RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-12956-RS
ADDRESS: 310 WEST OURAY AVENUE

SEPTEMBER 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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APPROVED BY Michael K Tucker
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DOE PROJECT ENGINEER

DATE September 10, 1985

REA12956:REA-KL019

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-12956-RS, is a single-family residence located at 310 West Ouray 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, 22 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is $2,069. Remedial action on this property will take approximately 10 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 310 West Ouray Avenue, Grand Junction, Colorado

Zoning: Residential (RMF-64)

Lot Size: Approximately 6,250 sf (0.1 acres)

Legal Description: Lots 1 and 2, Block 4, Carpenter's Subdivision Number 2, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 2 miles northwest 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:	West Ouray Avenue
South:	Commercial structure
East:	Mulberry Street
West:	Single-family residence

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-family residence
Size:	Approximately 1,173 sf
Construction Date:	1938
Construction:	Adobe
Foundation:	Rock and slab-on-grade
Footing Depth:	Approximately 8" to bottom of footing from grade
Basement:	None
Crawl Space:	None
Condition:	Good

Other Structures:

Type:	Trailer/shed
Size:	Approximately 326 sf
Construction:	Metal and Wood-frame
Foundation:	Stacked-brick
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-12956-RS on May 17, 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 located under or around the primary structure and in the yard.

The Bendix radiologic survey was designed to investigate the entire property, with emphasis on previously identified areas of contamination. Conclusions based upon data analyses are discussed in Section 3.5, Extent of Contamination. Photocopies of the Official Survey Report, 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: 14 to 17 uR/h
Highest Outside Gamma Reading (HOG): 30 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: 15 to 19 uR/h
Highest Inside Gamma Reading (HIG): 44 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.

3.3 Boreholes, Soil Samples, and Other Measurements

Areas which displayed elevated gamma levels were further investigated. Data from these investigations are included in Appendix Tables 3.1 and 3.2. Exterior locations are shown in Appendix Figure 3.2.

3.4 Radon/Radon Daughter Concentration (RDC)

Determined by CDH: 0.009 gross working level (WL). No additional RDC measurements were taken by Bendix.

3.5 Extent of Contamination

Appendix Figure 3.3 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) Surface Material: Soil
Direction From Primary Structure: North
Other Directions: Along the north fence line
Total Depth of Contamination: 6 inches
Approximate Square Footage: 73

(Area B) Surface Material: Soil
Direction From Primary Structure: East
Other Directions: Along the east fence line
Total Depth of Contamination: 9 inches
Approximate Square Footage: 33

(Area C) Surface Material: Soil
Direction From Primary Structure: East
Other Directions: East yard
Total Depth of Contamination: 6 inches
Approximate Square Footage: 316

(Area D) Surface Material: Soil
Direction From Primary Structure: West
Other Directions: Along the west fence line
Total Depth of Contamination: 6 inches
Approximate Square Footage: 128

(Area E) Surface Material: Soil and sod
Direction From Primary Structure: Southeast
Other Directions: Along the east fence line
Total Depth of Contamination: 12 inches
Approximate Square Footage: 207

(Area F) Surface Material: Soil
Direction From Primary Structure: Southeast
Other Directions: Along the east fence line
Total Depth of Contamination: 6 inches
Approximate Square Footage: 6

(Area G) Surface Material: Soil
Direction From Primary Structure: South
Other Directions: South of driveway
Total Depth of Contamination: 15 inches
Approximate Square Footage: 21

(Area H) Surface Material: Bricks and soil
Direction From Primary Structure: South
Other Directions: Around the trailer and shed
Total Depth of Contamination: Estimated 4", based on site observation.
Other (height or thickness): 4" x 2" x 8" bricks
Comments: This area includes two deposits of contaminated brick.
Approximate Square Footage: 275

(Area I) Surface Material: Bricks
Direction From Primary Structure: West and southwest
Other Directions: Outside the line of occupancy
Total Depth of Contamination: Surface
Other (height or thickness): 4" x 2" x 8" bricks
Comments: This area includes three deposits of contaminated brick.
Approximate Square Footage: 24

(Area J) Surface Material: Bricks
Direction From Primary Structure: Southwest
Total Depth of Contamination: Surface
Other (height or thickness): 18" X 18" X 12"
Comments: This deposit is a barbecue pit made up of contaminated brick. It is 18 inches square by 12 inches high.
Approximate Square Footage: 4

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-12956-RS, includes removal of all areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figure 3.3) and transport of removed material to the disposal site.

Area I is on an unmaintained site with an abandoned house. Although it falls outside the line of occupancy, Area I is recommended for remedial action in conjunction with remedial action at 310 West Ouray because the contamination is surface brick debris originating from the 310 West Ouray property.

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 $2,069.

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
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Figure 3.2	Exterior Sample Locations
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Official Survey Report
Team Leader Notes
Firebrick Lab Assay Report
Certificate of Assay
Deconvolution Graphs (Apparent Radium-226 Concentration)
Exterior Gamma Scan

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
4	153257	00	DS	2.9		*	North of the primary
		06	DS	<1.0		*	structure
5	155220	00	DS	3.0		*	3 feet from northwest
		06	DS	1.7		*	corner of the primary structure
6	156227	03	TC	3.3		*	Water line
		06	TC	3.4		*	
		09	TC	3.5		*	DC = 0 inches
		12	TC	3.5		*	
		15	TC	3.5		*	
		18	TC	3.5		*	
		21	TC	3.5		*	
		24	TC	3.4		*	
		27	TC	3.3		*	
		30	TC	3.3		*	
		33	TC	3.3		*	
		36	TC	3.4		*	
7	158240	03	TC	3.0		*	North foundation
		06	TC	3.2		*	
		09	TC	3.4		*	DC = 0 inches
		12	TC	3.5		*	
		15	TC	3.4		*	
		18	TC	3.4		*	
		21	TC	3.5		*	
		24	TC	3.4		*	
		27	TC	3.4		*	
		30	TC	3.3		*	
		33	TC	3.3		*	
8	163263	00	DS	6.6		*	East of the
		06	DS	<1.0		*	primary structure
9	163269	03	TC	6.0		*	East fence line
		06	TC	5.5		*	
		09	TC	4.7		*	DC = 9 inches
		12	TC	4.2		*	Based on the
		15	TC	4.0		*	deconvolution graph
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	TC	3.7		*	
		27	TC	3.5		*	
		30	TC	3.5		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
9	163269	33	TC	3.4		*	
		36	TC	3.3		*	
		39	TC	3.2		*	
10	173260	00	DS	2.8		*	Gas line
		06	DS	1.7		*	
		18	DS	1.2		*	
11	174221	03	TC	4.2		*	West foundation
		06	TC	3.9		*	
		09	TC	3.7		*	DC = 0 inches
		12	TC	3.4		*	
		15	TC	3.3		*	
		18	TC	3.2		*	
		21	TC	3.3		*	
		24	TC	3.3		*	
		27	TC	3.3		*	
12	174268	00	DS	2.5		*	East of the
		06	DS	1.3		*	primary structure
13	176263	03	TC	4.2		*	Foundation
		06	TC	4.1		*	
		09	TC	4.1		*	DC = 0 inches
		12	TC	4.0		*	
		15	TC	3.9		*	
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	TC	3.8		*	
		27	TC	3.7		*	
		30	TC	3.6		*	
		33	TC	3.5		*	
14	188241	03	TC	4.1		*	South foundation
		06	TC	4.0		*	
		09	TC	3.9		*	DC = 0 inches
		12	TC	3.7		*	
		15	TC	3.7		*	
		18	TC	3.6		*	
		21	TC	3.6		*	
		24	TC	3.6		*	
		27	TC	3.5		*	
		30	TC	3.4		*	
		33	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
14	188241	36	TC	3.3		*	
15	190254	00	DS	2.2		*	
		06	DS	1.2		*	
16	192214	00	DS	3.0		*	By the barbecue
		06	DS	1.5		*	pit
17	192231	03	TC	3.4		*	South foundation
		06	TC	3.4		*	
		09	TC	3.5		*	DC = 0 inches
		12	TC	3.5		*	
		15	TC	3.4		*	
		18	TC	3.3		*	
		21	TC	3.3		*	
		24	TC	3.2		*	
		27	TC	3.2		*	
		30	TC	3.1		*	
18	196229	03	TC	4.0		*	Sewer line
		06	TC	3.9		*	
		09	TC	3.7		*	DC = 0 inches
		12	TC	3.5		*	
		15	TC	3.3		*	
		18	TC	3.2		*	
		21	TC	3.2		*	
		24	TC	3.3		*	
		27	TC	3.5		*	
		30	TC	3.5		*	
		33	TC	3.6		*	
		36	TC	3.6		*	
19	196269	03	TC	5.7		*	DC = 12 inches
		06	TC	6.3		*	Based on the
		09	TC	5.5		*	deconvolution graph
		12	TC	4.9		*	
		15	TC	4.4		*	
		18	TC	4.1		*	
		21	TC	3.9		*	
		24	TC	3.8		*	
		27	TC	3.6		*	
		30	TC	3.5		*	
		33	TC	3.5		*	
		36	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
19	196269	39	TC	3.3		*	
20	202213	00	DS	14.5		*	On the bricks
		02	DS	<1.0		*	Off the bricks
21	207234	03	TC	3.3		*	Leach field
		06	TC	3.6		*	
		09	TC	3.7		*	DC = 0 inches
		12	TC	3.8		*	
		15	TC	3.7		*	
		18	TC	3.6		*	
		21	TC	3.6		*	
		24	TC	3.5		*	
		27	TC	3.3		*	
		30	TC	3.3		*	
		33	TC	3.3		*	
		36	TC	3.3		*	
		39	TC	3.4		*	
		42	TC	3.5		*	
		45	TC	3.6		*	
		48	TC	3.6		*	
		51	TC	3.4		*	
		54	TC	3.3		*	
		57	TC	3.2		*	
		60	TC	3.2		*	
22	209222	00	DS	4.2		*	On the bricks
		02	DS	2.0		*	Off the bricks
23	210203	00	DS	6.2		*	On the bricks
		02	DS	1.6		*	Off the bricks
24	221219	03	TC	3.6		*	Northwest corner
		06	TC	3.5		*	of shed
		09	TC	3.3		*	
		12	TC	3.5		*	DC = 0 inches
		15	TC	3.5		*	
		18	TC	3.4		*	
		21	TC	3.3		*	
		24	TC	3.2		*	
		27	TC	3.2		*	
		30	TC	3.2		*	
		33	TC	3.2		*	
		36	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
25	221224	00	SS			78.9	Grab sample (bricks)
26	226268	00	DS	3.0		*	
		06	DS	1.4		*	
27	230238	03	TC	3.5		*	Sewer line to the
		06	TC	3.6		*	trailer
		09	TC	3.7		*	
		12	TC	3.8		*	DC = 0 inches
		15	TC	3.7		*	
		18	TC	3.6		*	
		21	TC	3.6		*	
		24	TC	3.6		*	
		27	TC	3.5		*	
		30	TC	3.5		*	
		33	TC	3.5		*	
		36	TC	3.5		*	
		39	TC	3.5		*	
		42	TC	3.6		*	
		45	TC	3.5		*	
		48	TC	3.5		*	
28	239237	00	DS	2.1		*	Southeast corner
		06	DS	1.6		*	of the trailer
29	244260	00	DS	1.2		*	Background
		03	TC	3.4		*	
		06	BH	3.6	<1.0	*	DC = 0 inches
		09	TC	3.6		*	
		12	TC	3.6		*	
		15	TC	3.7		*	
		18	BH	3.6	1.0	*	
		21	TC	3.6		*	
		24	TC	3.6		*	
		27	TC	3.5		*	
		30	BH	3.4	<1.0	*	
		33	TC	3.5		*	
30	257276	00	DS	10.6		*	On the bricks
		02	DS	1.8		*	Off the bricks
31	261251	00	DS	5.2		*	South yard
		06	DS	14.6		*	
		12	DS	7.6		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
31	261251	03	TC	9.1		*	DC = 15 inches
		06	TC	13.2		*	Based on the
		09	TC	16.2		*	deconvolution graph
		12	TC	12.1		*	
		15	TC	6.6		*	
		18	TC	4.9		*	
		21	TC	4.1		*	
		24	TC	3.7		*	
		27	TC	3.7		*	
		30	TC	3.7		*	
		33	TC	3.7		*	

