

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-04370-RM
ADDRESS: 938 ROOD AVENUE

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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APPROVED BY

M. K. Tucker *by* *CD4*

M. TUCKER
DOE PROJECT ENGINEER

DATE

July 12, 1985

REA04370GJ:REA-GE003

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PDR WASTE PDR
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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-04370-RM, is a multi-family residence located at 938 Rood 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, 30 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$4,937. Remedial action on this property will take approximately 8 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 938 Rood Avenue, Grand Junction, Colorado

Zoning: Residential (RMF-64)

Lot Size: Approximately 6,250 sf (0.14 acre)

Legal Description: Lots 23 and 24, Block 91, City of Grand Junction, County of Mesa, State of Colorado

Point of Reference: This property is located approximately 1 mile 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:	Alley
South:	Rood Avenue
East:	Single-family residence
West:	Single-family residence

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Multi-family residence
Size:	Approximately 1,903 sf
Construction Date:	1905
Construction:	Single-story wood-frame with wood siding
Foundation:	Concrete spread footing
Footing Depth:	Approximately 19" to bottom of footing from grade
Basement:	Yes - partial
Crawl Space:	None
Condition:	Good

Other Structures:

Type:	Garage
Size:	Approximately 256 sf
Construction:	Wood-frame with wood siding
Foundation:	Concrete slab and spread footing
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 over 50 years old. Therefore, it does meet the eligibility criteria for consideration of inclusion on the National Register of Historic Places.

Alterations to Structure: Enclosed porch and attached single-story apartment north of original structure.

Architectural Significance: Minimal

Historical Significance: None known

3.0 RADIOLOGIC SURVEY

3.1 Introduction

Radiologic data were collected by Bendix at DOE ID No. GJ-04370-RM on March 14, 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 tailings involvement in the city sidewalk south of the primary structure. There is also tailings involvement under the sidewalk leading up to 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: 11 to 13 uR/h
Highest Outside Gamma Reading (HOG): 32 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: 10 to 12 uR/h
Highest Inside Gamma Reading (HIG): 15 uR/h

Interior gamma exposure-rate measurements are summarized in Appendix Table 3.2. 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 Figure 3.4. Data from these investigations are included in Appendix Table 3.1.

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) Southeast of the primary structure there is contamination to a depth of 8 inches below the 4-inch-thick uncontaminated concrete sidewalk. The total depth of contamination is 12 inches (approximately 75 sf).
- (AREA B) There is contamination to a depth of 11 inches below the 4-inch-thick uncontaminated concrete sidewalk south of the primary structure. The total depth of contamination is 15 inches (approximately 96 sf).
- (AREA C) The city sidewalk south of the primary structure has contamination to a depth of 14 inches below the 4-inch-thick concrete. The total depth of contamination is 18 inches (approximately 227 sf).
- (AREA D) The soil along the edges of the contaminated sidewalks is contaminated to a depth of 12 inches (approximately 260 sf).

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-04370-RM, 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 \$4,937.

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	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 - Basement
Figure 3.3b	Interior Gamma Exposure Rates - Ground Floor
Figure 3.4	Exterior Sample Locations
Figure 3.5	Exterior Estimated Extent of Contamination

Official Survey Report

Memo of Understanding

Team Leader Notes

Deconvolution Graphs (Apparent Radium-226 Concentration)

Radium Concentrations at Exterior Locations

DOE ID #GJ-04370-RM

938 Rood Avenue

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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	155235	00	DS	<1.0		*	Background
		00-06	SS			2.5	
		03	TC	3.0		*	
		06	TC	3.4		*	DC = 0 inches
		09	TC	3.7		*	
		12	BH	3.8	1.1	*	
		15	TC	4.0		*	
		18	BH	4.0	<1.0	*	
		21	TC	4.0		*	
		24	TC	4.0		*	
		27	TC	3.8		*	
		30	TC	3.8		*	
		33	TC	3.8		*	
		36	TC	3.8		*	
2	160210	03	TC	3.1		*	North foundation
		06	TC	3.4		*	
		09	TC	3.6		*	
		12	TC	3.7		*	DC = 0 inches
		15	TC	3.7		*	
		18	TC	3.6		*	
		21	TC	3.7		*	
		24	TC	3.6		*	
3	166219	03	TC	3.2		*	Near sewer line
		06	TC	3.2		*	
		09	TC	3.5		*	
		12	TC	3.6		*	DC = 0 inches
		15	TC	3.5		*	
		18	TC	3.6		*	
		21	TC	3.6		*	
		24	TC	3.4		*	
		27	TC	3.6		*	
		30	TC	3.7		*	
		33	TC	3.7		*	
		36	TC	3.7		*	
		39	TC	3.6		*	
		42	TC	3.8		*	
		45	TC	3.9		*	
		48	TC	4.0		*	
		51	TC	4.1		*	
		54	TC	4.2		*	
		57	TC	4.2		*	
		60	TC	4.4		*	

