

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-01204-RS  
ADDRESS: 2542 KENNEDY AVENUE

AUGUST 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION  
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APPROVED BY

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DATE

August 8, 1985

REA01204:REA-KL016

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## 1.0 EXECUTIVE SUMMARY

### 1.1 Introduction

The location, DOE ID No. GJ-01204-RS, is a single-family residence located at 2542 Kennedy 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, 83 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$3,809. Remedial action on this property will take approximately 10 days to complete.

## 2.0 PROPERTY DESCRIPTION

### 2.1 General Description

Address: 2542 Kennedy Avenue, Grand Junction, Colorado

Zoning: RSF-8

Lot Size: Approximately 8,650 sf (0.2 acres)

Legal Description: Lot 10, Block 1, 2nd Houlton Re-sub, 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:	Single-family residence
South:	Single-family residence
East:	Single-family residence
West:	Kennedy Avenue

### 2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-family residence
Size:	Approximately 854 sf
Construction Date:	1956
Construction:	One-story frame
Foundation:	Concrete stemwall on spread footing, porch is slab-on-grade
Footing Depth:	Approximately 36" to bottom of footing from grade
Basement:	None
Crawl Space:	Under house
Condition:	Good



Other Structures:

Type:	Shed #1
Size:	Approximately 71 sf
Construction:	Wood-frame
Foundation:	Slab-on-grade
Condition:	Good

Type:	Shed #2
Size:	Approximately 32 sf
Construction:	Wood-frame
Foundation:	Loose CMU
Condition:	Good

General Remarks:

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

Historical Data:

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

### 3.0 RADIOLOGIC SURVEY

#### 3.1 Introduction

Radiologic data were collected by Bendix at DOE ID No. GJ-01204-RS on May 16, 1985. Data collection methods were performed in accordance with procedures fully described in the Radiologic Support Operations Procedures Manual GJ-07(84) (Bendix Field Engineering Corporation, 1984). These data were evaluated to determine the areal and vertical extent of uranium mill tailings contamination at this property as well as any other contaminated material that may have originated from the millsite.

A review of historical information from the files of the Colorado Department of Health (CDH) and the inclusion data from Oak Ridge National Laboratory (ORNL) was conducted. These records indicate contamination in the yards, north and east of the primary structure.

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

#### 3.2 Gamma Exposure-Rate Surveys

##### 3.2.1 Exterior Findings

Background Readings: 15 to 17 uR/h  
Highest Outside Gamma Reading (HOG): 49 uR/h

Exterior radium-concentration measurements are presented in Appendix Table 3.1. Grid-point survey results are shown in Appendix Figure 3.1.

##### 3.2.2 Interior Findings

Background Readings: 13 to 17 uR/h  
Highest Inside Gamma Reading (HIG): 26 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 Figure 3.2 shows interior exposure rates and location 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 3.2 and 3.3. 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 Figures 3.4a and 3.4b 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 under Shed 2 is contaminated to depth of 6 inches, measured from ground surface. The shed has a wooden floor which is 6 inches above the surface of the ground (approximately 32 sf).
- (AREA B) The soil north of the primary structure is contaminated to a depth of 9 inches (approximately 144 sf).
- (AREA C) The soil along a portion of the north fence is contaminated. The depth of contamination is 6 inches (approximately 54 sf).
- (AREA D) The soil adjacent to Area B is contaminated. The depth of contamination is 6 inches (approximately 88 sf).
- (AREA E) A deposit south of the north fence is contaminated to a depth of 12 inches (approximately 531 sf).
- (AREA F) The soil in the northeast corner of the property is contaminated. The depth of contamination is 6 inches (approximately 295 sf).
- (AREA G) A deposit east of the primary structure is contaminated to a depth of 6 inches (approximately 363 sf).
- (AREA H) A section of the backyard along the east fence is contaminated. The depth of contamination is 9 inches (approximately 1,078 sf).
- (AREA I) Several small deposits east of the primary structure are contaminated to a depth of 6 inches (approximately 59 sf).
- (AREA J) The soil that is adjacent to Area K is contaminated to a depth of 9 inches (approximately 90 sf).
- (AREA K) A deposit in the backyard between the sidewalk and the south fence is contaminated to a depth of 6 inches (approximately 349 sf).

(AREA L) The soil south of Shed 1 is contaminated to a depth of 9 inches (approximately 27 sf).

(AREA M) There is contamination south of the carport driveway. The depth of contamination is 6 inches (approximately 21 sf).

(AREAS REQUIRING FURTHER INVESTIGATION DURING REMEDIAL ACTION)

The northeast corner of the property should be monitored during remedial action because this area was inaccessible during the survey.

#### 4.0 RECOMMENDED REMEDIAL ACTION

##### 4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-01204-RS, includes removal of all areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figures 3.4a and 3.4b) 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 \$3,809.

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

Owner preference is to be consulted prior to scheduling remedial action. 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 Rate
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	Interior Gamma Exposure Rates and Sample Location
Figure 3.3	Exterior Sample Locations
Figure 3.4a	Interior Estimated Extent of Contamination
Figure 3.4b	Exterior Estimated Extent of Contamination

Official Survey Report

Team Leader Notes

Deconvolution Graphs (Apparent Radium-226 Concentration)

Exterior Gamma Scan

## Radium Concentrations at Exterior Locations

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
2	189228	03	TC	3.0		*	Water line DC = 0 inches
		06	TC	3.4		*	
		09	TC	3.6		*	
		12	TC	3.7		*	
		15	TC	3.7		*	
		18	TC	3.7		*	
		21	TC	3.6		*	
		24	TC	3.5		*	
		27	TC	3.4		*	
		30	TC	3.3		*	
		33	TC	3.1		*	
		36	TC	3.0		*	
		39	TC	3.1		*	
		42	TC	3.3		*	
		45	TC	3.4		*	
		48	TC	3.5		*	
		51	TC	3.6		*	
		54	TC	3.6		*	
		57	TC	3.6		*	
		60	TC	3.5		*	
		63	TC	3.4		*	
		66	TC	3.4		*	
3	193241	00	DS	1.5		*	Gas line
		15	DS	1.3		*	
4	200250	00	DS	<1.0		*	Background DC = 0 inches
		03	TC	3.1		*	
		06	BH	3.4	1.0	*	
		09	TC	3.7		*	
		12	TC	3.7		*	
		15	TC	3.8		*	
		18	BH	3.8	<1.0	*	
		21	TC	3.6		*	
		24	TC	3.4		*	
		27	TC	3.4		*	
		30	BH	3.1	1.2	*	
		33	TC	3.1		*	
5	215250	00	DS	1.9		*	Backyard
		06	DS	2.0		*	
6	219192	00	DS	5.3		*	South of carport
		06	DS	1.3		*	

## Radium Concentrations at Exterior Locations

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
7	219261	00	DS	8.8		*	Backyard
		06	DS	3.5		*	
		12	DS	<1.0		*	
8	220243	00	DS	7.0		*	Backyard
		06	DS	2.2		*	
		12	DS	2.0		*	
9	220250	03	TC	14.3		*	North of primary structure DC = 9 inches Based on the deconvolution graph
		06	TC	10.0		*	
		09	TC	6.6		*	
		12	TC	5.1		*	
		15	TC	4.4		*	
		18	TC	4.1		*	
		21	TC	3.8		*	
		24	TC	3.5		*	
		27	TC	3.3		*	
		30	TC	3.4		*	
		33	TC	3.4		*	
10	224256	00	DS	3.3		*	Northeast of primary structure
		06	DS	2.3		*	
		12	DS	1.3		*	
11	225192	03	TC	9.7		*	By Shed 1 DC = 9 inches Based on the deconvolution graph
		06	TC	7.3		*	
		09	TC	5.6		*	
		12	TC	4.7		*	
		15	TC	4.2		*	
		18	TC	4.0		*	
		21	TC	3.9		*	
		24	TC	3.8		*	
		27	TC	3.7		*	
		30	TC	3.7		*	
		33	TC	3.6		*	
12	225224	03	TC	4.0		*	Sewer line DC = 0 inches
		06	TC	4.0		*	
		09	TC	4.0		*	
		12	TC	3.8		*	
		15	TC	3.8		*	
		18	TC	3.8		*	

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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.		
12	225224	21	TC	3.8		*	
		24	TC	3.7		*	
		27	TC	3.7		*	
		30	TC	3.7		*	
		33	TC	3.6		*	
		36	TC	3.6		*	
		39	TC	3.5		*	
		42	TC	3.5		*	
		45	TC	3.6		*	
		48	TC	3.6		*	
		51	TC	3.7		*	
		54	TC	3.7		*	
		57	TC	3.7		*	
		60	TC	3.6		*	
		63	TC	3.6		*	
		66	TC	3.7		*	
13	226265	00	DS	3.4		*	Backyard
		06	DS	1.8		*	
14	229205	00	DS	2.9		*	By Shed 1
		06	DS	1.1		*	
15	230263	03	TC	11.8		*	North side of property DC = 12 inches Based on the deconvolution graph
		06	TC	13.6		*	
		09	TC	10.1		*	
		12	TC	6.9		*	
		15	TC	5.1		*	
		18	TC	4.4		*	
		21	TC	4.1		*	
		24	TC	3.8		*	
		27	TC	3.6		*	
		30	TC	3.6		*	
		33	TC	3.5		*	
		36	TC	3.5		*	
16	235191	00	DS	23.8		*	By south fence
		06	DS	3.0		*	
		12	DS	2.0		*	
17	235204	00	DS	3.8		*	By Shed 1
		06	DS	1.8		*	
18	236261	00	DS	2.1		*	Backyard