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 = 05-17-85
Team Leader = RRV

RADRPT V85.1<850513.1530> Table 3.2

Radium Concentrations at Interior Locations

DOE ID #GJ-12956-RS 310 West Ouray 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	DS	22.9		*	Dining room,
		00	GS		17.5	*	kitchen entryway
2		[48]	DS	6.8		*	South wall of
		[48]	GS		8.7	*	the dining room
		00	DS	<1.0		*	
3		00	DS	<1.0		*	Northeast corner
		00	GS		6.8	*	of dining room

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 = 05-17-85
- Team Leader = RRV

Table 3.3
Summary of Interior Gamma Exposure Rates
DOE ID No. GJ-12956-RS 310 West Ouray 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)
Primary Structure	52	15-26	17	52	15-44	18
Trailer	13	15-16	15	13	15-17	16
Shed	07	16-18	17	07	16-21	19

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-12956-RS

AREA	CALCULATIONS(ft)		SF		DEPTH(ft)		CF	CUBIC YARDS
EXTERIOR								
Contaminated Fill								
A	2 x 7	=	14					
	2 x 6	=	12					
	3 x 13	=	39					
	2 x 4	=	8					
			73	x	0.5	=	37	
B	3 x 11	=	33	x	0.8	=	26	
C	2 x 26	=	52					
	4 x 10	=	40					
	7 x 24	=	168					
	4 x 14	=	56					
			316	x	0.5	=	158	
D	3 x 4	=	12					
	6 x 18	=	108					
	2 x 4	=	8					
			128	x	0.5	=	64	
E	5 x 11	=	55					
	7 x 14	=	98					
	5 x 6	=	30					
	3 x 8	=	24					
			207	x	1.0	=	207	
F	2 x 3	=	6	x	0.5	=	3	
G	3 x 7	=	21	x	1.3	=	27	

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-12956-RS

AREA	CALCULATIONS(ft)		SF	DEPTH(ft)		CF	CUBIC YARDS
H*	3 x 12	=	36				
	5 x 6	=	30				
	3 x 7	=	21				
	5 x 16	=	80				
	3 x 6	=	18				
	2 x 2	=	4				
	2 x 18	=	36				
	2 x 11	=	22				
	2 x 4	=	8				
	4 x 5	=	20				
			275	x	0.2 =	55	
I*	(3)2 x 4	=	24	x	0.3 =	7	
J*	2 x 2	=	4	x	1.0 =	4	
	TOTAL VOLUME - EXTERIOR				=	588 = 588/27 =	22

* Areas of fire brick and fire brick rubble are calculated as contaminated fill.

See Appendix Figure 3.3 For Areas

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-12956-RS

EXTERIOR		
Remove identified residual radioactive material		
18 cy @ $14.50/cy (machine)	$	261
4 cy @ $44/cy (manual)		176
Remove small trees/shrubs		
3 @ $5/ea		15
Replace roadbase		
2 cy @ $11.50/cy		23
Replace topsoil		
16 cy @ $9.50/cy		152
Replace weed-free soil/compost		
4 cy @ $12.50/cy		50
Remove concrete-block step and brick barbecue		
11 sf @ $.75/sf		8
Replace concrete block, no grout		
5 sf @ $2/sf		10
Replace brick barbecue		
6 sf @ $5.50/sf		33
Remove/replace wood-picket fence		
111 lf @ $3/lf		333
Replace sod		
50 sf @ $.25/sf		13
Replace 5-gallon shrubs, 1 Pfitzer, 1 unidentified		
2 @ $20/ea		40
Replace 1" caliper globe willow		
1 @ $30/ea		30
TOTAL EXTERIOR	$	1,144

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-12956-RS

TOTAL EXTERIOR	$	1,144
TOTAL INTERIOR		0
ACCESS CONTROL		200
SUBTOTAL	$	1,344
CONTINGENCY @ 10%		134
SUBTOTAL	$	1,478
CONTRACTOR OVERHEAD & PROFIT @ 40%		591
GRAND TOTAL	$	2,069

VD090485
REA12956:REA-KL019:LMR

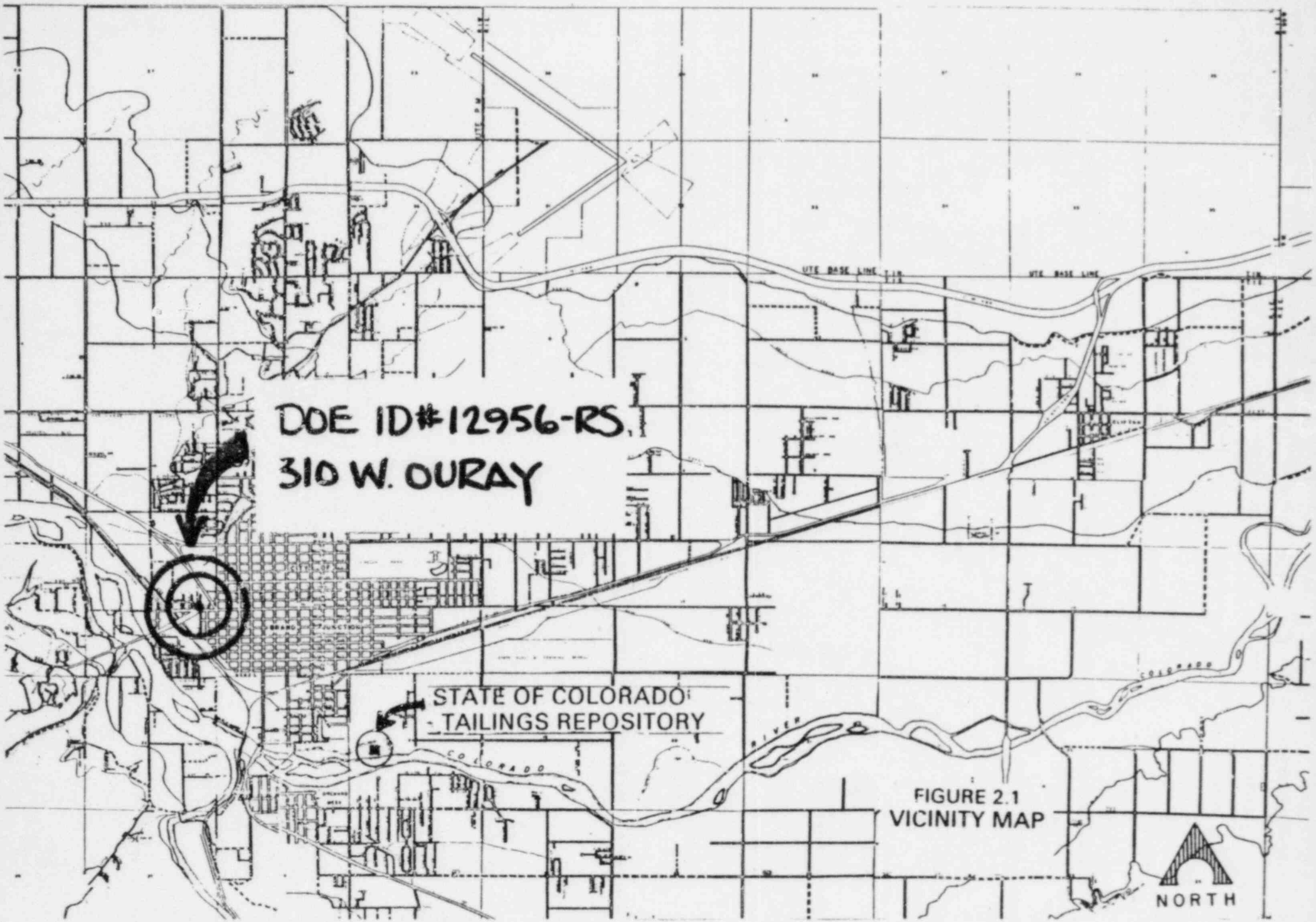
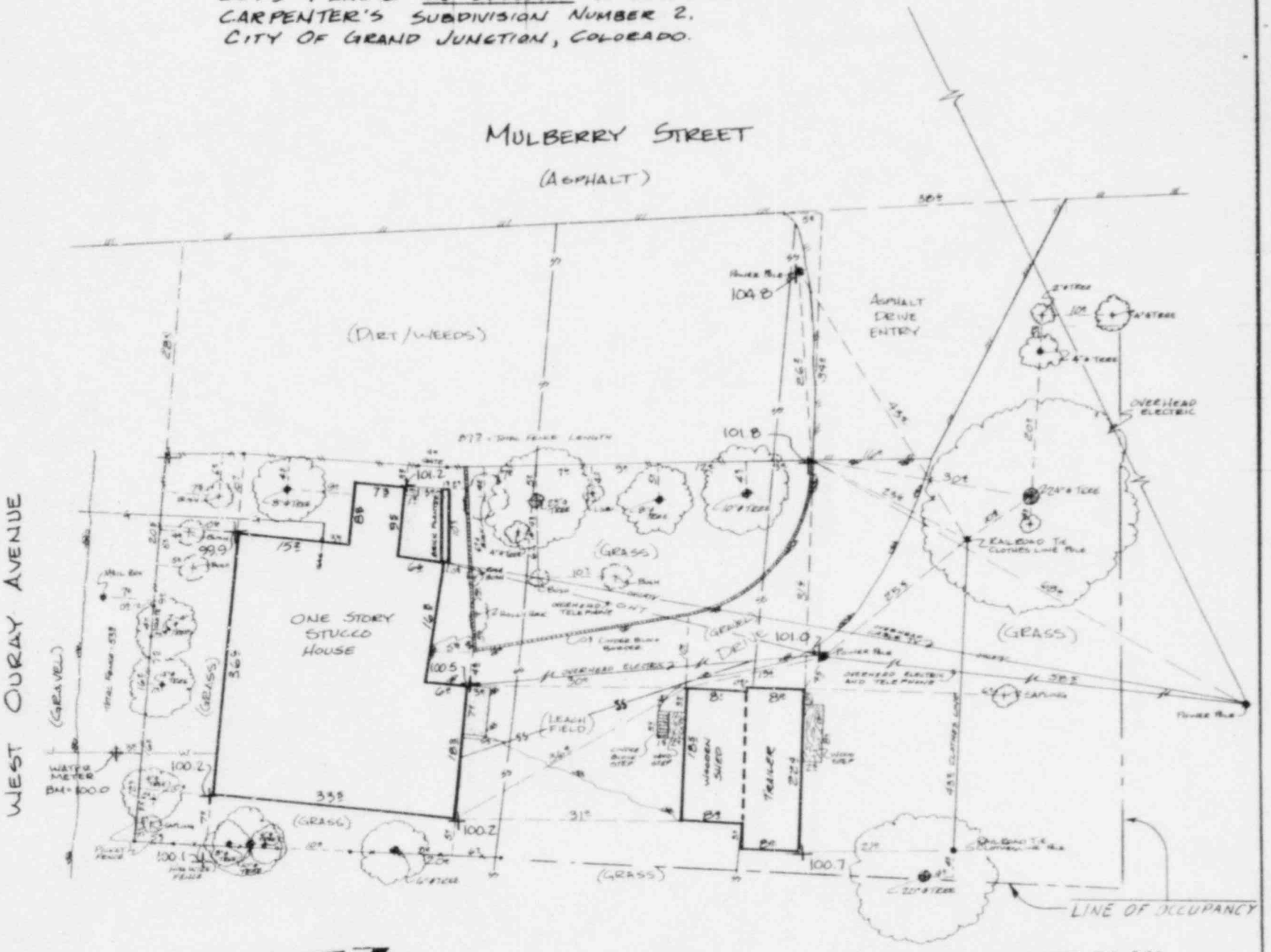


