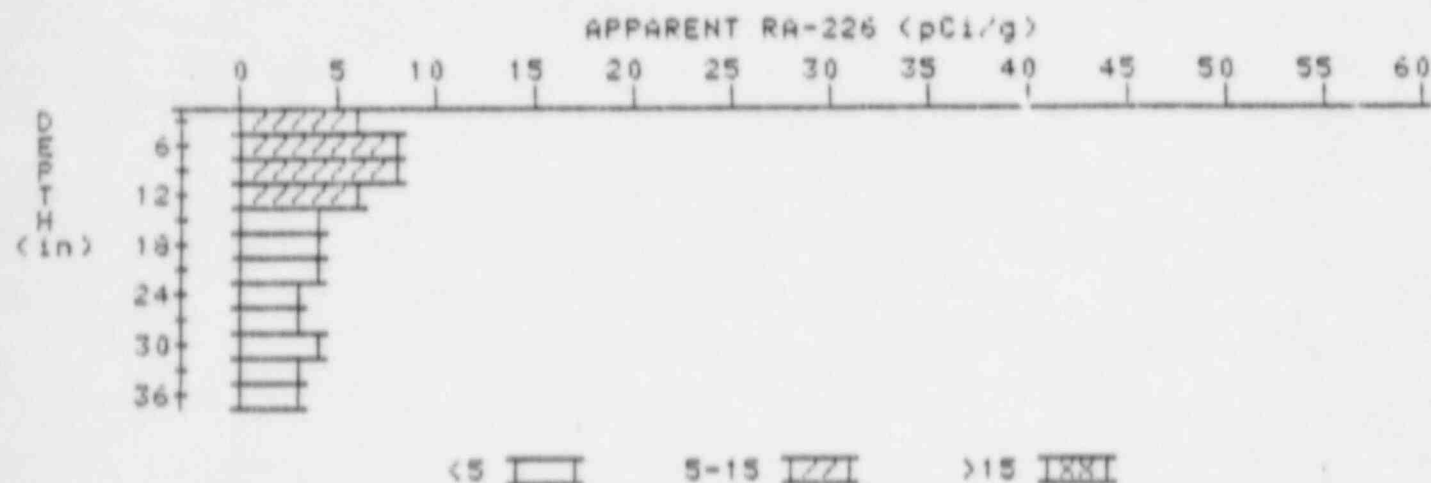
3.5  
3.3

# APPARENT RADIUM-226 CONCENTRATION 25 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13970-M&

HOLE NUMBER: 25

LOCATION: 250260

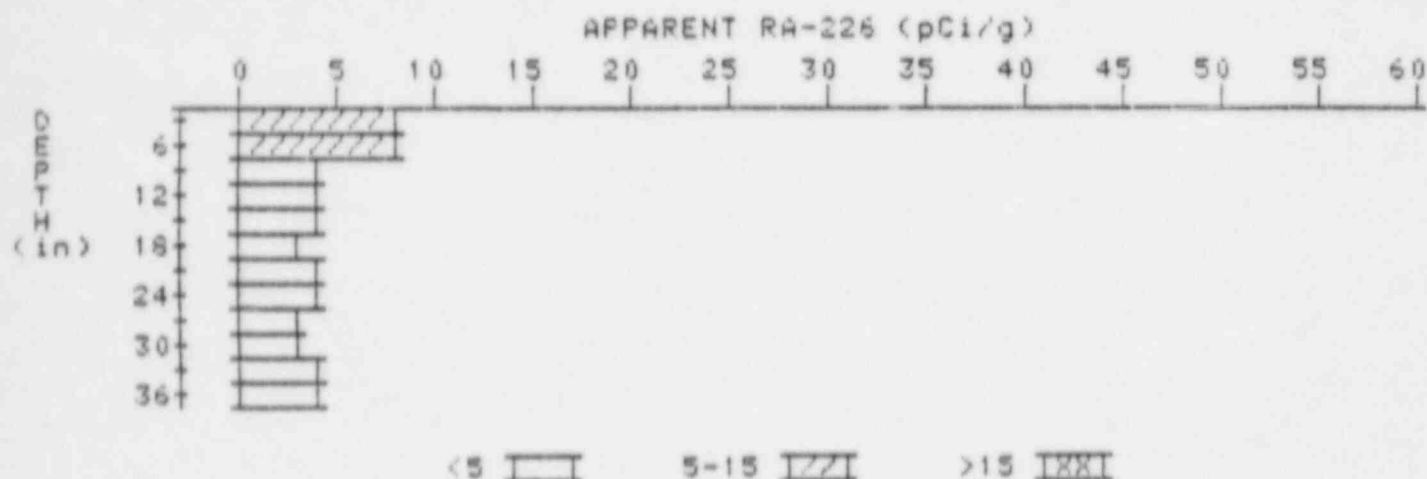


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.4	6.4
6	7.0	8.2
9	6.9	8.3
12	6.0	6.2
15	5.0	4.1
18	4.5	4.1
21	4.2	4.4
24	3.8	3.4
27	3.6	3.4