## Radium Concentrations at Exterior Locations

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
18	236261	06	DS	2.4		*	
		12	DS	1.5		*	
19	240201	00	DS	3.0		*	
		06	DS	1.9		*	
20	243192	00	DS	9.9		*	By south fence
		06	DS	1.5		*	
21	245270	00	DS	4.1		*	North side of
		06	DS	3.5		*	property
		12	DS	1.6		*	
22	248263	00	DS	2.4		*	Backyard
		06	DS	1.4		*	
23	249202	00	DS	3.4		*	By Shed 2
		06	DS	1.2		*	
24	253194	00	DS	2.4		*	Backyard
		06	DS	1.7		*	
25	253265	03	TC	7.4		*	Backyard
		06	TC	8.3		*	DC = 12 inches
		09	TC	7.0		*	Based on the
		12	TC	5.5		*	deconvolution graph
		15	TC	4.9		*	
		18	TC	4.6		*	
		21	TC	4.3		*	
		24	TC	4.1		*	
		27	TC	4.0		*	
		30	TC	3.8		*	
		33	TC	3.8		*	
		36	TC	3.8		*	
26	254253	00	DS	5.4		*	Backyard
		06	DS	1.6		*	
27	255209	00	DS	2.7		*	By sidewalk
		06	DS	1.4		*	
		06	DS	1.5		*	Horizontal under sidewalk

## Radium Concentrations at Exterior Locations

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
28	255222	00	DS	3.9		*	Garden
		06	DS	2.4		*	
		12	DS	<1.0		*	
29	255234	00	DS	4.0		*	Garden
		06	DS	2.8		*	
		12	DS	2.1		*	
30	258192	00	DS	6.8		*	By east fence
		06	DS	2.0		*	
31	259276	00	DS	5.5		*	North edge of property
		06	DS	3.3		*	
		12	DS	<1.0		*	
32	260205	03	TC	10.6		*	By Shed 2 DC = 9 inches Based on the deconvolution graph
		06	TC	7.4		*	
		09	TC	5.3		*	
		12	TC	4.6		*	
		15	TC	4.2		*	
		18	TC	4.0		*	
		21	TC	3.9		*	
		24	TC	3.7		*	
		27	TC	3.7		*	
		30	TC	3.7		*	
		33	TC	3.6		*	
		36	TC	3.7		*	
33	265245	03	TC	4.5		*	North edge of garden DC = 9 inches Based on the deconvolution graph
		06	TC	4.7		*	
		09	TC	4.3		*	
		12	TC	4.0		*	
		15	TC	3.8		*	
		18	TC	3.7		*	
		21	TC	3.7		*	
		24	TC	3.7		*	
		27	TC	3.6		*	
		30	TC	3.6		*	
		33	TC	3.6		*	
34	268220	03	TC	6.3		*	Backyard DC = 9 inches Based on the deconvolution graph
		06	TC	6.2		*	
		09	TC	5.3		*	
		12	TC	4.6		*	



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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
34	268220	15	TC	4.2		*	
		18	TC	4.0		*	
		21	TC	3.9		*	
		24	TC	3.9		*	
		27	TC	3.8		*	
		30	TC	3.8		*	
		33	TC	3.8		*	
		36	TC	3.9		*	
35	270265	03	TC	8.3		*	Backyard
		06	TC	8.3		*	DC = 9 inches
		09	TC	6.2		*	Based on the
		12	TC	4.9		*	deconvolution graph
		15	TC	4.2		*	
		18	TC	4.0		*	
		21	TC	3.9		*	
		24	TC	3.9		*	
		27	TC	3.8		*	
		30	TC	3.8		*	
		33	TC	3.9		*	
36	272233	03	TC	7.0		*	Backyard
		06	TC	6.4		*	DC = 9 inches
		09	TC	5.2		*	Based on the
		12	TC	4.5		*	deconvolution graph
		15	TC	4.3		*	
		18	TC	4.0		*	
		21	TC	3.8		*	
		24	TC	3.7		*	
		27	TC	3.4		*	
		30	TC	3.5		*	
		33	TC	3.5		*	
		36	TC	3.6		*	
37	273272	00	DS	3.6		*	Backyard
		06	DS	1.2		*	
38	275255	03	TC	7.7		*	Backyard
		06	TC	6.2		*	DC = 9 inches
		09	TC	4.8		*	Based on the
		12	TC	4.3		*	deconvolution graph
		15	TC	4.1		*	
		18	TC	4.0		*	
		21	TC	3.9		*	

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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.		
38	275255	24	TC	3.9		*	
		27	TC	3.9		*	
		30	TC	3.9		*	
		33	TC	3.9		*	
39	281264	00	DS	4.7		*	
		06	DS	1.4		*	
40	282251	00	DS	2.8		*	By east fence
		06	DS	1.3		*	
41	289282	00	DS	3.7		*	Northeast corner
		06	DS	1.7		*	of property

Measurement Types:

GB = GAD-6 Borehole

GS = GAD-6 Surface

DS = Delta Scintillometer

TC = Total Count Borehole

SS = Soil Sample

BH = Combined GAD-6 and  
Total Count Borehole

Notes:

DC = Depth of Contamination

\* = No Soil Sample Taken

[n] = Reading Taken n-Inches  
Above Floor or Ground

Date of Survey = 05-16-85

Team Leader = TRU

## Radium Concentrations at Interior Locations

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
1		00	DS	3.4		*	Under Shed 2
		06	DS	1.4		*	

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

Notes: DC = Depth of Contamination  
\* = No Soil Sample Taken  
[n] = Reading Taken n-Inches  
Above Floor or Ground  
Date of Survey = 05-16-85  
Team Leader = TRU

Table 3.3  
Summary of Interior Gamma Exposure Rates

DOE ID #GJ-01204-RS      2542 Kennedy Avenue      Page 1 of 1

=====

Location *	Number of Readings Taken at Waist Level	Range at Waist Level (uR/h)	Mean at Waist Level (uR/h)	Number of Readings Taken at Surface	Range at Surface (uR/h)	Mean Surface (uR/h)
CRAWL SPACE	00	-	-	12	16-18	17
GROUND FLOOR	*	*	*	*	13-15	*
SHED 1	*	*	*	*	14-15	*
SHED 2	01	22-22	22	01	25-25	25

=====

\* A walking gamma scan was performed to confirm the absence of interior contamination.

Table 4.1  
Area and Volume Calculations  
DOE ID No. GJ-01204-RS

Page 1 of 2

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
EXTERIOR					
Contaminated Fill					
A	8 x 4	= 32	x 0.5	= 16	
B	16 x 9	= 144	x 0.8	= 115	
C	27 x 2	= 54	x 0.5	= 27	
D	7 x 4	= 28			
	20 x 3	= 60			
		<hr/>			
		88	x 0.5	= 44	
E	19 x 4	= 76			
	11 x 9	= 99			
	16 x 11	= 176			
	18 x 10	= 180			
		<hr/>			
		531	x 1.0	= 531	
F	12 x 6	= 72			
	9 x 5	= 45			
	11 x 11	= 121			
	19 x 3	= 57			
		<hr/>			
		295	x 0.5	= 148	
G	12 x 6	= 72			
	20 x 9	= 180			
	19 x 4	= 76			
	7 x 5	= 35			
		<hr/>			
		363	x 0.5	= 182	
H	35 x 22	= 770			
	22 x 14	= 308			
		<hr/>			
		1,078	x 0.8	= 862	

Table 4.1  
Area and Volume Calculations  
DOE ID No. GJ-01204-RS

Page 2 of 2

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
I	4 x 1	= 4			
	3 x 1	= 3			
	13 x 4	= 52			
			59 x 0.5 =	30	
J	10 x 9	= 90	x 0.8 =	72	
K	7 x 10	= 70			
	13 x 15	= 195			
	4 x 14	= 56			
	4 x 7	= 28			
			349 x 0.5 =	175	
L	9 x 3	= 27	x 0.8 =	22	
M	7 x 3	= 21	x 0.5 =	11	
TOTAL VOLUME - EXTERIOR				= 2,235 = 2,235/27 =	83

See Appendix Figures 3.4a and 3.4b For Areas

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Table 4.2  
Estimated Cost of Decontamination and Restoration  
DOE ID No. GJ-01204-RS

Page 1 of 2

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EXTERIOR

Remove identified residual radioactive material 83 cy @ \$14.50/cy (machine)	\$ 1,204
Remove small trees/shrubs 8 @ \$5/ea	40
Replace topsoil 65 cy @ \$9.50/cy	618
Replace weed-free soil/compost 17 cy @ \$12.50/cy	213
Replace vines and shrubs 5 raspberries @ \$10/ea 2 grapes @ \$10/ea	50 20
Replace 1 1/2" Caliper tree (cherry) 1 @ \$30/ea	30
Replace strawberries 24 sf @ \$3/doz/sf	72
Replace pea gravel 1 cy @ \$16/cy	16
Replace raised bed for strawberries 3 - 2"x8"x8' #3 grade fir @ \$3.77/ea	11
<hr/>	
TOTAL EXTERIOR	\$ 2,274

Table 4.2  
Estimated Cost of Decontamination and Restoration  
DOE ID No. GJ-01204-RS