FIGURE 2.1
VICINITY MAP

LOTS 1 AND 2 As Occupied OF BLOCK 4
CARPENTER'S SUBDIVISION NUMBER 2.
CITY OF GRAND JUNCTION, 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.

FIGURE 2.2 SITE PLAN

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECT OFFICE, COLORADO	DOE ID NO. GJ12956RS
ADDRESS 310 WEST OURAY AVENUE GRAND JUNCTION, COLORADO	ALLIED Bendix Aerospace Bendix Field Engineering Corporation Grand Junction Operations
SURV GDE 5 9 85 DRAFT RSK 5 14 85	CK
DRAWING NO. 3.C.669.F1	SHEET 1 OF 1

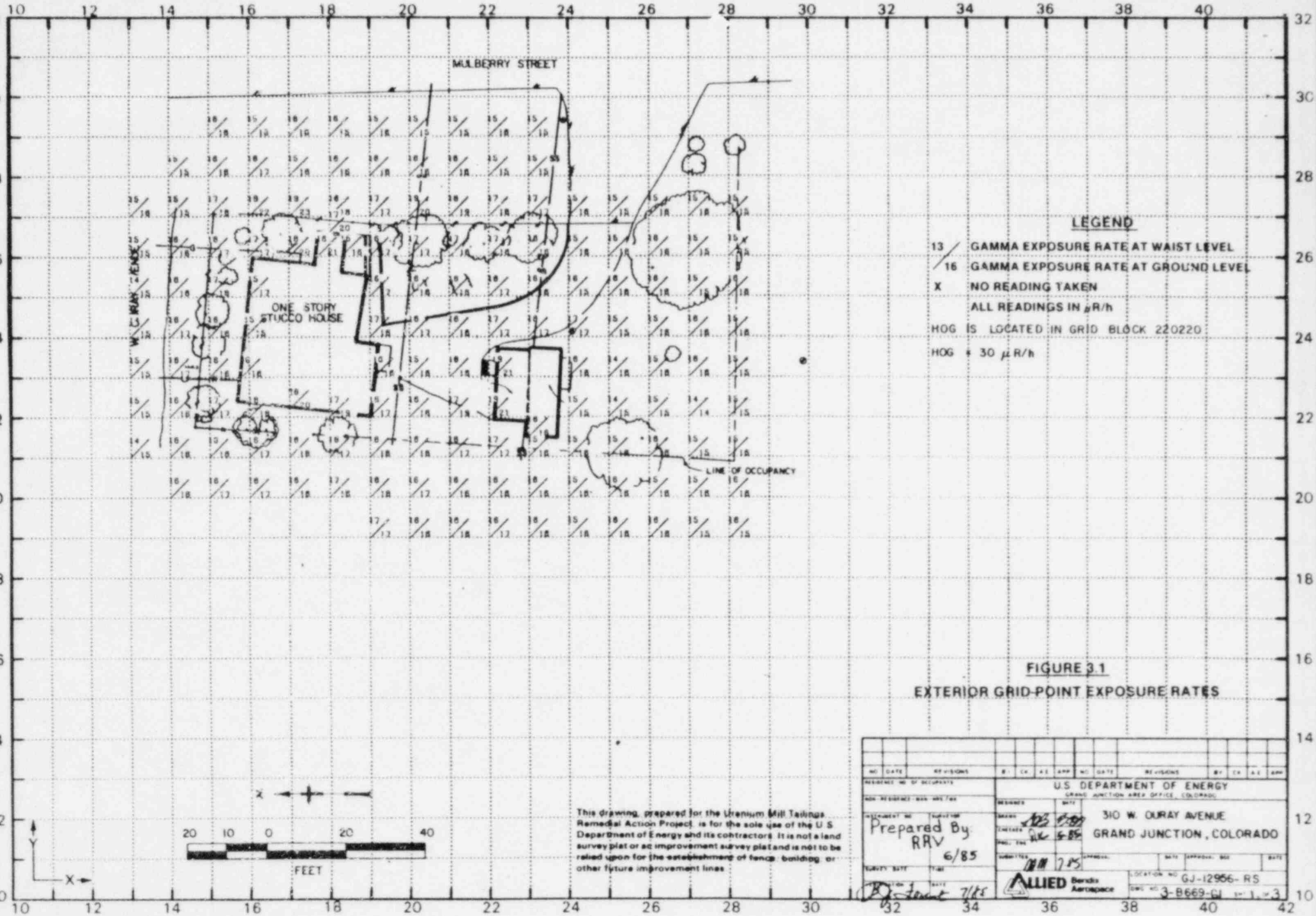


FIGURE 3.1

EXTERIOR GRID-POINT EXPOSURE RATES

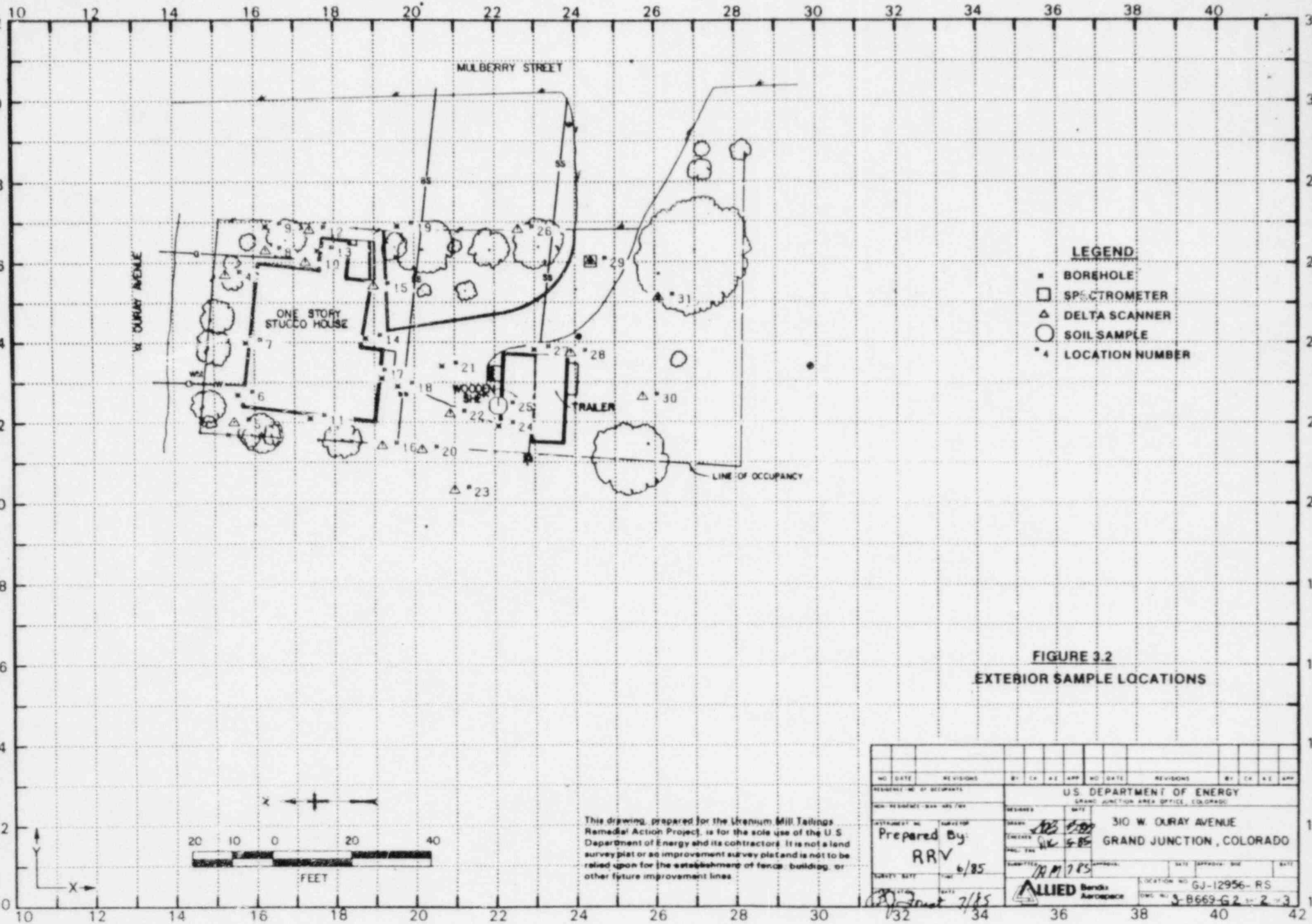


FIGURE 3.2

EXTERIOR SAMPLE LOCATIONS

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 as improvement survey plat and is not to be relied upon for the establishment of fence, building, or other future improvement lines.

Prepared By: RRV 6/85

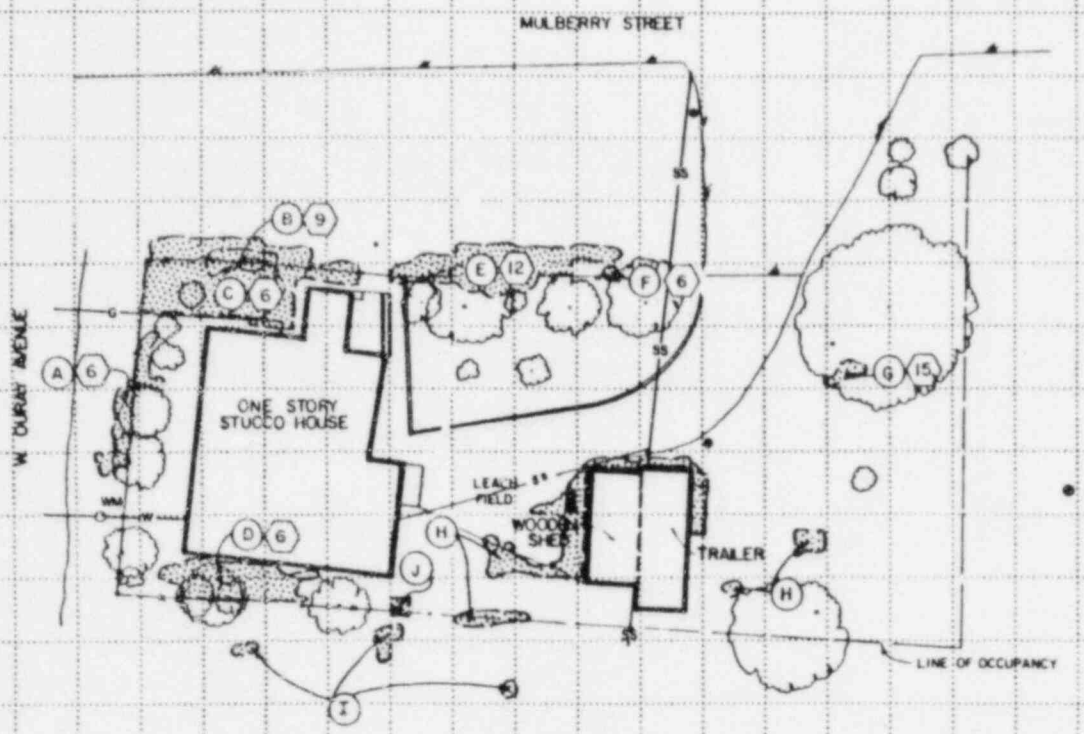
U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION AREA OFFICE, COLORADO

310 W. OURAY AVENUE
GRAND JUNCTION, COLORADO

ALLIED Bendix Aerospace

GJ-12956-RS

S-B669-G2-2-3



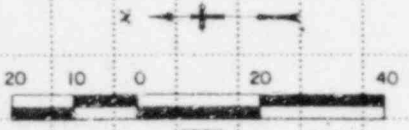
LEGEND

- BOUNDARY OF CONTAMINATION
- A — AREA OF CONTAMINATION
- 18 — DEPTH OF CONTAMINATION (INCHES)
- CONTAMINATED AREA

NOTE:
AREAS 'H AND J' ARE SURFACE CONTAMINATION
AREA 'I' IS SURFACE CONTAMINATION OUTSIDE THE LINE OF OCCUPANCY

FIGURE 3.3

EXTERIOR ESTIMATED EXTENT OF CONTAMINATION



Prepared By: RRV 6/85

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

310 W. OURAY AVENUE
GRAND JUNCTION, COLORADO

ALLIED Bendix Aerospace

GJ-12956-RS

3-B669-G3-3-3

3/85

DOE ID NO. GJ-12956-RS Date June 17, 1985

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

Official Survey Report

Property Address 310 West Ouray Avenue

Property Owner Ben Guillen

Address of Owner (if different from above) _____

Report Prepared By Robert R. Vialpando

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

1___1 No evidence of residual radioactive material on surveyed property.

1_XX_1 Residual ractioactive materials found at the following locations:

1_XX_1 In open areas.

1_XX_1 Under or around exterior improvements.

1_XX_1 Under or around a typically nonoccupied structure.

1_XX_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 = 44 uR/h
HOG = 30 uR/h

MEMORANDUM

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado

Date: May 17, 1985

To: Files

From: Robert R. Vialpando
Robert R. Vialpando

Subject: Team Leader Notes - GJ-12956-RS

Address: 310 West Ouray Avenue

Owner: Mr. and Mrs. Ben Guillen

Telephone: 243-1369

Occupancy: Two

Date of Survey: May 17, 1985, 0900 Hours

Colorado Department of Health (CDH) and Oak Ridge National Laboratory (ORNL) data indicates contamination to be located in the yard and under or around the house.

Team Members

R. Vialpando (Team Leader)	M. Gilfillan
P. Hardy	S. Larsen
H. Mattison	V. Rothman
V. Young	N. Wallace

Instruments

Scintillometers: C-1042, C-1127, C-1149, C-1207
Deltas: C-3937, C-3940
Total Count Meters: C-3573, C-4006
Surface Spectrometer: C-3431
Downhole Spectrometer: C-3361

Upon arrival, the Bendix team was met by Mr. Guillen. Verbal approval was given to survey the property.

Since historical data indicated interior contamination, interior exposure-rate measurements were taken at surface and 3-foot levels. A complete gamma scan of the ground floor of the primary structure showed general range of background. Exposure rate readings ranged from 90 to 145 counts per second (cps). Elevated gamma levels ranging from 250 to 500 cps were measured in a small area in the doorway between the dining room and the kitchen. In isolated areas of the interior dining room walls, measurements of 195 to 300 cps were recorded on contact. Source points (ore samples) were the suspected cause of the elevated readings.