30	3.5	3.7
33	3.3	2.9
36	3.2	3.3



# APPARENT RADIUM-226 CONCENTRATION 26 DECONVOLUTION GRAPH

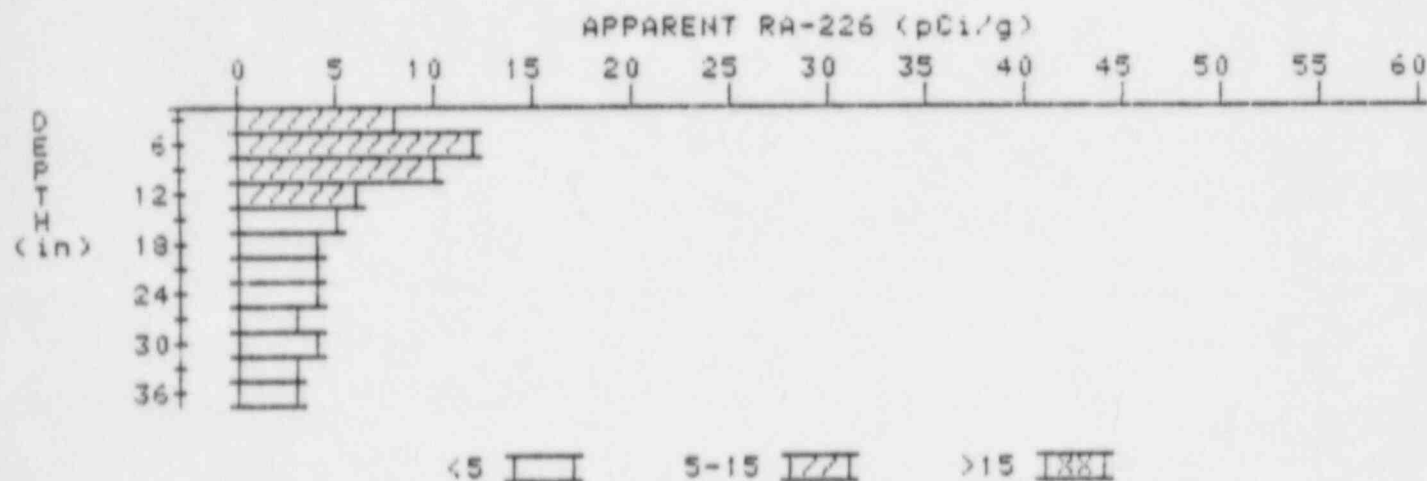
PROPERTY NUMBER: GJ-13970-MK  
HOLE NUMBER: 26  
LOCATION: 290265



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	7.9	7.9
6	7.0	6.2
9	5.5	4.4
12	4.6	3.9
15	4.1	3.9
18	3.7	3.0
21	3.7	3.9
24	3.6	3.6
27	3.5	3.3
30	3.5	3.3
33	3.6	4.0
36	3.8	3.8

