RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-01565-RS
ADDRESS: 1526 ELM AVENUE

JUNE 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-01565-RS, is a single-family residence located at 1526 Elm Avenue, Grand Junction, Colorado.

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

1.2 Evaluation and Recommendation

The action recommended is the removal of contaminated material and restoration of the property to its original condition. The identified residual radioactive material found on this property is tailings; the estimated volume is: exterior, 44 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is $2,107. Remedial action on this property will take approximately 7 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 1526 Elm Avenue, Grand Junction, Colorado

Zoning: Residential (RMF-32)

Lot Size: Approximately 6,330 sf (0.1 acre)

Legal Description: Lot 8, Paulson Subdivision, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 2 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:	Utility easement
South:	Elm Avenue
East:	Single-family residence
West:	Single-family residence

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-story residence
Size:	Approximately 747 sf
Construction Date:	1935
Construction:	Wood-frame
Foundation:	Concrete grade beam and concrete slab-on-grade
Footing Depth:	Approximately 4" to bottom of footing from grade
Basement:	None
Crawl Space:	None
Condition:	Fair

Other Structures:

Type:	Shed
Size:	Approximately 102 sf
Construction:	Wood-frame
Foundation:	None (mudsill)
Condition:	Fair

Type:	Root-cellar (underground)
Size:	Approximately 80 sf
Construction:	Concrete with dirt cover
Foundation:	Concrete
Condition:	Fair

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-01565-RS on April 26, 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) was conducted. These records indicate that ore samples were found in the shed. Bendix records indicate that spillover contamination was observed during the radiologic survey of an adjoining property.

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: 14 to 15 uR/h
Highest Outside Gamma Reading (HOG): 124 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: 15 to 16 uR/h
Highest Inside Gamma Reading (HIG): 16 uR/h

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

3.3 Boreholes, Soil Samples, and Other Measurements

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

3.4 Radon/Radon Daughter Concentration (RDC)

The working level was not assessed by CDH. No RDC measurements were taken by Bendix.

3.5 Extent of Contamination

Appendix Figure 3.5 shows identified areas and estimated depths of contamination on this property, based on assessments of all measurements taken. As noted in this figure, areas recommended for remedial action that contain identified residual radioactive materials are:

(AREA A) The northeast corner of the property is contaminated to a depth of 12 inches (approximately 678 sf).

(AREA B) In the northwest corner of the property contamination extends to a depth of 12 inches (approximately 198 sf).

(AREA C) A deposit west of the shed located in the north portion of the property is 6 inches deep (approximately 77 sf).

(AREA D) A small deposit adjacent to the south wall of the shed is contaminated to a depth of 9 inches (approximately 18 sf).

(AREA E) In the middle of the north yard, the lawn is contaminated to a depth of 6 inches (approximately 54 sf).

(AREA F) Near the east fence in the north yard, contamination extends to a depth of 9 inches (approxiamtely 54 sf).

(AREA G) A small deposit exists northeast of the primary structure and south of Area F. The depth of contamination is 12 inches (approximately 36 sf).

(AREA H) Along the west property line, a small contaminated deposit is 6 inches deep (approximately 25 sf).

(AREA I) In the southwest corner of the property, contamination extends to a depth of 18 inches. Although this area of contamination is beyond the actual boundary, it is within the fenced portion of this property. This deposit was not assessed with the adjacent property (approximately 78 sf).

(AREA J) In the dirt driveway southwest of the primary structure, an isolated deposit of contamination is 6 inches deep (approximately 24 sf).

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-01565-RS, includes removal of all areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figure 3.5) 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 $2,107.

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 - Crawl Space
Figure 3.4b	Interior Gamma Exposure Rates and Sample Location - Ground Floor
Figure 3.4	Exterior Sample Locations
Figure 3.5	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) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
2	141250	00	DS	6.8		*	Behind shed
		06	DS	6.8		*	DC = 12 inches
		12	DS	2.0		*	
		00-06	SS			11.4	
3	143238	00	DS	2.1		*	On top of brick
		04	DS	<1.0		*	Under brick
							DC = 0 inches
4	145264	03	TC	9.8		*	North yard
		06	TC	10.3		*	DC = 12 inches
		09	TC	7.1		*	Based on the
		12	TC	6.4		*	deconvolution graph
		15	TC	5.5		*	
		18	TC	4.9		*	
		21	TC	4.7		*	
		24	TC	4.5		*	
		27	TC	4.6		*	
		30	TC	4.5		*	
		33	TC	4.6		*	
		36	TC	4.4		*	
5	147250	00	DS	8.5		*	By root cellar
		06	DS	3.2		*	DC = 12 inches
		12	DS	2.0		*	
6	153273	03	TC	6.7		*	North yard
		06	TC	7.2		*	DC = 12 inches
		09	TC	6.5		*	Based on the
		12	TC	5.5		*	deconvolution graph
		15	TC	5.0		*	
		18	TC	4.8		*	
		21	TC	4.6		*	
		24	TC	4.5		*	
		27	TC	4.6		*	
		30	TC	4.5		*	
		33	TC	4.4		*	
		36	TC	4.4		*	
7	155235	03	TC	11.3		*	East of fence
		06	TC	10.8		*	DC = 12 inches
		09	TC	8.5		*	Based on the
		12	TC	6.7		*	deconvolution graph
		15	TC	5.7		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
7	155235	18	TC	5.0		*	
		21	TC	4.8		*	
		24	TC	4.5		*	
		27	TC	4.5		*	
		30	TC	4.5		*	
		33	TC	4.5		*	
		36	TC	4.5		*	
8	158240	00	DS	7.2		*	By root cellar
		06	DS	1.1		*	DC = 6 inches
9	165255	03	TC	17.0		*	Against the shed
		06	TC	12.3		*	DC = 9 inches
		09	TC	8.4		*	Based on the
		12	TC	6.4		*	deconvolution graph
		15	TC	5.3		*	
		18	TC	4.8		*	
		21	TC	4.6		*	
		24	TC	4.6		*	
		27	TC	4.6		*	
		30	TC	4.6		*	
		33	TC	4.8		*	
10	166261	00-04	SS			1.1	Core
		04-10	SS			1.7	Southeast of shed
		03	TC	4.5		*	DC = 0 inches
		06	TC	5.3		*	
		09	TC	5.4		*	
		12	TC	5.0		*	
		15	TC	4.8		*	
		18	TC	4.4		*	
		21	TC	4.3		*	
		24	TC	4.3		*	
		27	TC	4.3		*	
		30	TC	4.3		*	
		33	TC	4.3		*	
		36	TC	4.4		*	
		39	TC	4.3		*	
		42	TC	4.3		*	
11	166264	03	TC	6.9		*	Northeast yard
		06	TC	6.4		*	DC = 12 inches
		09	TC	5.6		*	Based on the
		12	TC	4.9		*	deconvolution graph

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
11	166264	15	TC	4.6		*	
		18	TC	4.5		*	
		21	TC	4.4		*	
		24	TC	4.3		*	
		27	TC	4.3		*	
		30	TC	4.4		*	
		33	TC	4.4		*	
		36	TC	4.4		*	
12	168272	00	DS	8.6		*	East of the shed
		06	DS	4.7		*	DC = 12 inches
		12	DS	2.5		*	
13	170255	00	DS	4.7		*	South of the shed
		03	TC	5.7		*	DC = 6 inches
		06	TC	5.1		*	Based on the
		09	TC	4.7		*	deconvolution graph
		12	TC	4.4		*	
		15	TC	4.3		*	
		18	TC	4.3		*	
		21	TC	4.3		*	
		24	TC	4.2		*	
		27	TC	4.2		*	
		30	TC	4.2		*	
		33	TC	4.4		*	
		36	TC	4.4		*	
		39	TC	4.3		*	
14	180260	00	DS	5.2		*	North yard
		06	DS	4.0		*	DC = 12 inches
		12	DS	2.9		*	
		18	DS	2.4		*	
15	180270	03	TC	6.4		*	East fence
		06	TC	5.7		*	DC = 9 inches
		09	TC	5.1		*	Based on the
		12	TC	4.7		*	deconvolution graph
		15	TC	4.4		*	
		18	TC	4.5		*	
		21	TC	4.4		*	
		24	TC	4.4		*	
		27	TC	4.5		*	
		30	TC	4.5		*	
		33	TC	4.5		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
16	189265	03	TC	8.4		*	North yard
		06	TC	8.1		*	DC = 12 inches
		09	TC	6.7		*	Based on the
		12	TC	5.6		*	deconvolution graph
		15	TC	4.9		*	
		18	TC	4.5		*	
		21	TC	4.4		*	
		24	TC	4.4		*	
		27	TC	4.3		*	
		30	TC	4.4		*	
		33	TC	4.4		*	
17	191271	00	DS	14.1		*	North yard
		06	DS	3.4		*	DC = 12 inches
		12	DS	1.5		*	
18	202250	03	TC	2.7		*	North foundation
		06	TC	3.0		*	DC = 0 inches
		09	TC	3.3		*	
		12	TC	3.5		*	
		15	TC	3.6		*	
		18	TC	3.7		*	
		21	TC	3.7		*	
		24	TC	4.0		*	
		27	TC	4.0		*	
		30	TC	4.0		*	
		33	TC	4.0		*	
		36	TC	4.0		*	
		39	TC	3.9		*	
19	210261	03	TC	3.2		*	East foundation
		06	TC	3.4		*	DC = 0 inches
		09	TC	3.5		*	
		12	TC	3.6		*	
		15	TC	3.6		*	
		18	TC	3.7		*	
		21	TC	3.8		*	
		24	TC	3.8		*	
		27	TC	3.9		*	
		30	TC	3.9		*	
		33	TC	3.8		*	
		36	TC	3.8		*	
		39	TC	3.8		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	In Situ Ra-226 (pCi/g) Spectr.	Chem Ra-226 (pCi/g)	Comments
20	220231	03	TC	2.8		*	Sewer line
		06	TC	3.2		*	DC = 0 inches
		09	TC	3.3		*	
		12	TC	3.4		*	
		15	TC	3.5		*	
		18	TC	3.6		*	
		21	TC	3.5		*	
		24	TC	3.5		*	
		27	TC	3.5		*	
		30	TC	3.6		*	
		33	TC	3.7		*	
		36	TC	3.7		*	
		39	TC	3.9		*	
		42	TC	4.0		*	
		45	TC	4.1		*	
		48	TC	4.1		*	
		51	TC	4.2		*	
		54	TC	4.1		*	
		57	TC	4.1		*	
		60	TC	3.9		*	
		63	TC	3.8		*	
		66	TC	3.9		*	
		69	TC	3.9		*	
		72	TC	3.7		*	
21	230228	00	DS	5.2		*	West side
		06	DS	1.2		*	DC = 6 inches
		03	TC	8.7		*	Based on the
		06	TC	8.9		*	delta readings
		09	TC	7.2		*	
		12	TC	5.7		*	
		15	TC	4.9		*	
		18	TC	4.5		*	
		21	TC	4.2		*	
		24	TC	4.1		*	
		27	TC	4.1		*	
		30	TC	4.0		*	
		33	TC	4.0		*	
		36	TC	4.1		*	
22	241248	00	DS	<1.0		*	Gas line
		15	DS	<1.0		*	

Radium Concentrations at Exterior Locations

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
23	244227	00	DS	4.2		*	South yard
		06	DS	4.5		*	DC = 18 inches
		12	DS	3.3		*	Based on all
		18	DS	3.4		*	data available
		03	TC	4.8		*	
		06	TC	5.3		*	
		09	TC	5.3		*	
		12	TC	5.7		*	
		15	TC	5.2		*	
		18	TC	4.8		*	
		21	TC	4.1		*	
		24	TC	3.9		*	
		27	TC	3.8		*	
		30	TC	3.8		*	
		33	TC	3.8		*	
		36	TC	4.0		*	
		39	TC	4.2		*	
		42	TC	4.3		*	
		45	TC	4.5		*	
		48	TC	4.5		*	
		51	TC	4.5		*	
		54	TC	4.4		*	
		57	TC	4.4		*	
		60	TC	4.3		*	
		63	TC	4.3		*	
		66	TC	4.4		*	
24	246242	03	TC	2.6		*	Water and sewer
		06	TC	3.0		*	lines
		09	TC	3.2		*	DC = 0 inches
		12	TC	3.4		*	
		15	TC	3.4		*	
		18	TC	3.4		*	
		21	TC	3.4		*	
		24	TC	3.4		*	
		27	TC	3.4		*	
		30	TC	3.4		*	
		33	TC	3.5		*	
		36	TC	3.5		*	
		39	TC	3.8		*	
		42	TC	3.9		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
24	246242	45	TC	4.0		*	
		48	TC	4.0		*	
		51	TC	4.0		*	
		54	TC	4.1		*	
		57	TC	3.9		*	
		60	TC	3.9		*	
		63	TC	3.8		*	
		66	TC	3.8		*	
		69	TC	3.6		*	
		72	TC	3.7		*	
25	254272	03	TC	4.7		*	Driveway
		06	TC	4.3		*	DC = 0 inches
		09	TC	3.9		*	
		12	TC	3.8		*	
		15	TC	3.8		*	
		18	TC	3.7		*	
		21	TC	3.8		*	
		24	TC	3.9		*	
		27	TC	3.9		*	
		30	TC	3.8		*	
		33	TC	3.9		*	
		36	TC	3.7		*	
		39	TC	3.8		*	
26	258273	00	DS	3.2		*	Driveway
		06	DS	<1.0		*	DC = 6 inches
27	260250	00	DS	<1.0		*	South yard
		00-06	SS			2.3	Background
		03	TC	2.8		*	DC = 0 inches
		06	TC	3.1		*	
		09	TC	3.3		*	
		12	TC	3.4		*	
		15	TC	3.5		*	
		18	TC	3.7		*	
		21	TC	3.8		*	

