RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-43551-RS
ADDRESS: 2237 NORTH 20TH STREET

JULY 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION
P.O. Box 1569
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DATE July 22, 1985

REA43551-GJ:REA-GE004

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-43551-RS, is a single-family residence located at 2237 North 20th Street, 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, 19 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is $3,378. Remedial action on this property will take approximately 15 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 2237 North 20th Street, Grand Junction, Colorado

Zoning: Residential (RSF-8)

Lot Size: Approximately 7,440 sf (0.172 acre)

Legal Description: Lot 20, Sungold Park Subdivision, Section 12, 1S, 1W, City of Grand Junction, County of Mesa, State of Colorado

Point of Reference: This property is located approximately 2-1/2 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:	20th Street
West:	19th Street

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-story residence with basement
Size:	Approximately 960 sf each level
Construction Date:	1955
Construction:	Wood-frame
Foundation:	Concrete
Footing Depth:	Approximately 72" to bottom of footing from grade
Basement:	Full under residence
Crawl Space:	None
Condition:	Good

Other Structures:

Type:	Garage
Size:	Approximately 480 sf
Construction:	Wood-frame, built 1960
Foundation:	Thickened edge of concrete slab
Condition:	Good

General Remarks:

Typical small residential site in fair condition. 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-43551-RS on April 25, 1985. Data collection methods were performed in accordance with procedures fully described in the Radiologic Support Operations Procedures Manual GJ-07(84) (Bendix Field Engineering Corporation, 1984). These data were evaluated to determine the areal and vertical extent of uranium mill tailings contamination at this property as well as any other contaminated material that may have originated from the millsite.

This property was put on the inclusion list because of spillover contamination. There is no historical information from CDH or ORNL in the folio. The spillover data indicate contamination is located in the backyard and associated with a concrete patio between the garage and the primary structure.

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

3.2 Gamma Exposure-Rate Surveys

3.2.1 Exterior Findings

Background Readings: 14 to 16 uR/h
Highest Outside Gamma Reading (HOG): 74 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: 13 to 16 uR/h
Highest Inside Gamma Reading (HIG): 19 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, 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) Northwest of the primary structure, between the fence and the patio, a narrow strip of soil has contamination extending to depth of 18 inches, based on data gathered from Area B (approximately 25 sf).

(AREA B) The soil under the 4-inch-thick concrete patio is contaminated to a total depth of 18 inches (approximately 264 sf).

(AREA C) A portion of lawn, adjacent to the south side of the patio and the west side of the primary structure, is contaminated to a depth of 6 inches (approximately 75 sf).

(AREA D) The concrete that anchors the swing set, west of the primary structure, is contaminated. The total estimated depth of contamination is 21 inches, based on owner knowledge (approximately 18 sf).

(AREAS REQUIRING FURTHER INVESTIGATION DURING REMEDIAL ACTION)

- The bedroom adjacent to Area B should be scanned after the tailings are removed from the exterior to assure that the elevated gamma readings recorded in this room are shine.

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-43551-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 $3,378.

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

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

5.0 REFERENCES

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

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

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

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

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

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

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

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

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

6.0 APPENDIX

This Appendix contains the following:

Appendix Tables:

Table 3.1	Radium Concentrations at Exterior Locations
Table 3.2	Radium Concentrations at Interior Locations
Table 3.3	Summary of Interior Gamma Exposure Rates
Table 4.1	Area and Volume Calculations
Table 4.2	Estimated Cost of Decontamination and Restoration

Appendix Figures:

Figure 2.1	Vicinity Map
Figure 2.2	Site Plan
Figure 3.1	Exterior Grid-Point Exposure Rates
Figure 3.2	Exterior Gamma Scan
Figure 3.3a	Interior Gamma Exposure Rates and Sample Locations (Basement)
Figure 3.3b	Interior Gamma Exposure Rates and Sample Locations (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	In Situ Ra-226 (pCi/g) Spectr.	Chem Ra-226 (pCi/g)	Comments
8	166221	03	TC	2.9		*	Next to swing
		06	TC	3.4		*	DC = 0 inches
		09	TC	3.6		*	
		12	TC	3.9		*	
		15	TC	4.0		*	
		18	TC	4.1		*	
		21	TC	4.0		*	
		24	TC	4.0		*	
		27	TC	3.9		*	
		30	TC	3.8		*	
		33	TC	3.7		*	
		36	TC	3.5		*	
		39	TC	3.4		*	
9	166227	06	DS	7.8		*	Swing set Top of concrete
10	166228	03	TC	3.3		*	Next to swing
		06	TC	3.7		*	DC = 0 inches
		09	TC	3.9		*	
		12	TC	4.1		*	
		15	TC	4.3		*	
		18	TC	4.4		*	
		21	TC	4.3		*	
		24	TC	4.3		*	
		27	TC	4.2		*	
		30	TC	4.0		*	
		33	TC	3.9		*	
		36	TC	3.6		*	
11	190266	00	DS	6.9		*	Along fence line
		06	DS	10.3		*	
		12	DS	6.0		*	
12	192252	00	DS	<1.0		*	Near patio
		06	DS	1.1		*	
13	200260	00	GS		18.6	*	
		00-04	SS			4.5	Core
		04-10	SS			97.5	Soil
		03	TC	34.0		*	Back patio
		06	BH	30.9	112.5	*	
		09	TC	20.7		*	
		12	BH	14.4	49.0	*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
13	200260	15	TC	11.9		*	DC = 18 inches
		18	TC	10.4		*	Based on the
		21	TC	9.6		*	deconvolution graph
		24	BH	9.3	22.3	*	
		27	TC	9.2		*	
		30	TC	8.6		*	
		33	TC	7.9		*	
		36	BH	7.3	17.7	*	
		39	TC	6.8		*	
		42	TC	6.2		*	
		45	TC	5.7		*	
		48	BH	5.3	10.4	*	
		51	TC	5.1		*	
		54	TC	4.8		*	
		57	TC	4.5		*	
		60	TC	4.4		*	
		63	TC	4.3		*	
		66	TC	4.1		*	
		69	TC	3.9		*	
14	202254	00	DS	2.1		*	Next to patio
		06	DS	2.6		*	
		12	DS	2.0		*	
		15	DS	2.0		*	
15	208229	03	TC	3.1		*	West side of
		06	TC	3.2		*	primary structure
		09	TC	3.2		*	DC = 0 inches
		12	TC	3.2		*	
		15	TC	3.2		*	
		18	TC	3.3		*	
		21	TC	3.3		*	
		24	TC	3.3		*	
		27	TC	3.2		*	
		30	TC	3.3		*	
		33	TC	3.2		*	
		36	TC	3.3		*	
		39	TC	3.3		*	
		42	TC	3.3		*	
		45	TC	3.2		*	
		48	TC	3.2		*	
		51	TC	3.2		*	
		54	TC	3.2		*	
		57	TC	3.2		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
15	208229	60	TC	3.2		*	
		63	TC	3.2		*	
		66	TC	3.1		*	
		69	TC	3.1		*	
		72	TC	3.1		*	
		75	TC	3.0		*	
		78	TC	3.2		*	
		81	TC	3.2		*	
		84	TC	3.4		*	
		87	TC	3.5		*	
		90	TC	3.5		*	
		93	TC	3.6		*	
16	208230	00	DS	<1.0		*	West side of
		06	DS	<1.0		*	primary structure
17	208234	00	DS	<1.0		*	West side of
		06	DS	<1.0		*	primary structure
18	208248	00	DS	<1.0		*	Backyard
		06	DS	<1.0		*	
19	208252	00	DS	2.1		*	Backyard
		06	DS	2.3		*	
		12	DS	1.2		*	
20	209242	03	TC	3.0		*	Sewer line
		06	TC	3.2		*	DC = 0 inches
		09	TC	3.3		*	
		12	TC	3.4		*	
		15	TC	3.4		*	
		18	TC	3.4		*	
		21	TC	3.4		*	
		24	TC	3.5		*	
		27	TC	3.4		*	
		30	TC	3.5		*	
		33	TC	3.5		*	
		36	TC	3.5		*	
		39	TC	3.4		*	
		42	TC	3.5		*	
		45	TC	3.5		*	
		48	TC	3.4		*	
		51	TC	3.4		*	
		54	TC	3.4		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
20	209242	57	TC	3.4		*	
		60	TC	3.4		*	
		63	TC	3.4		*	
		66	TC	3.4		*	
		69	TC	3.4		*	
21	210233	03	DS	1.4		*	Buried electrical line
22	213263	03	TC	4.0		*	Northwest corner of
		06	TC	4.0		*	primary structure
		09	TC	3.9		*	DC = 0 inches
		12	TC	3.9		*	
		15	TC	3.8		*	
		18	TC	3.8		*	
		21	TC	3.7		*	
		24	TC	3.7		*	
		27	TC	3.6		*	
		30	TC	3.6		*	
		33	TC	3.7		*	
		36	TC	3.6		*	
23	215260	03	TC	3.3		*	North side of
		06	TC	3.4		*	primary structure
		09	TC	3.5		*	DC = 0 inches
		12	TC	3.5		*	
		15	TC	3.5		*	
		18	TC	3.6		*	
		21	TC	3.6		*	
		24	TC	3.6		*	
		27	TC	3.6		*	
		30	TC	3.6		*	
		33	TC	3.7		*	
		36	TC	3.7		*	
		39	TC	3.7		*	
		42	TC	3.7		*	
		45	TC	3.7		*	
		48	TC	3.6		*	
		51	TC	3.6		*	
		54	TC	3.6		*	
		57	TC	3.6		*	
		60	TC	3.5		*	
		63	TC	3.6		*	
		66	TC	3.4		*	