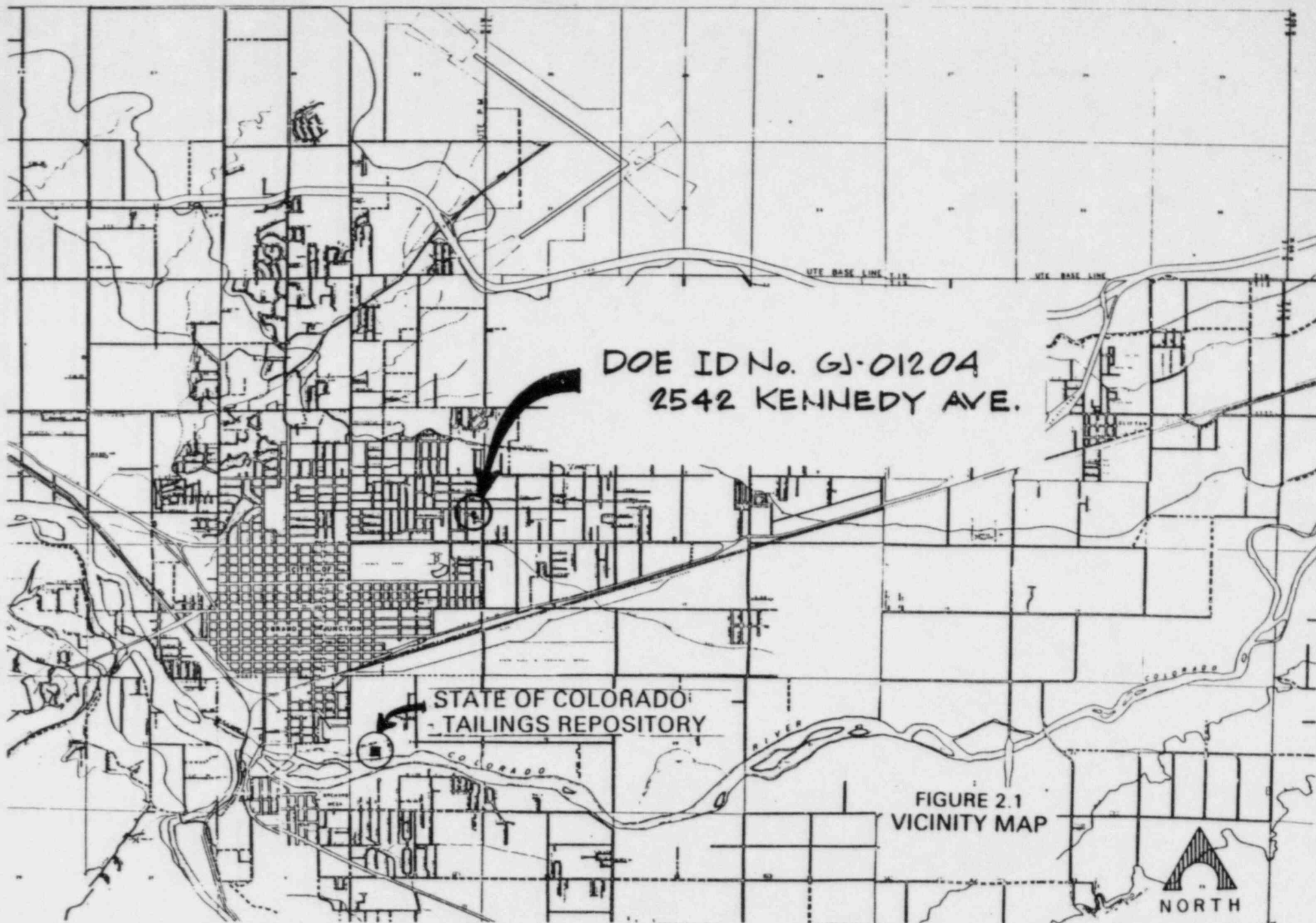
Page 2 of 2

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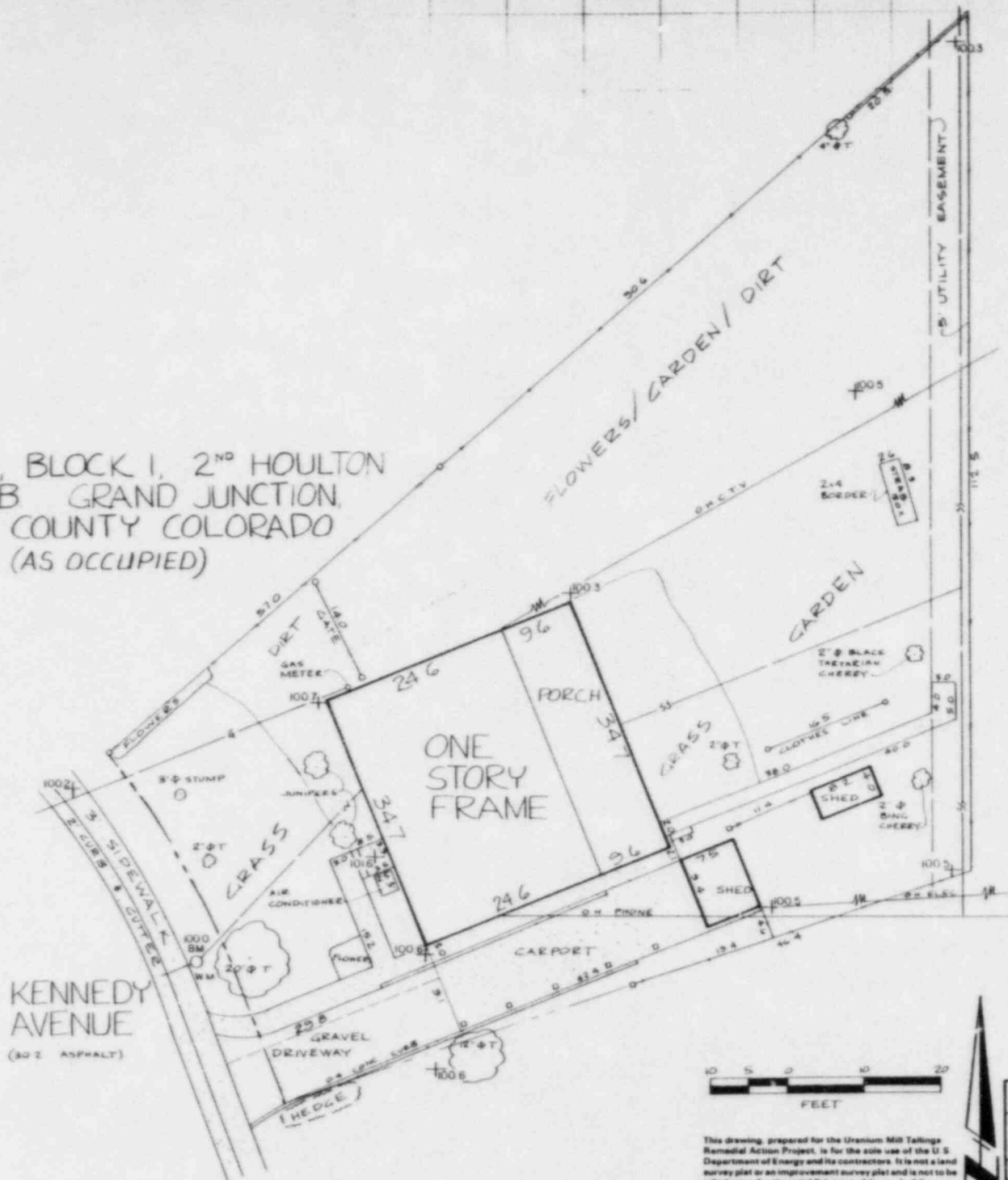
TOTAL EXTERIOR	\$	2,274
TOTAL INTERIOR		0
ACCESS CONTROL		200
		<hr/>
SUBTOTAL	\$	2,474
CONTINGENCY @ 10%		247
		<hr/>
SUBTOTAL	\$	2,721
CONTRACTOR OVERHEAD & PROFIT @ 40%		1,088
		<hr/>
GRAND TOTAL	\$	3,809

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VD080685  
REA01204/REA-KL016:AP




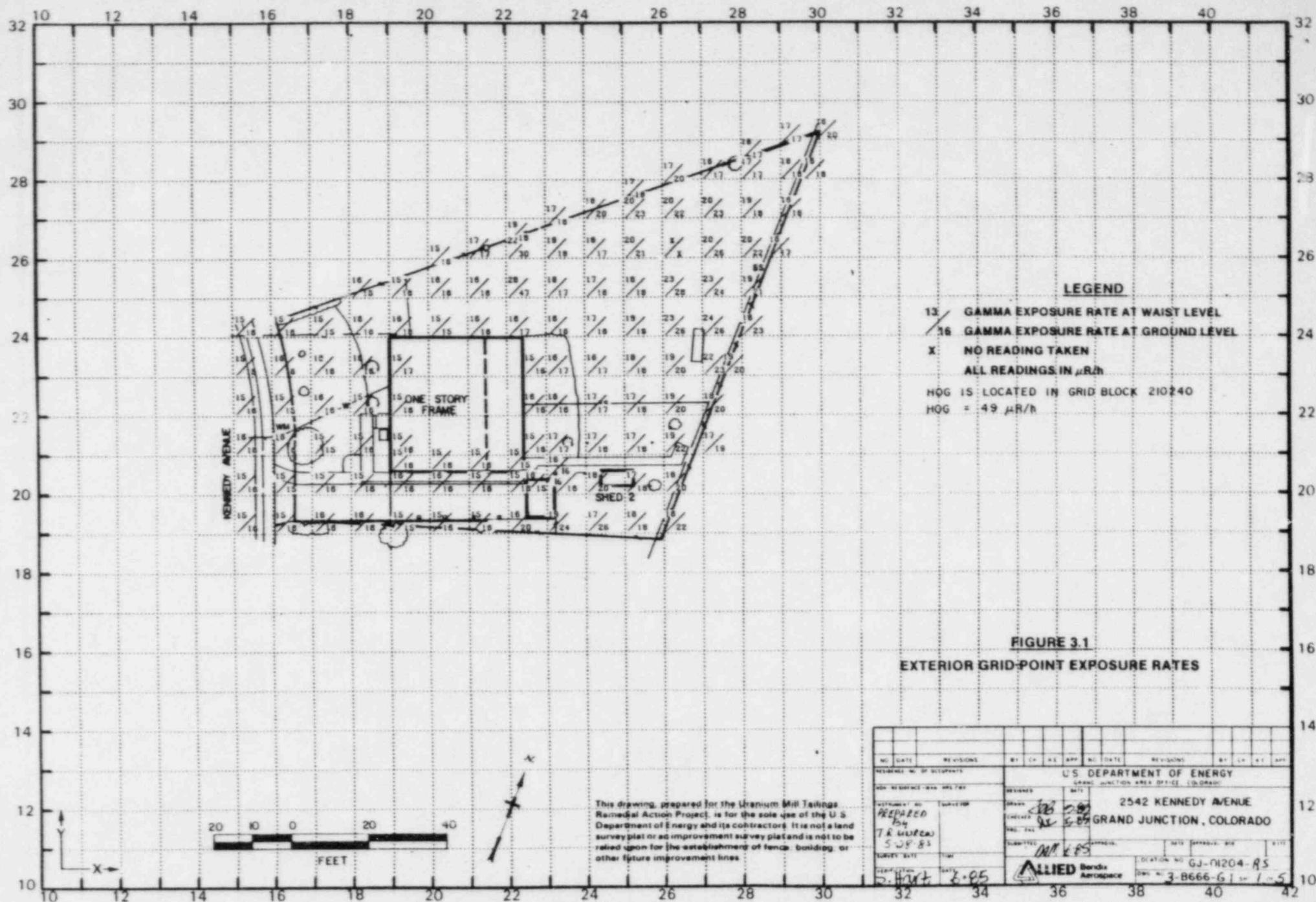
KENNEDY  
AVENUE  
(302 ASPHALT)



A horizontal scale bar with alternating black and white segments. Above the bar, the numbers 10, 5, 0, 10, and 20 are marked. Below the bar, the word "FEET" is centered.