Radium Concentrations at Exterior Locations

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	In Situ Ra-226 (pCi/g) Spectr.	Chem Ra-226 (pCi/g)	Comments
27	260250	24	TC	3.8		*	
		27	TC	3.8		*	
		30	TC	3.9		*	
		33	TC	3.8		*	
		36	TC	3.8		*	

Measurment 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 = 04-26-85
- Team Leader = TC

RADRPT V85.1<850225.1330> Table 3.2

Radium Concentrations at Interior Locations

DOE ID #GJ-01565-RS 1526 Elm Avenue

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	In Situ Ra-226 (pCi/g) Spectr.	Chem Ra-226 (pCi/g)	Comments
1		00-04	SS			1.1	Core
		04-10	SS			1.6	Soil under the core
		03	TC	3.6		*	In the shed
		06	TC	3.8		*	DC = 0 inches
		09	TC	4.0		*	
		12	TC	4.0		*	
		15	TC	4.2		*	
		18	TC	4.2		*	
		21	TC	4.2		*	
		24	TC	4.3		*	
		27	TC	4.3		*	
		30	TC	4.3		*	
		33	TC	4.3		*	

Measurment 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 = 04-26-85
- Team Leader = TC

Table 3.3
Summary of Interior Gamma Exposure Rates
DOE ID No. GJ-01565-RS 1526 Elm Avenue

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	-	-	02	17-17	17
GROUND FLOOR	*	*	*	*	15-16	*
SHED	07	16-19	17	07	15-21	18

* The historical data indicates the absence of contamination in the primary structure. This information was investigated by performing a walking gamma scan. This area and the range of gamma measurements are shown in Appendix Figure 3.3. Exposure rates in the crawl space and shed are shown in Appendix Figures 3.3a and 3.3b.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-01565-RS

AREA	CALCULATIONS(ft)		SF	DEPTH(ft)		CF		CUBIC YARDS
EXTERIOR								
	Contaminated Fill							
A	10 x 24	=	240					
	26 x 8	=	208					
	10 x 5	=	50					
	20 x 9	=	180					
			678	x	1.0	=	678	
B	22 x 9	=	198	x	1.0	=	198	
C	11 x 7	=	77	x	0.5	=	39	
D	3 x 6	=	18	x	0.8	=	14	
E	9 x 6	=	54	x	0.5	=	27	
F	9 x 6	=	54	x	0.8	=	43	
G	6 x 6	=	36	x	1.0	=	36	
H	5 x 5	=	25	x	0.5	=	13	
I	26 x 3	=	78	x	1.5	=	117	
J	6 x 4	=	24	x	0.5	=	12	
							1,177 = 1,177/27 =	44
	TOTAL VOLUME - EXTERIOR						=	44

See Appendix Figure 3.5 For Areas

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-01565-RS

EXTERIOR		
Remove identified residual radioactive material		
39 cy @ $14.50/cy (machine-open)	$	566
5 cy @ $44/cy (manual-open)		220
Replace areas with roadbase		
2 cy @ $11.50/cy		23
Replace areas with topsoil		
42 cy @ $9.50/cy		399
Replace areas with sod		
300 sf @ $.25/sf		75
TOTAL EXTERIOR	$	1,283
TOTAL INTERIOR		0
ACCESS CONTROL		150
SUBTOTAL	$	1,433
CONTINGENCY @ 5%		72
SUBTOTAL	$	1,505
CONTRACTOR OVERHEAD & PROFIT @ 40%		602
GRAND TOTAL	$	2,107

FV0612085
REA01565/REA-508/LAJ

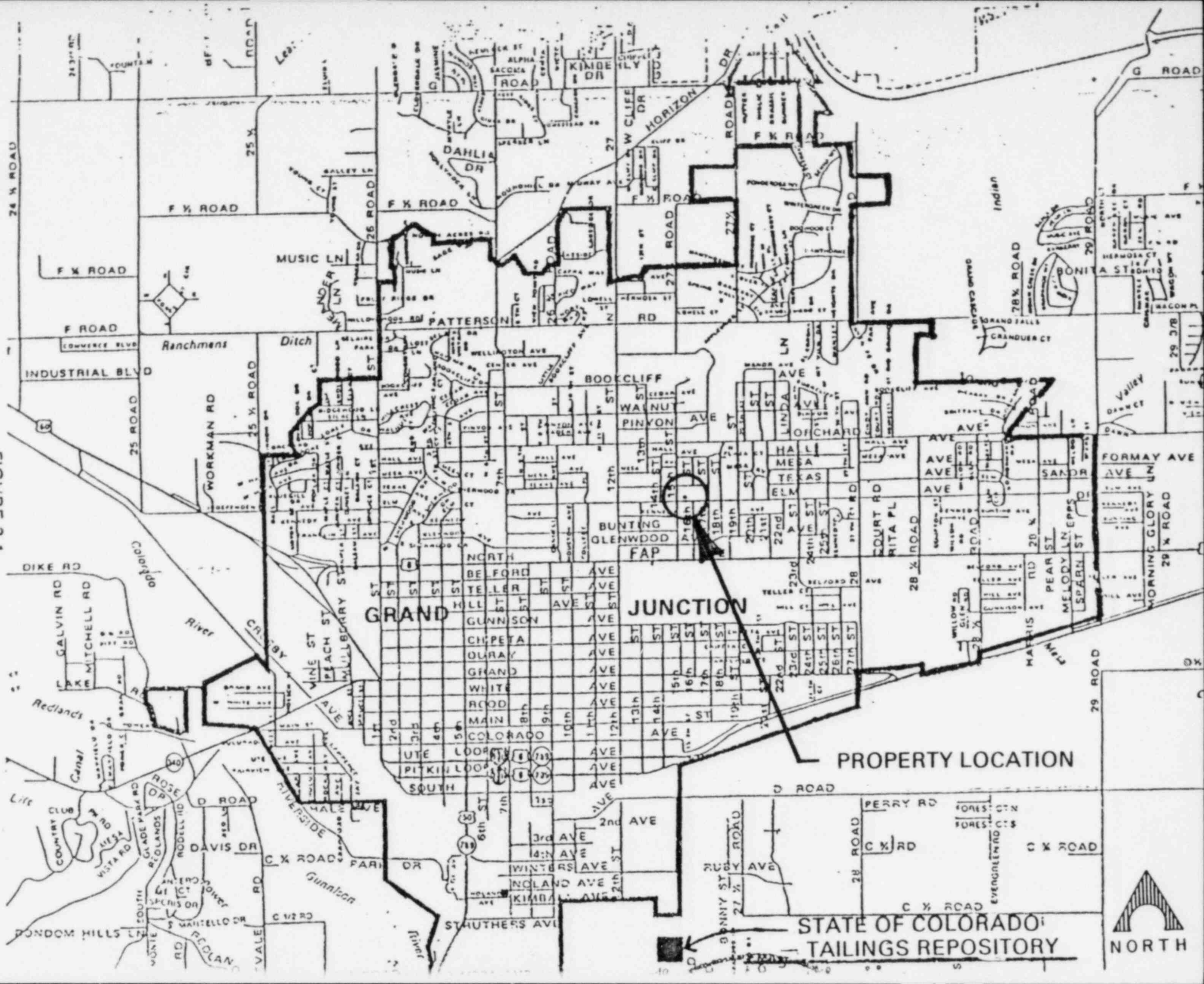
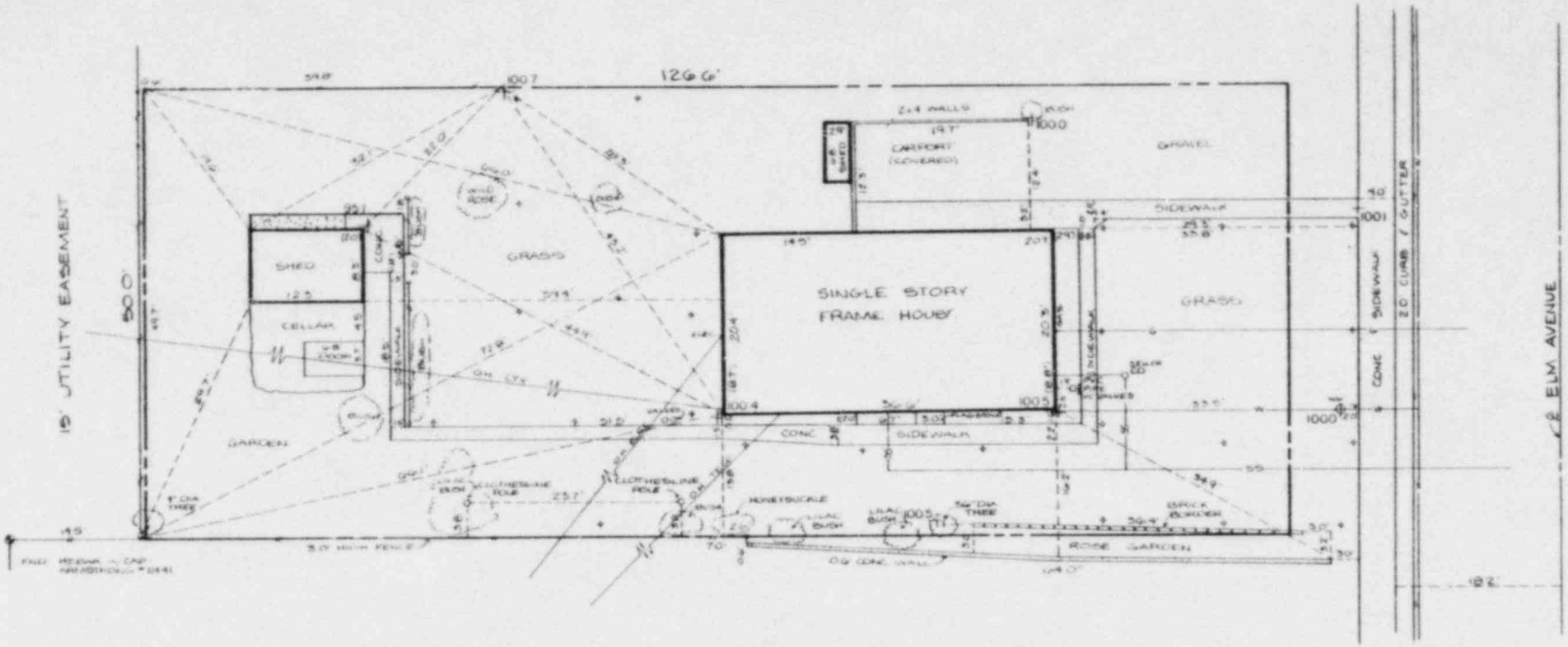


FIGURE 2.1
VICINITY MAP



LOT 8, PAULSON SUBDIVISION
CITY OF GRAND JUNCTION
MESA COUNTY, COLORADO

SCALE IN FEET

0 5 10 20 30

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

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECT OFFICE, COLORADO	DOE ID NO. GJ-01565-RS
ADDRESS 1526 ELM GRAND JUNCTION, COLO	Allied Bendix Aerospace Bendix Field Engineering Corporation Grand Junction Operations
SURV RLB/4-12-85 DRAFT KAS/4-17-85	CK
DRAWING NO 3-C618-F1	SHEET 1 OF 1