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.		
3	166219	63	TC	4.4		*	
		66	TC	4.4		*	
4	188221	00	DS	<1.0		*	Above gas line
		12	DS	1.6		*	On gas line
5	189236	03	TC	3.1		*	Near sewer line
		06	TC	3.4		*	
		09	TC	3.5		*	
		12	TC	3.6		*	
		15	TC	3.7		*	
		18	TC	3.7		*	
		21	TC	3.8		*	
		24	TC	3.6		*	
		27	TC	3.6		*	
		30	TC	3.6		*	
		33	TC	3.4		*	
		36	TC	3.3		*	
		39	TC	3.3		*	
		42	TC	3.4		*	
		45	TC	3.4		*	
		48	TC	3.5		*	
		51	TC	3.7		*	
		54	TC	3.9		*	
		57	TC	4.1		*	
		60	TC	4.1		*	
		63	TC	4.2		*	
		66	TC	4.1		*	
6	212212	03	TC	3.2		*	West foundation
		06	TC	3.5		*	
		09	TC	3.7		*	
		12	TC	3.8		*	
		15	TC	3.8		*	
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	TC	3.7		*	
		27	TC	3.7		*	
		30	TC	3.7		*	
		33	TC	3.5		*	
		36	TC	3.7		*	
7	243240	00	DS	8.8		*	Concrete sidewalk
		00-04	SS			2.6	Concrete core

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	243240	04-10	SS			22.8	Soil under core
		03	TC	15.5		*	
		06	TC	16.5		*	
		09	TC	11.2		*	
		12	BH	7.6	9.7	*	
		15	TC	6.0		*	
		18	BH	5.3	3.1	*	
		21	TC	4.9		*	
		24	BH	4.6	2.1	*	
		27	TC	4.5		*	DC = 12 inches
		30	TC	4.4		*	Based on the
		33	TC	4.3		*	deconvolution graph
		36	TC	4.2		*	
		39	TC	4.1		*	
		42	TC	4.1		*	
		45	TC	4.1		*	
		48	TC	4.2		*	
		51	TC	4.2		*	
		54	TC	4.3		*	
		57	TC	4.3		*	
		60	TC	4.2		*	
		63	TC	4.1		*	
		66	TC	4.1		*	
		69	TC	4.0		*	
8	244228	03	TC	3.7		*	Near water line
		06	TC	3.7		*	
		09	TC	3.8		*	
		12	TC	3.8		*	
		15	TC	3.8		*	
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	TC	3.8		*	
		27	TC	3.7		*	DC = 0 inches
		30	TC	3.6		*	
		33	TC	3.7		*	
		36	TC	3.6		*	
		39	TC	3.7		*	
		42	TC	3.9		*	
		45	TC	3.9		*	
		48	TC	4.0		*	
		51	TC	4.1		*	
		54	TC	4.1		*	
		57	TC	4.1		*	

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.		
8	244228	60	TC	4.0		*	
		63	TC	4.0		*	
9	245244	00	DS	7.4		*	Next to sidewalk
		06	DS	3.3		*	
		12	DS	1.8		*	DC = 12 inches
		00-06	SS			14.9	
10	246232	00	DS	12.9		*	Concrete sidewalk
		00-04	SS			4.5	Concrete core
		04-10	SS			86.3	Soil under core
		03	TC	18.2		*	
		06	TC	24.4		*	
		09	TC	17.4		*	
		12	BH	11.0	12.1	*	
		15	TC	7.4		*	
		18	BH	6.0	4.5	*	DC = 15 inches
		21	TC	5.3		*	Based on the
		24	BH	4.9	2.1	*	deconvolution graph
		27	TC	4.5		*	
		30	TC	4.4		*	
		33	TC	4.2		*	
		36	TC	4.1		*	
11	269226	00-04	SS			4.9	Concrete core
		04-10	SS			75.3	Soil under core
		03	TC	29.3		*	City sidewalk
		06	TC	34.3		*	
		09	TC	23.5		*	
		12	BH	15.2	20.6	*	
		15	TC	10.7		*	
		18	BH	8.3	7.7	*	
		21	TC	7.0		*	
		24	BH	6.3	4.0	*	DC = 18 inches
		27	TC	6.0		*	Based on the
		30	TC	5.7		*	deconvolution graph
		33	TC	5.4		*	
		36	TC	5.1		*	
		39	TC	4.9		*	
		42	TC	4.8		*	
		45	TC	4.7		*	
		48	TC	4.6		*	
		51	TC	4.7		*	
		54	TC	4.6		*	

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.		
11	269226	57	TC	4.5		*	
		60	TC	4.4		*	
		63	TC	4.3		*	
		66	TC	4.2		*	
		69	TC	4.1		*	
12	270234	00	DS	15.3		*	By city sidewalk
		06	DS	6.6		*	
		12	DS	<1.0		*	DC = 12 inches
		00-06	SS			29.8	
		06-12	SS			8.9	