# APPARENT RADIUM-226 CONCENTRATION 27 DECONVOLUTION GRAPH

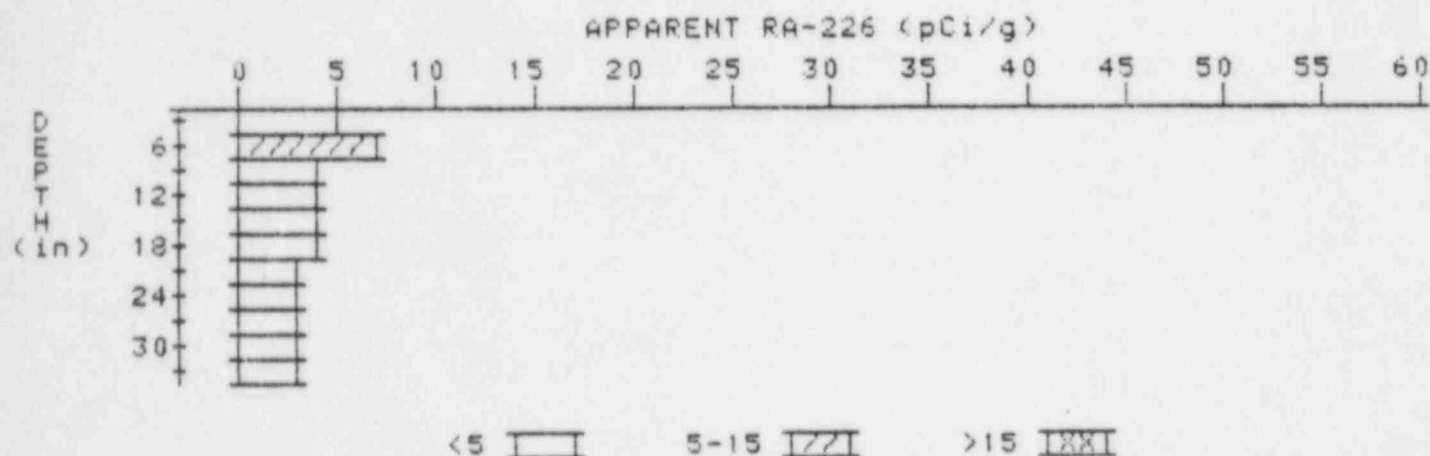
PROPERTY NUMBER: GJ-13970-MK  
HOLE NUMBER: 27  
LOCATION: 300240



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	7.6	7.6
6	8.7	11.9
9	8.0	9.6
12	6.4	5.5
15	5.3	4.6
18	4.6	4.2
21	4.1	3.7
24	3.8	3.6
27	3.6	3.4
30	3.5	3.3
33	3.4	3.2
36	3.4	3.4

# APPARENT RADIUM-226 CONCENTRATION 28 DECONVOLUTION GRAPH

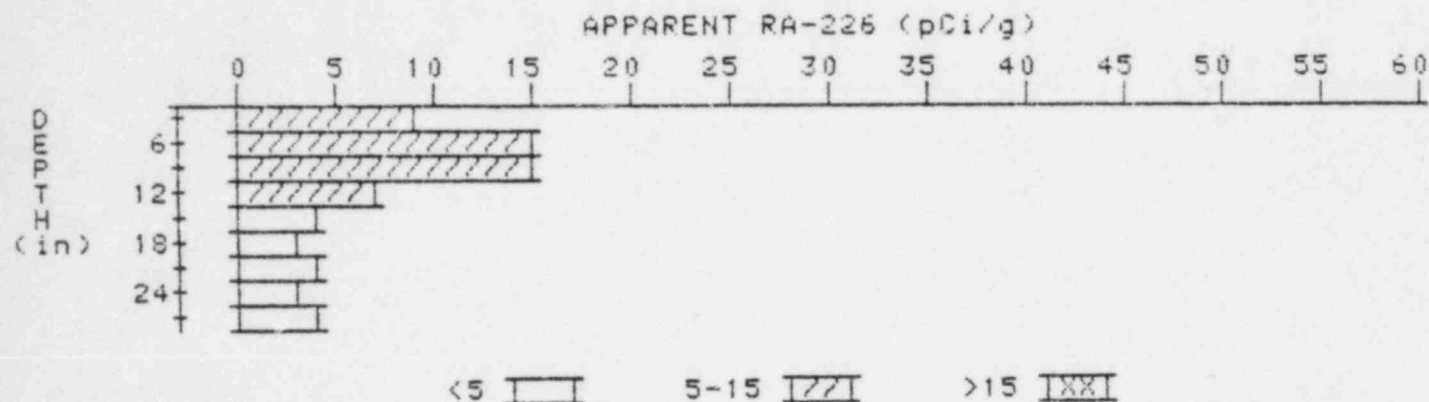
PROPERTY NUMBER: GJ-13970-MK  
HOLE NUMBER: 28  
LOCATION: 300275



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.9	4.9
6	5.2	7.0
9	4.5	4.0
12	4.1	3.9
15	3.8	3.6
18	3.6	3.6
21	3.4	3.2
24	3.3	3.1
27	3.3	3.3
30	3.3	3.3
33	3.3	3.3