FIGURE 2.2 SITE PLAN

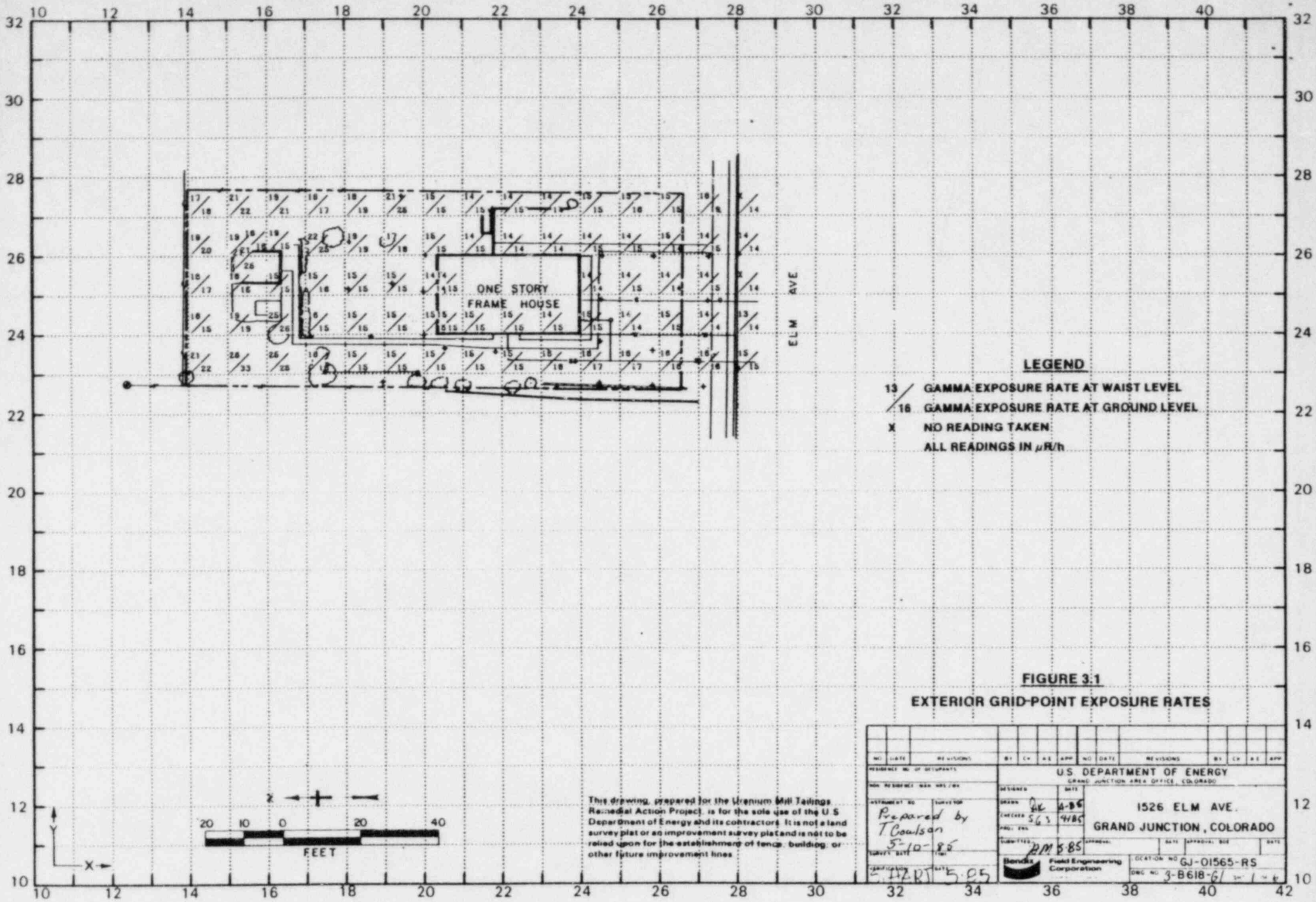
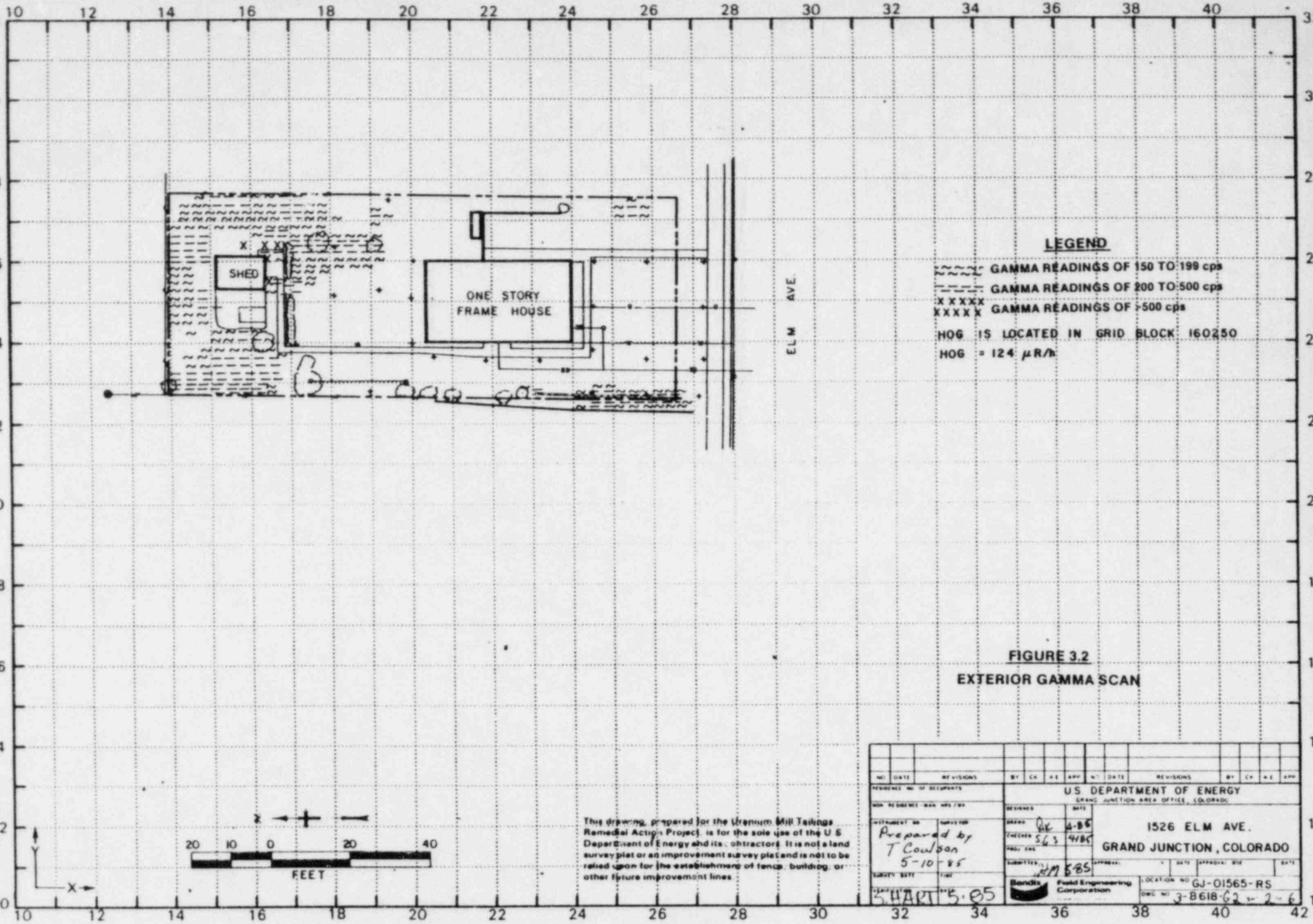


FIGURE 3.1

EXTERIOR GRID-POINT EXPOSURE RATES


SHED
ONE STORY
FRAME HOUSE
ELM AVE.
LEGEND
GAMMA READINGS OF 150 TO 199 cps
GAMMA READINGS OF 200 TO 500 cps
GAMMA READINGS OF >500 cps
HOG IS LOCATED IN GRID BLOCK 160250
HOG = 124 μR/h
FIGURE 3.2
EXTERIOR GAMMA SCAN
FEET
This drawing, prepared for the Uranium Mill Tailings Remedial Action Project, is for the sole use of the U.S. Department of Energy and its contractors. It is not a land survey plat or an improvement survey plat and is not to be relied upon for the establishment of fence, building, or other future improvement lines.
Prepared by T Coulson 5-10-85
S. HART 5-85
U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION AREA OFFICE, COLORADO
1526 ELM AVE.
GRAND JUNCTION, COLORADO
Bendix Field Engineering Corporation
LOCATION NO GJ-01565-RS
DWG NO 3-B618-G2 Sh 2-6