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

Date of Survey = 03-14-85
 Team Leader = R2

Table 3.2

Summary of Interior Gamma Exposure Rates

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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)
BASEMENT	*	*	*	*	12-15	*
SOUTH APARTMENT	*	*	*	*	10-12	*
NORTH APARTMENT	*	*	*	*	10-10	*

* The CDH and ORNL data indicates the absence of interior contamination at this property. This information was investigated by performing a walking gamma scan. These areas and the ranges of gamma measurements are shown in Appendix Figures 3.3a and 3.3b.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-04370-RM

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<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
EXTERIOR					
	Concrete				
A	15 x 5 =	75	x 0.3 =	23	
B	8 x 5 =	40			
	16 x 3 =	48			
		<hr/>			
		88	x 0.3 =	26	
	Steps				
	4 x 2 =	8	x 1.0 =	8	
		<hr/>			
		96			
C	37 x 5 =	185			
	14 x 3 =	42			
		<hr/>			
		227	x 0.3 =	68	
				<hr/>	
	Volume of Concrete			= 125	= 125/27 = 5
	Contaminated Fill				
A	15 x 5 =	75	x 0.7 =	53	
B	8 x 5 =	40			
	16 x 3 =	48			
	4 x 2 =	8			
		<hr/>			
		96	x 1.0 =	96	
C	37 x 5 =	185			
	14 x 3 =	42			
		<hr/>			

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-04370-RM

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<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
D	130 x 2 =	260	x 1.0 =	260	
	Volume of Contaminated Fill			= 681	= 681/27 = 25
	TOTAL VOLUME - EXTERIOR				30

See Appendix Figure 3.5 For Areas

=====

Table 4.2
Estimated Cost of Decontamination and Restoration
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EXTERIOR

Remove concrete sidewalks 390 sf @ \$1.50/sf	\$ 585
Remove concrete stoop 1 cy @ \$100.00/cy	100
Remove identified residual radioactive material (manual - open) 25 cy @ \$44.00/cy	1,100
Remove/replace paving stones and bricks Lump sum	150
Replace roadbase 15 cy @ \$11.50/cy	173
Replace concrete sidewalks 390 sf @ \$1.50/sf	585
Replace concrete stoop 1 cy @ \$175.00/cy	175
Replace topsoil 10 cy @ \$9.50/cy	95
Install sod 180 sf @ \$.50/sf	90