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.

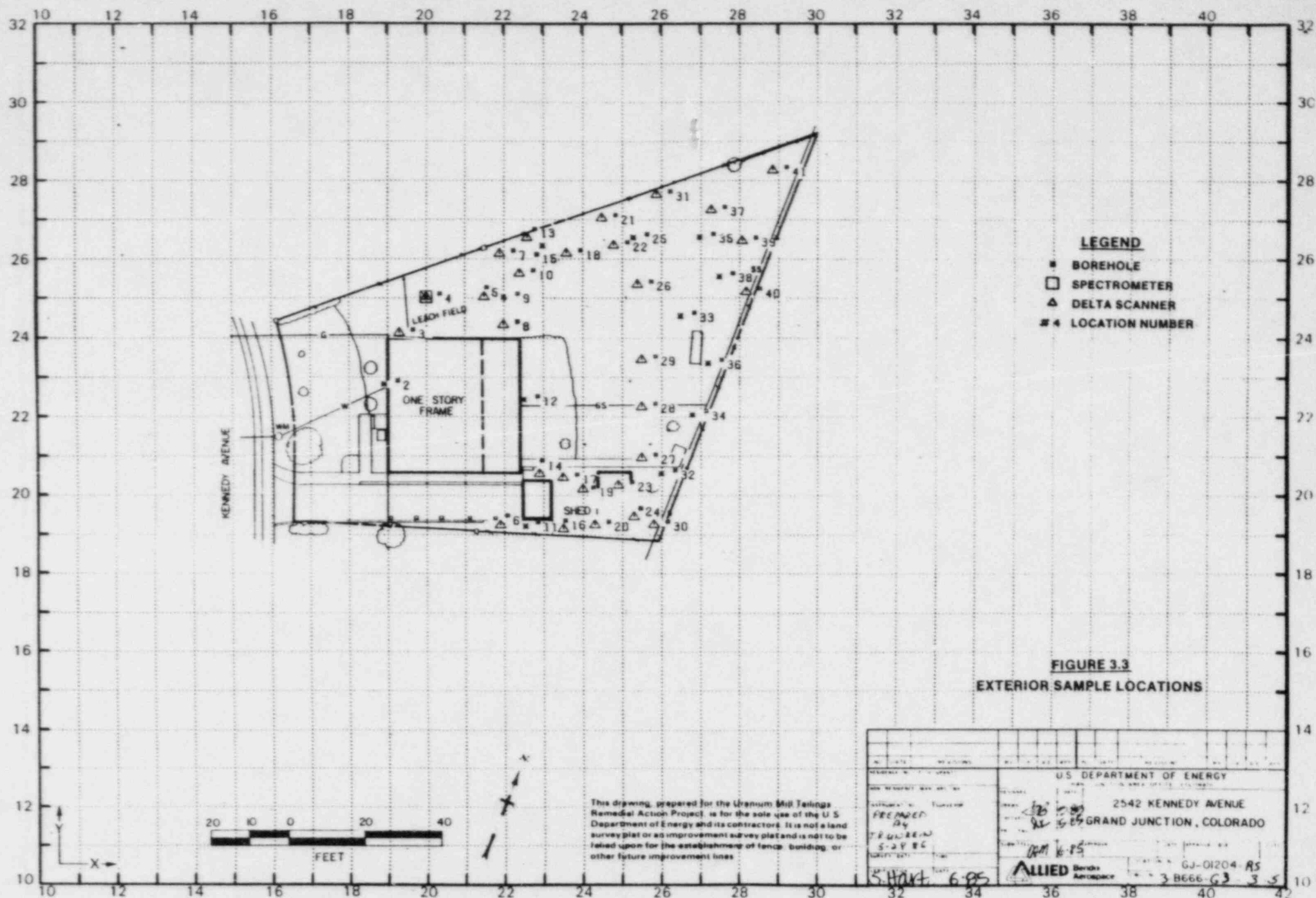
<b>U.S. DEPARTMENT OF ENERGY</b> GRAND JUNCTION PROJECT OFFICE COLORADO		DOE ID NO G101204 R9
ADDRESS <b>2542 KENNEDY AVE</b> <b>GRAND JUNCTION, COLO</b>		 Allied Building & Construction Branch Facilities Engineering - Construction Grand Junction Colorado
SURV T J 5/10/85 DRAWING NO 3 C 666	DRAFT T J 5/13/85 F I	SHEET 1 OF 1