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
23	215260	69	TC	3.4		*	
		72	TC	3.3		*	
		75	TC	3.2		*	
		78	TC	3.2		*	
		81	TC	3.2		*	
24	218261	00	DS	<1.0		*	North side of
		06	DS	<1.0		*	primary structure
25	222260	21	DS	<1.0		*	Exposed gas line
26	230220	03	TC	3.0		*	Southeast corner of
		06	TC	3.2		*	primary structure
		09	TC	3.2		*	DC = 0 inches
		12	TC	3.3		*	
		15	TC	3.3		*	
		18	TC	3.3		*	
		21	TC	3.3		*	
		24	TC	3.4		*	
		27	TC	3.4		*	
		30	TC	3.4		*	
		33	TC	3.4		*	
		36	TC	3.4		*	
		39	TC	3.4		*	
		42	TC	3.3		*	
		45	TC	3.4		*	
		48	TC	3.4		*	
		51	TC	3.4		*	
		54	TC	3.4		*	
		57	TC	3.4		*	
		60	TC	3.4		*	
		63	TC	3.5		*	
		66	TC	3.3		*	
		69	TC	3.3		*	
		72	TC	3.4		*	
		75	TC	3.4		*	
		78	TC	3.3		*	
		81	TC	3.3		*	
27	235238	03	TC	3.0		*	Water line
		06	TC	3.4		*	DC = 0 inches
		09	TC	3.4		*	
		12	TC	3.5		*	
		15	TC	3.6		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
27	235238	18	TC	3.7		*	
		21	TC	3.6		*	
		24	TC	3.6		*	
		27	TC	3.7		*	
		30	TC	3.6		*	
		33	TC	3.6		*	
		36	TC	3.7		*	
		39	TC	3.7		*	
		42	TC	3.7		*	
		45	TC	3.7		*	
		48	TC	3.7		*	
		51	TC	3.7		*	
		54	TC	3.7		*	
28	235255	03	TC	3.3		*	East side of
		06	TC	3.5		*	primary structure
		09	TC	3.5		*	DC = 0 inches
		12	TC	3.5		*	
		15	TC	3.4		*	
		18	TC	3.5		*	
		21	TC	3.5		*	
		24	TC	3.3		*	
		27	TC	3.5		*	
		30	TC	3.4		*	
		33	TC	3.5		*	
		36	TC	3.5		*	
		39	TC	3.4		*	
		42	TC	3.5		*	
		45	TC	3.4		*	
		48	TC	3.4		*	
		51	TC	3.4		*	
		54	TC	3.5		*	
		57	TC	3.5		*	
		60	TC	3.5		*	
		63	TC	3.6		*	
		66	TC	3.6		*	
		69	TC	3.6		*	
		72	TC	3.6		*	
29	238209	00	DS	<1.0		*	South side of
		06	DS	<1.0		*	primary structure
30	238259	00	DS	<1.0		*	Northeast corner of
		03	TC	3.3		*	primary structure

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
30	238259	06	TC	3.5		*	DC = 0 inches
		09	TC	3.6		*	
		12	TC	3.6		*	
		15	TC	3.5		*	
		18	TC	3.4		*	
		21	TC	3.4		*	
		24	TC	3.4		*	
		27	TC	3.4		*	
		30	TC	3.5		*	
		33	TC	3.5		*	
		36	TC	3.5		*	
31	255235	00	DS	<1.0		*	Background
		00	GS		2.5	*	DC = 0 inches
		00-06	SS			2.3	
		03	TC	2.9		*	
		06	TC	3.3		*	
		09	TC	3.4		*	
		12	TC	3.5		*	
		15	TC	3.5		*	
		18	TC	3.6		*	
		21	TC	3.6		*	
		24	TC	3.6		*	
		27	TC	3.7		*	
		30	TC	4.0		*	
		33	TC	4.0		*	

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 = 04-25-85
Team Leader = TRU

RADRPT V85.1<850225.1330> Table 3.2

Radium Concentrations at Interior Locations

DOE ID #GJ-43551-RS 2237 North 20th Street

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	DS	<1.0		*	In basement
2		00	DS	<1.0		*	In basement
3		00	DS	<1.0		*	In basement
4		00	DS	<1.0		*	In basement
5		00	DS	<1.0		*	In basement
6		00	DS	<1.0		*	In basement
7		00	DS	2.8		*	Northwest corner of bedroom

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 = 04-25-85
Team Leader = TRU

Table 3.3
Summary of Interior Gamma Exposure Rates
DOE ID #GJ-43551-RS 2237 North 20th Street

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	08	16-17	17	08	16-18	17
ROOM B	05	16-18	17	05	16-18	17
ROOM C	07	16-18	16	07	16-18	17
ROOM D	03	15-16	15	03	16-16	16
ROOM E	06	16-18	17	06	16-18	17
GROUND FLOOR	*	*	*	*	13-19	*
GARAGE	*	*	*	*	14-16	*

* The spillover data indicate the absence of interior contamination at this property. This information was investigated by performing a walking gamma scan on the ground floor of the primary structure and in the garage. These areas and the ranges of gamma measurements are shown in Appendix Figure 3.3b. Exposure rates and room locations for the basement are shown in Appendix Figure 3.3a.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-43551-RS

AREA	CALCULATIONS(ft)		SF		DEPTH(ft)		CF				CUBIC YARDS
EXTERIOR											
	Concrete										
B	11 x 24	=	264	x	0.3	=	79				
D	(2) 3 x 3	=	18	x	1.8	=	32				
	Volume of Concrete					=	111	=	111/27	=	4
	Contaminated Fill										
A	1 x 25	=	25	x	1.5	=	38				
B	11 x 24	=	264	x	1.2	=	317				
C	5 x 15	=	75	x	0.5	=	38				
	Volume of Fill					=	393	=	393/27	=	15
	TOTAL VOLUME - EXTERIOR									=	19

See Appendix Figure 3.5 For Areas

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-43551-RS

EXTERIOR		
Remove identified residual radioactive material (manual) 16 cy @ $44/cy	$	704
Remove and replace 4" thick concrete patio slab 264 sf @ $3/sf		792
Replace roadbase 13 cy @ $11.50/cy		150
Replace topsoil 3 cy @ $9.50/cy		29
Replace sod 100 sf @ $0.35/sf		35
Sawcut concrete 4 lf @ $1.50/lf		6
Remove and replace concrete step Lump sum		28
Remove and replace wood swing frame Lump sum		100
Replace concrete base for swing frame 1 cy @ $150.00/cy		150
TOTAL EXTERIOR	$	1,994
ACCESS CONTROL		200
SUBTOTAL	$	2,194
CONTINGENCY @ 10%		219
SUBTOTAL	$	2,413
CONTRACTOR OVERHEAD & PROFIT @ 40%		965
GRAND TOTAL	$	3,378

FHW071885
REA43551:REA-GE004:LMR

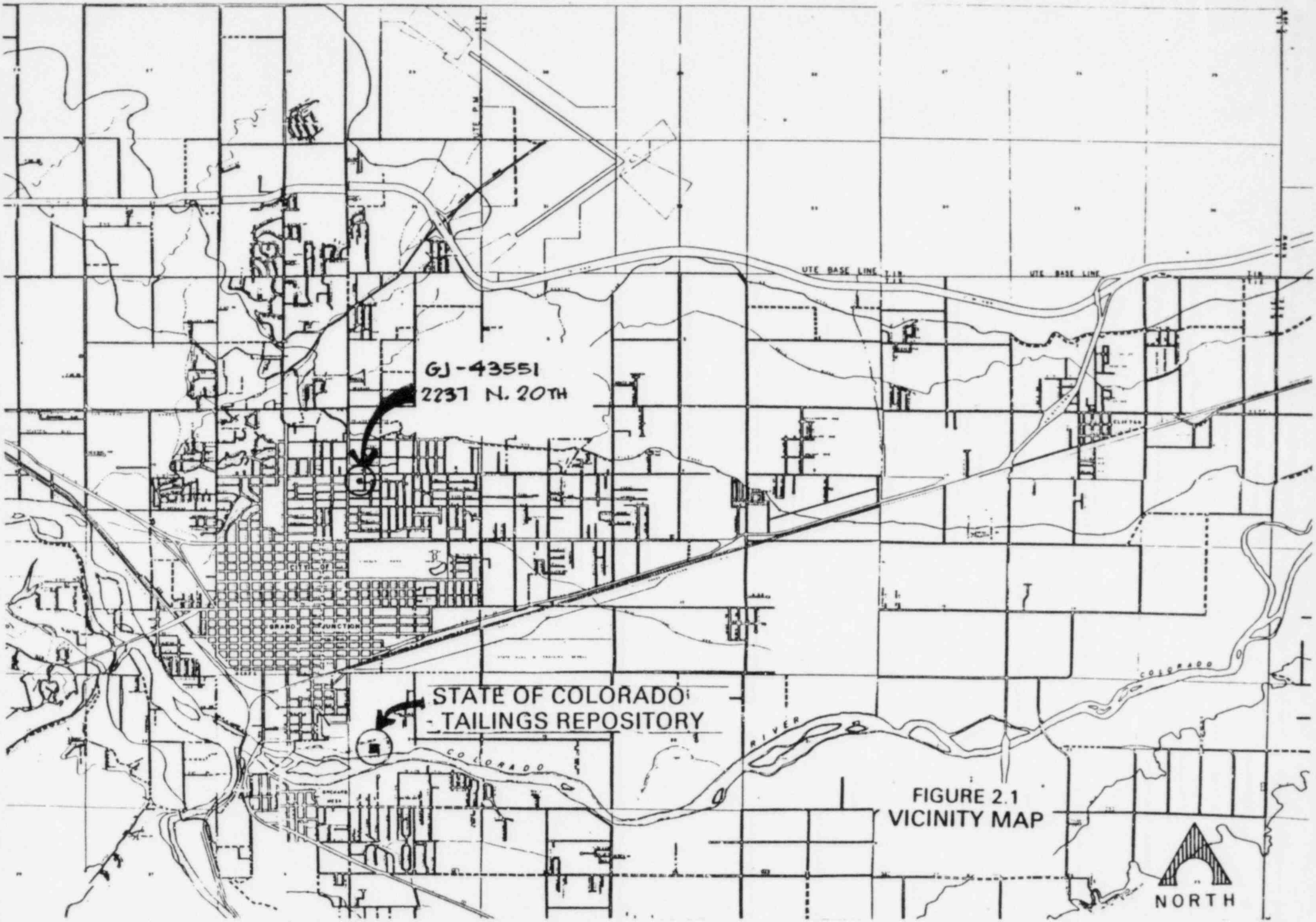
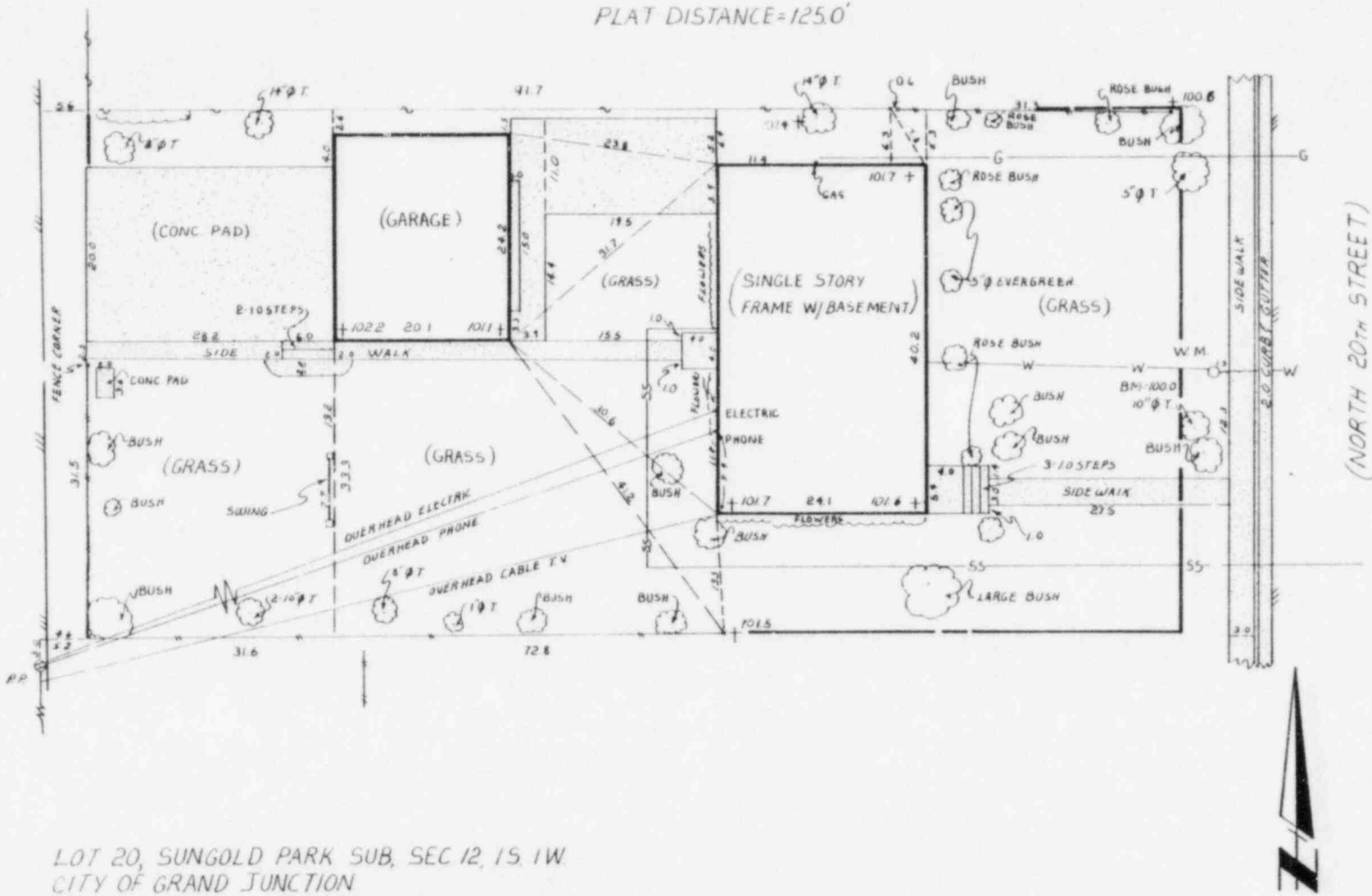