TOTAL EXTERIOR \$ 3,053

ACCESS CONTROL 250

SUBTOTAL \$ 3,303

CONTINGENCY @ 15% 495

SUBTOTAL \$ 3,798

CONTRACTOR OVERHEAD & PROFIT @ 30% 1,139

GRAND TOTAL \$ 4,937

RDJ071185
REA04370/REA-GE003/LAJ

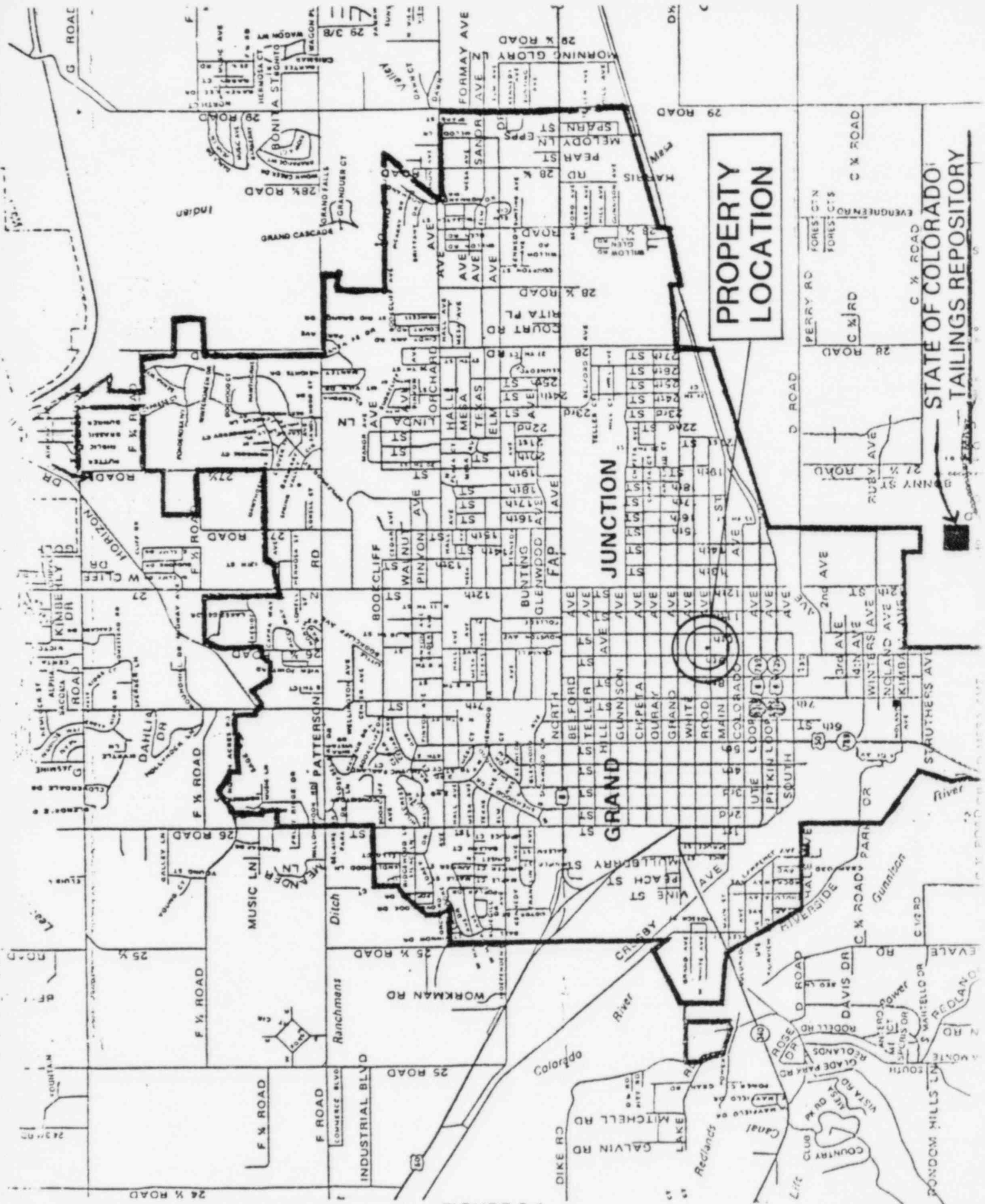
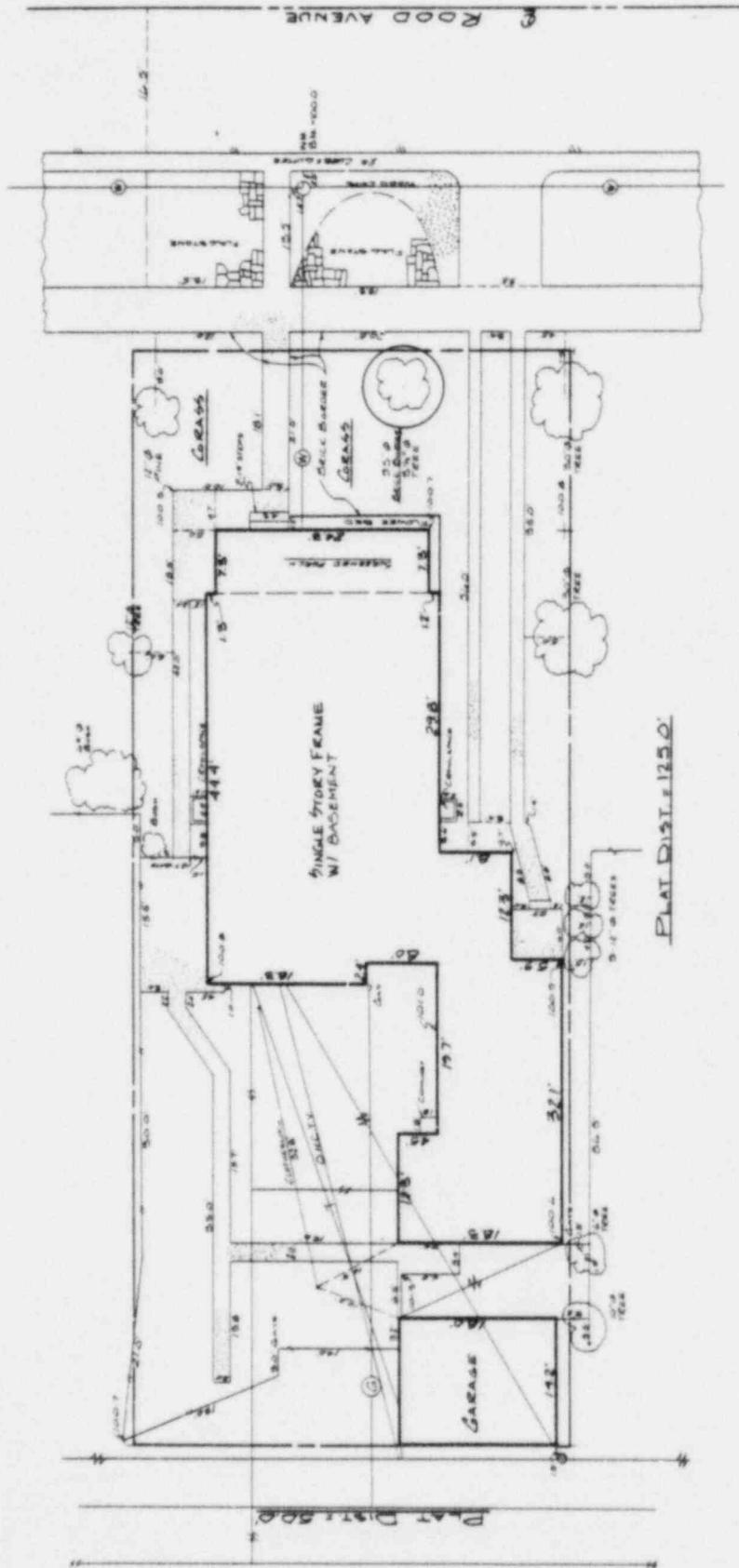
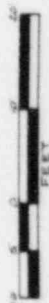