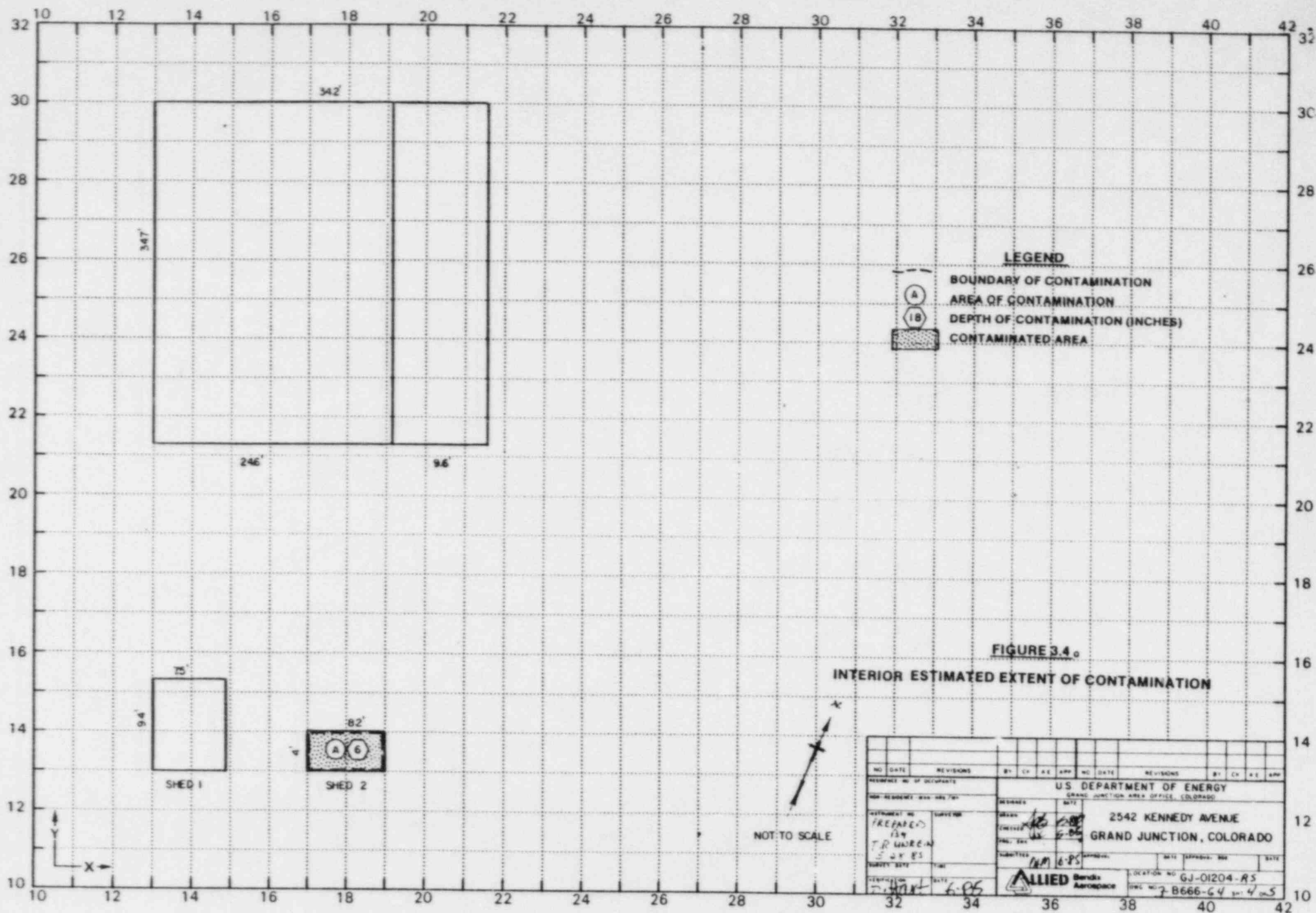




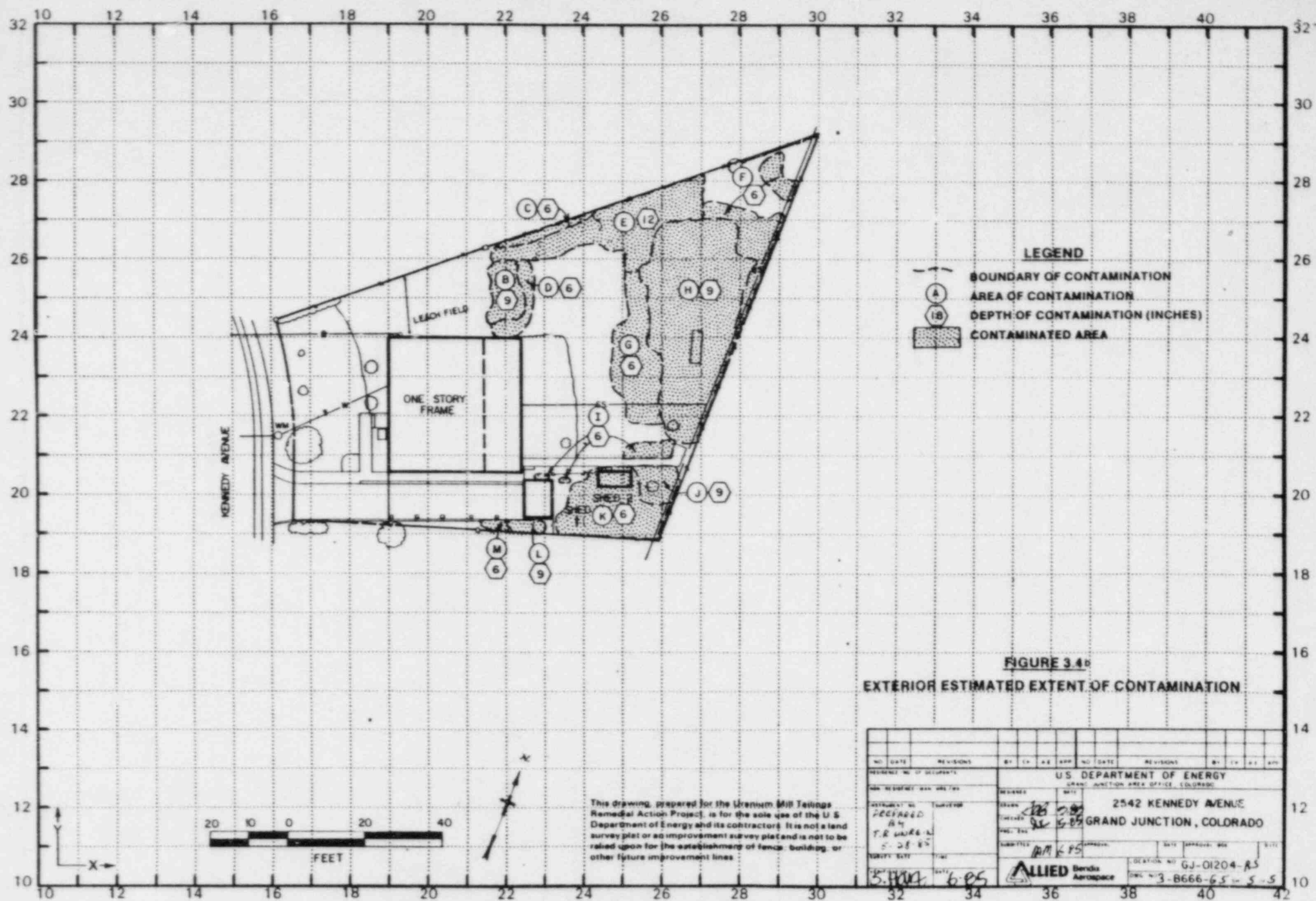








NO. DATE REVISIONS				BY: CH AE APP NO. DATE REVISIONS				BY: CH AE APP							
REFERENCE NO. OF OCCUPANTS								U.S. DEPARTMENT OF ENERGY							
NEW REQUESTS AND NEW TOL								GRAND JUNCTION AREA OFFICE, COLORADO							
INSTRUMENT NO.				SURVEY NO.				DESIGNED				DATE			
134				TR-UNRE-1				CHECKED				DATE			
5-24-85				5-24-85				DRAWN				DATE			
SURVEY DATE				TIME				CLASSIFIED				DATE			
7-10-85				6-05				ALLIED				DATE			
7-10-85				6-05				Bendix Aerospace				DATE			
LOCATION NO. GJ-01204-R3								DATE NO. 7-8666-64							
7-8666-64								4-5							



3/85

DOE ID NO. GJ-01204-RS

Date 5-23-85

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

Official Survey Report

Property Address 2542 Kennedy Avenue

Property Owner J.A. Estes

Address of Owner (if different from above) Same

Report Prepared By T. R. Unrein

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

1 1 No evidence of residual radioactive material on surveyed property.

1 XX 1 Residual radioactive materials found at the following locations:

1 1 In open areas.

1 XX 1 Under or around exterior improvements.

1 XX 1 Under or around a typically nonoccupied structure.

1 1 Under or around a typically occupied structure.

II. RESULTS OF RADIOLOGIC ASSESSMENT

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

1 XX 1 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 = 26 uR/h  
HOG = 49 uR/h

MEMORANDUM

ALLIED Bendix  
Aerospace

Bendix Field Engineering Corporation  
Grand Junction Operations  
Grand Junction, Colorado

Date: May 16, 1985  
To: Files  
From: Thomas R. Unrein  
Subject: Team Leader Notes - GJ-01204-RS

Address: 2542 Kennedy Avenue

Owner: J.A. Estes

Team Members

T. Unrein (Team Leader)	H. Mattison
D. Herrera	R. Herman
J. Dickerson	D. Bell
P. Hardy	L. Kula

Instruments

Delta Scintillometer - C-3935, C-3943, C-3936, C-3937  
Total Count - C-4005, C-3957, C-3956  
Downhole Spectrometer - C-3361  
Crutch Scintillometer - C-1196, C-1181, C-1205, C-1206, C-1168

Team members arrived at the property at 8:30 A.M. and proceeded to grid.

When talking with the homeowner, he informed me that he never brought in tailings. However, he stated that he thought the tailings were brought in after the house was built and used for fill.

Shed 2 is on skids with approximately a 6-inch clearance. The contamination is underneath it.

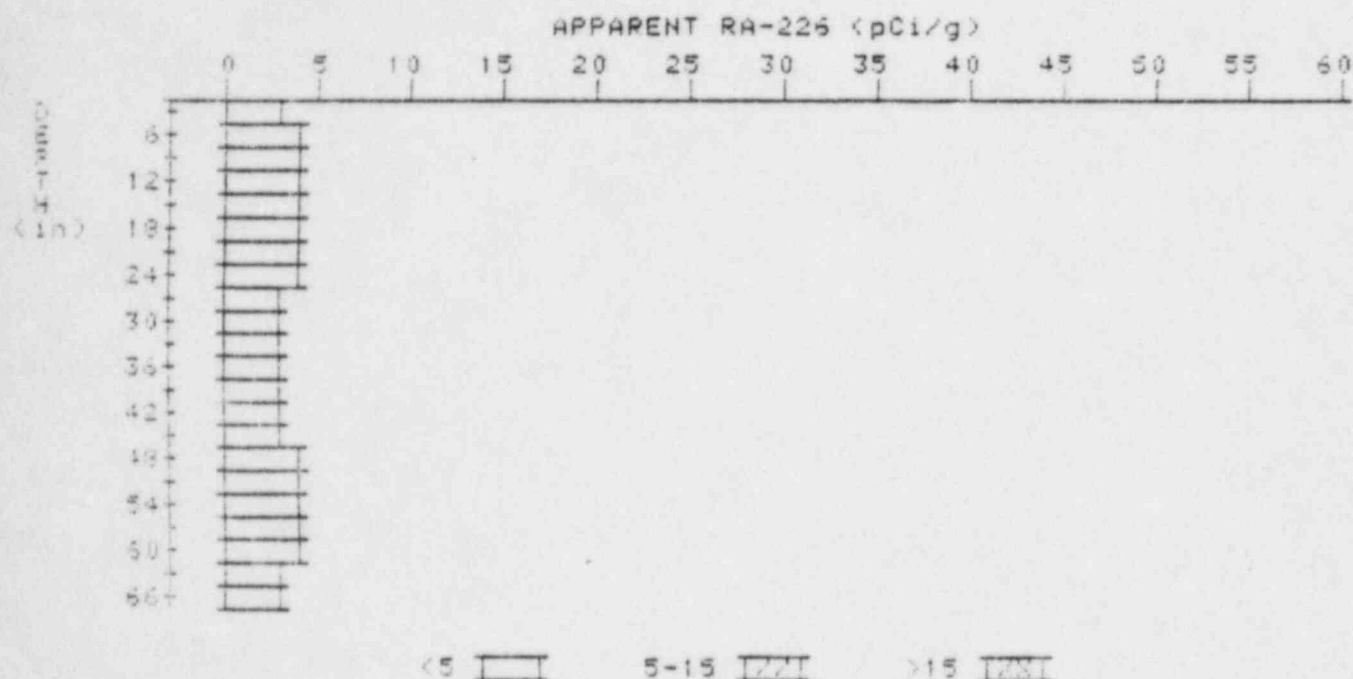
The survey was completed at 3:00 P.M.

All team members were frisked and returned to the office.