FIGURE 2.1
VICINITY MAP



LOT 20, SUNGOLD PARK SUB, SEC 12, 1S, 1W
CITY OF GRAND JUNCTION
MESA COUNTY, COLORADO

10' 5' 0 10' 20'
(SCALE IN 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.

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECT OFFICE, COLORADO	DOE ID NO. GJ-43551-RS
ADDRESS 2237 N 20TH STREET GRAND JUNCTION, COLORADO	ALLIED Nuclear Technologies Bendix Field Engineering Corporation Grand Junction Operations
SURV RLB 1/85 DRAFT JRG	CK [illegible]
DRAWING NO. 3-C616-F1	SHEET 1 OF 1

FIGURE 2.2 SITE PLAN

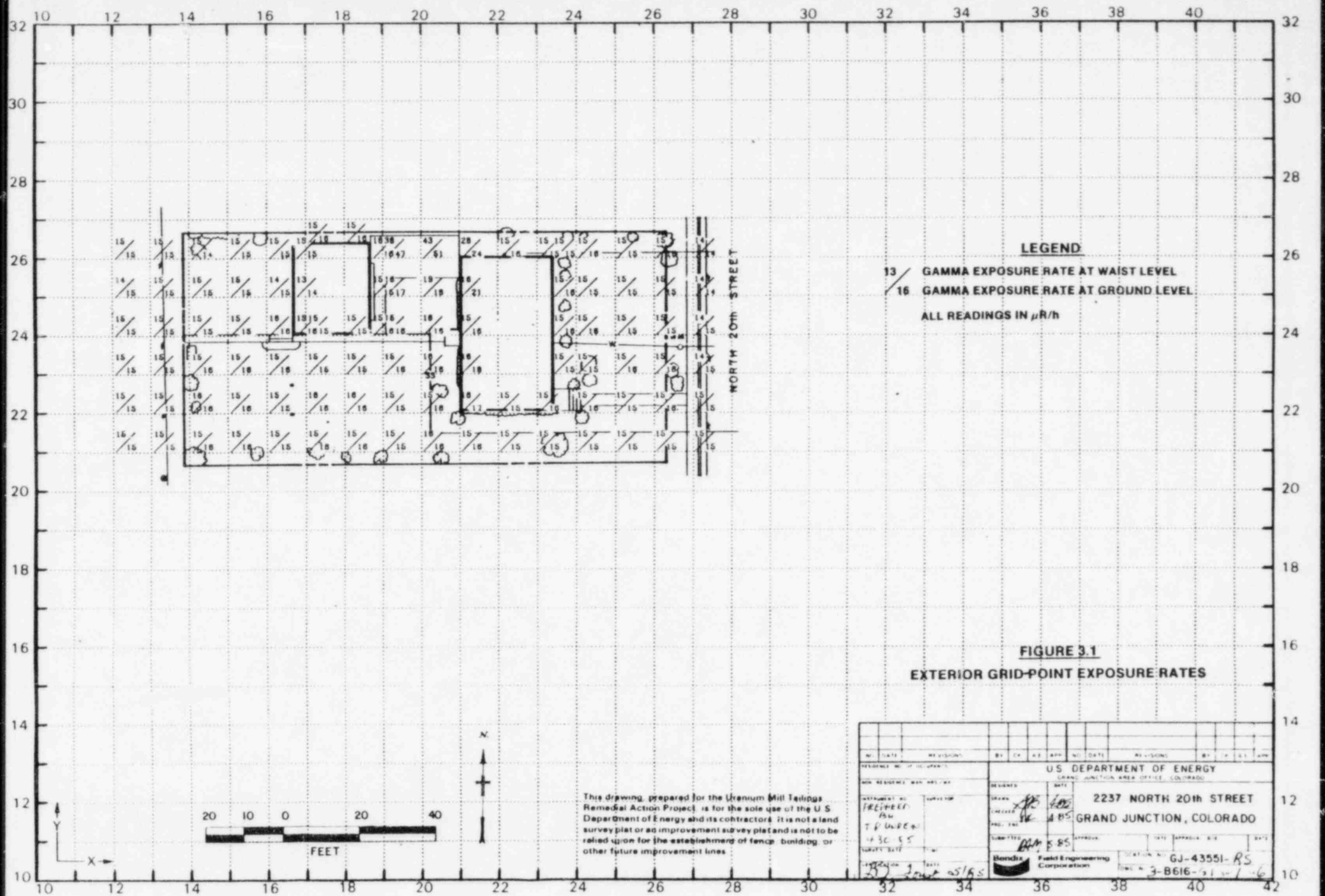
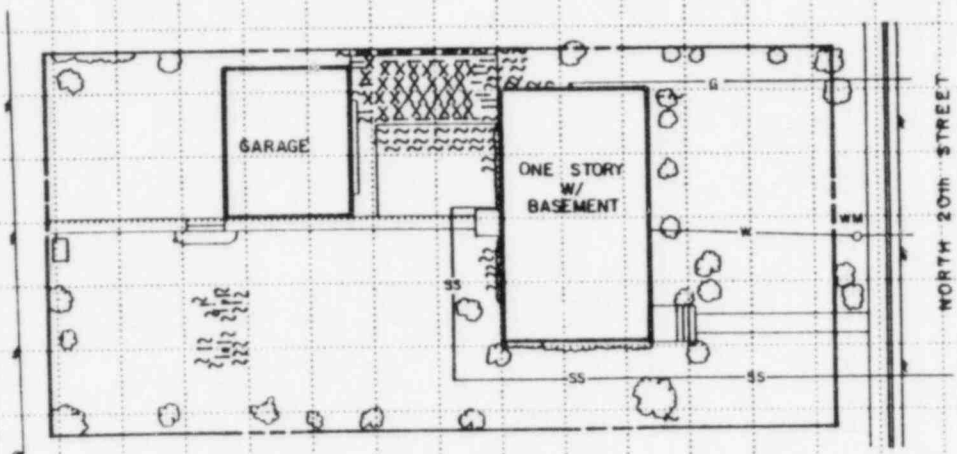


FIGURE 3.1

EXTERIOR GRID-POINT EXPOSURE RATES



LEGEND

GAMMA READINGS OF 150 TO 199 cps

GAMMA READINGS OF 200 TO 500 cps

XXXXX
XXXXX GAMMA READINGS OF >500 cps

HOG IS LOCATED IN GRID BLOCK 190260

HOG = 74 μ R/h

FIGURE 3.2

EXTERIOR GAMMA SCAN

20 10 0 20 40

FEET

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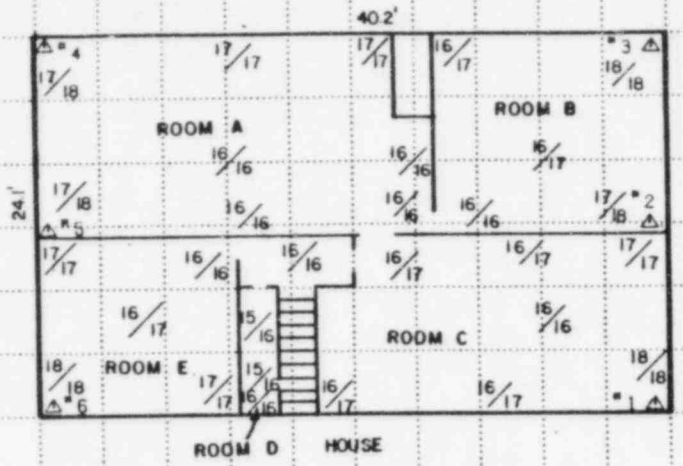
U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION AREA OFFICE, COLORADO