# APPARENT RADIUM-226 CONCENTRATION 29 DECONVOLUTION GRAPH

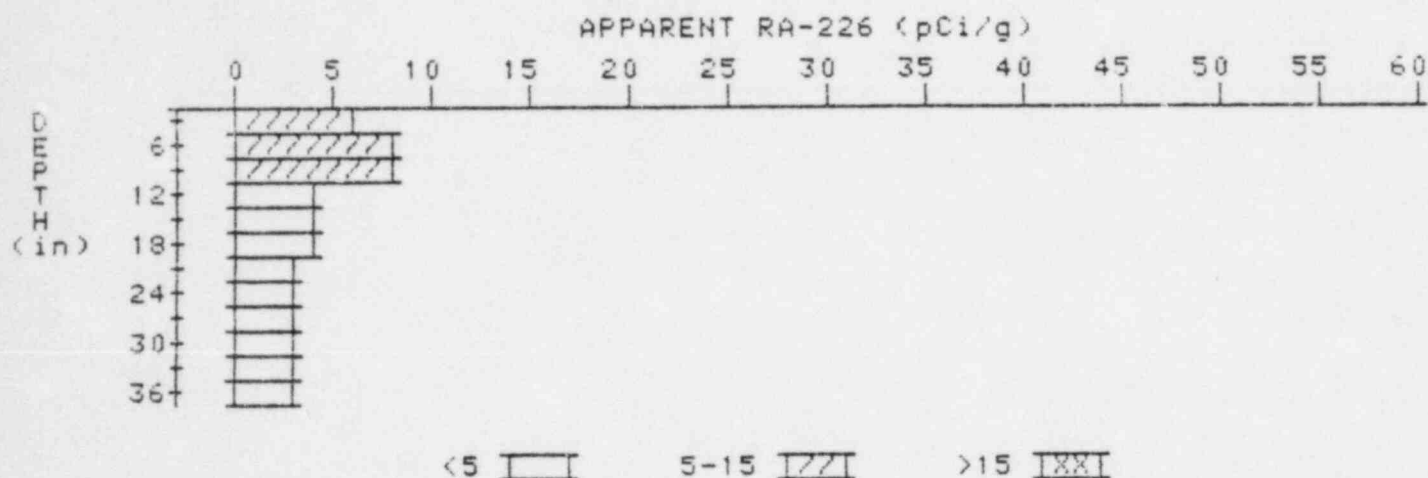
PROPERTY NUMBER: GJ-13970-MR  
HOLE NUMBER: 29  
LOCATION: 310255



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	8.8	8.8
6	10.8	14.9
9	10.5	14.6
12	7.9	7.4
15	5.6	3.6
18	4.4	3.2
21	3.9	3.5
24	3.6	3.2
27	3.5	3.5