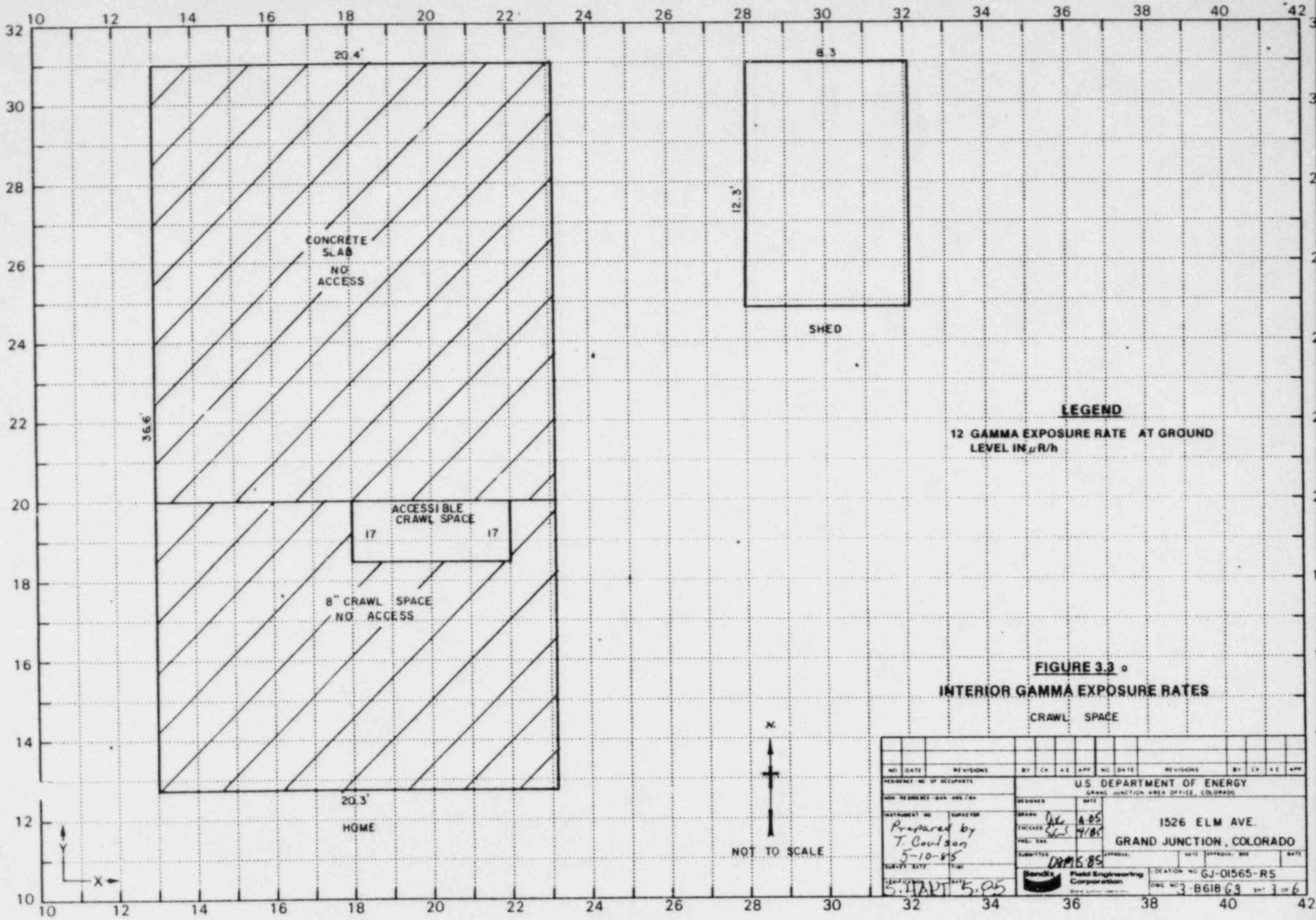


FIGURE 3.3

INTERIOR GAMMA EXPOSURE RATES

CRAWL SPACE

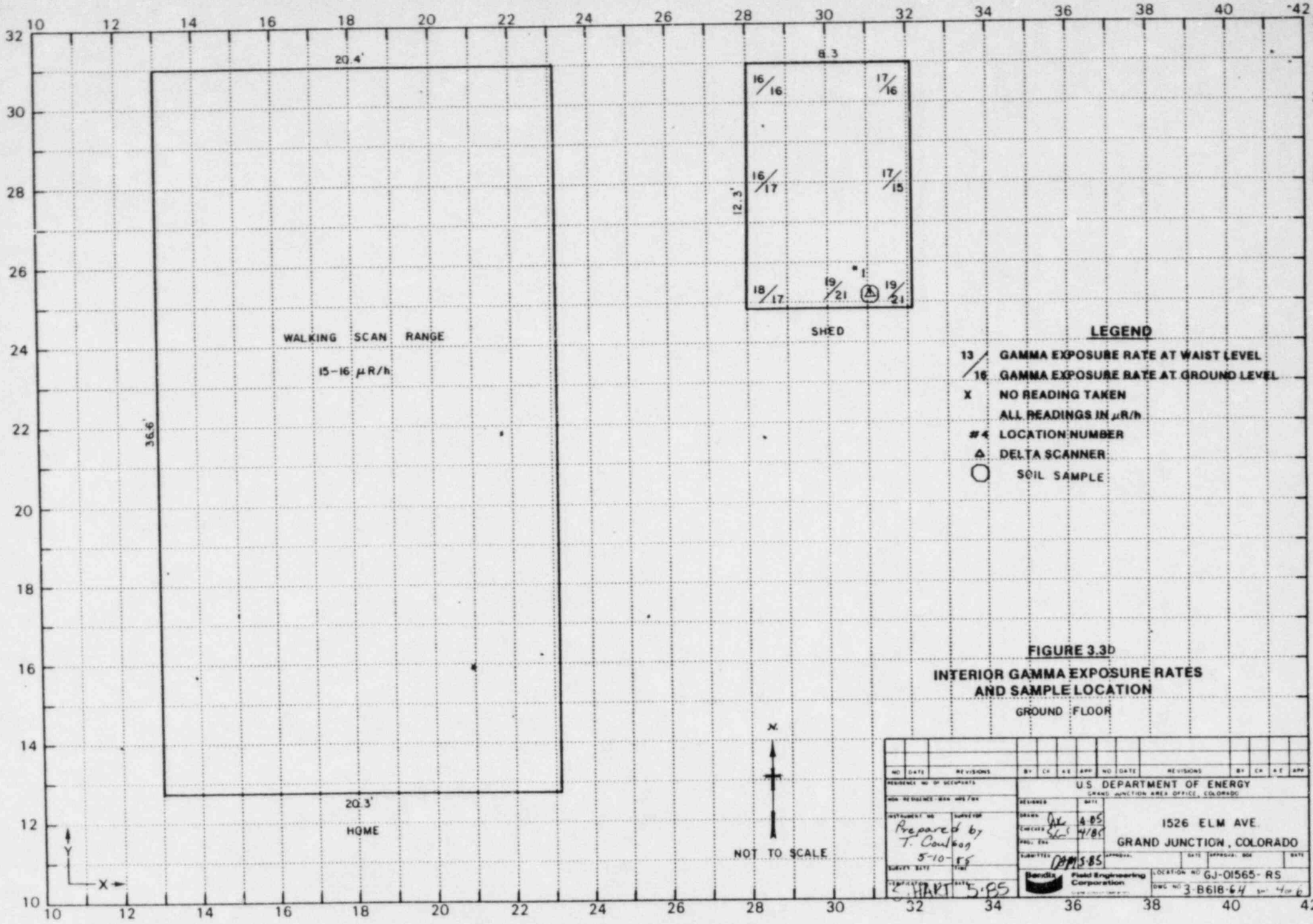


FIGURE 3.3b

INTERIOR GAMMA EXPOSURE RATES AND SAMPLE LOCATION

GROUND FLOOR

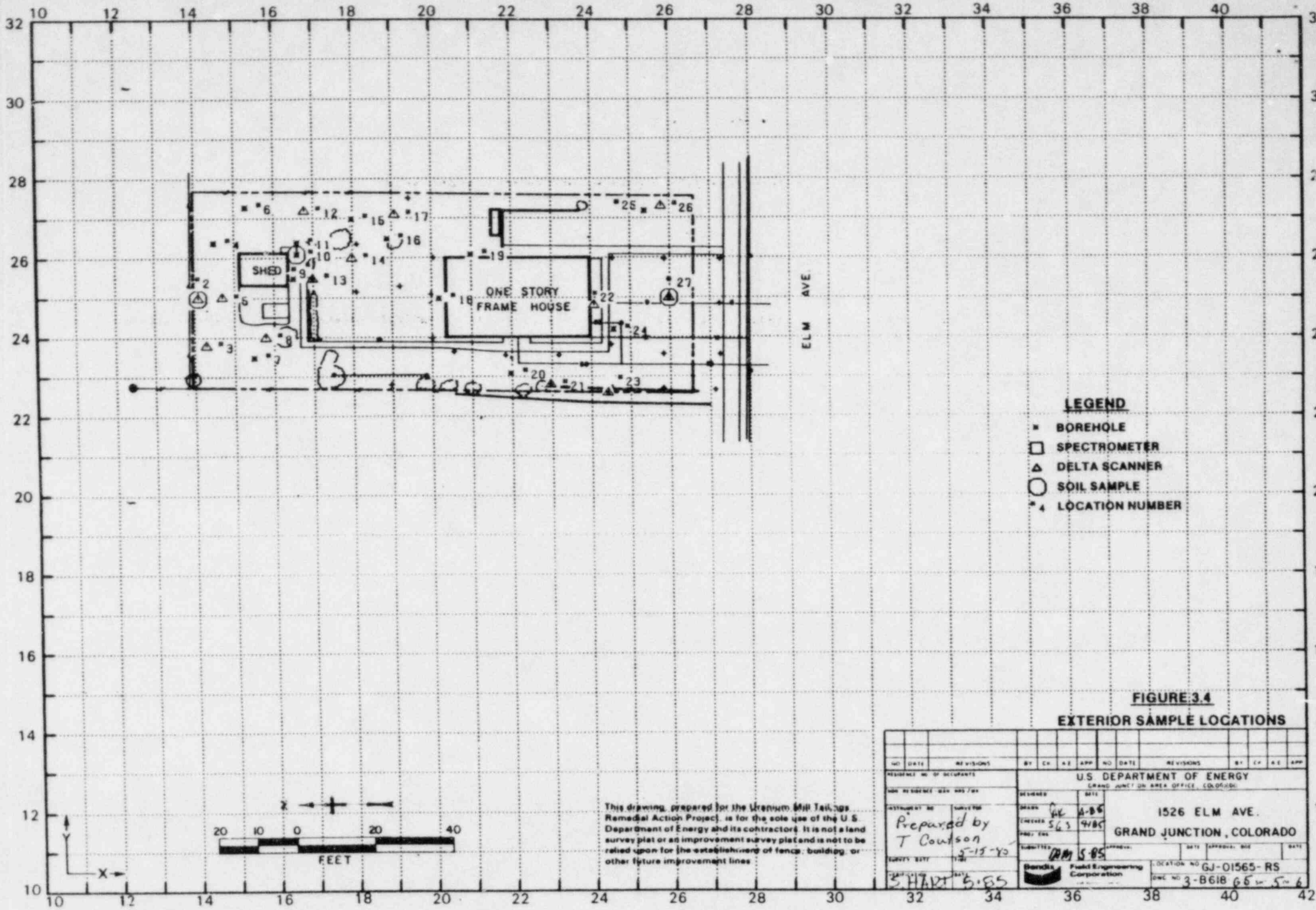


FIGURE 3.4

EXTERIOR SAMPLE LOCATIONS

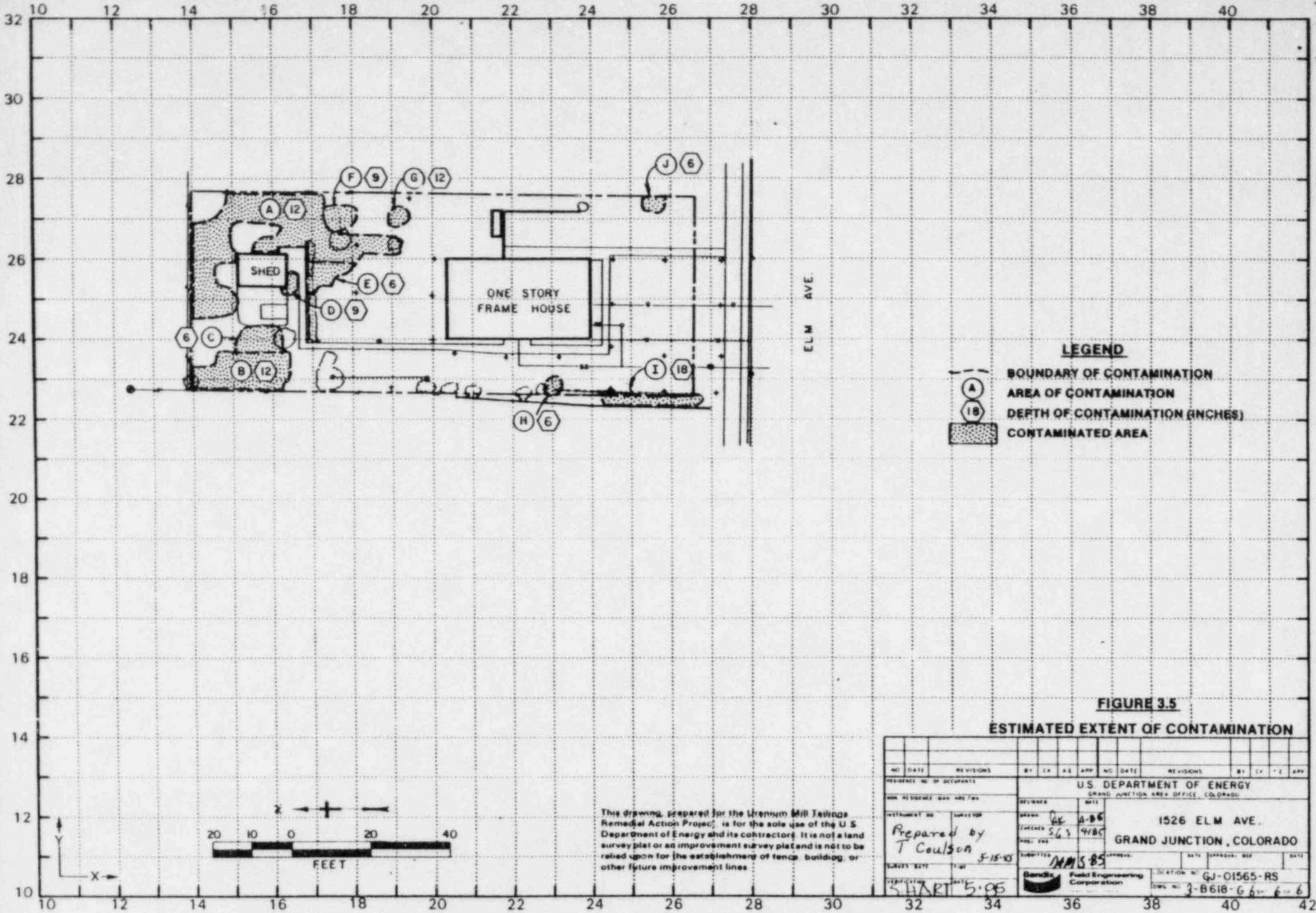


FIGURE 3.5

ESTIMATED EXTENT OF CONTAMINATION

3/85

DOE ID NO. GJ-01565-RS Date May 19, 1985

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

Official Survey Report

Property Address 1526 Elm Avenue

Property Owner Marvin White

Address of Owner (if different from above) 1413 North 16th, Grd Jct.

Report Prepared By T. Coulson

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

[ ] No evidence of residual radioactive material on surveyed property.

[X] Residual ractioactive materials found at the following locations:

- [X] 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.

[X] Levels of radiation from residual radioactive materials exceed EPA Standards such that Remedial Action is recommended and will be accomplished, with your consent, as soon as budget and schedule permit.

cc:
G. A. Franz, III, GJ/CDH
J. Themelis, Mgr. UMTRA Proj. Off.

HIG = 16 uR/h
HOG = 124 uR/h

ALLIED Bendix Aerospace

Bendix Field Engineering Corporation
P.O. Box 1569
Grand Junction, CO 81502-1569
Telephone (303) 242-8621
Telex: 454-338

May 14, 1985

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

ATTN: Jon Luellen

Dear Jon:

The following is in response to your questions and comments during the Technical Review concerning Department of Energy (DOE) Identification (ID) number GJ-01565-RS (1526 Elm Avenue), conducted by telephone 10 May 1985.

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

1. Area 'A' has been revised to include grid point 180260.

2. According to the raw data, Location 21 should have been listed as 244229 and added to the delta taken at this location. This change has been made.

3. Team leader notes and a copy of the survey map are enclosed.

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

Very truly yours,

Terry Coulson

Terry Coulson
RSD Survey Team Leader

Enclosure

TC:pr

CDH.LETTER:01565.COULSON

MEMORANDUM

ALLIED Bendix Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado 81501

DATE: April 26, 1985

TO: Files

FROM: Terry Coulson

SUBJECT: Team Leader Notes - GJ-01565-RS

Address: 1526 Elm Avenue

Owner: Marvin D. White

Team Members

T. Coulson (Team Leader)
B. Wilkins
M. Dexter
C. Adams
M. Gilfillan
R. Herman
N. Wallace
V. Young
D. Dow

Instruments

Crutch Scintillometer - C-3510, C-3502, C-1042, C-1185
Delta Scintillometer - C-3935
Total Count - C-4006, C-3959

Instrument C-3502 did not work (batteries were low).

Date: April 26, 1985

This property displayed more contamination than anticipated, the majority of it being in the extreme north portion.

This property is a rental, new tenants had just moved in. The original or southern half of the house was built on a slab. The addition is on a 8- by 8-foot concrete block foundation.