2237 NORTH 20th STREET
GRAND JUNCTION, COLORADO

GJ-43551-RS

3-8616-62-2-6

Bendix Field Engineering Corporation



LEGEND

13 / 18 GAMMA EXPOSURE RATE AT WAIST LEVEL / GAMMA EXPOSURE RATE AT GROUND LEVEL

ALL READINGS IN μR/h

4 LOCATION NUMBER

△ DELTA SCANNER

FIGURE 3.3 a

INTERIOR GAMMA EXPOSURE RATES AND SAMPLE LOCATIONS

BASEMENT

NOT TO SCALE

NO.	DATE	REVISIONS	BY	CK	AE	APP
1	4-30-85	PREPARED FOR T.R. LINDEN				

US DEPARTMENT OF ENERGY
GRAND JUNCTION AREA OFFICE, COLORADO

2237 NORTH 20th STREET
GRAND JUNCTION, COLORADO

Bendix Field Engineering Corporation

LOCATION NO. GJ-43551-AS
DWG. NO. 3-B616-G3 SHT 3 OF 6

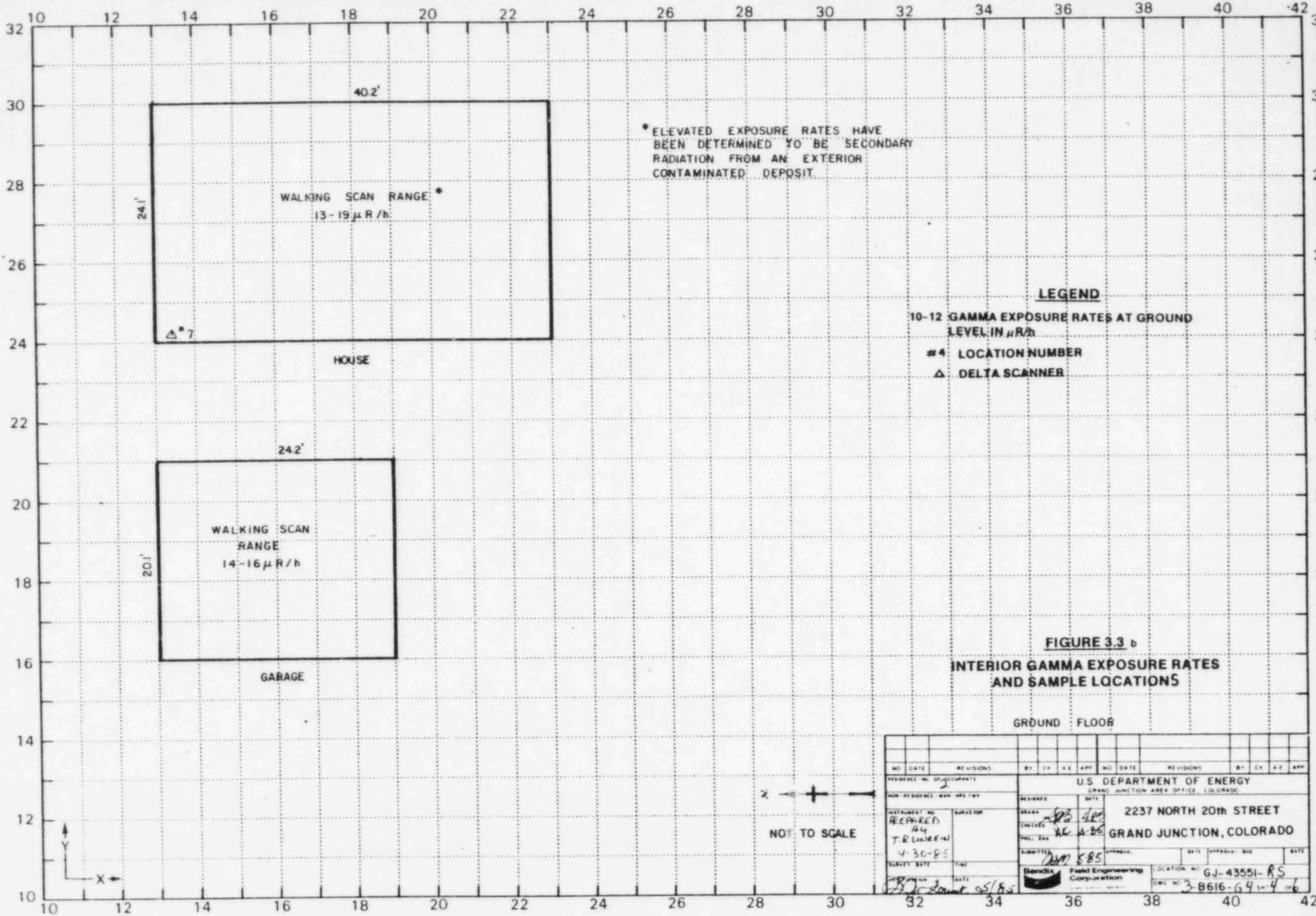
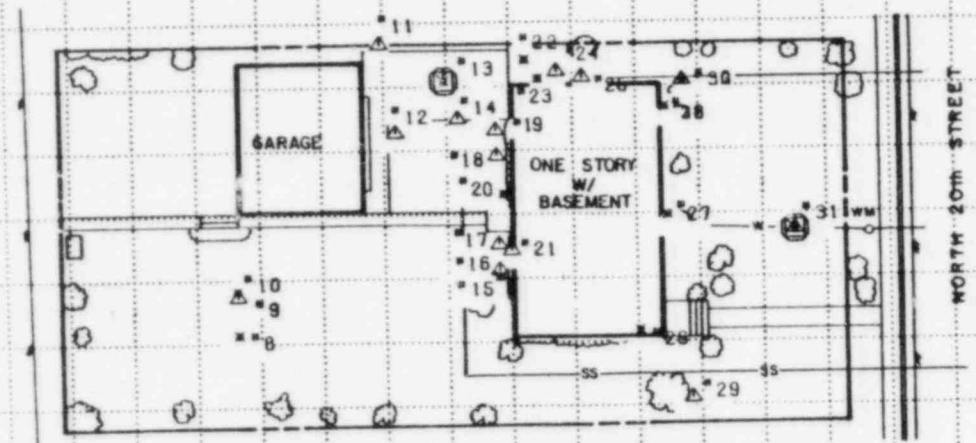


FIGURE 3.3 b

INTERIOR GAMMA EXPOSURE RATES AND SAMPLE LOCATIONS



LEGEND

- BOREHOLE
- SPECTROMETER
- DELTA SCANNER
- SOIL SAMPLE
- *4 LOCATION NUMBER

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.

FIGURE 3.4

EXTERIOR SAMPLE LOCATIONS

US DEPARTMENT OF ENERGY
GRAND JUNCTION AREA OFFICE, COLORADO

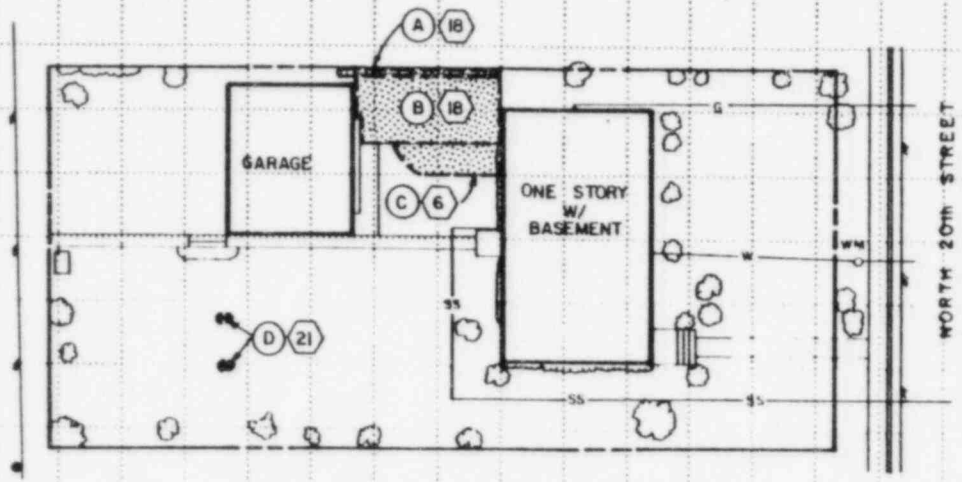
2237 NORTH 20th STREET
GRAND JUNCTION, COLORADO

PREPARED BY (R LOREAL) 5-14-85

Bendix Field Engineering Corporation

GJ-43551-85

3-B616-35-5-6



LEGEND

- BOUNDARY OF CONTAMINATION
- AREA OF CONTAMINATION
- DEPTH OF CONTAMINATION (INCHES)
- CONTAMINATED AREA

20 10 0 20 40
FEET

N

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.

FIGURE 3.5

ESTIMATED EXTENT OF CONTAMINATION

U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION AREA OFFICE, COLORADO

2237 NORTH 20th STREET
GRAND JUNCTION, COLORADO

Bendix Field Engineering Corporation

GJ-43551-R5
3-B616-06-06

3/85

DOE ID NO. GJ 43551- RS Date May 9, 1985

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

Official Survey Report

Property Address 2237 North 20th Street

Property Owner Bert and Alice Allred

Address of Owner (if different from above) N/A

Report Prepared By Tom Unrein

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:

- [ ] In open areas.
- [x] Under or around exterior improvements.
- [x] Under or around a typically nonoccupied structure.
- [X] 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 = 19 uR/h
HOG = 74 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: Coleen Campbell

SUBJECT: GJ-43551-RS

Dear Coleen:

The following is in response to your questions and comments during the Technical Review concerning Department of Energy (DOE) Identification (ID) number GJ-43551-RS.

1. Yes, it is a spillover from GJ-34247-RS (2249 North 20th Street).
2. The tailings were used around the patio area.
3. This will be added to the areas of further investigation.

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

Very truly yours,

Thomas R. Unrein
RSD Survey Team Leader

TRU:pr

MEMORANDUM

ALLIED **Bendix**
Aerospace

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

DATE: April 30, 1985

TO: Files

FROM: Thomas R. Unrein

SUBJECT: Team Leader Notes - GJ-43551-RS

Address: 2237 North 20th Street

Owner: Bert and Alice Allred

Team Members

T.R. Unrein (Team Leader)
H. Mattison
N. Wallace
M. Gilfillan
T. Flores
R. Herman
V. Young
D. Bell
R. Wilkins

Instruments

Crutch Scintillometer - C-1127, C-3502, C-3510, C-1182, C-1196
Delta Scintillometer - C-3942
Total Count - C-3959, C-3957
Surface Spectrometer - C-3413
Downhole Spectrometer - C-3361

Date: April 25, 1985

Team members arrived at the property at 8:45 A.M. and proceeded to grid the property (while it was raining). We then waited 45 minutes for the rain to stop before finishing the survey.

The data shows contamination around the patio area and the swing set.

We had a 160 cps reading in one of the bedrooms, but I believe this is secondary radiation (shine) from the patio. This bedroom is adjacent to the patio. The owner informed me that he has owned the house since it was built and the only time tailings were used was for the concrete patio. He also stated that there was a small amount of tailings leftover which he used to anchor his swing set and to fill in a few places in the yard.