# APPARENT RADIUM-226 CONCENTRATION 30 DECONVOLUTION GRAPH

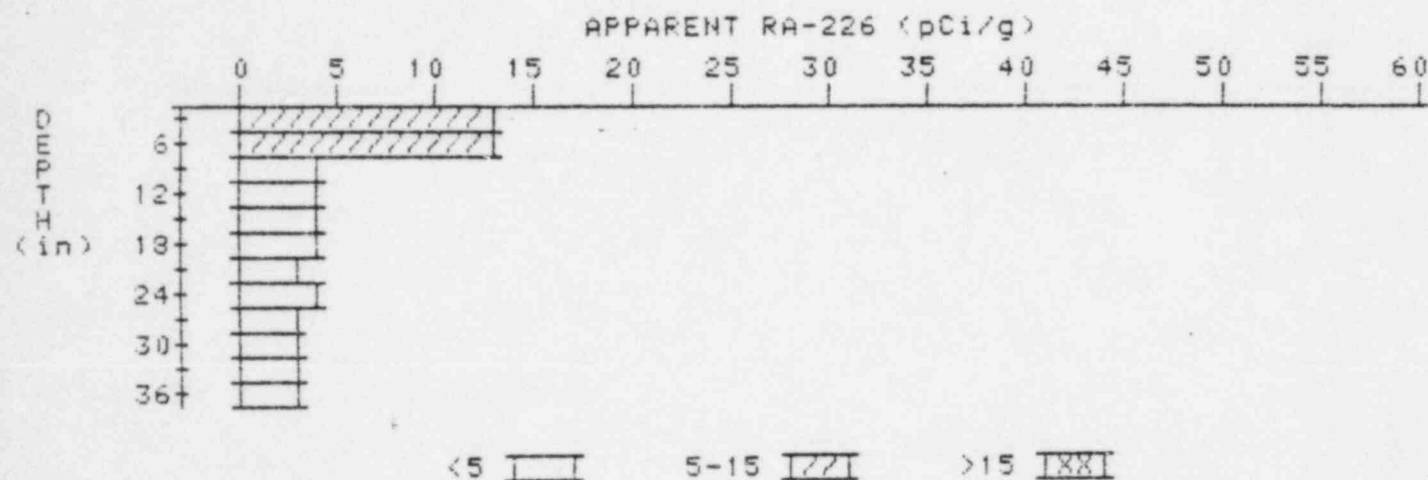
PROPERTY NUMBER: GJ-13970-MR  
HOLE NUMBER: 30  
LOCATION: 315230



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.1	6.1
6	6.6	8.2
9	6.2	7.6
12	5.0	4.1
15	4.3	3.8
18	3.9	3.9
21	3.5	3.1
24	3.3	3.3
27	3.1	2.7
30	3.1	3.3
33	3.0	2.8
36	3.0	3.0

# APPARENT RADIUM-226 CONCENTRATION 31 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13970-MK  
HOLE NUMBER: 31  
LOCATION: 335240

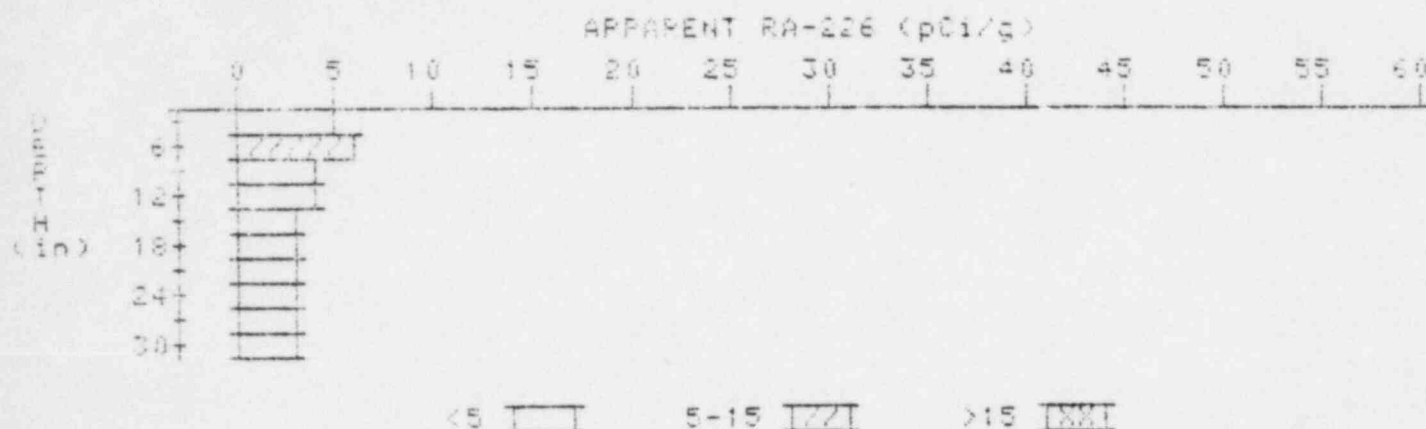


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	12.8	12.8
6	10.6	12.6
9	7.3	4.5
12	5.6	4.4
15	4.6	3.7
18	4.1	3.9
21	3.7	3.3
24	3.5	3.5
27	3.3	3.1
30	3.2	3.0
33	3.2	3.2
36	3.2	3.2