Suspected source points in the adobe walls were detected in the south wall, approximately 2 feet from the west wall and 48 inches from the floor surface; in the north wall, approximately 18 inches from the east wall and 60 inches from the surface; in the east corner wall, 50 inches from the surface; and in the west wall, approximately 27 inches from the north wall, approximately 54 inches from the surface.

The owner (Mr. Guillen) stated that in 1978 an addition to the south portion of the primary structure was built; however, before the addition was constructed, soil was removed and an ore sample that was found along the south exterior wall was also removed.

The floor consisted of wood planks resting directly on the soil surface. The exterior walls were built on stone footings. The bearing wall, in the center of the structure, is constructed of railroad neckties. The bearing wall runs east and west.

Trailer and Shed

Interior exposure rates were taken, a background range from 90 to 135 counts per second (cps) was recorded. Elevated gamma levels ranging from 165 to 180 cps were recorded at the surface of the shed. Elevated counts were believed to be shine from the exterior, since the floor was made of wood. The trailer and shed were resting on brick.

Exterior Investigation

The surveyor's sketch showed no property pins or property boundaries Property description was; Lots 1 and 2 as occupied, of Block 4, Carpenter's Subdivision number 2.

Exterior grid points and gamma survey was conducted. Background range was 80 to 145 cps. Elevated gamma levels were detected in the north, east, south, and west yards. These areas were investigated by taking surface and subsurface delta measurements and borehole logs with the total count meters. The locations that showed elevated gamma levels appeared to be associated with the fire brick, which was scattered throughout the property, since decayed brick was found near or around these areas. No visible evidence of mill tailings material was sighted while augering holes or digging subsurface delta holes, nor when footing/foundation holes were dug.

While the team members were attempting to locate the utility lines, I talked with Mr. Guillen. Mr. Guillen stated that the property was once a dump site for the city and that the primary structure was built in the 1930's. All utility lines and an abandoned leach field in the south yard were investigated. It was brought to my attention by the owner that the sewer line from the primary structure leading out, does not drain as shown on the surveyor's sketch. The sewer line runs southeast to the sewer line that exits the trailer.

A grab sample of the fire brick, which was associated with the elevated gamma levels, was taken for analysis.

West of the primary structure outside the line of occupancy, elevated gamma levels were detected. Fire brick existed around these areas. Delta measurements were taken at surface and subsurface in grid block 210200. Surface measurement showed an elevated delta count.

Since the property description is line of occupancy, no spillover request was generated.

Team members were frisked for possible gamma exposure, results were negative. All actions and work details were conducted in a safe manner, no accidents occurred.