We worked through lunch and finished around 2:00 P.M.

All team members were frisked and returned back to the office.

Revisit

Instruments

Delta Scintillometer - C-3942

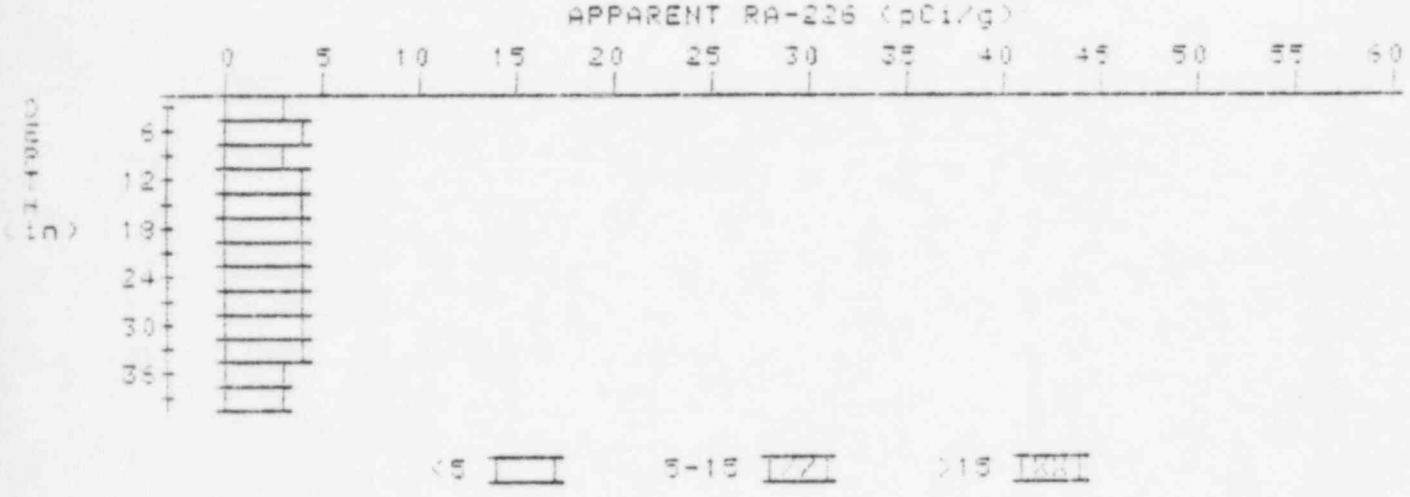
Date: April 30, 1985

I sent T. Flores back out to the property to do a few more deltas.

DECON V85.1(850117.1233)

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-43551-RS
HOLE NUMBER: 8'
LOCATION: 166221'

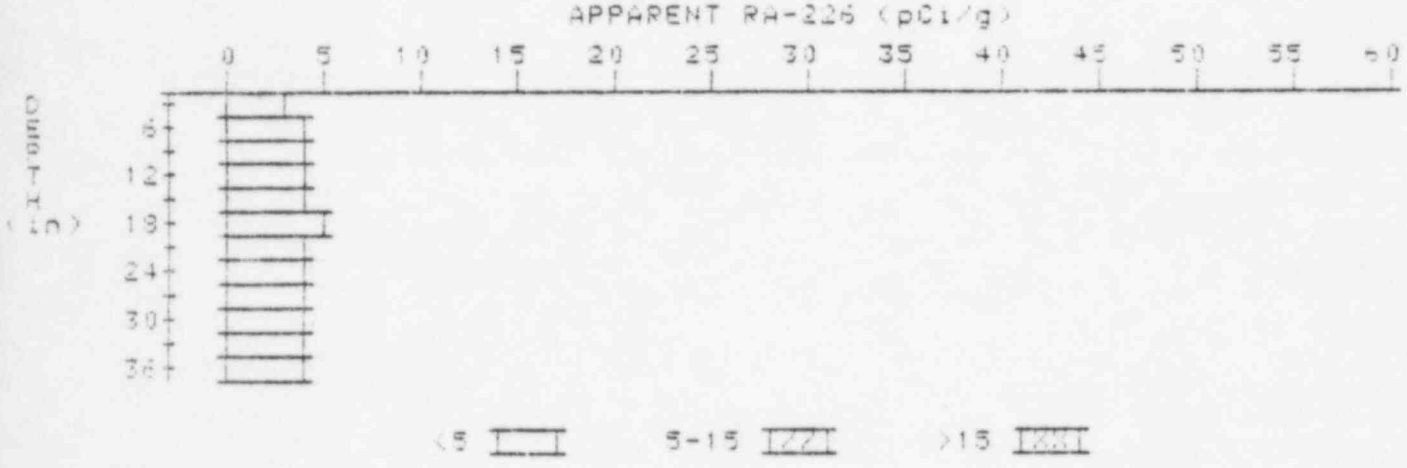


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.9	2.9
6	3.4	3.9
9	3.6	3.4
12	3.9	4.3
15	4.0	4.0
18	4.1	4.5
21	4.0	3.8
24	4.0	4.2
27	3.9	3.9
30	3.8	3.6
33	3.7	3.9
36	3.6	3.7
39	3.4	3.4

DECON V85.1<350117.1233>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 10

PROPERTY NUMBER: GJ-43551-RS
HOLE NUMBER: 10
LOCATION: 166228

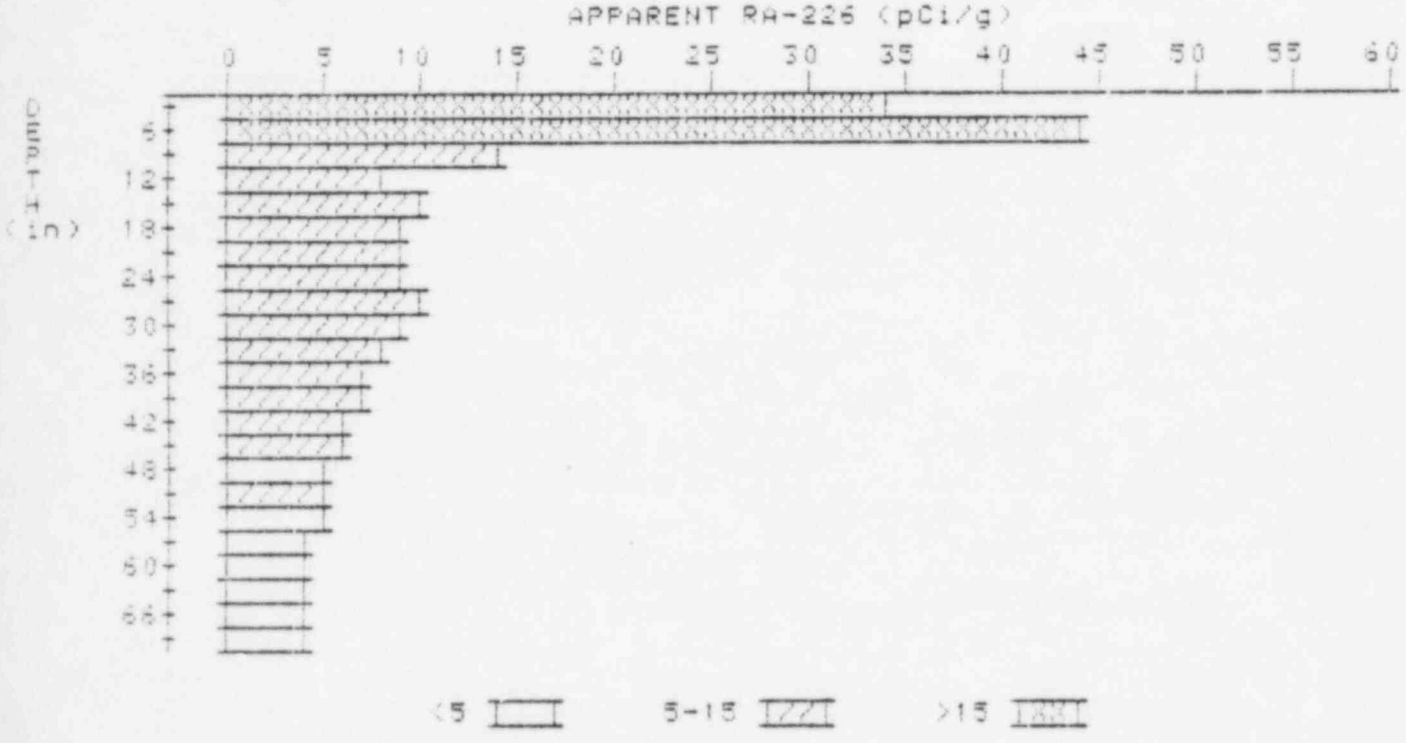


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.7	3.3
6	3.7	4.1
9	3.9	3.9
12	4.1	4.1
15	4.3	4.5
18	4.4	4.8
21	4.3	4.1
24	4.3	4.5
27	4.2	4.4
30	4.0	3.8
33	3.9	4.3
36	3.6	3.6

DECON V85.1(850117.1233)

APPARENT RADIUM-226 CONCENTRATION 13
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-43551-RS
HOLE NUMBER: 13
LOCATION: 200260