FIGURE 2.1
VICINITY MAP





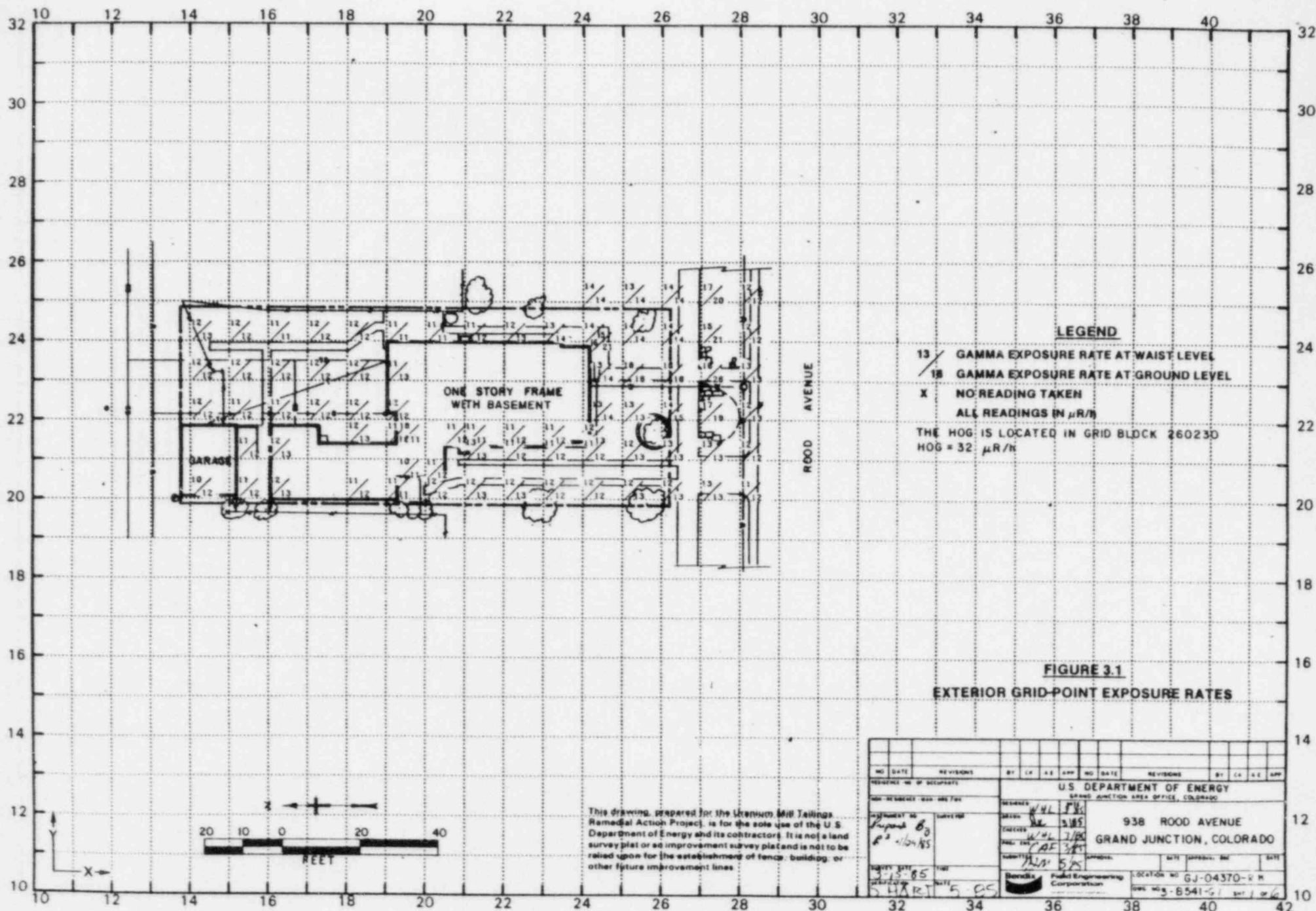
LOTS 23 AND 24 BLOCK 21 GRAND JUNCTION
CITY OF GRAND JUNCTION
MESA COUNTY, COLORADO