Memorandum

ALLIED Bendix Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado

Date: September 3, 1985

To: C. Kelleher

From: R. B. Chessmore

Subject: Sample MBD 637--GJ-12956-RS, located at 310 W. Ouray

The analyses performed to date show that the isotopes in the uranium-238 chain are out of equilibrium. This would lead me to suspect that the sample probably contains tailings material.

RBC:jp

BENDIX FIELD ENGINEERING CORPORATION

P.O. Box 1569
Grand Junction, Colorado 81502

CERTIFICATE OF ASSAY

REQUESTED BY C. Kelleher REQUISITION NO. 402484 DATE August 30, 1985

	LAB NO.	pCi/g U-238	pCi/g U-234	pCi/g Th-230
MBD 637	106097	10	12	31

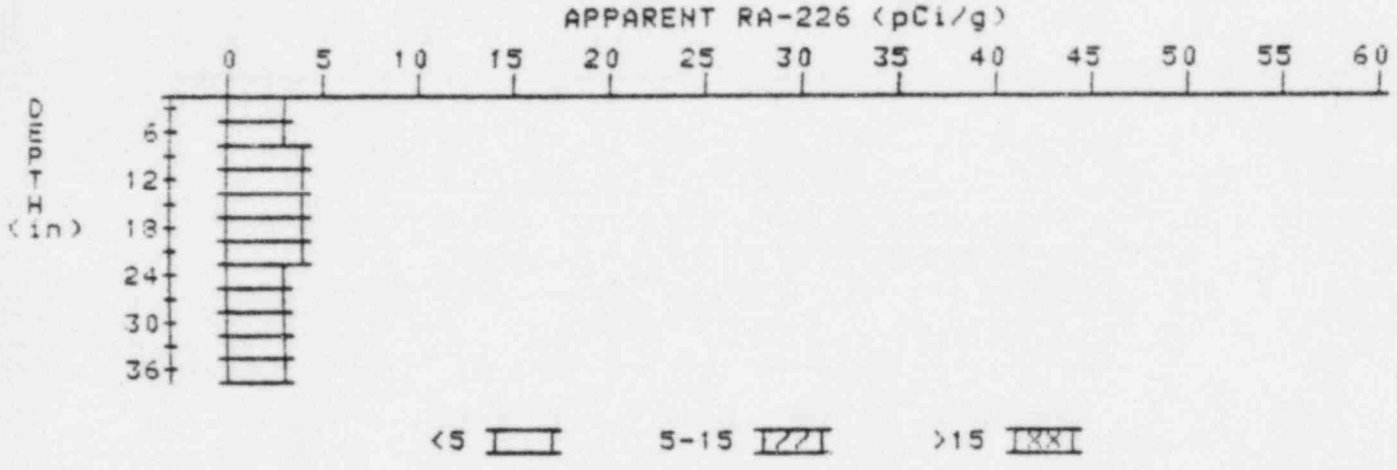
Reference: GJ-12956-RS, located at 310 W. Ouray

SENIOR ANALYST

DECON V85.1<950524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 6

PROPERTY NUMBER: GJ-12956-RS
HOLE NUMBER: 6
LOCATION: 156227

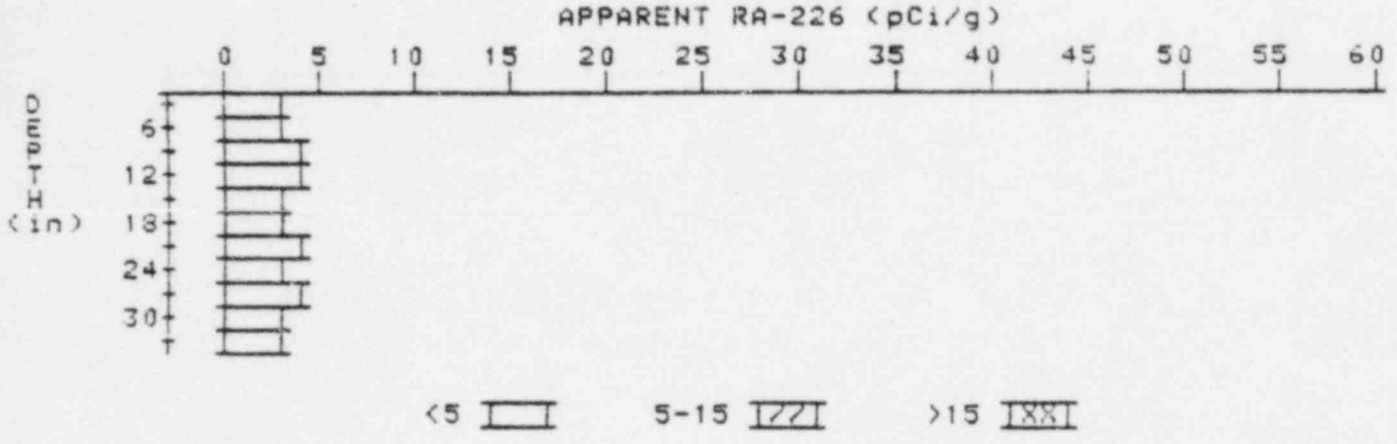


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.4	3.4
9	3.5	3.7
12	3.5	3.5
15	3.5	3.5
18	3.5	3.5
21	3.5	3.7
24	3.4	3.4
27	3.3	3.1
30	3.3	3.3
33	3.3	3.1
36	3.4	3.4

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 7

PROPERTY NUMBER: GJ-12956-RS
HOLE NUMBER: 7
LOCATION: 158240

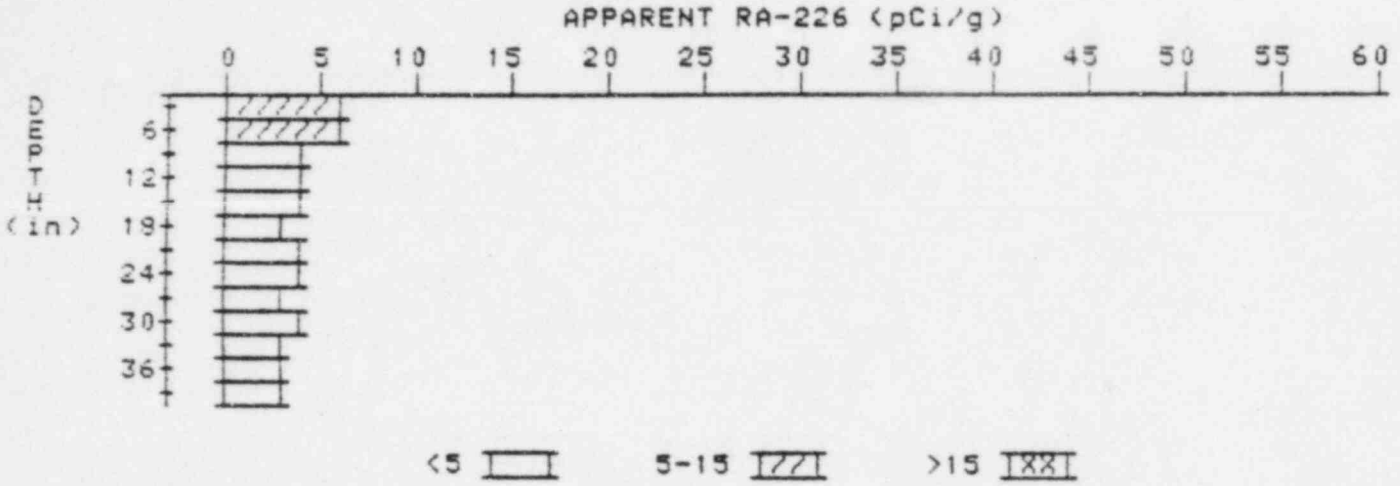


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.2	3.2
9	3.4	3.6
12	3.5	3.9
15	3.4	3.2
18	3.4	3.2
21	3.5	3.9
24	3.4	3.2
27	3.4	3.6
30	3.3	3.1
33	3.3	3.3

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-12936-RS
HOLE NUMBER: 9
LOCATION: 163269

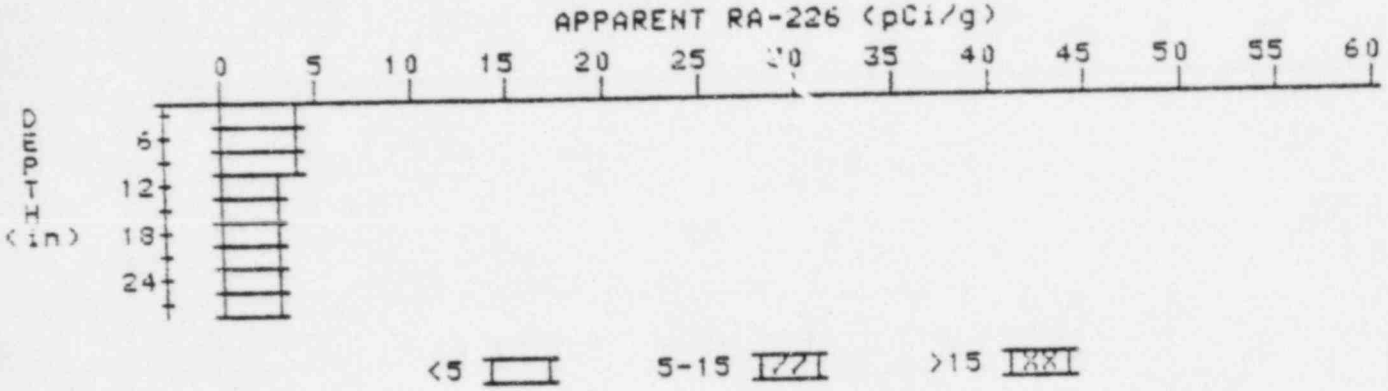


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.0	6.0
6	5.5	6.0
9	4.7	4.2
12	4.2	3.7
15	4.0	4.0
18	3.8	3.4
21	3.8	4.0
24	3.7	3.9
27	3.5	3.1
30	3.5	3.7
33	3.4	3.4
36	3.3	3.3
39	3.2	3.2