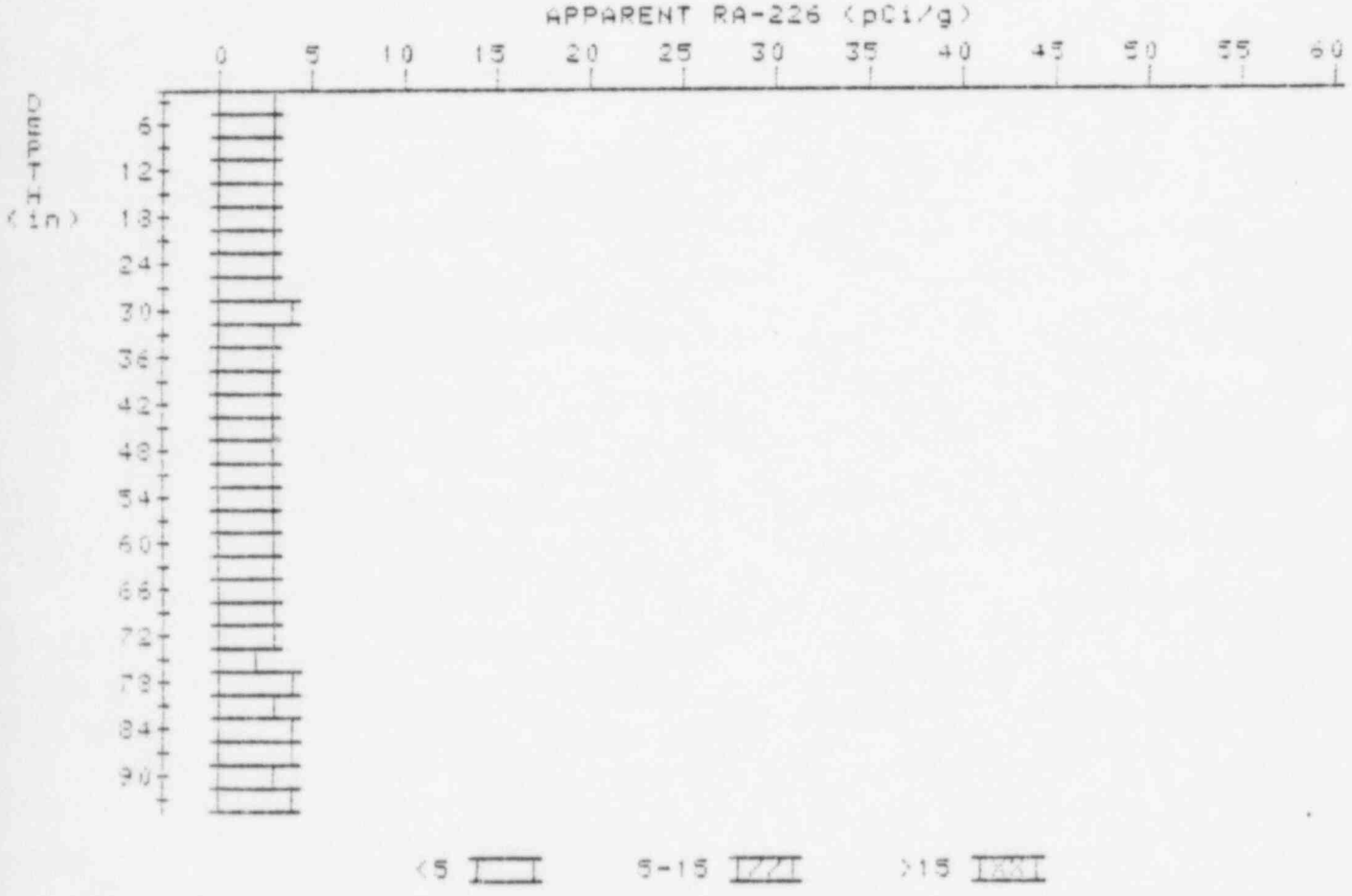
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	34.0	34.0
6	30.9	43.5
9	20.7	13.8
12	14.4	7.6
15	11.9	10.1
18	10.4	9.2
21	9.6	8.7
24	9.3	8.9
27	9.2	10.1
30	8.6	8.8
33	7.9	7.7
36	7.3	7.1
39	6.9	7.0
42	6.2	6.0
45	5.7	5.5

48	5.3	4.9
51	5.1	5.3
54	4.8	4.8
57	4.5	4.1
60	4.4	4.4
63	4.3	4.5
66	4.1	4.1
69	3.9	3.9

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION 15
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-43551-RS
HOLE NUMBER: 15
LOCATION: 208229



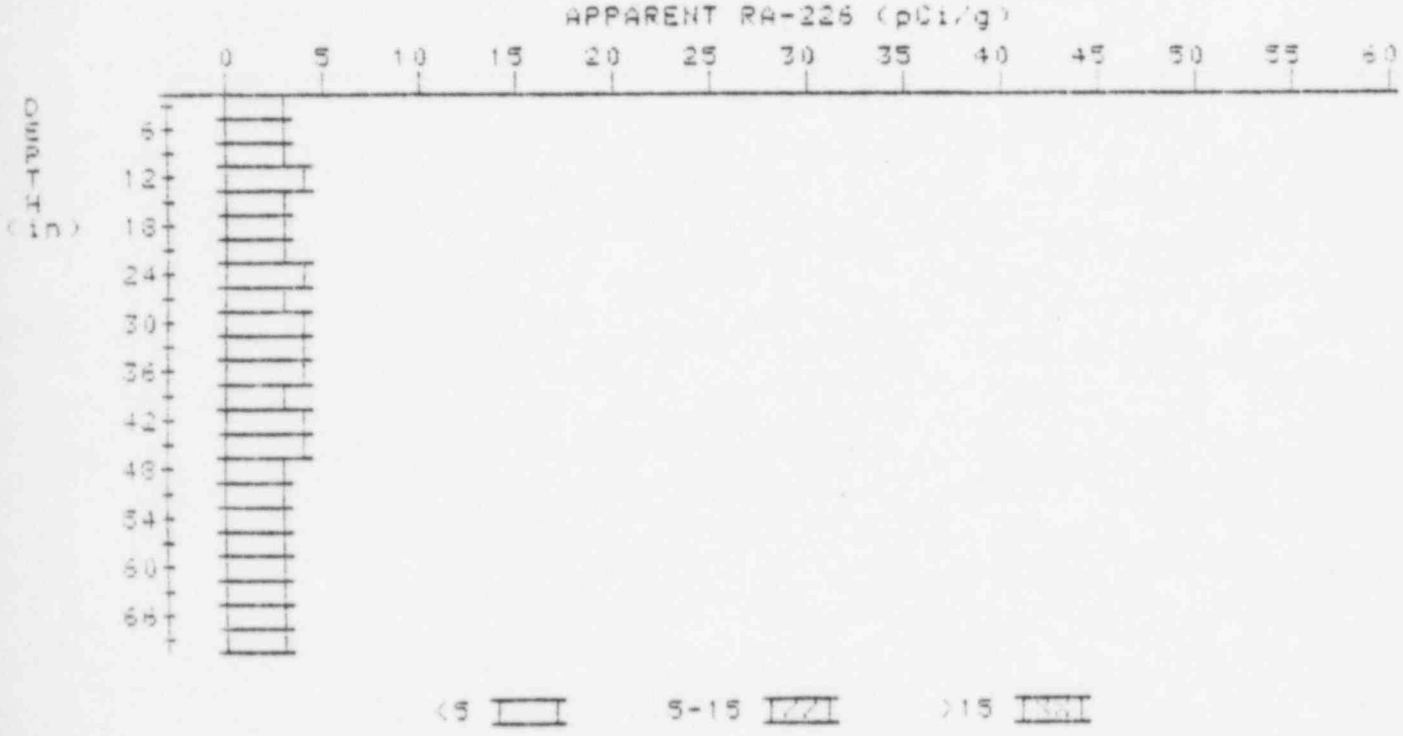
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.1	3.1
6	3.0	3.4
9	3.2	3.4
12	3.2	3.2
15	3.2	3.0
18	3.3	3.5
21	3.3	3.3
24	3.3	3.5
27	3.2	2.9

30	3.3	3.7
33	3.2	2.8
36	3.3	3.5
39	3.3	3.3
42	3.3	3.5
45	3.2	3.0
48	3.2	3.2
51	3.2	3.2
54	3.2	3.2
57	3.2	3.2
60	3.2	3.2
63	3.2	3.4
66	3.1	2.9
69	3.1	3.1
72	3.1	3.3
75	3.0	2.5
78	3.2	3.6
81	3.2	2.8
84	3.4	3.6
87	3.5	3.7
90	3.5	3.3
93	3.6	3.6

DECON V85.1(850117.1233)

APPARENT RADIUM-226 CONCENTRATION 20
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-43551-RS
HOLE NUMBER: 20
LOCATION: 209242



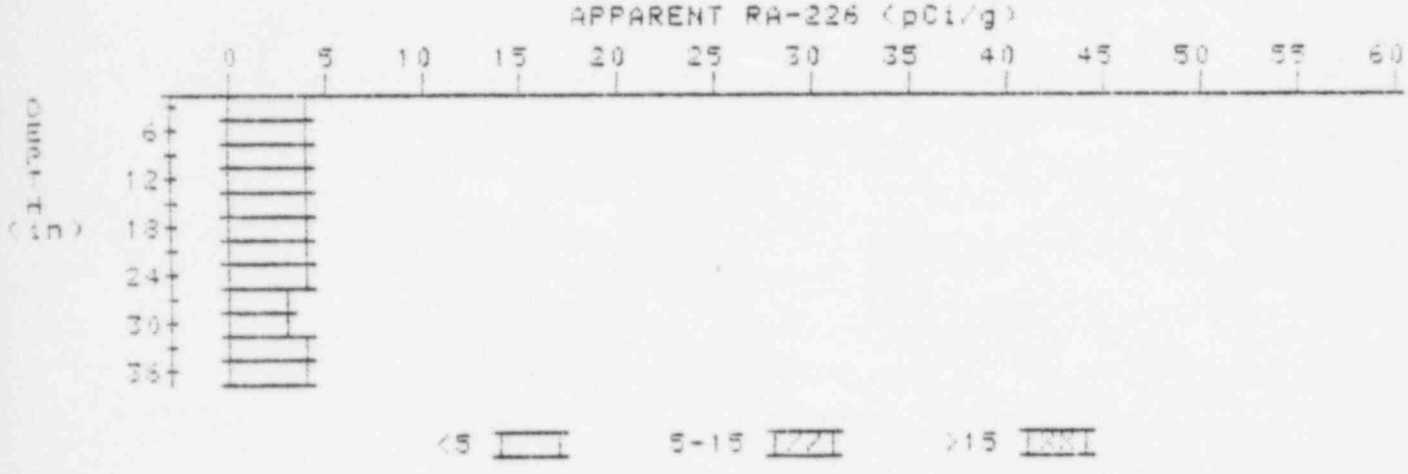
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.2	3.4
9	3.3	3.3
12	3.4	3.6
15	3.4	3.4
18	3.4	3.4
21	3.4	3.2
24	3.5	3.9
27	3.4	3.0
30	3.5	3.7
33	3.5	3.5
36	3.5	3.7
39	3.4	3.0
42	3.5	3.7
45	3.5	3.7

48	3.4	3.2
51	3.4	3.4
54	3.4	3.4
57	3.4	3.4
60	3.4	3.4
63	3.4	3.4
66	3.4	3.4
69	3.4	3.4

DECON V85.1(850117.1233)

APPARENT RADIUM-226 CONCENTRATION 22
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-43551-RS
HOLE NUMBER: 22
LOCATION: 213263