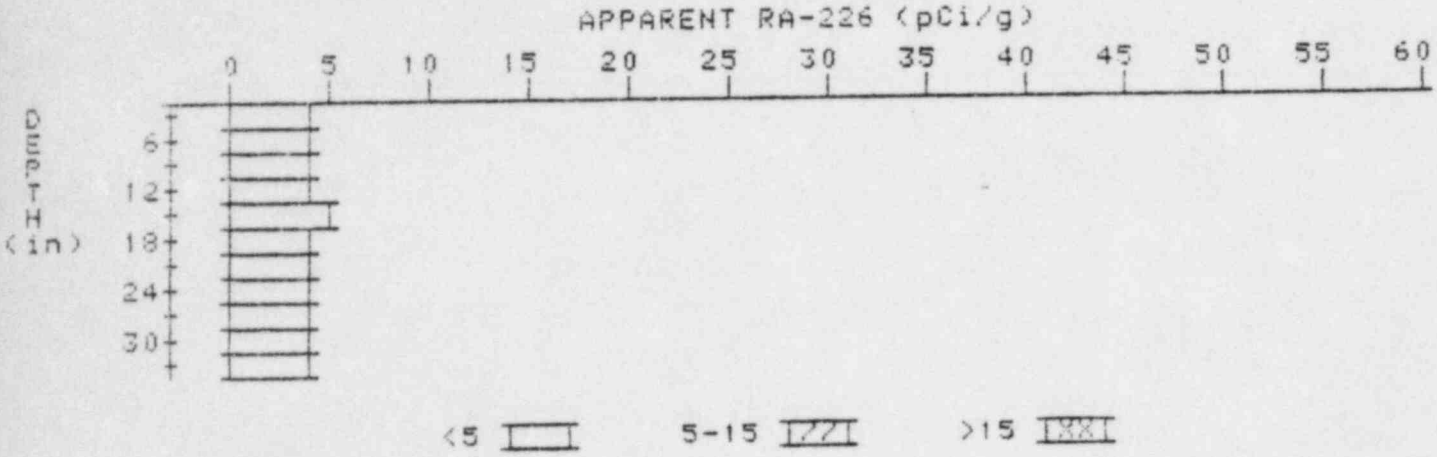
Underneath one closet, a 2- by 5-foot area has been dug out as a crawl space. Other areas underneath the house were not accessible.

The elevated reading in the shed and sidewalk in front of the shed are thought to be shine. The soil samples are negative.

All team members were frisked before leaving the site.

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

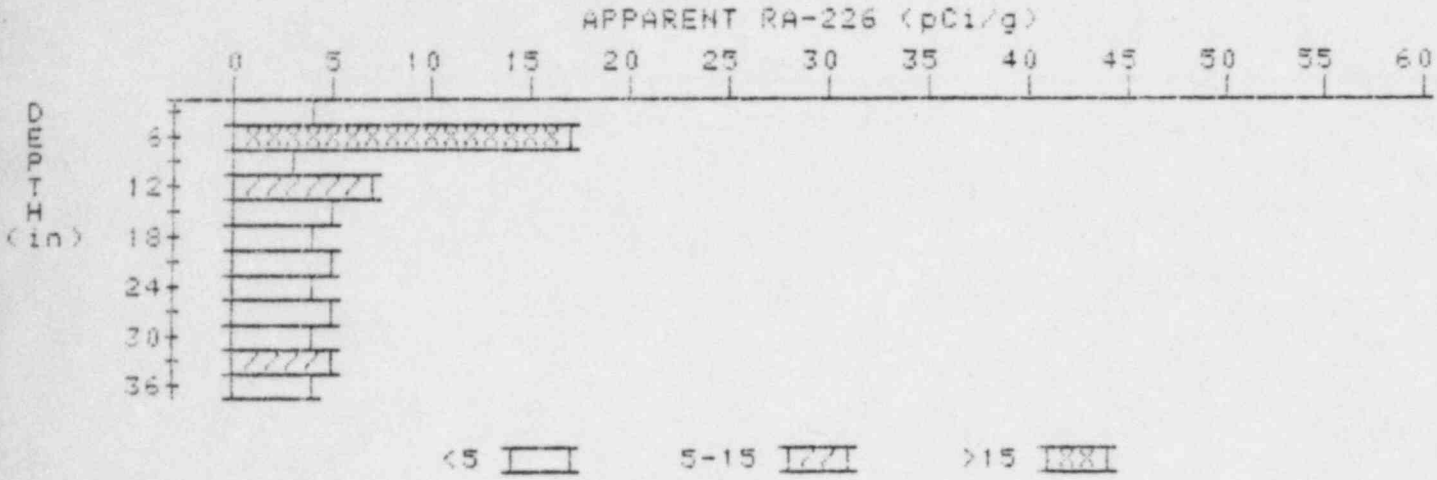
PROPERTY NUMBER: GJ-01565-RS
HOLE NUMBER: 1
LOCATION:



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.6	3.6
6	3.8	3.8
9	4.0	4.4
12	4.0	3.6
15	4.2	4.6
18	4.2	4.2
21	4.2	4.0
24	4.3	4.5
27	4.3	4.3
30	4.3	4.3
33	4.3	4.3

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01565-RS
HOLE NUMBER: 4
LOCATION: 145264



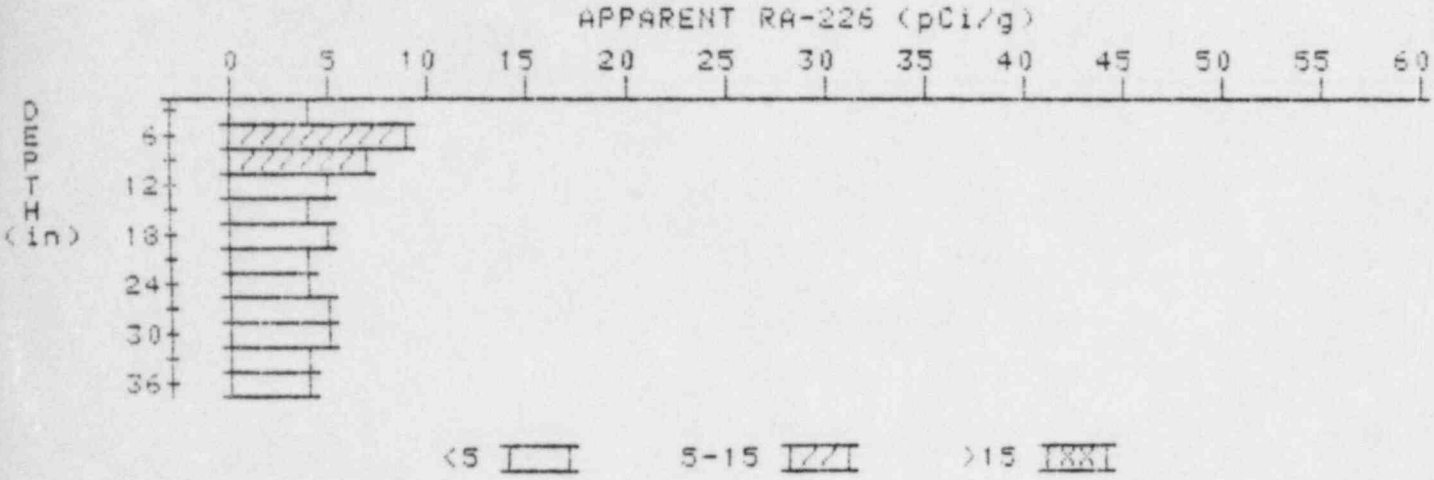
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	9.8	9.8
6	10.3	16.9
9	7.1	2.7
12	6.4	6.8
15	5.5	5.0
18	4.9	4.2
21	4.7	4.7
24	4.5	4.0
27	4.6	5.0
30	4.5	4.1
33	4.6	5.1
36	4.4	4.4

DECDN V85.1(850215.1335)

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

6

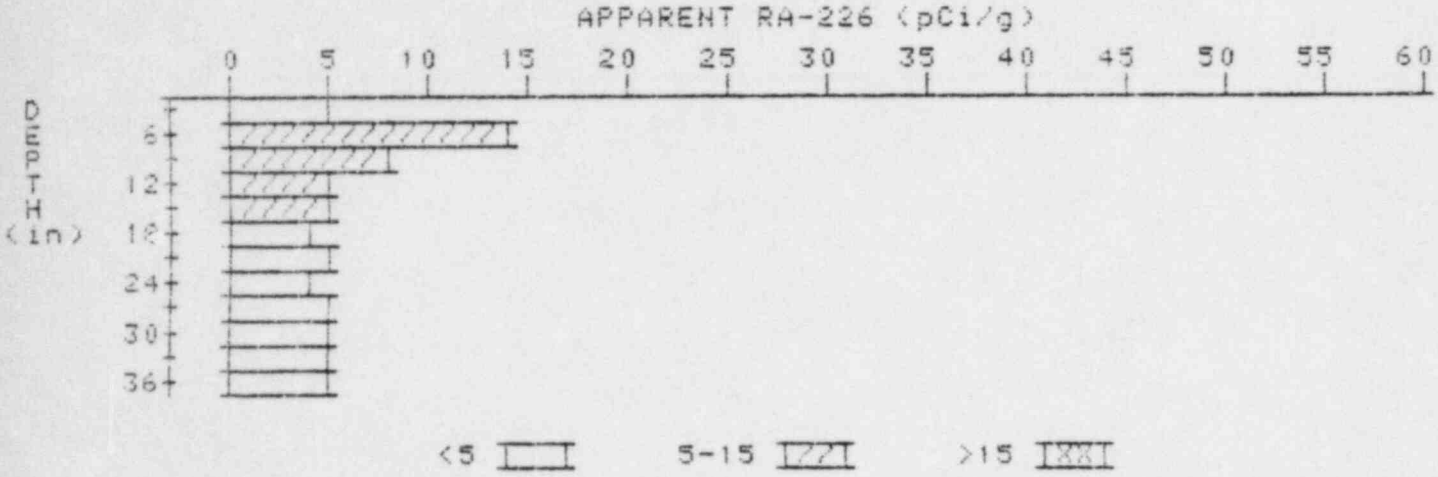
PROPERTY NUMBER: GJ-01565-RS
HOLE NUMBER: 6
LOCATION: 153273



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.7	6.7
6	7.2	9.3
9	6.5	7.0
12	5.5	4.6
15	5.0	4.5
18	4.8	4.8
21	4.6	4.4
24	4.5	4.1
27	4.6	5.0
30	4.5	4.5
33	4.4	4.2
36	4.4	4.4

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

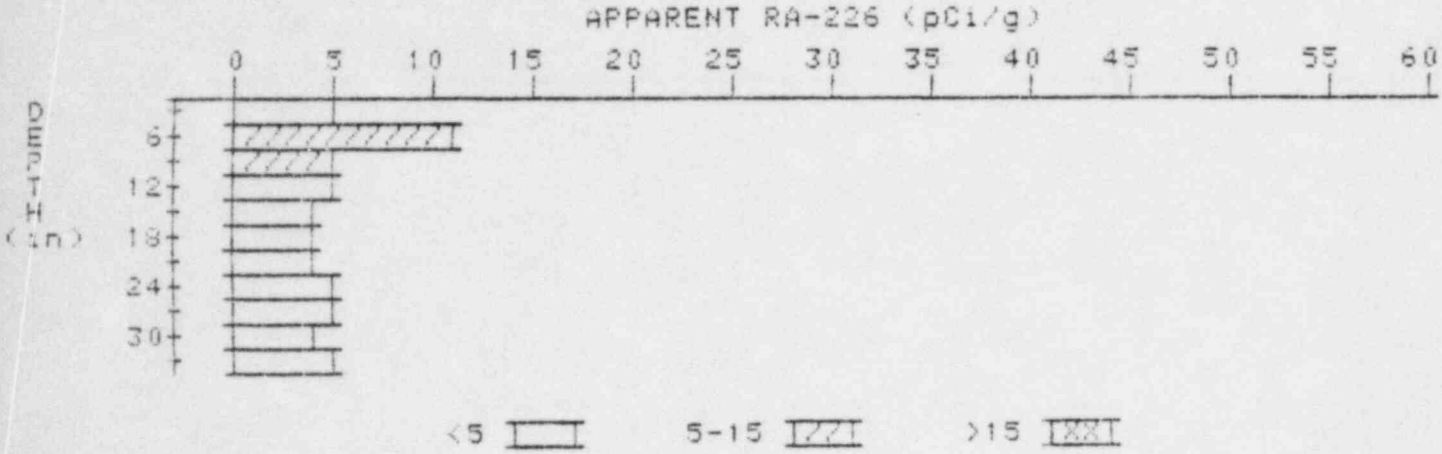
PROPERTY NUMBER: GJ-01565-RS
HOLE NUMBER: 7
LOCATION: 155235



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	11.3	11.3
6	10.8	14.0
9	8.5	7.6
12	6.7	5.3
15	5.7	5.2
18	5.0	4.1
21	4.8	5.0
24	4.5	4.0
27	4.5	4.5
30	4.5	4.5
33	4.5	4.5
36	4.5	4.5