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 11

PROPERTY NUMBER: GJ-12936-RS
HOLE NUMBER: 11
LOCATION: 174221

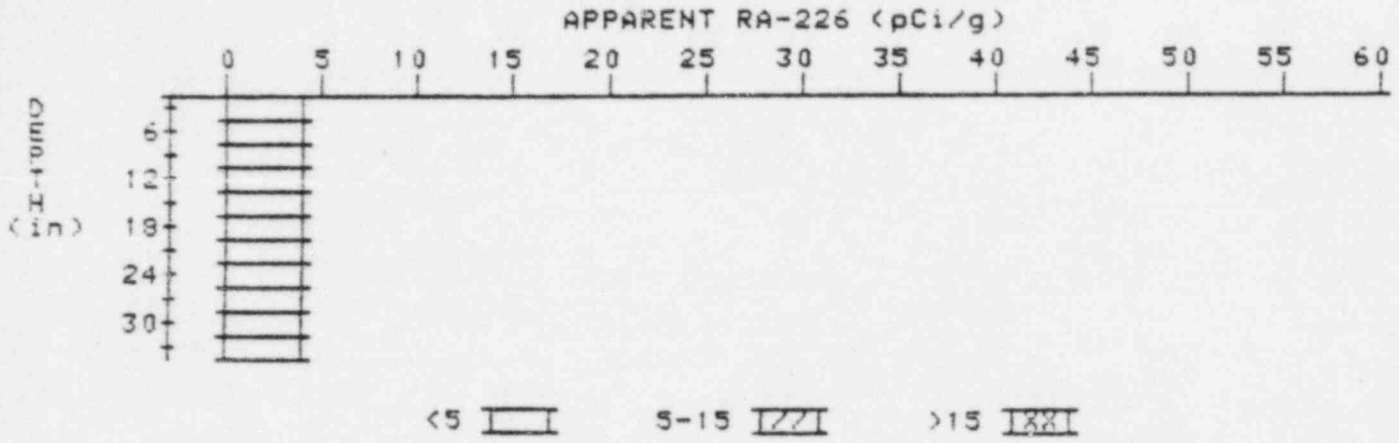


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.2	4.2
6	3.9	3.7
9	3.7	3.9
12	3.4	3.0
15	3.3	3.3
18	3.2	2.8
21	3.3	3.5
24	3.3	3.3
27	3.3	3.3

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 13

PROPERTY NUMBER: GJ-12956-RS
HOLE NUMBER: 13
LOCATION: 176263

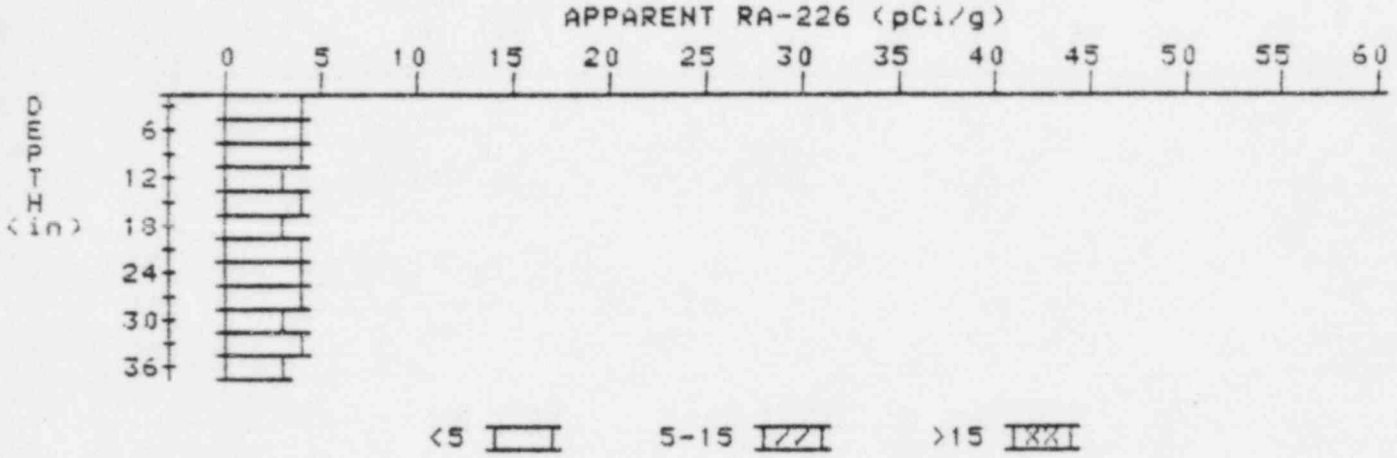


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.2	4.2
6	4.1	3.9
9	4.1	4.3
12	4.0	4.0
15	3.9	3.9
18	3.8	3.6
21	3.8	3.8
24	3.8	4.0
27	3.7	3.7
30	3.6	3.6
33	3.5	3.5

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 14

PROPERTY NUMBER: GJ-12936-RS
HOLE NUMBER: 14
LOCATION: 188241

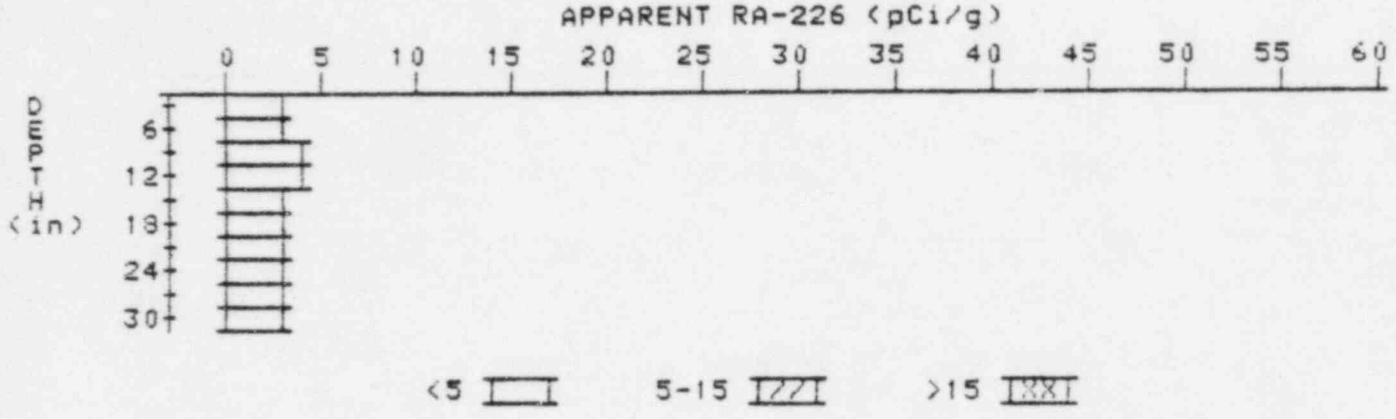


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.1	4.1
6	4.0	4.0
9	3.9	4.1
12	3.7	3.3
15	3.7	3.9
18	3.6	3.4
21	3.6	3.6
24	3.6	3.8
27	3.5	3.5
30	3.4	3.2
33	3.4	3.6
36	3.3	3.3

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 17

PROPERTY NUMBER: GJ-12956-RS
HOLE NUMBER: 17
LOCATION: 192231

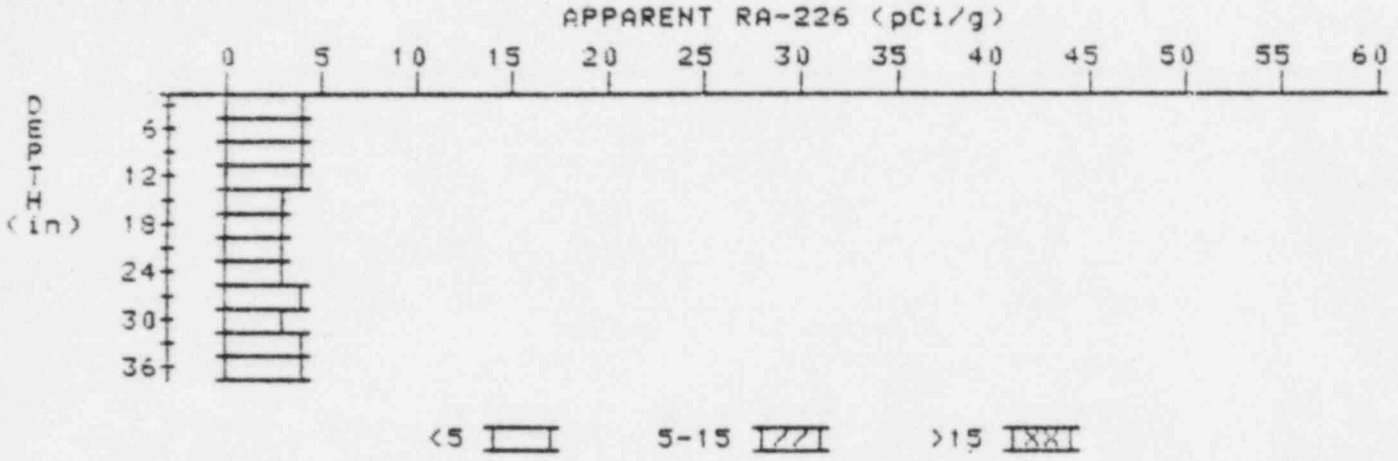


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.4	3.4
6	3.4	3.2
9	3.5	3.7
12	3.5	3.7
15	3.4	3.4
18	3.3	3.1
21	3.3	3.5
24	3.2	3.0
27	3.2	3.4
30	3.1	3.1

DECON V85.1(850524.0823)

APPARENT RADIUM-226 CONCENTRATION 18
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-12956-RS
HOLE NUMBER: 18
LOCATION: 196229