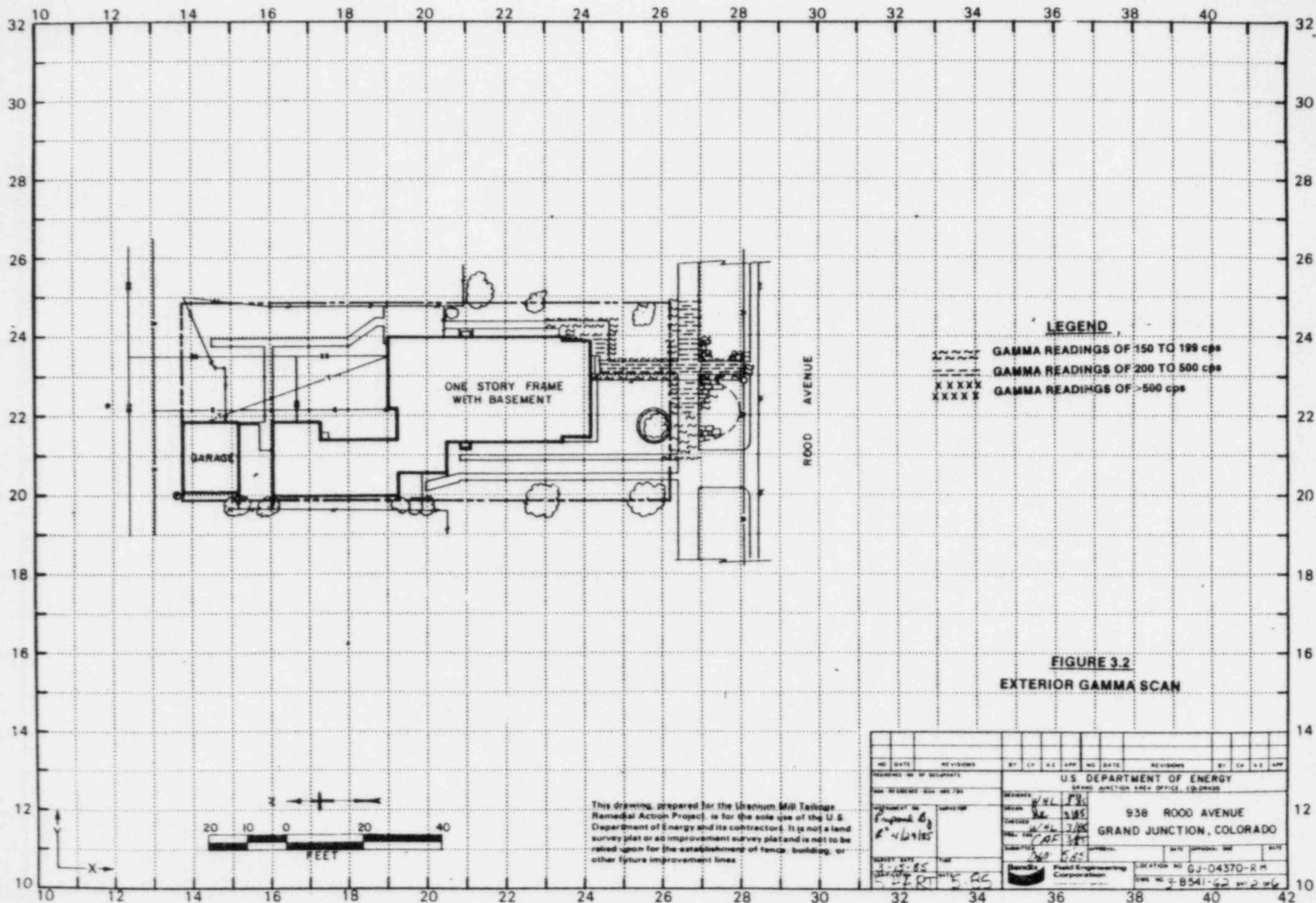


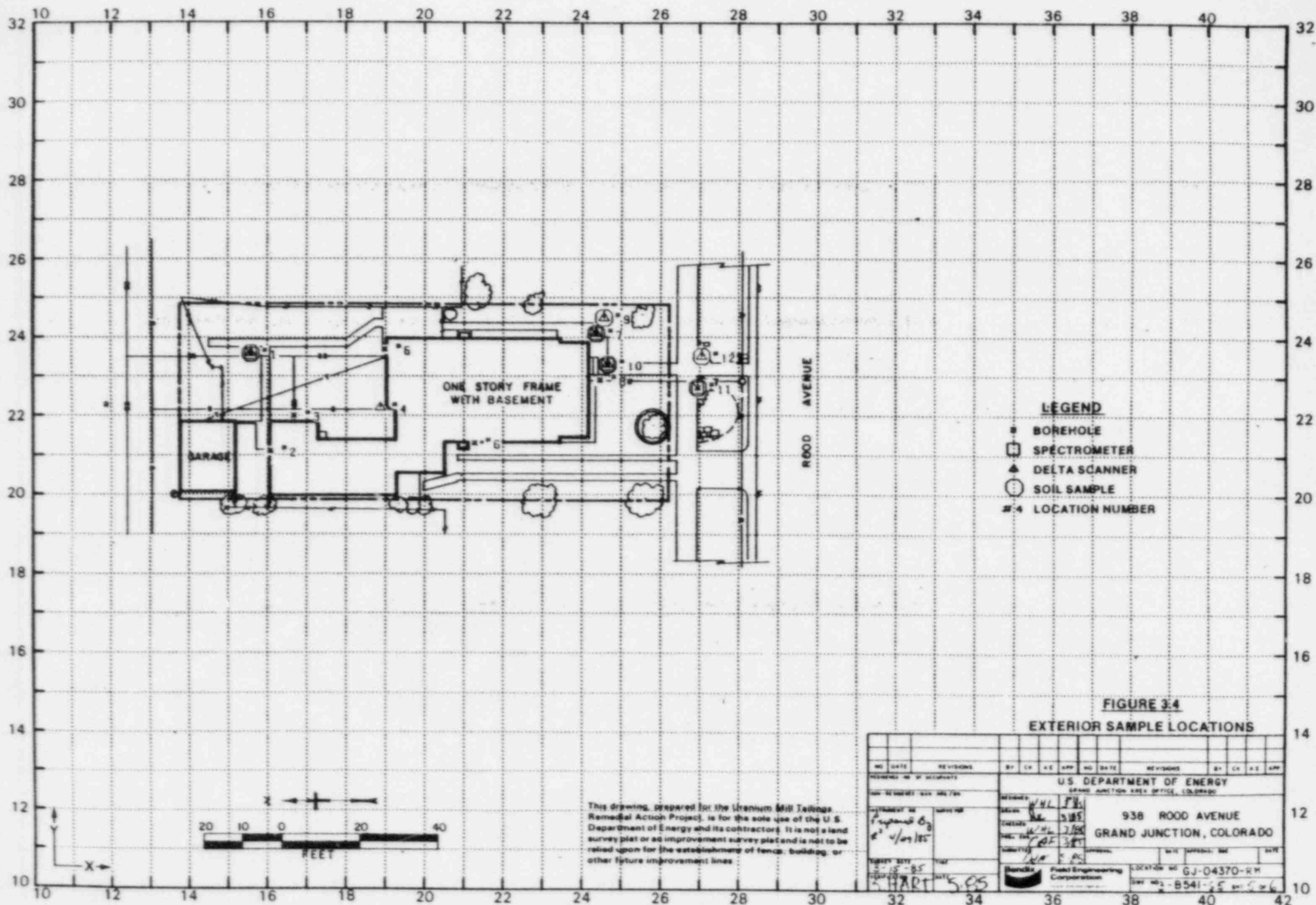
This drawing, prepared for the U.S. Department of Energy, is for the site use of the U.S. Department of Energy and is not to be used for any other purpose. It is not to be relied upon for the establishment of fence, building, or other improvements.