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

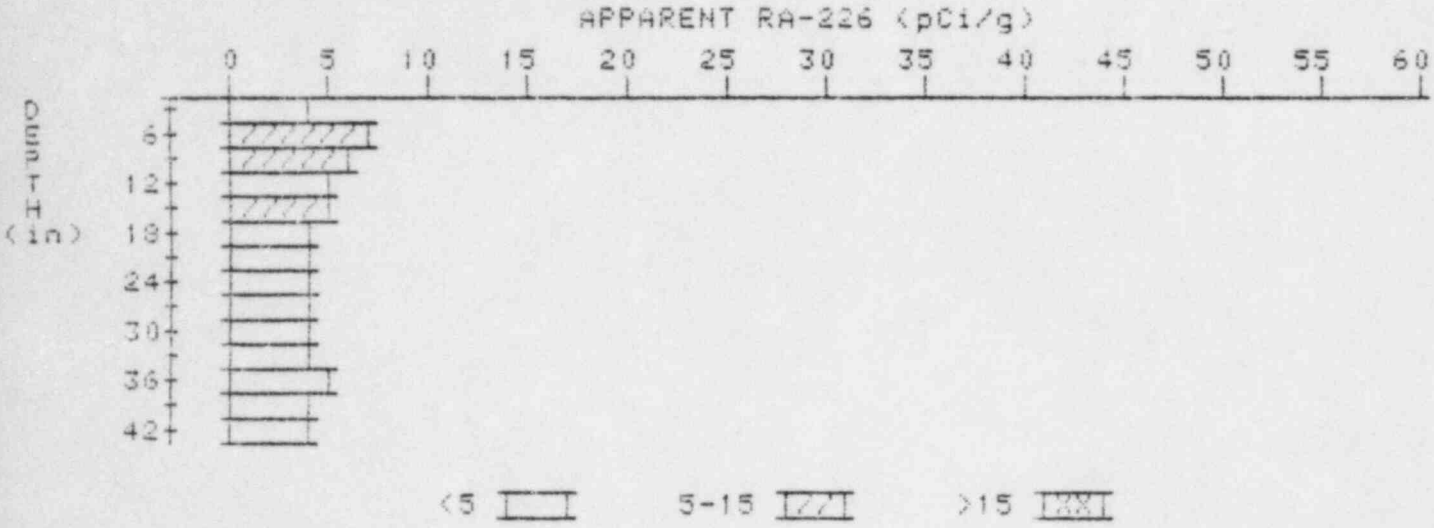
PROPERTY NUMBER: GJ-01565-RS
HOLE NUMBER: 9
LOCATION: 165255



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	17.0	17.0
6	12.3	10.9
9	8.4	5.0
12	6.4	4.8
15	5.3	4.2
18	4.8	4.3
21	4.6	4.2
24	4.6	4.6
27	4.6	4.6
30	4.6	4.2
33	4.8	4.8

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

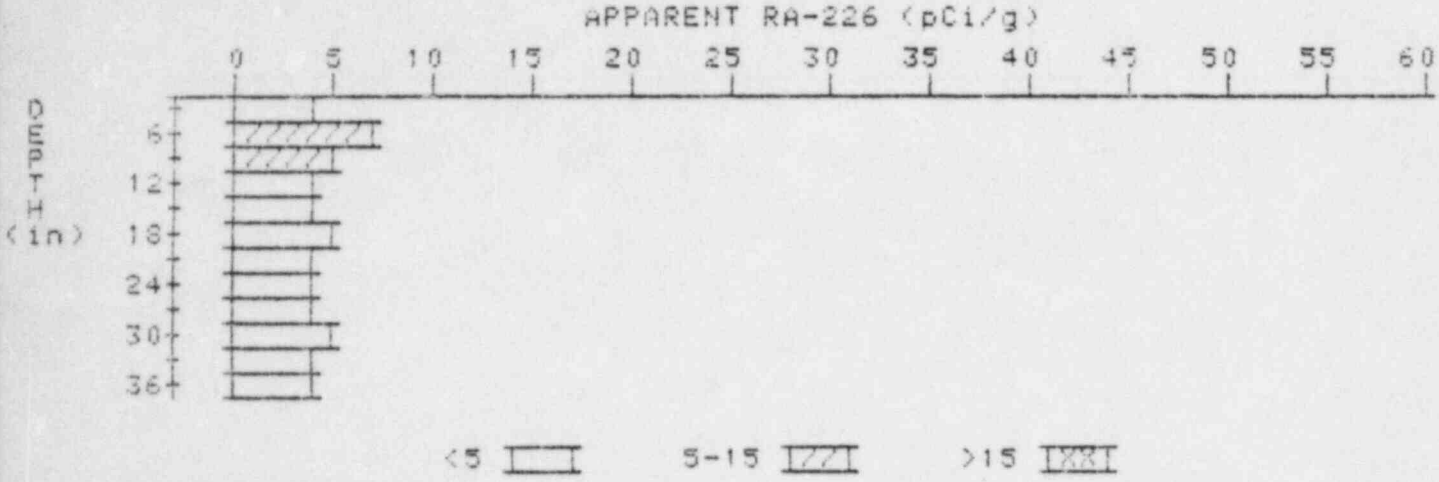
PROPERTY NUMBER: GJ-01565-RS
HOLE NUMBER: 10
LOCATION: 166261



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.5	4.5
6	5.3	6.5
9	5.4	6.3
12	5.0	4.6
15	4.8	5.2
18	4.4	3.9
21	4.3	4.1
24	4.3	4.3
27	4.3	4.3
30	4.3	4.3
33	4.3	4.1
36	4.4	4.8
39	4.3	4.1
42	4.3	4.3

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01565-RS
HOLE NUMBER: 11
LOCATION: 166264



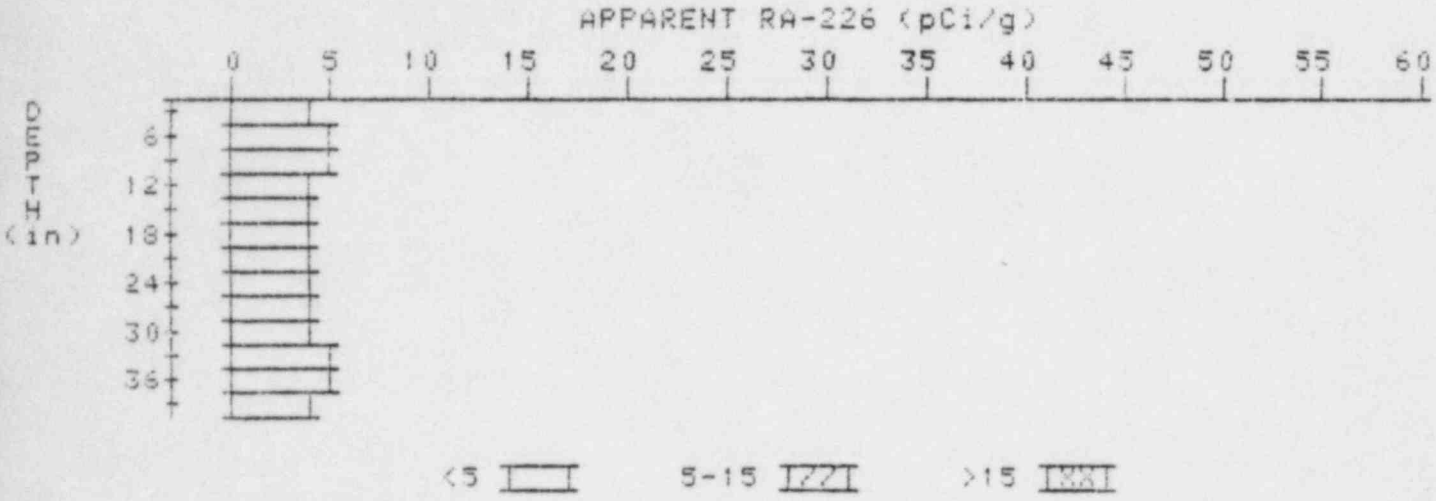
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.9	6.9
6	6.4	6.9
9	5.6	5.4
12	4.9	4.2
15	4.6	4.2
18	4.5	4.5
21	4.4	4.4
24	4.3	4.1
27	4.3	4.1
30	4.4	4.6
33	4.4	4.4
36	4.4	4.4

DECON V85.1(850215.1335)

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

13

PROPERTY NUMBER: GJ-01565-RS
HOLE NUMBER: 13
LOCATION: 170255



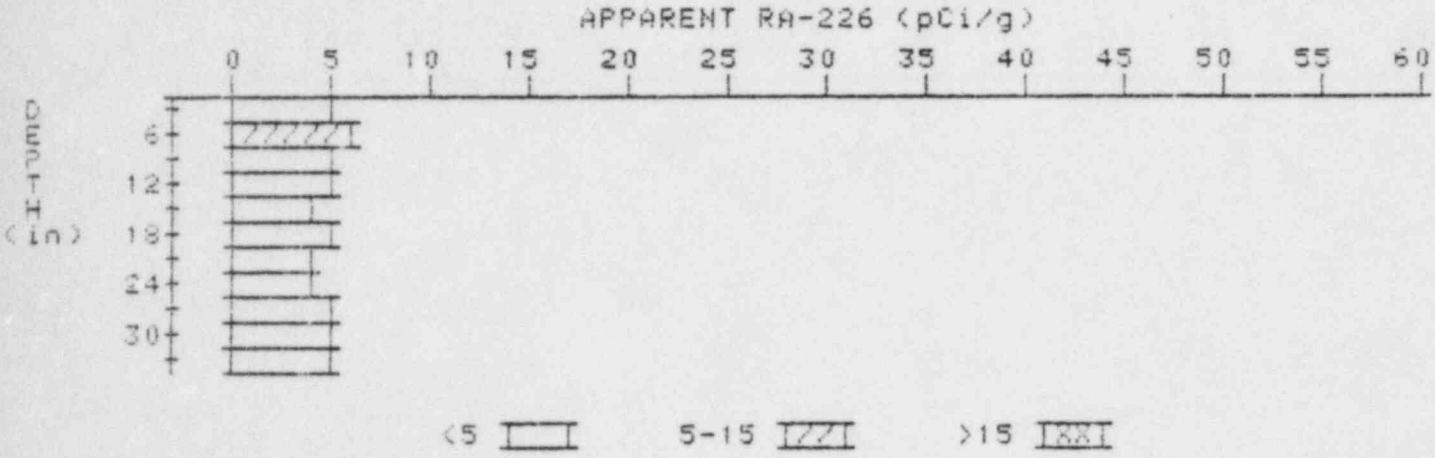
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.7	5.7
6	5.1	4.7
9	4.7	4.5
12	4.4	4.0
15	4.3	4.1
18	4.3	4.3
21	4.3	4.5
24	4.2	4.0
27	4.2	4.2
30	4.2	3.8
33	4.4	4.8
36	4.4	4.6
39	4.3	4.3

DECON V85.1(850215.1335)

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

15

PROPERTY NUMBER: GJ-01565-RS
HOLE NUMBER: 15
LOCATION: 180270



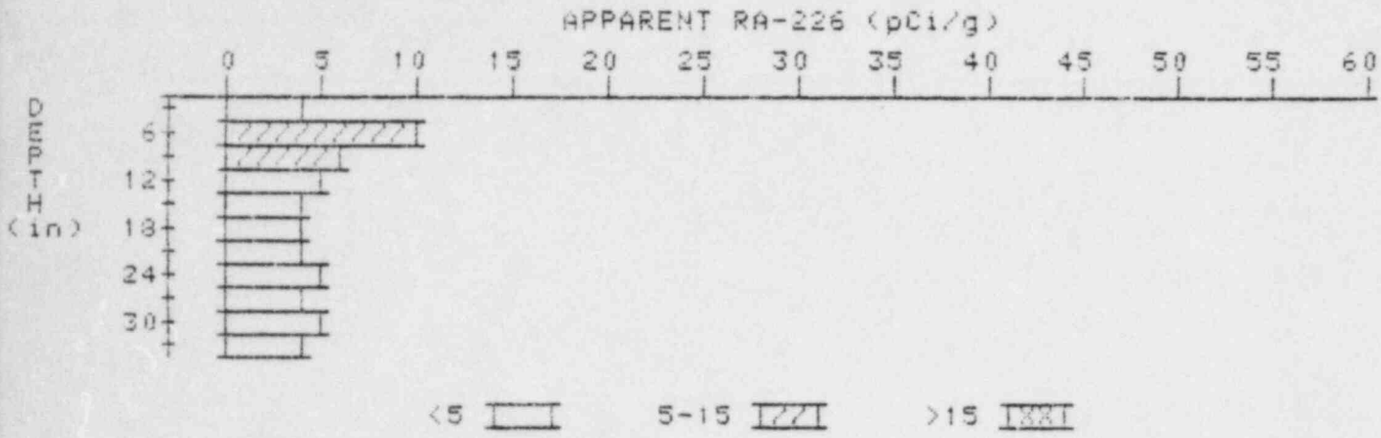
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.4	6.4
6	5.7	5.5
9	5.1	4.7
12	4.7	4.5
15	4.4	3.7
18	4.5	4.9
21	4.4	4.2
24	4.4	4.2
27	4.5	4.7
30	4.5	4.5
33	4.5	4.5