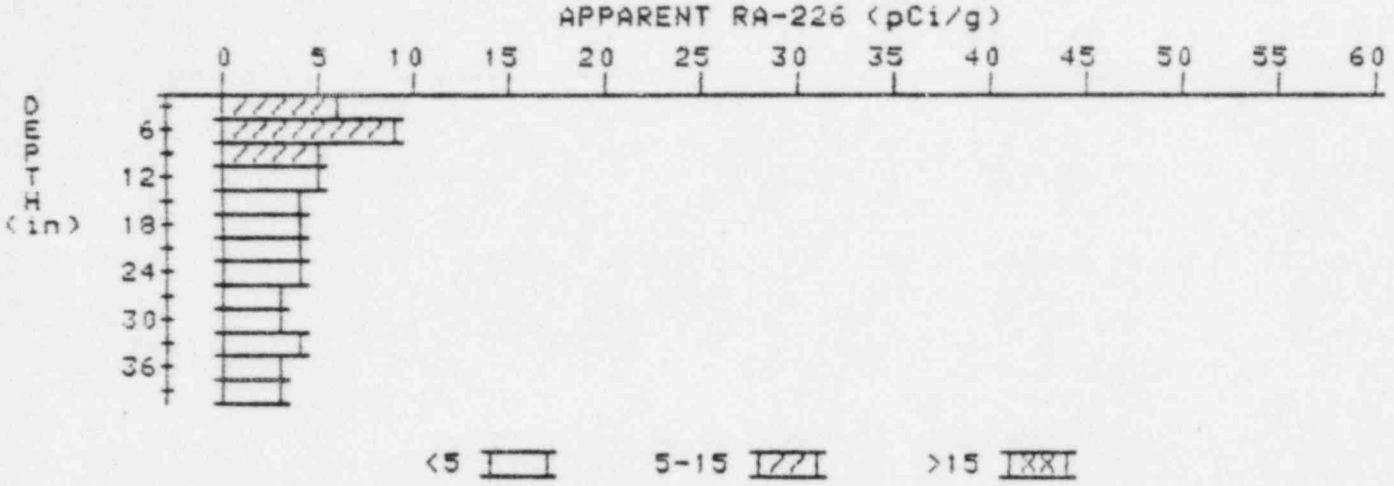


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.0	4.0
6	3.9	4.1
9	3.7	3.7
12	3.5	3.5
15	3.3	3.1
18	3.2	3.0
21	3.2	3.0
24	3.3	3.1
27	3.9	3.9
30	3.5	3.3
33	3.6	3.8
36	3.6	3.6

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 19

PROPERTY NUMBER: GJ-12956-RS
HOLE NUMBER: 19
LOCATION: 196269

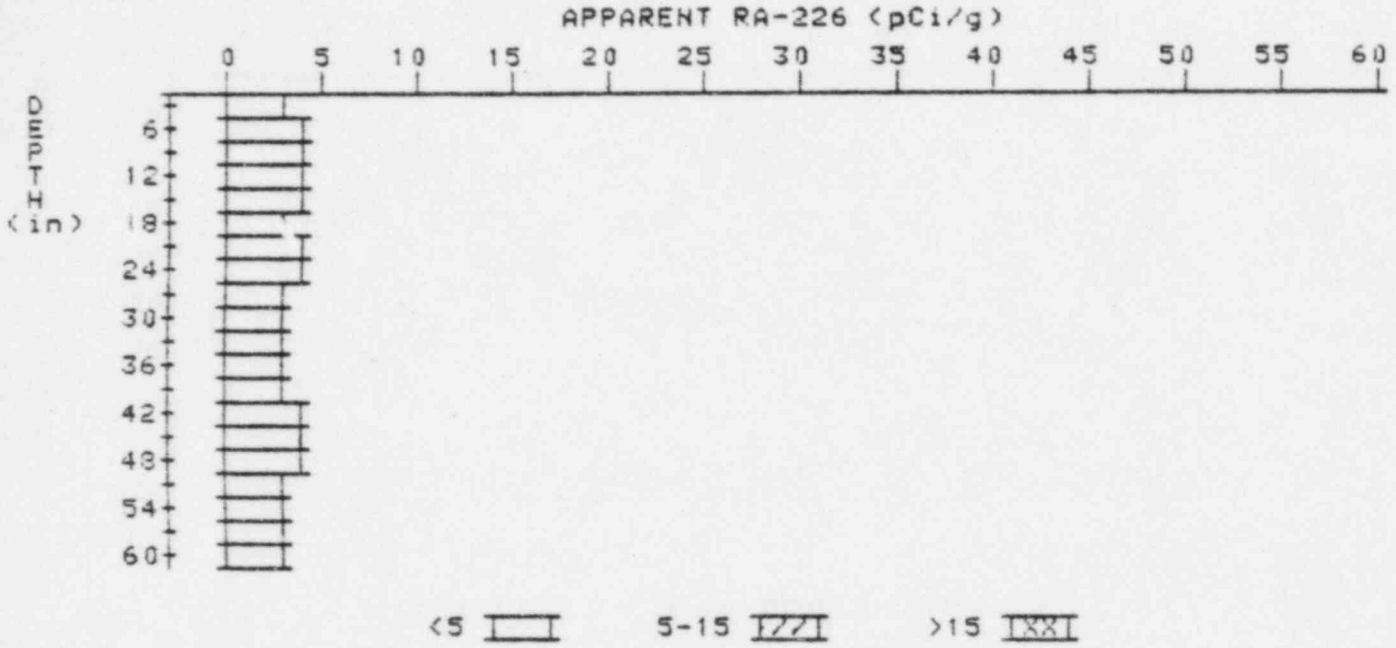


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.7	5.7
6	6.3	3.8
9	5.5	5.1
12	4.9	4.7
15	4.4	4.0
18	4.1	3.9
21	3.9	3.7
24	3.8	4.0
27	3.6	3.4
30	3.5	3.3
33	3.5	3.7
36	3.4	3.4
39	3.3	3.3

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION 21
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-12956-RS
HOLE NUMBER: 21
LOCATION: 207234



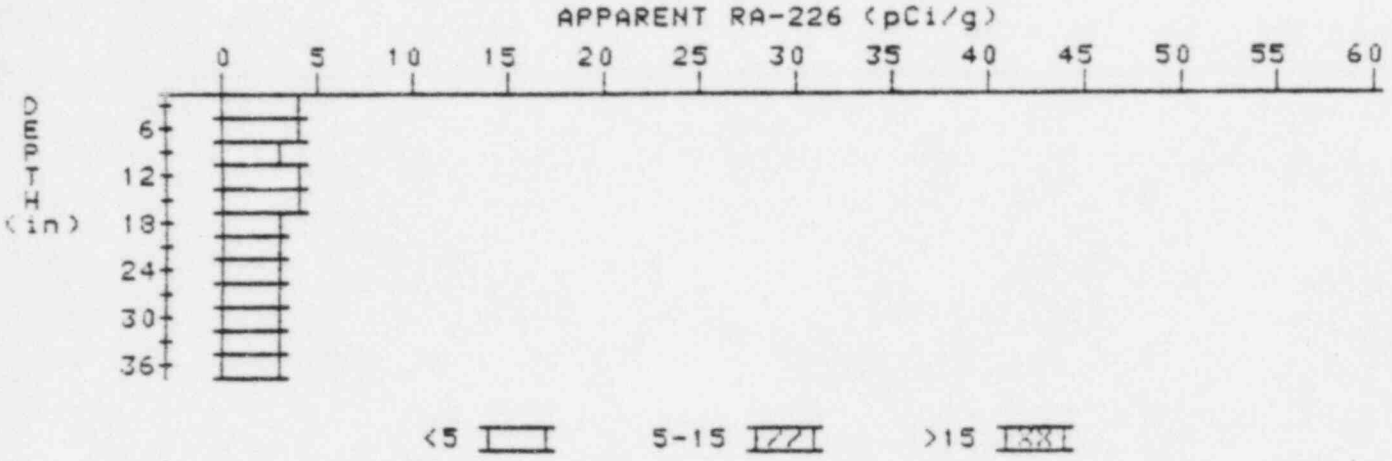
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.6	4.0
9	3.7	3.7
12	3.8	4.2
15	3.7	3.7
18	3.6	3.4
21	3.6	3.8
24	3.5	3.7
27	3.3	2.9
30	3.3	3.3
33	3.3	3.3
36	3.3	3.1
39	3.4	3.4
42	3.5	3.5
45	3.6	3.8
48	3.6	4.0
51	3.4	3.2
54	3.3	3.3

57	3.2	3.0
60	3.2	3.2.

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 24

PROPERTY NUMBER: GJ-12956-RS
HOLE NUMBER: 24
LOCATION: 221219

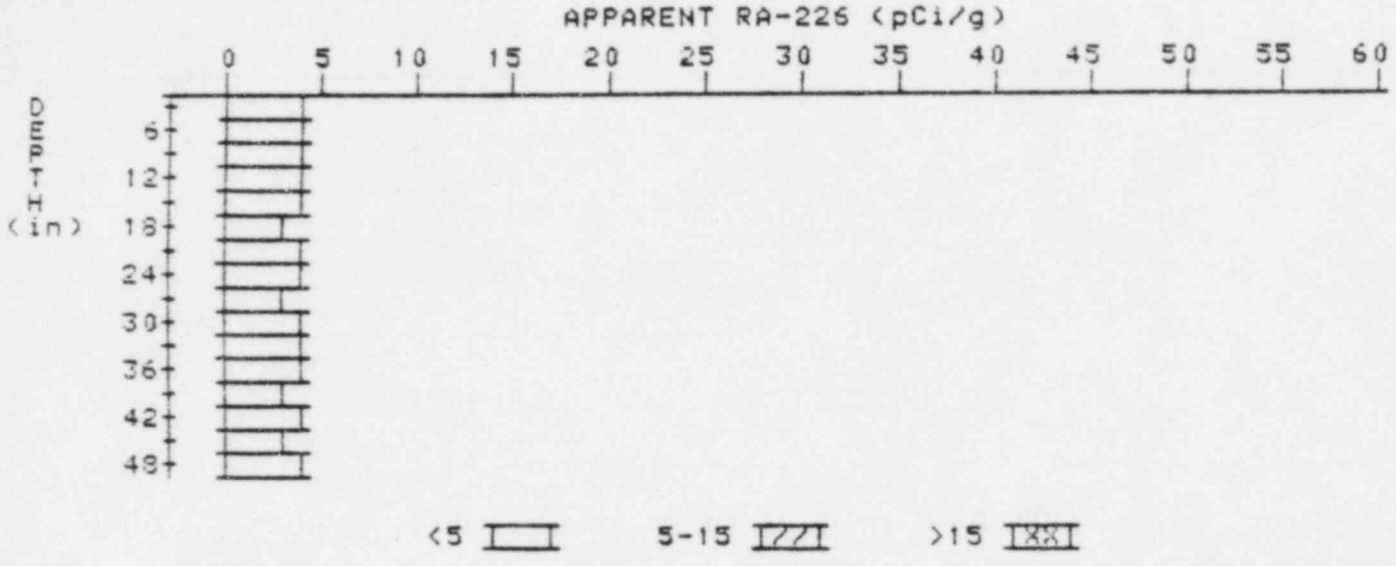


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.6	3.6
6	3.5	3.7
9	3.3	2.6
12	3.5	3.9
15	3.5	3.7
18	3.4	3.4
21	3.3	3.3
24	3.2	3.0
27	3.2	3.2
30	3.2	3.2
33	3.2	3.2
36	3.2	3.2