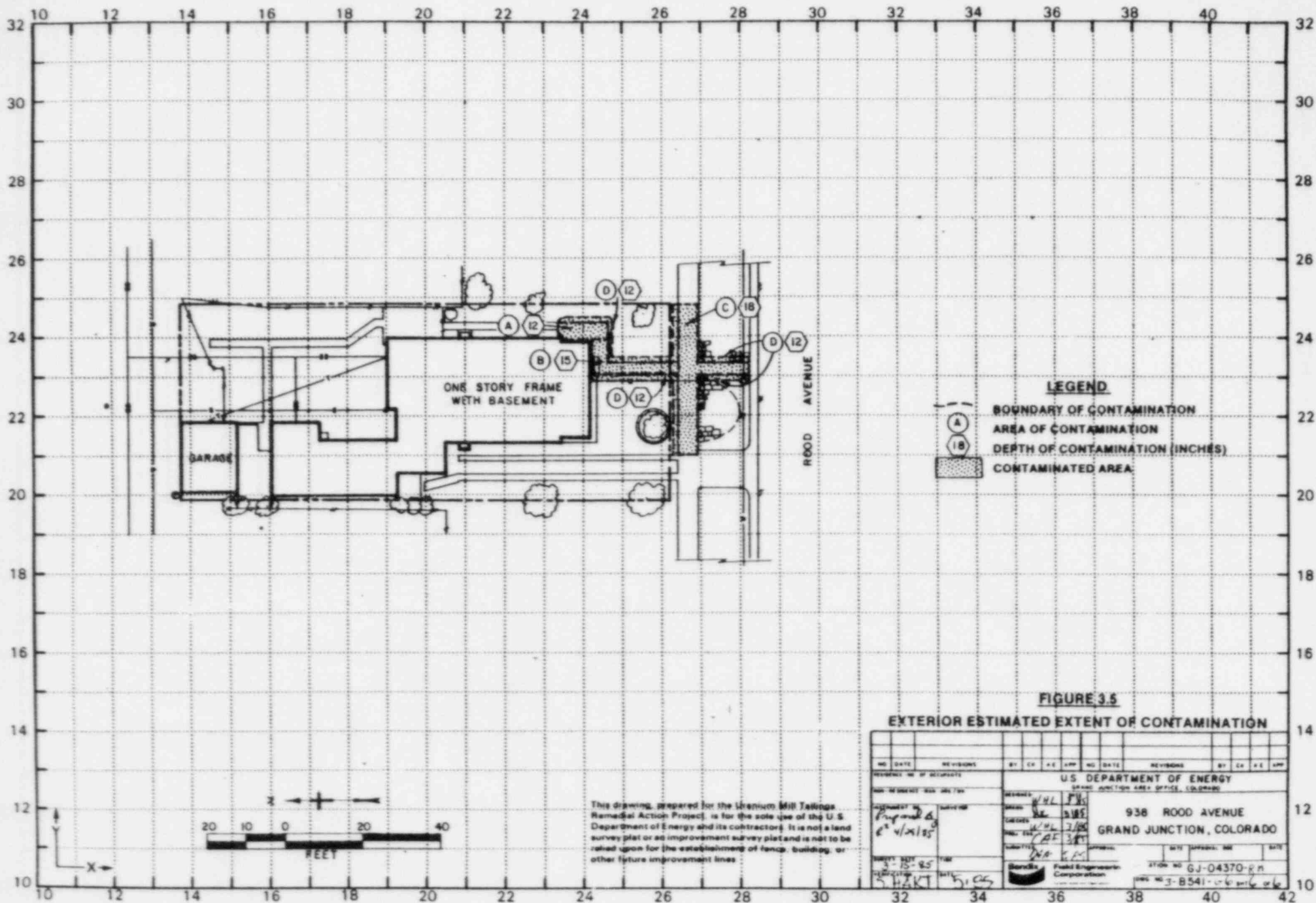
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GRAND JUNCTION PROJECT OFFICE, CO. COLORADO	6304370KS
ADDRESS 935 ROAD AVE	MADE
GRAND JUNCTION, COLORADO	MADE
SURV. NO. 34-85	GRANT 218 3-7-85
DATE 10/1/85	OK 10/1/85