DECON V85.1<850215.1335>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

16

PROPERTY NUMBER: GJ-01565-RS
HOLE NUMBER: 16
LOCATION: 189265



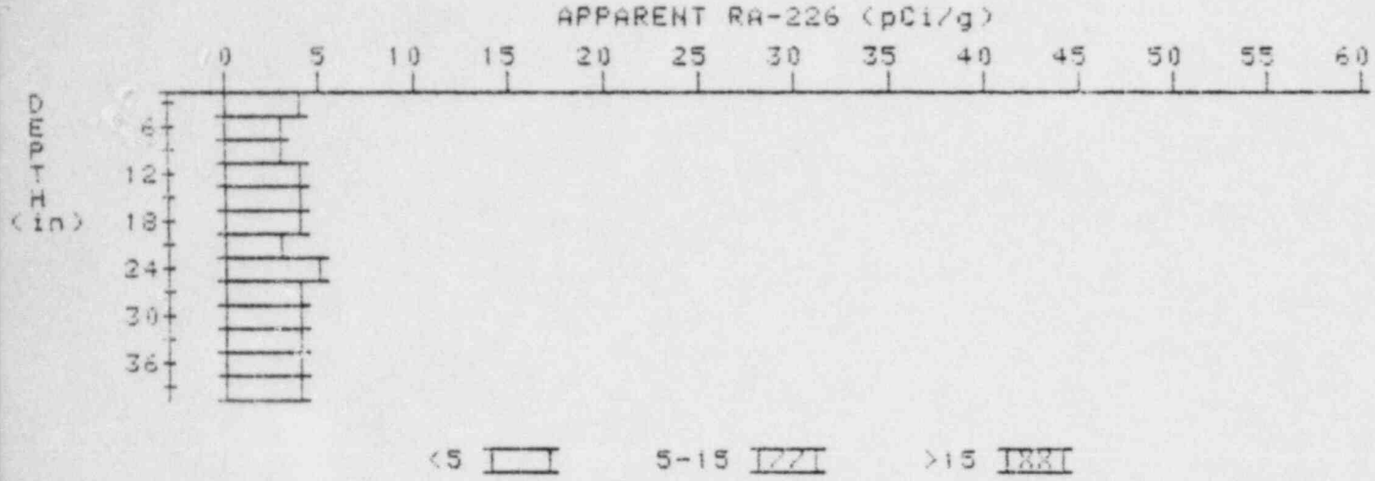
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	8.4	8.4
6	8.1	10.1
9	6.7	6.2
12	5.6	4.9
15	4.9	4.4
18	4.5	4.0
21	4.4	4.2
24	4.4	4.6
27	4.3	3.9
30	4.4	4.6
33	4.4	4.4

DECON V85.1(850215.1335)

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

18

PROPERTY NUMBER: GJ-01565-RS
HOLE NUMBER: 18
LOCATION: 202250



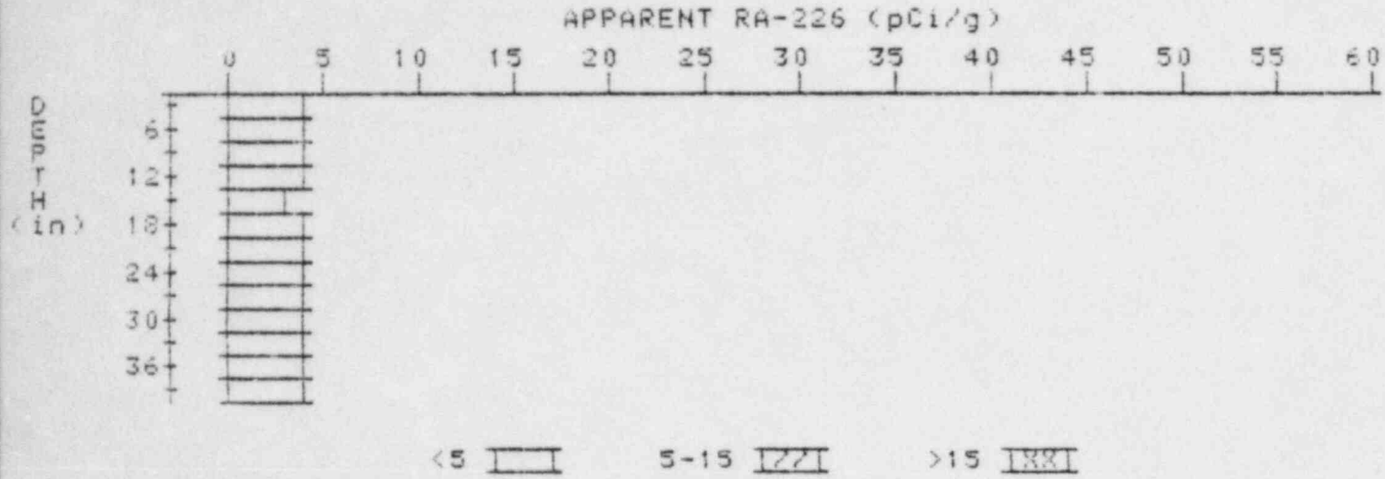
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.7	2.7
6	3.0	3.0
9	3.3	3.5
12	3.5	3.7
15	3.6	3.6
18	3.7	3.9
21	3.7	3.2
24	4.0	4.5
27	4.0	4.0
30	4.0	4.0
33	4.0	4.0
36	4.0	4.2
39	3.9	3.9

DECON V85.1<850215.1335>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

19

PROPERTY NUMBER: GJ-01565-RS
HOLE NUMBER: 19
LOCATION: 210261



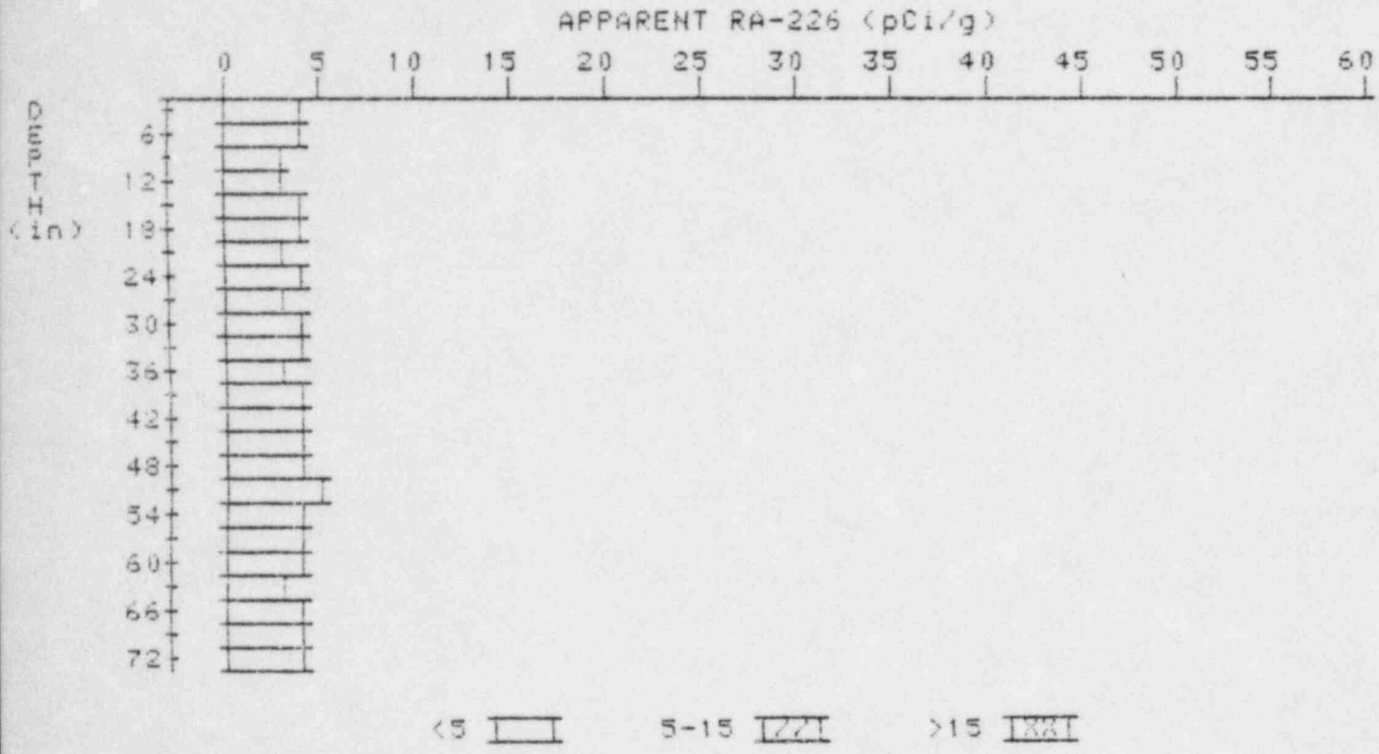
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.2	3.2
6	3.4	3.6
9	3.5	3.5
12	3.6	3.8
15	3.6	3.4
18	3.7	3.7
21	3.8	4.0
24	3.8	3.6
27	3.9	4.1
30	3.9	4.1
33	3.8	3.6
36	3.8	3.8
39	3.8	3.8

DECON V85.1(850215.1335)

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

20

PROPERTY NUMBER: GJ-01565-RS
HOLE NUMBER: 20
LOCATION: 220231

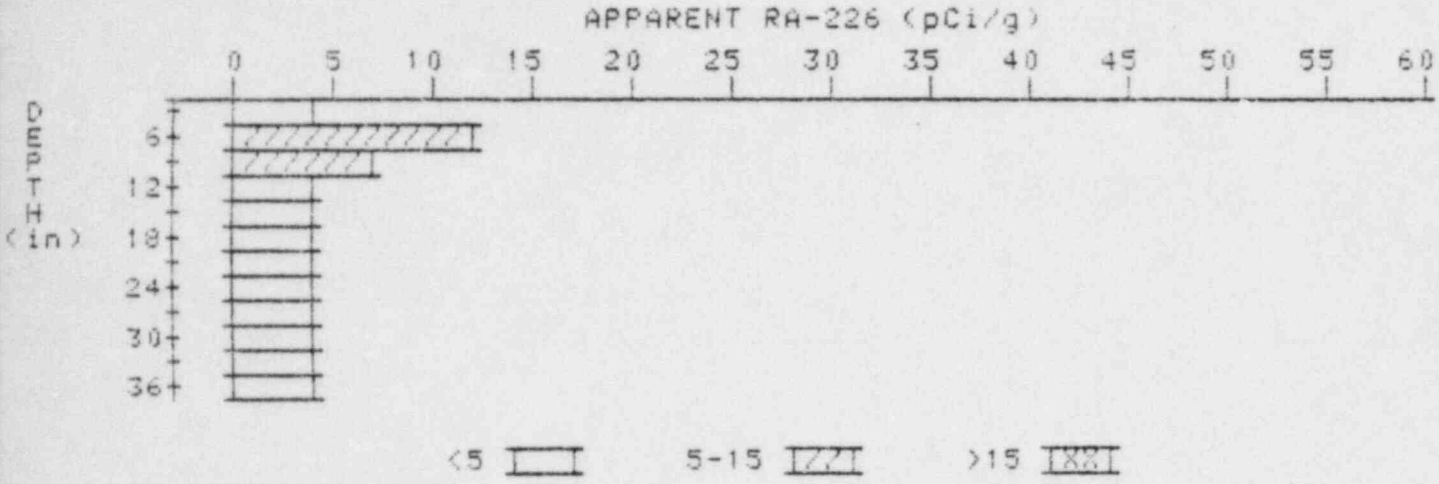


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.8	2.8
6	3.2	3.7
9	3.3	3.3
12	3.4	3.4
15	3.5	3.5
18	3.6	4.0
21	3.5	3.3
24	3.5	3.5
27	3.5	3.3
30	3.6	3.6
33	3.7	3.9
36	3.7	3.3
39	3.9	4.1
42	4.0	4.0
45	4.1	4.3

48	4.1	3.9
51	4.2	4.6
54	4.1	3.9
57	4.1	4.5
60	3.9	3.7
63	3.8	3.4
66	3.9	4.1
69	3.9	4.3
72	3.7	3.7