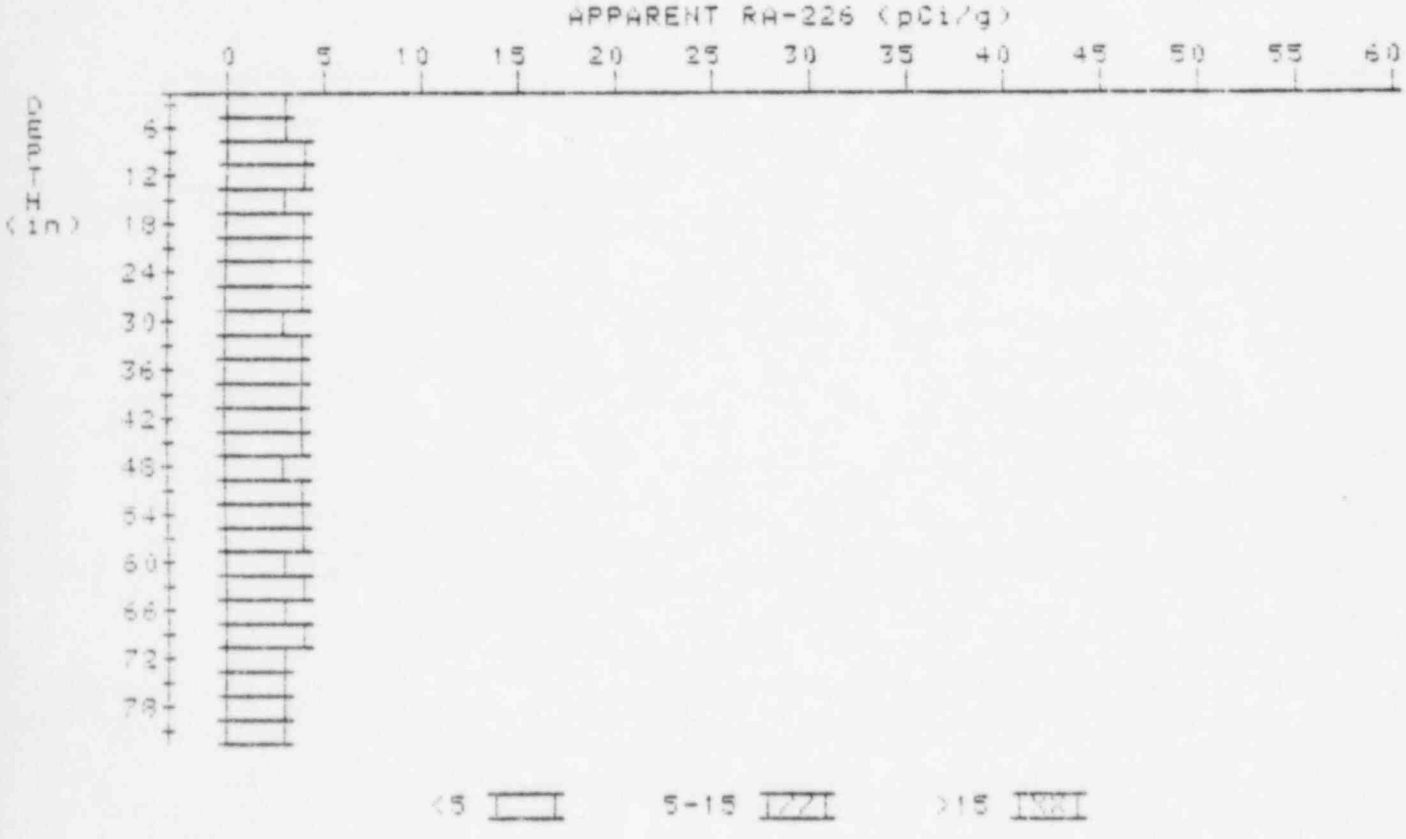


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.0	4.0
6	4.0	4.2
9	3.9	3.7
12	3.9	4.1
15	3.8	3.6
18	3.8	4.0
21	3.7	3.5
24	3.7	3.9
27	3.6	3.4
30	3.6	3.4
33	3.7	4.1
36	3.6	3.6

DECON V85.1(850117.1233)

APPARENT RADIUM-226 CONCENTRATION 23
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-43551-RS
HOLE NUMBER: 23
LOCATION: 215260'



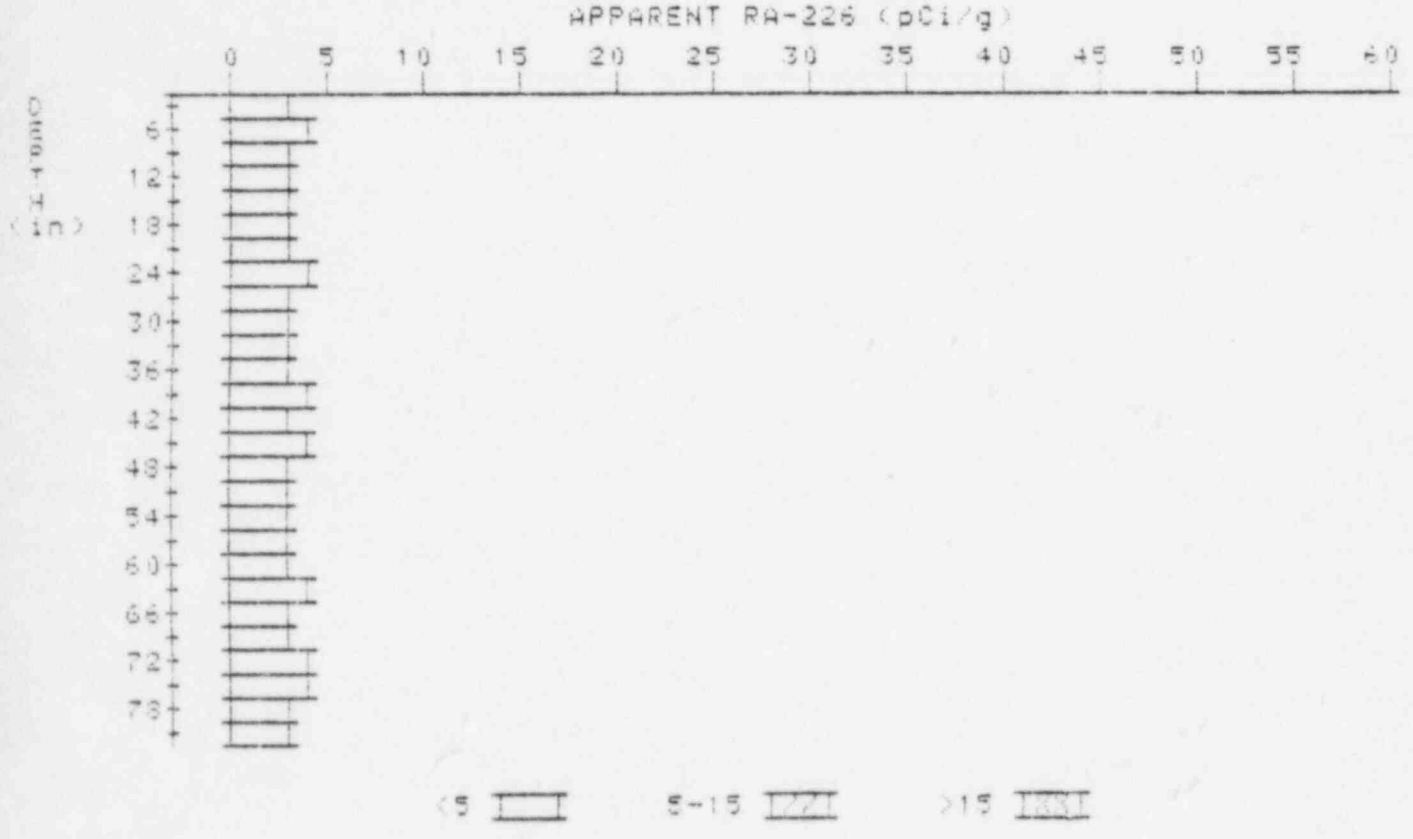
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.4	3.4
9	3.5	3.7
12	3.5	3.5
15	3.5	3.5
18	3.6	3.6
21	3.6	3.6
24	3.6	3.6
27	3.6	3.6
30	3.6	3.4
33	3.7	3.9
36	3.7	3.7

39	3.7	3.7
42	3.7	3.7
45	3.7	3.8
48	3.6	3.4
51	3.6	3.6
54	3.6	3.6
57	3.6	3.6
60	3.5	3.1
63	3.6	4.1
66	3.4	3.0
69	3.4	3.6
72	3.3	3.3
75	3.2	3.0
78	3.2	3.2
81	3.2	3.2

DECON V85.1(850117.1233)

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 26

PROPERTY NUMBER: GJ-43551-RS
HOLE NUMBER: 26
LOCATION: 230220



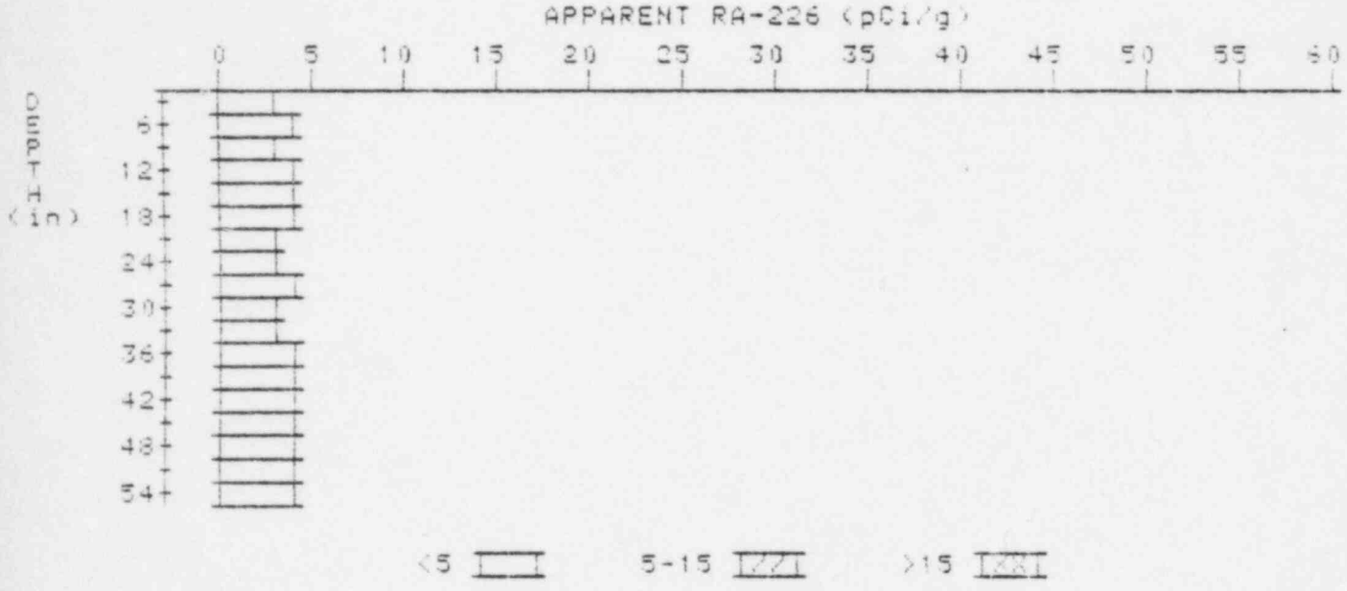
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.2	3.6
9	3.2	3.0
12	3.3	3.5
15	3.3	3.3
18	3.3	3.3
21	3.2	3.1
24	3.4	3.6
27	3.4	3.4
30	3.4	3.4
33	3.4	3.4
36	3.4	3.4