# APPARENT RADIUM-226 CONCENTRATION 32 DECONVOLUTION GRAPH

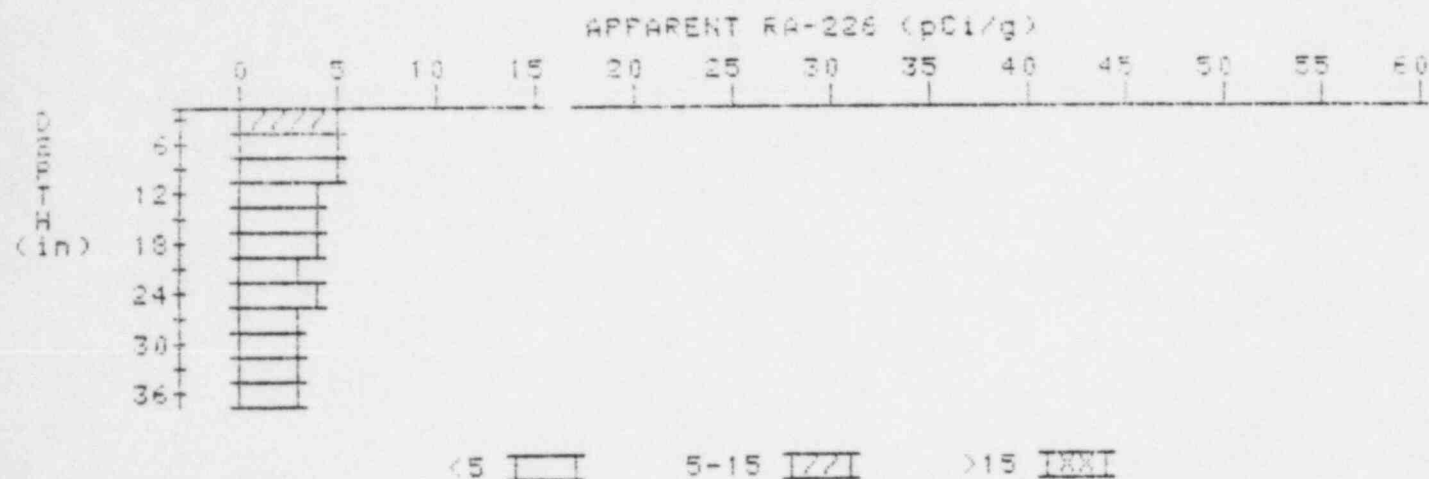
PROPERTY NUMBER: GJ-13970-MR  
HOLE NUMBER: 32  
LOCATION: 355250



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
0	4.6	4.6
6	4.6	6.0
12	4.6	4.1
18	3.9	3.7
24	3.6	3.4
30	3.4	3.4
36	3.2	3.0
42	3.1	3.1
48	3.0	2.6
54	3.1	3.1