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

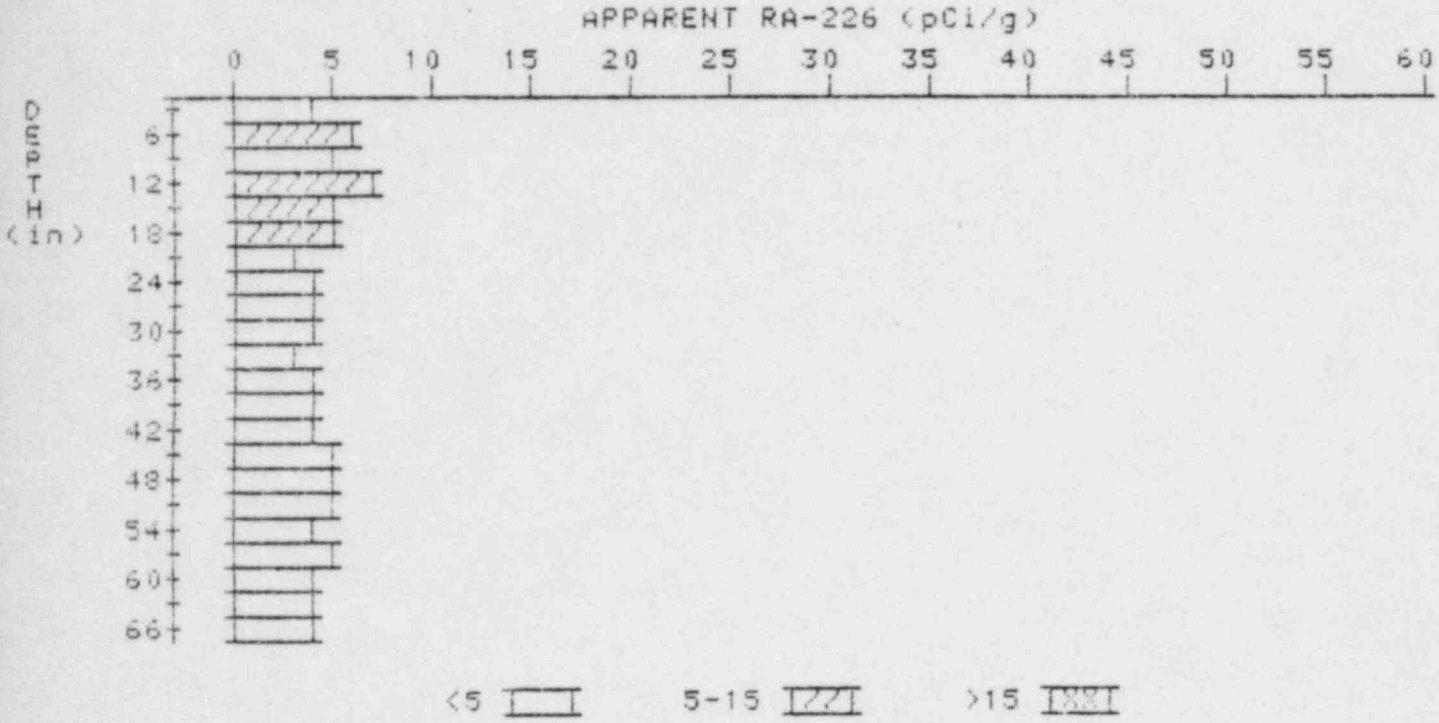
PROPERTY NUMBER: GJ-01565-RS
HOLE NUMBER: 21
LOCATION: 230228



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	8.7	8.7
6	8.9	12.3
9	7.2	6.8
12	5.7	4.5
15	4.9	4.2
18	4.5	4.3
21	4.2	3.8
24	4.1	3.9
27	4.1	4.3
30	4.0	3.8
33	4.0	3.8
36	4.1	4.1

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01565-R3
HOLE NUMBER: 23
LOCATION: 244227



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.8	4.8
6	5.3	6.2
9	5.3	4.6
12	5.7	7.3
15	5.2	5.0
18	4.8	5.3
21	4.1	3.2
24	3.9	3.7
27	3.8	3.6
30	3.8	3.8
33	3.8	3.4
36	4.0	4.0
39	4.2	4.4
42	4.3	4.1
45	4.5	4.9
48	4.5	4.5

51	4.5	4.7
54	4.4	4.2
57	4.4	4.6
60	4.3	4.1
63	4.3	4.1
66	4.4	4.4

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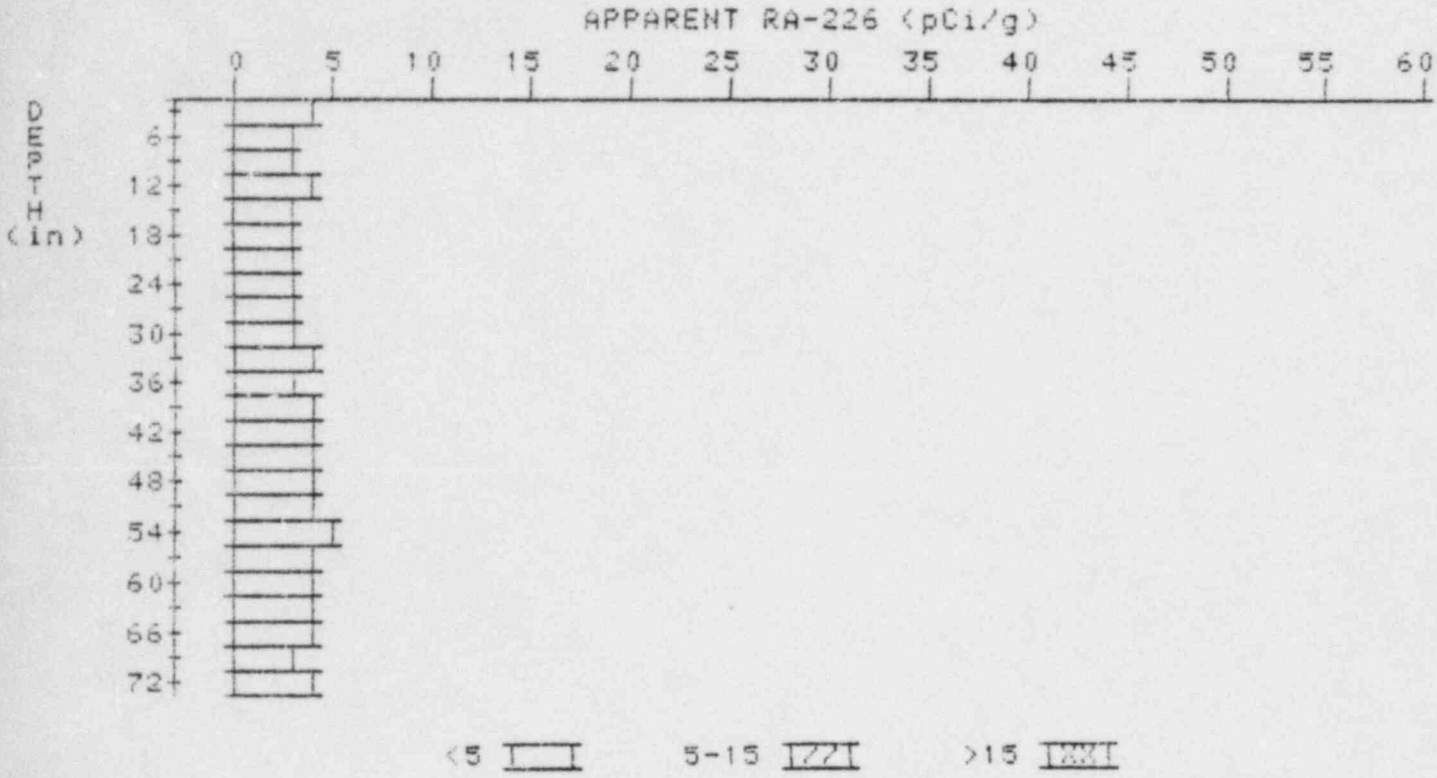
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

24

PROPERTY NUMBER: GJ-01565-RS
HOLE NUMBER: 24
LOCATION: 246242



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.6	2.6
6	3.0	3.4
9	3.2	3.2
12	3.4	3.8
15	3.4	3.4
18	3.4	3.4
21	3.4	3.4
24	3.4	3.4
27	3.4	3.4
30	3.4	3.2
33	3.5	3.7
36	3.5	3.0
39	3.8	4.2
42	3.9	3.9

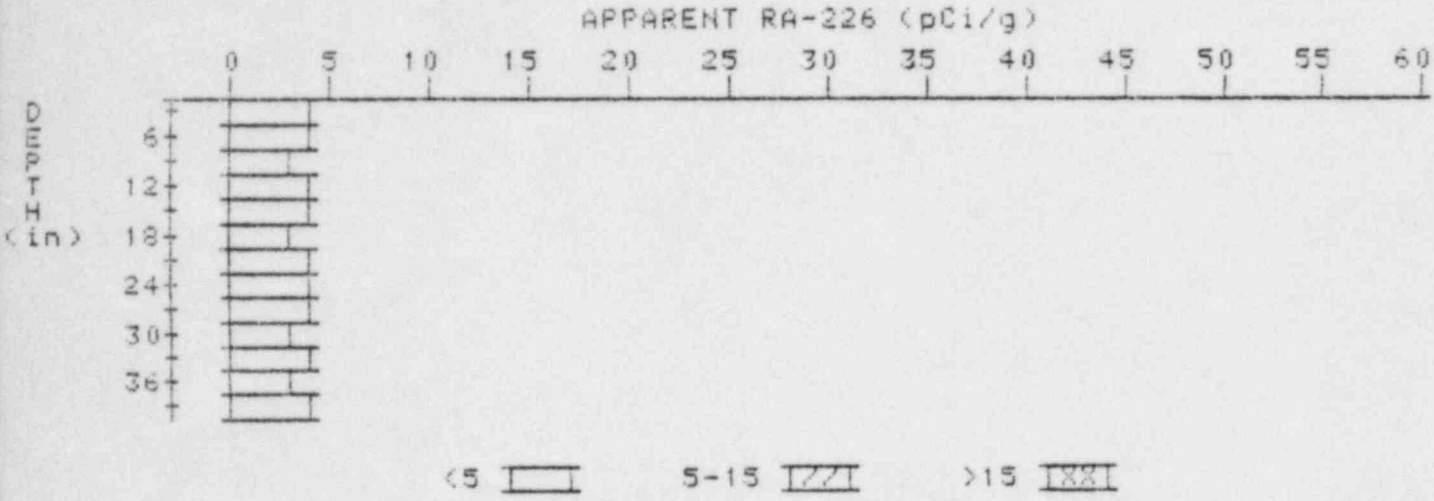
48	4.0	4.0
51	4.0	3.8
54	4.1	4.6
57	3.9	3.5
60	3.9	4.1
63	3.8	3.6
66	3.8	4.2
69	3.6	3.1
72	3.7	3.7

DECON V85.1(850215.1335)

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

25

PROPERTY NUMBER: GJ-01565-RS
HOLE NUMBER: 25
LOCATION: 254272



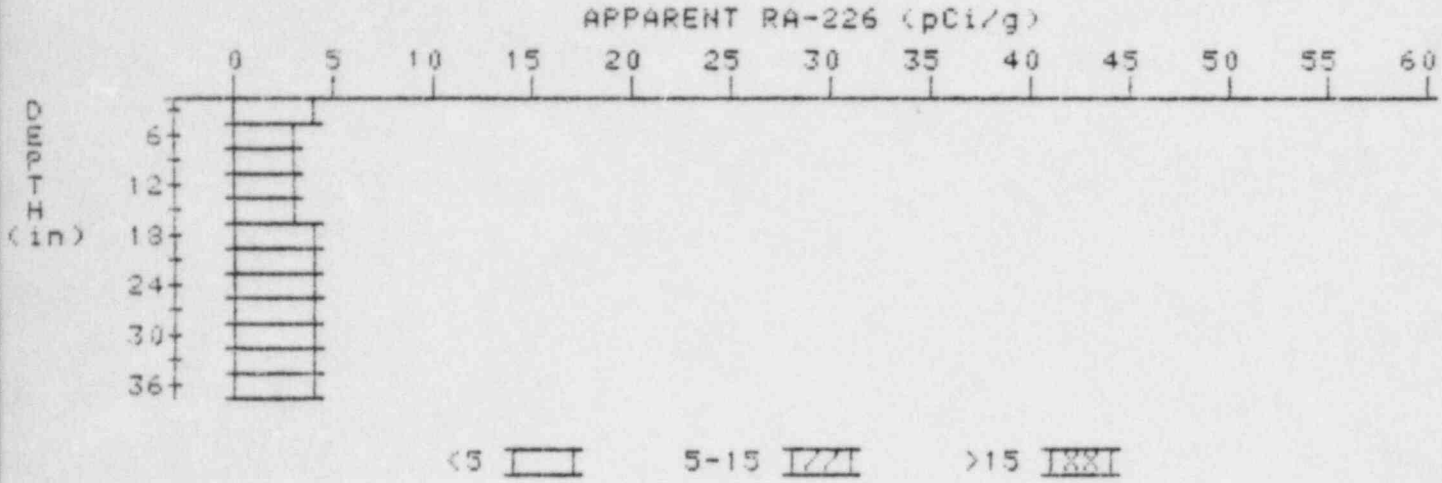
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.7	4.7
6	4.3	4.3
9	3.9	3.4
12	3.8	3.6
15	3.8	4.0
18	3.7	3.3
21	3.8	3.8
24	3.9	4.1
27	3.9	4.1
30	3.8	3.4
33	3.9	4.4
36	3.7	3.2
39	3.8	3.8

DECON V85.1(850215.1335)

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

27

PROPERTY NUMBER: GJ-01565-R3
HOLE NUMBER: 27
LOCATION: 260250



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.8	2.8
6	3.1	3.3
9	3.3	3.5
12	3.4	3.4
15	3.5	3.3
18	3.7	3.9
21	3.8	4.0
24	3.8	3.8
27	3.8	3.6
30	3.9	4.3
33	3.8	3.6
36	3.8	3.8