# APPARENT RADIUM-226 CONCENTRATION 2 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01204-R3  
HOLE NUMBER: 2  
LOCATION: 189228



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
6	3.0	3.0
9	3.4	3.3
12	3.6	3.3
15	3.7	3.3
18	3.7	3.3
21	3.7	3.3
24	3.6	3.3
27	3.8	3.3
30	3.4	3.3
33	3.0	3.3
36	3.1	3.3
39	3.0	3.3
42	3.1	3.3
45	3.4	3.3
48	3.4	3.3



51  
54  
57  
60  
63  
66

3.6  
3.6  
3.6  
3.5  
3.4  
3.4

3.3  
3.6  
3.3  
3.5  
3.2  
3.4

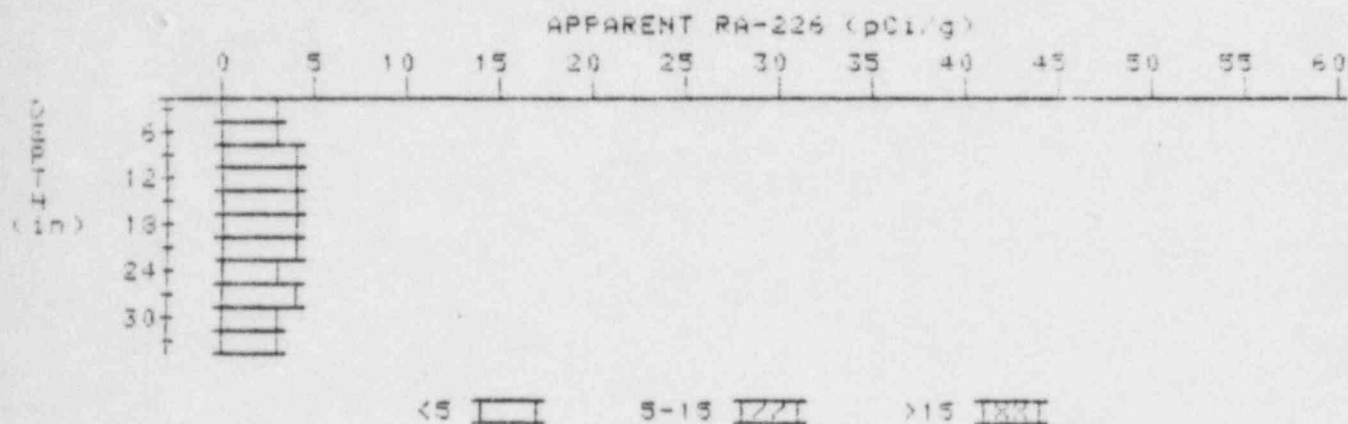
# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

4

PROPERTY NUMBER: GJ-01204-R5

HOLE NUMBER: 4

LOCATION: 200250



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.1	3.1
6	3.4	3.4
9	3.7	4.2
12	3.7	3.5
15	3.8	4.0
18	3.8	4.2
21	3.6	3.6
24	3.4	3.0
27	3.4	3.9
30	3.1	2.6
33	3.1	3.1

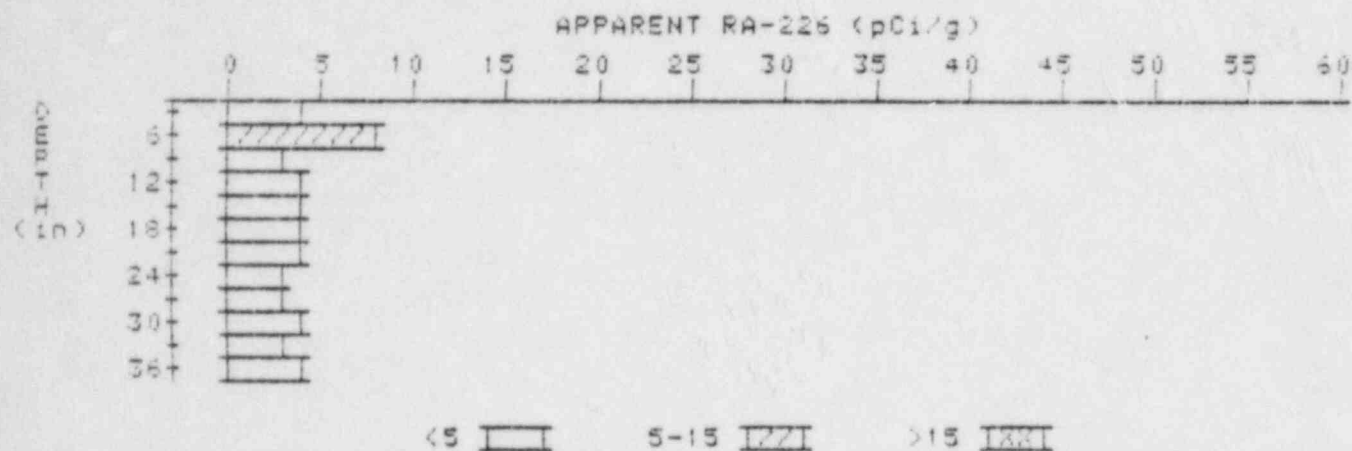
# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

9

PROPERTY NUMBER: GJ-01204-R3

HOLE NUMBER: 9

LOCATION: 220250



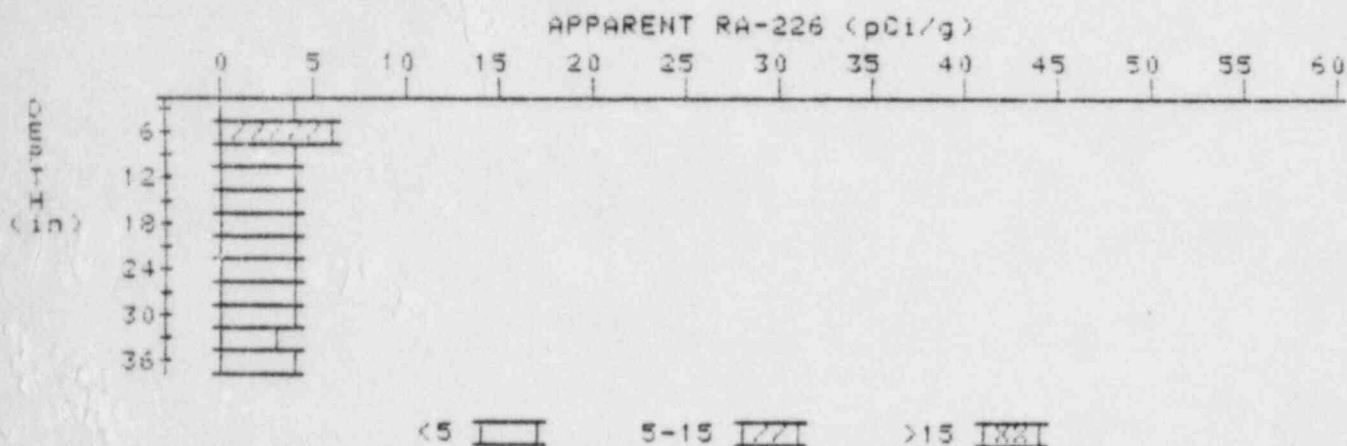
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	14.3	14.3
6	10.0	8.4
9	6.6	3.2
12	5.1	3.7
15	4.4	3.7
18	4.1	4.1
21	3.8	3.8
24	3.5	3.3
27	3.3	2.8
30	3.4	3.6
33	3.4	3.2
36	3.5	3.5

# APPARENT RADIUM-226 CONCENTRATION 11 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01204-RS

HOLE NUMBER: 11

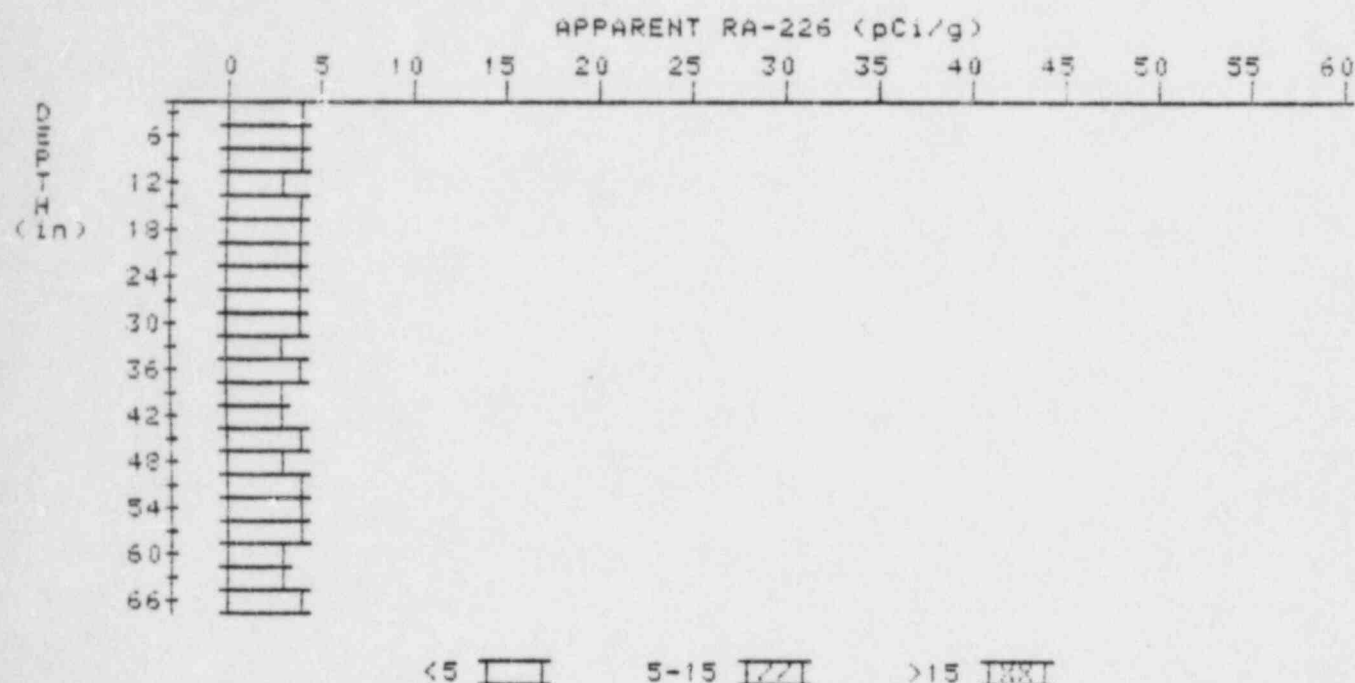
LOCATION: 225192



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	9.7	9.7
6	7.3	6.1
9	5.6	4.2
12	4.7	4.0
15	4.2	3.7
18	4.0	3.6
21	3.9	3.6
24	3.8	3.6
27	3.7	3.6
30	3.7	3.6
33	3.6	3.4
36	3.6	3.6

# APPARENT RADIUM-226 CONCENTRATION 12 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01204-RS  
HOLE NUMBER: 12  
LOCATION: 225224