39	3.4	3.6
42	3.3	2.9
45	3.4	3.6
48	3.4	3.4
51	3.4	3.4
54	3.4	3.4
57	3.4	3.4
60	3.4	3.2
63	3.5	4.0
66	3.3	2.9
69	3.3	3.1
72	3.4	3.6
75	3.4	3.6
78	3.3	3.1
81	3.3	3.3

DECON V85.1(850117.1233)

APPARENT RADIUM-226 CONCENTRATION 27
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-43551-R8
HOLE NUMBER: 27
LOCATION: 235238

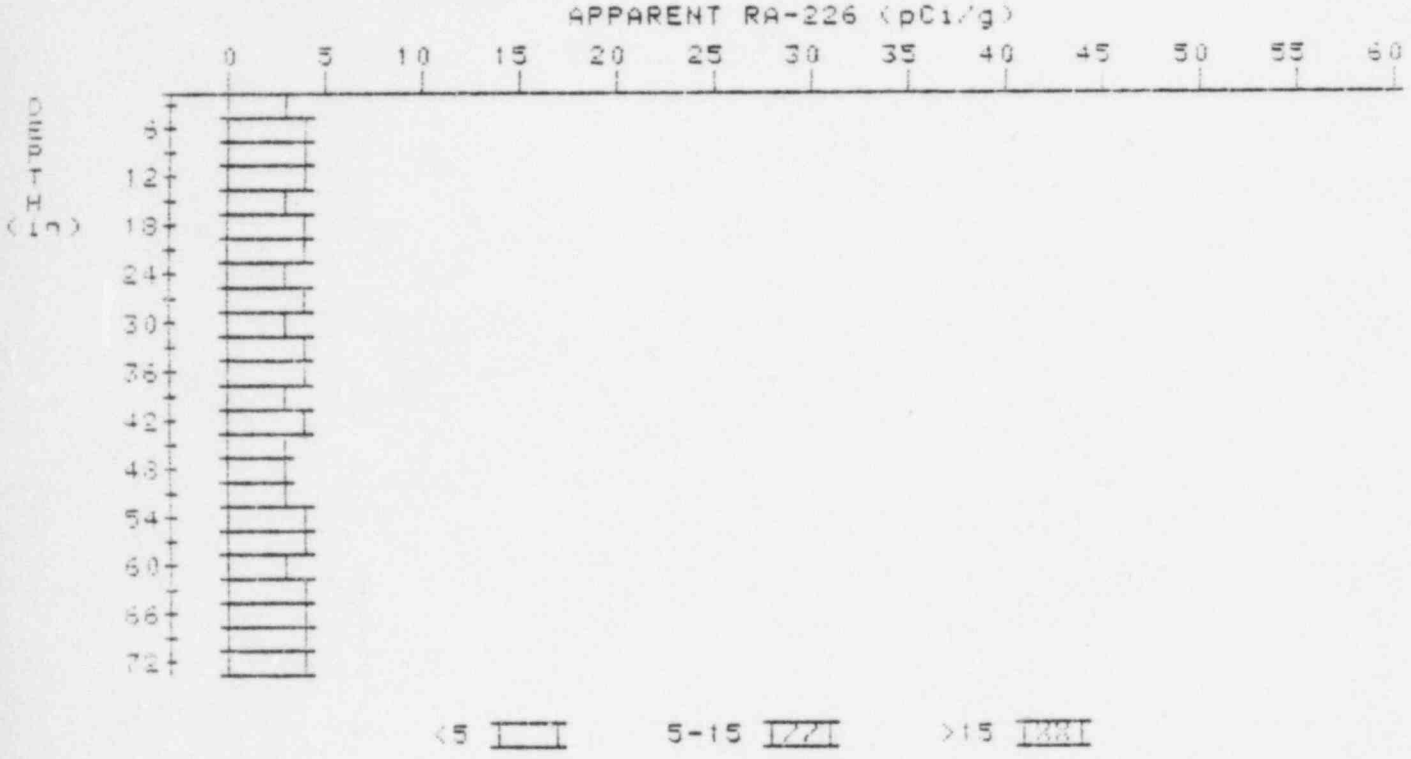


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.4	4.1
9	3.4	3.4
12	3.5	3.5
15	3.6	3.6
18	3.7	4.1
21	3.6	3.4
24	3.6	3.4
27	3.7	4.1
30	3.6	3.4
33	3.6	3.4
36	3.7	3.9
39	3.7	3.7
42	3.7	3.7
45	3.7	3.7
48	3.7	3.7
51	3.7	3.7
54	3.7	3.7

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION 28
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-43351-RS
HOLE NUMBER: 28
LOCATION: 233255



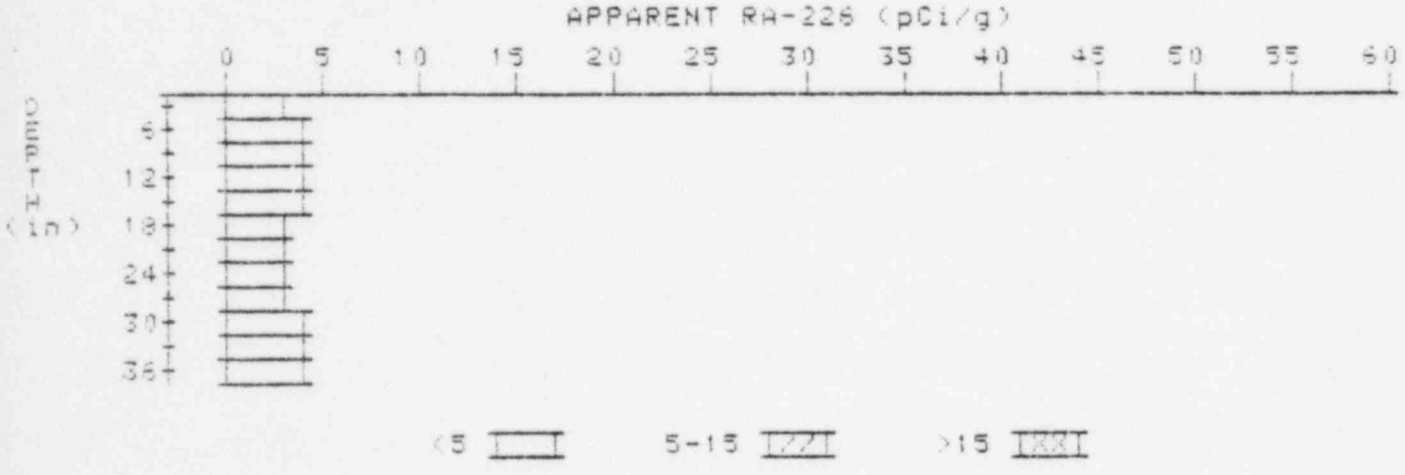
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.5	3.9
9	3.5	3.5
12	3.5	3.7
15	3.4	3.0
18	3.5	3.7
21	3.5	3.9
24	3.3	2.6
27	3.5	4.0
30	3.4	3.0
33	3.5	3.7
36	3.5	3.7
39	3.4	3.0
42	3.5	3.9
45	3.4	3.2

48	3.4	3.4
51	3.4	3.2
54	3.5	3.7
57	3.5	3.5
60	3.5	3.3
63	3.6	3.8
66	3.6	3.6
69	3.6	3.6
72	3.6	3.6

DECON V85.1(850117.1233)

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 30

PROPERTY NUMBER: GJ-43551-RS
HOLE NUMBER: 30
LOCATION: 238259

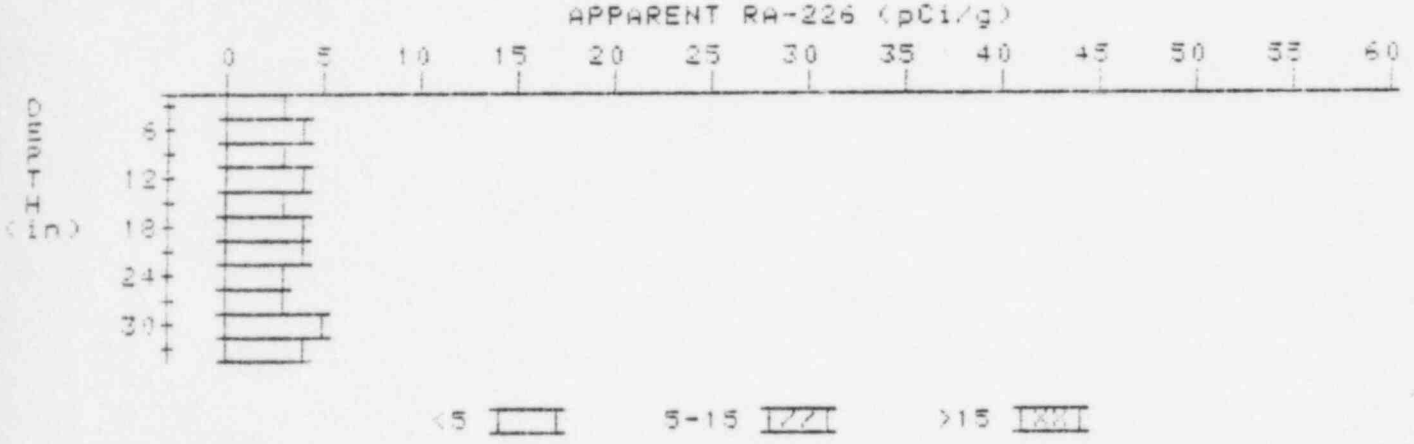


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.5	3.7
9	3.6	3.8
12	3.6	3.8
15	3.5	3.5
18	3.4	3.2
21	3.4	3.4
24	3.4	3.4
27	3.4	3.2
30	3.6	3.7
33	3.5	3.5
36	3.5	3.5

DECON V85.1(850117.1233)

APPARENT RADIUM-226 CONCENTRATION 31
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-43031-RS
HOLE NUMBER: 31
LOCATION: 255235



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.9	2.9
6	3.3	3.8
9	3.4	3.4
12	3.5	3.7
15	3.5	3.3
18	3.6	3.8
21	3.6	3.6
24	3.6	3.4
27	3.7	3.3
30	4.0	4.5
33	4.0	4.0