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION 27
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-12956-RS
HOLE NUMBER: 27
LOCATION: 230238

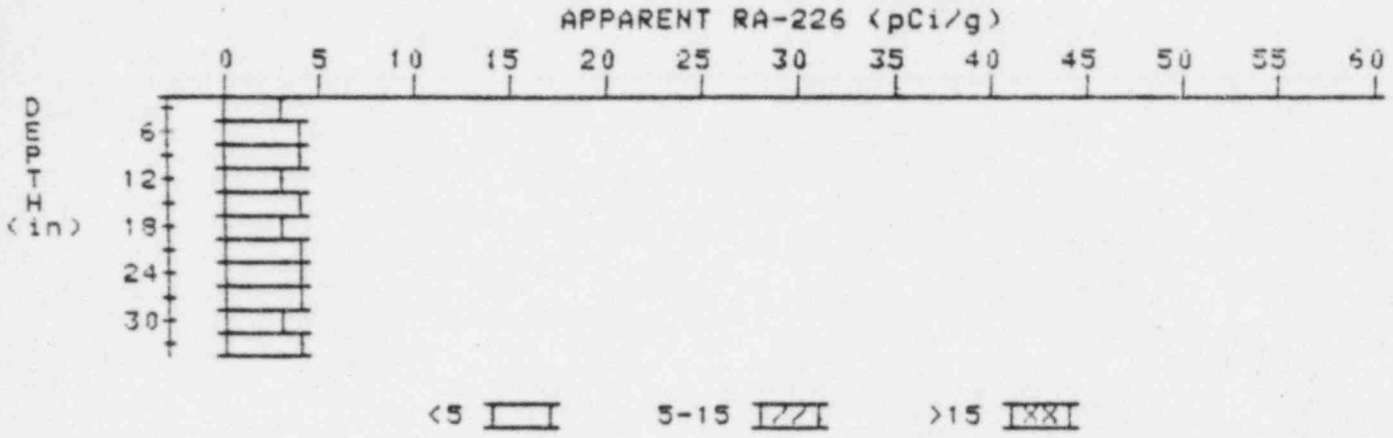


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.5	3.5
6	3.6	3.6
9	3.7	3.7
12	3.8	4.2
15	3.7	3.7
18	3.6	3.4
21	3.6	3.6
24	3.6	3.8
27	3.5	3.3
30	3.5	3.5
33	3.5	3.5
36	3.5	3.5
39	3.5	3.3
42	3.6	4.0
45	3.5	3.3
48	3.5	3.5

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 29

PROPERTY NUMBER: GJ-12956-RS
HOLE NUMBER: 29
LOCATION: 244260

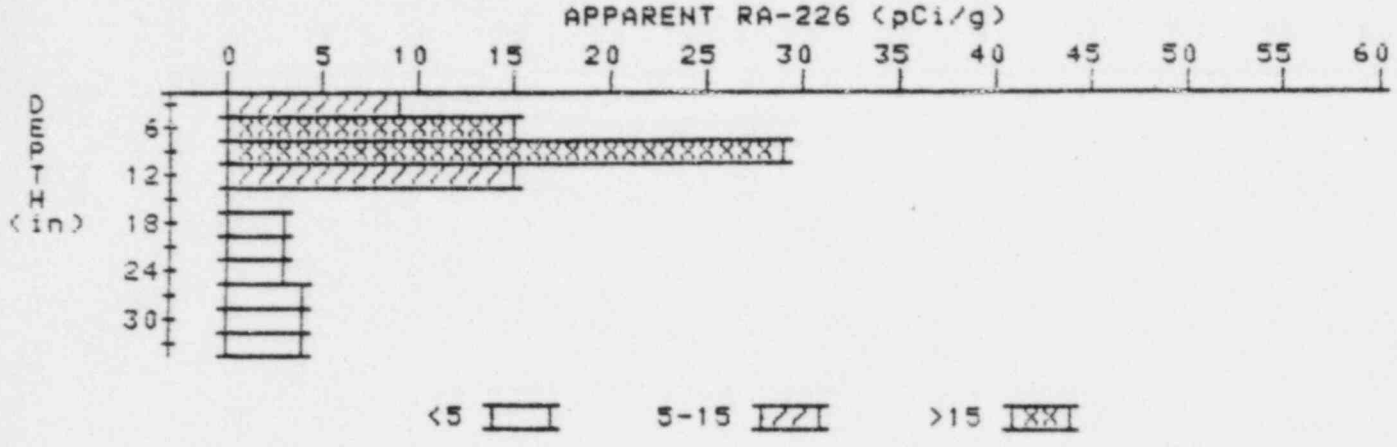


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.4	3.4
6	3.6	4.0
9	3.6	3.6
12	3.6	3.4
15	3.7	4.1
18	3.6	3.4
21	3.6	3.6
24	3.6	3.8
27	3.5	3.5
30	3.4	3.0
33	3.5	3.5

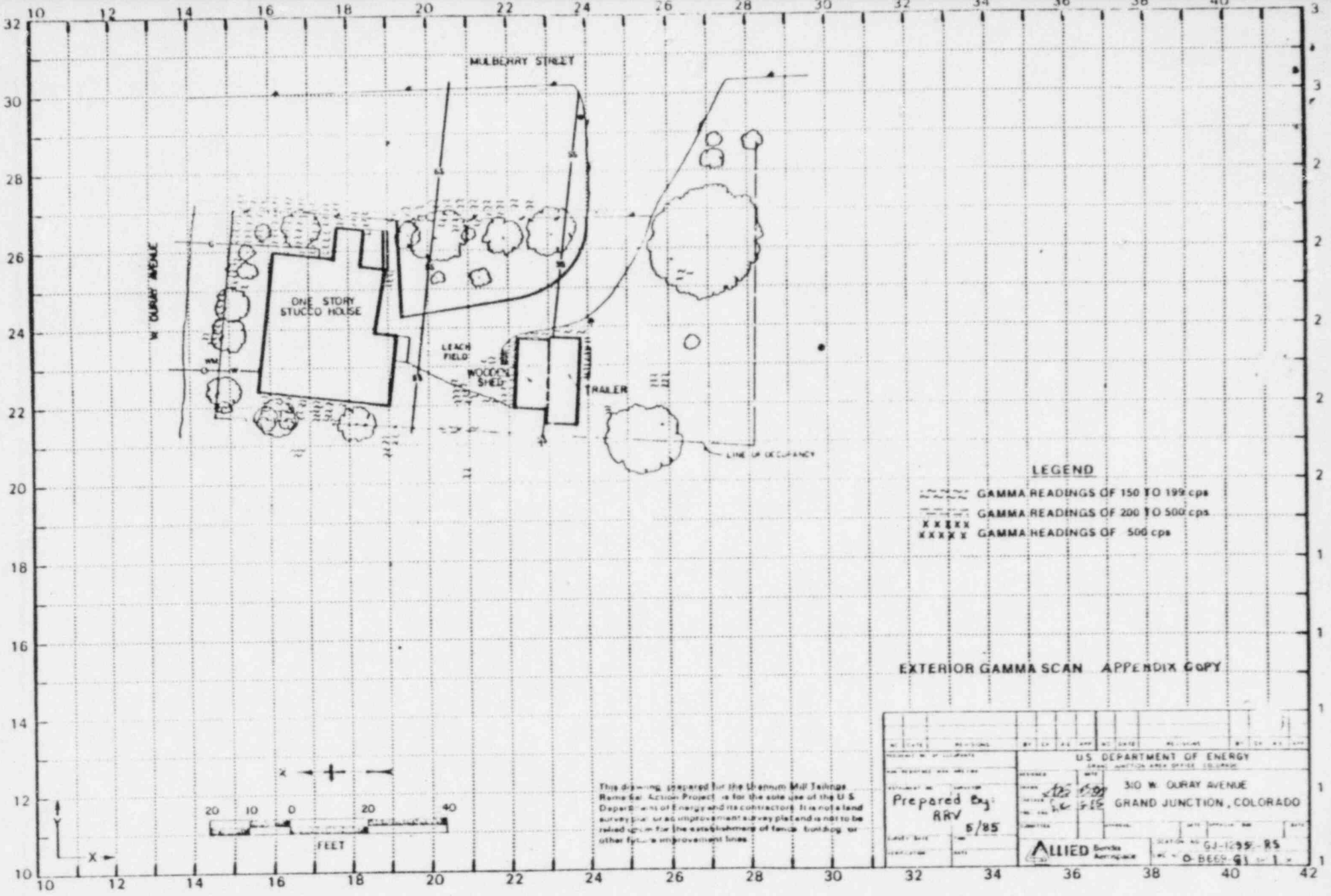
DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 31

PROPERTY NUMBER: GJ-12956-RS
HOLE NUMBER: 31
LOCATION: 261251



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	9.1	9.1
6	13.2	15.2
9	16.2	28.8
12	12.1	14.6
15	6.6	-.2
18	4.9	3.3
21	4.1	3.4
24	3.7	3.0
27	3.7	3.7
30	3.7	3.7
33	3.7	3.7


MULBERRY STREET
W. OURAY AVENUE
ONE STORY STUCCO HOUSE
LEACH FIELD
WOODEN SHED
TRAILER
LINE OF OCCUPANCY
LEGEND
GAMMA READINGS OF 150 TO 199 cps
GAMMA READINGS OF 200 TO 500 cps
GAMMA HEADINGS OF 500 cps
EXTERIOR GAMMA SCAN APPENDIX COPY
20 10 0 20 40
FEET
X
Y
Prepared by
RRV
5/85
US DEPARTMENT OF ENERGY
310 W. OURAY AVENUE
GRAND JUNCTION, COLORADO
ALLIED
GJ-1295-85
O-BEES-G1-1