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.0	4.0
6	4.0	4.0
9	4.0	4.4
12	3.8	3.4
15	3.8	3.3
18	3.8	3.3
21	3.8	4.0
24	3.7	3.5
27	3.7	3.7
30	3.7	3.9
33	3.6	3.4
36	3.6	3.8
39	3.5	3.6
42	3.5	3.6
45	3.6	3.8
48	3.6	3.4

51  
54  
57  
60  
63  
66

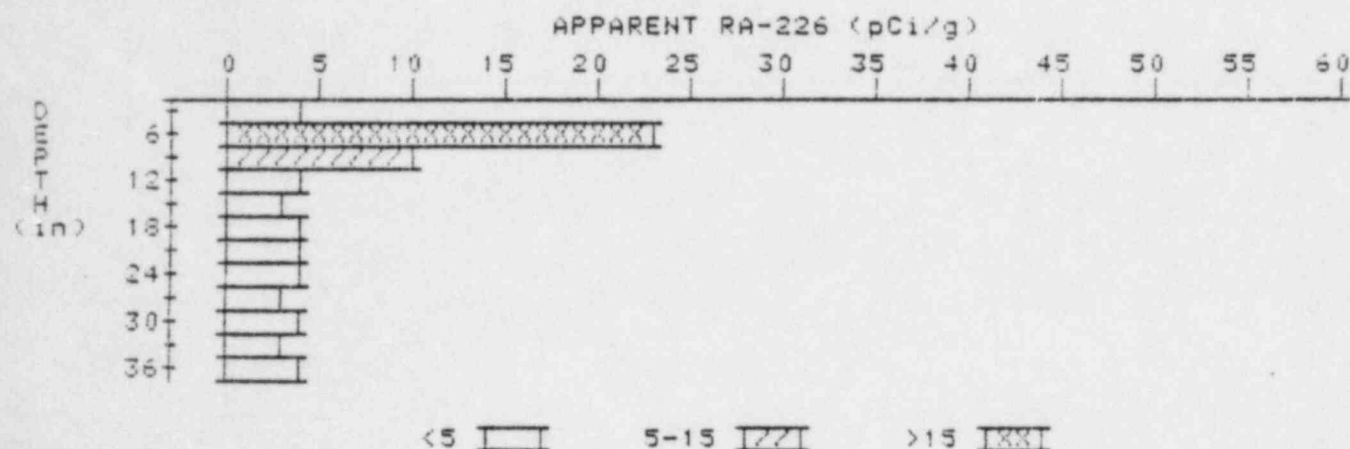
3.7  
3.7  
3.7  
3.6  
3.6  
3.7

3.9  
3.7  
3.9  
3.4  
3.4  
3.7



# APPARENT RADIUM-226 CONCENTRATION 15 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01204-RS  
HOLE NUMBER: 15  
LOCATION: 230263



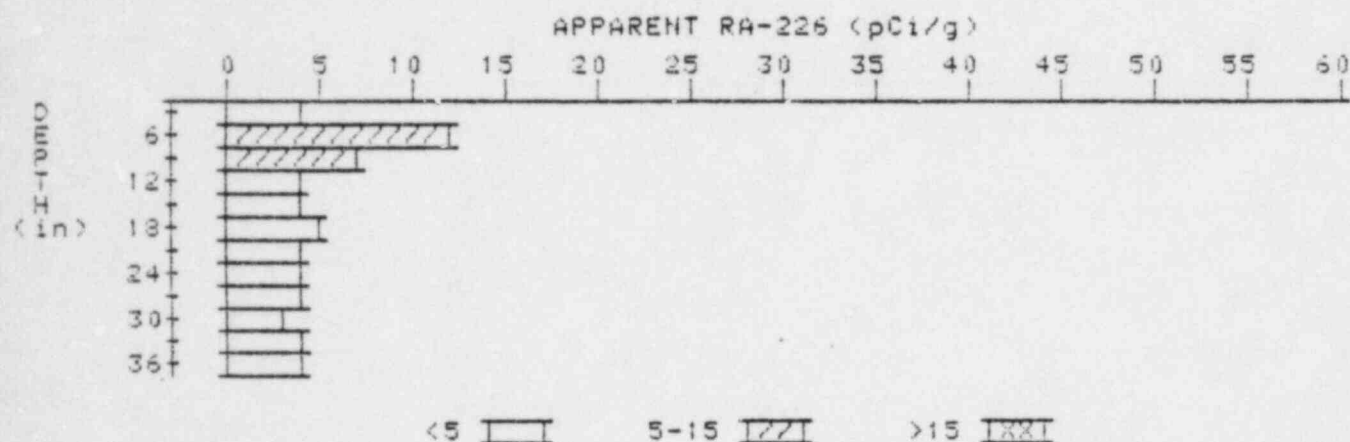
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	11.8	11.8
6	13.6	23.0
9	10.1	9.6
12	6.9	4.4
15	5.1	3.1
18	4.4	3.7
21	4.1	4.1
24	3.8	3.6
27	3.6	3.2
30	3.6	3.8
33	3.5	3.3
36	3.5	3.5

# APPARENT RADIUM-226 CONCENTRATION 25 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01204-RS

HOLE NUMBER: 25

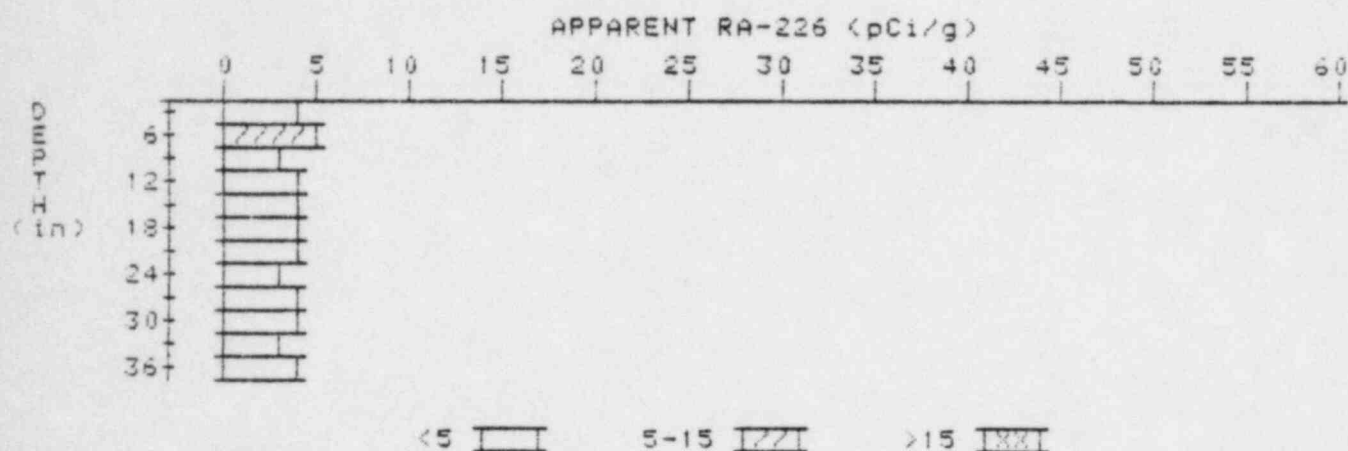
LOCATION: 253265



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	7.4	7.4
6	8.3	12.2
9	7.0	7.4
12	5.5	3.9
15	4.9	4.4
18	4.6	4.6
21	4.3	4.1
24	4.1	3.9
27	4.0	4.2
30	3.8	3.4
33	3.8	3.8
36	3.8	3.8

# APPARENT RADIUM-226 CONCENTRATION 32 DECONVOLUTION GRAPH

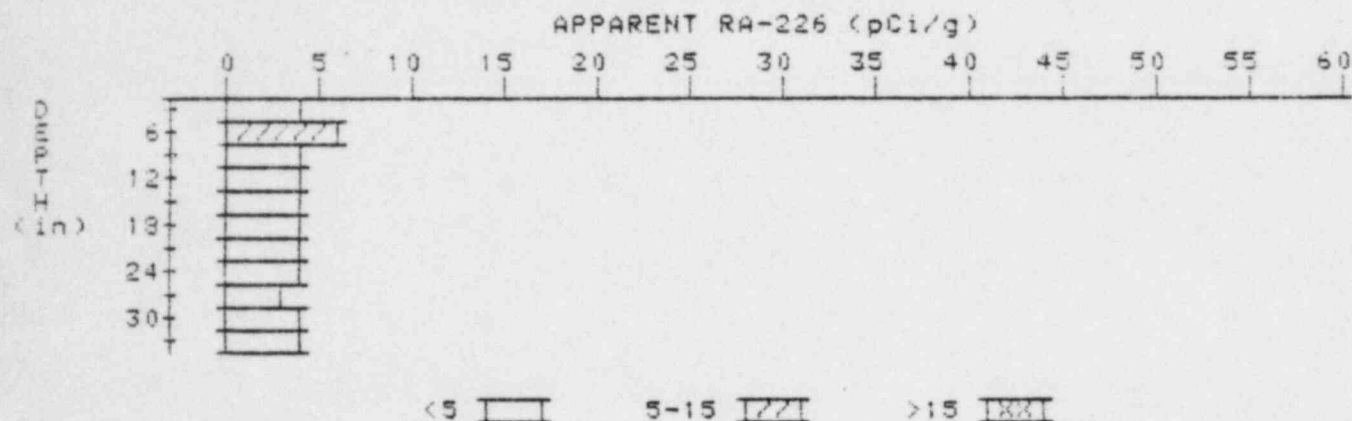
PROPERTY NUMBER: GJ-01204-RS  
HOLE NUMBER: 32  
LOCATION: 260205



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	10.6	10.6
6	7.4	5.4
9	5.3	2.8
12	4.6	4.1
15	4.2	3.8
18	4.0	3.8
21	3.9	4.1
24	3.7	3.3
27	3.7	3.7
30	3.7	3.9
33	3.6	3.2
36	3.7	3.7