# APPARENT RADIUM-226 CONCENTRATION 33 DECONVOLUTION GRAPH

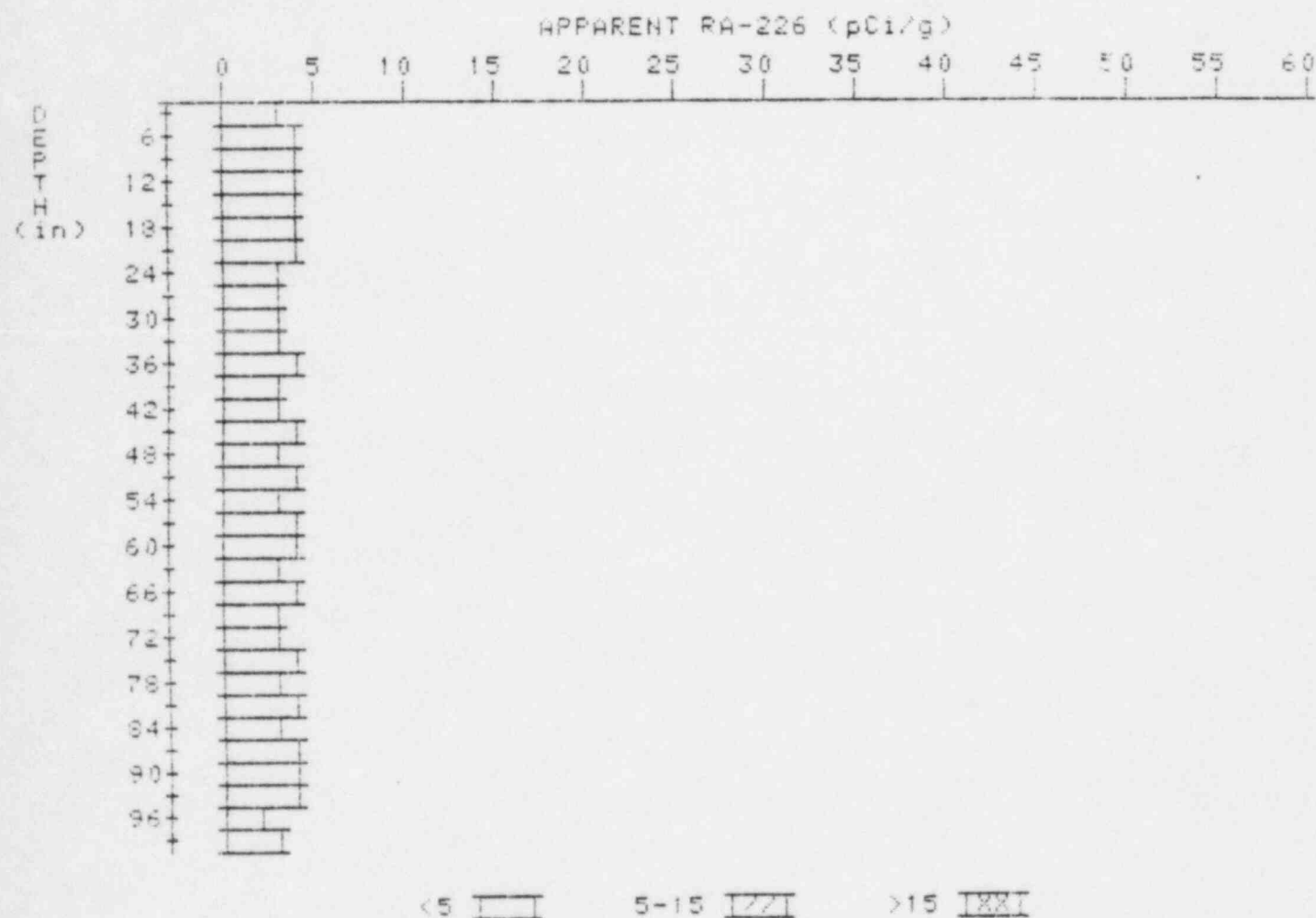
PROPERTY NUMBER: GJ-13970-MK  
HOLE NUMBER: 33  
LOCATION: 251235



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.0	5.0
6	4.8	5.0
9	4.5	4.7
12	4.1	3.7
15	3.9	3.7
18	3.8	4.0
21	3.6	3.4
24	3.5	3.5
27	3.4	3.4
30	3.3	3.1
33	3.3	3.1
36	3.4	3.4

# APPARENT RADIUM-226 CONCENTRATION 34 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13970-MR  
HOLE NUMBER: 34  
LOCATION: 300240



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.1	3.1
6	3.5	3.9
9	3.7	4.1
12	3.7	3.7
15	3.7	3.9
18	3.6	3.6
21	3.5	3.5
24	3.4	3.2

27  
30  
33  
36  
39  
42  
45  
48  
51  
54  
57  
60  
63  
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72  
75  
78  
81  
84  
87  
90  
93  
96  
99

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3.4  
3.1  
3.2

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3.6  
3.1  
3.1  
3.6  
3.4  
3.6  
2.9  
3.6  
3.6  
2.9  
3.6  
3.4  
3.4  
3.6  
2.9  
3.6  
3.6  
4.0  
4.0  
3.6  
2.4  
3.2