# APPARENT RADIUM-226 CONCENTRATION 33 DECONVOLUTION GRAPH

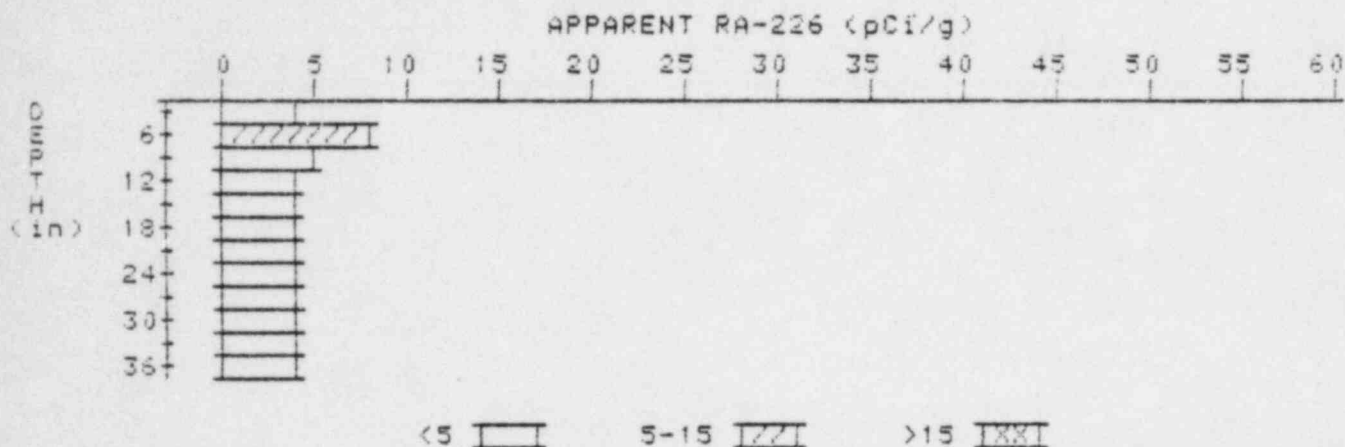
PROPERTY NUMBER: GJ-01204-RS  
HOLE NUMBER: 33  
LOCATION: 265245



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.5	4.5
6	4.7	5.8
9	4.3	4.1
12	4.0	3.8
15	3.8	3.6
18	3.7	3.5
21	3.7	3.7
24	3.7	3.9
27	3.6	3.4
30	3.6	3.6
33	3.6	3.6

# APPARENT RADIUM-226 CONCENTRATION 34 DECONVOLUTION GRAPH

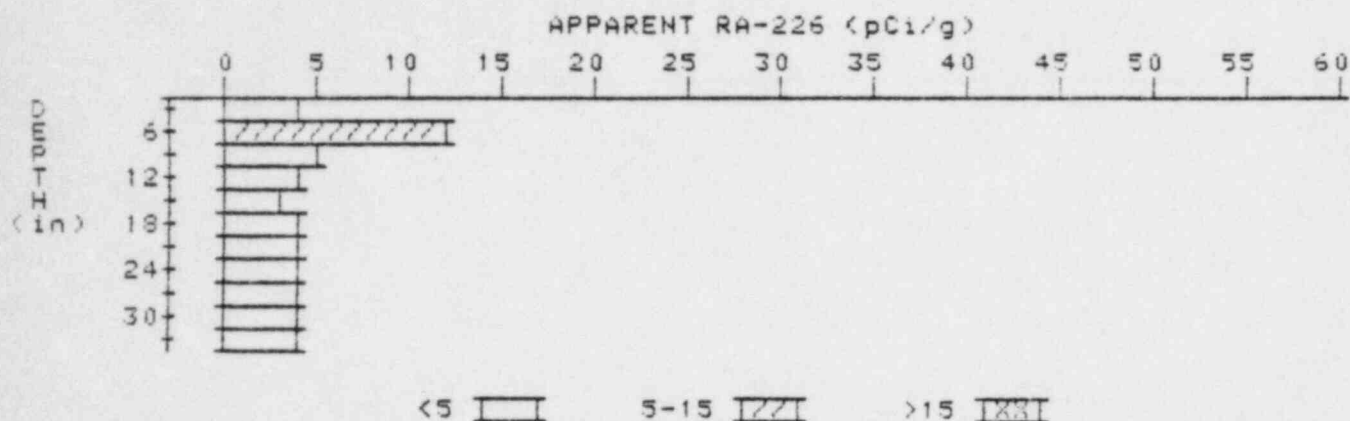
PROPERTY NUMBER: GJ-01204-RS  
HOLE NUMBER: 34  
✓ LOCATION: 263220



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.3	6.3
6	6.2	7.6
9	5.3	4.9
12	4.6	4.1
15	4.2	3.8
18	4.0	3.8
21	3.9	3.7
24	3.9	4.1
27	3.8	3.6
30	3.8	3.8
33	3.8	3.6
36	3.9	3.9

# APPARENT RADIUM-226 CONCENTRATION 35 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01204-RS  
HOLE NUMBER: 35  
LOCATION: 270265

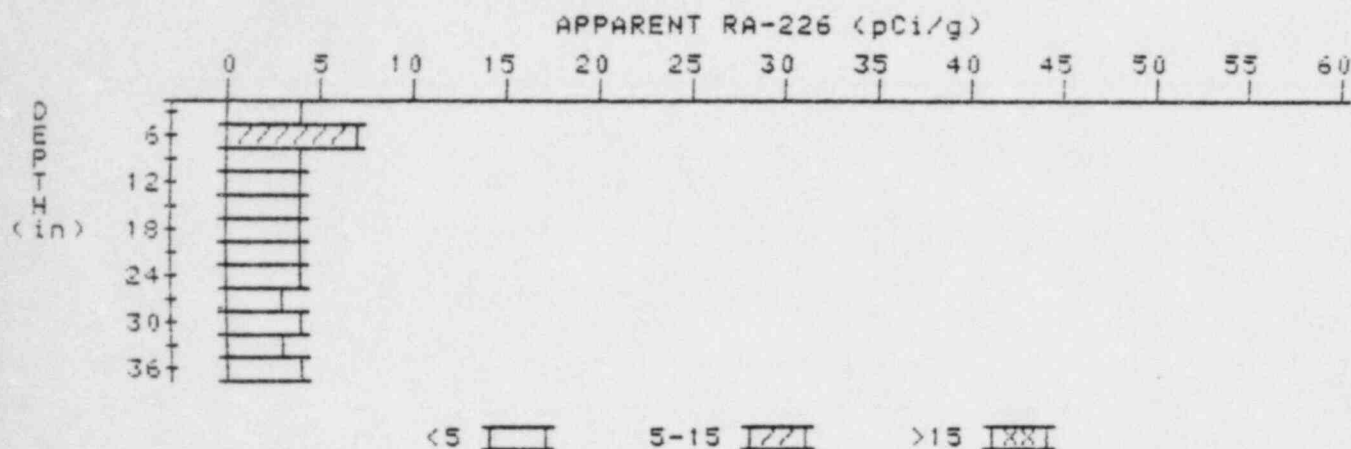


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	8.3	8.3
6	8.3	12.0
9	6.2	4.8
12	4.9	3.8
15	4.2	3.3
18	4.0	3.8
21	3.9	3.7
24	3.9	4.1
27	3.8	3.6
30	3.8	3.6
33	3.9	3.9



# APPARENT RADIUM-226 CONCENTRATION 36 DECONVOLUTION GRAPH

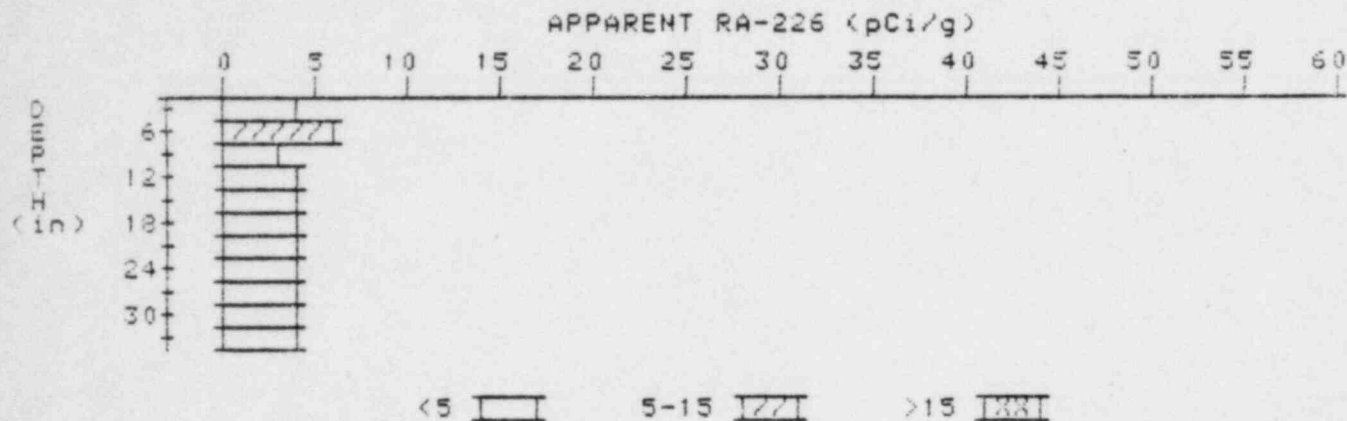
PROPERTY NUMBER: GJ-01204-RS  
HOLE NUMBER: 36  
LOCATION: 272233



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	7.0	7.0
6	6.4	7.5
9	5.2	4.3
12	4.5	3.6
15	4.3	4.5
18	4.0	3.8
21	3.8	3.6
24	3.7	4.1
27	3.4	2.7
30	3.5	3.7
33	3.5	3.3
36	3.6	3.6

# APPARENT RADIUM-226 CONCENTRATION 38 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01204-RS  
HOLE NUMBER: 38  
LOCATION: 275255



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	7.7	7.7
6	6.2	6.0
9	4.8	3.2
12	4.3	3.8
15	4.1	3.9
18	4.0	4.0
21	3.9	3.7
24	3.9	3.9
27	3.9	3.9
30	3.9	3.9
33	3.9	3.9