FIGURE 2.2 SITE PLAN









3/85

DOE ID NO.

GJ-04370-RS *RM*
8/27/85

Date April 30, 1985

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

Official Survey Report

Property Address 938 Rood Avenue

Property Owner B. D. Black

Address of Owner (if different from above) P.O. Box 160, Whitewater, Colorado 81527

Report Prepared By R. Ryan

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

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

1XXXX1 Residual radioactive materials found at the following locations:

1XXX 1 In open areas.

1 1 Under or around exterior improvements.

1 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.

1XXXX1 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 = 15 uR/h
HOG = 32 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

April 30, 1985

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

ATTN: Elaine Brummett

Dear Elaine:

The following is in response to your questions and comments during the Technical Review concerning Department of Energy (DOE) Identification (ID) number GJ-04370-^{RM}~~RS~~ (938 Rood Avenue), conducted 19 April 1985.
₂₀₄₆₅

Areas requiring further comments are:

1. The final maps will be changed to read one story frame with Basement instead of Crawl Space.
2. The height of the basement floor below grade is approximately 5-feet.
3. The basement displayed no elevated readings during the interior scan, thus specific wall readings were not collected during the survey.
4. The specific locations of the water and sewer lines were not confirmed before investigation.
5. The key to the garage is not in the owner's possession but is kept by the owner's son. He is currently out of town, thus an interior survey was not done. The garage was built at approximately the same time the house was. According to the owner, the house was built in 1923.

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

Sincerely,

Rick Ryan
RSD Survey Team

RR:pr

MEMORANDUM

ALLIED Bendix
Aerospace

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

DATE: March 14, 1985
TO: Files
FROM: Rick Ryan
SUBJECT: Team Leader Notes - GJ-04370-~~RS~~ RM
#2/1/85

Address: 938 Rood Avenue

Owner: Beverly D. Black

Team Members

R. Ryan (Team Leader)	C. Holmes
N. Wallace	M. Dexter
C. Adams	J. Dickerson
M. Heronema	P. Hardy
T. Coulson	

Instruments

See equipment summary list.

Scintillometer C-1196 came loose at the base where it plugs into the meter. The readings were not affected, however, the instrument was red tagged and exchanged for another to assure it did not break down in the middle of the scan.

Contamination was found mainly associated with the city sidewalk south of the main structure and the sidewalk leading up to the house on the south side.

The water line was checked with an auger hole near the south side of the house.

Team Leader Notes

Rick Ryan

GJ-04370-~~88~~ RM *mrg* 6-4-85

March 14, 1985

Page 2

The gas line was investigated with a surface delta followed by a subsurface delta on top of the gas line.

The two sewer lines exiting the structure on the north and east sides were checked with auger holes close to the structure.

Elevated gamma readings were noted next to the contaminated sidewalks. To check for possible 'shine' from the sidewalk, a surface delta, depth deltas, and soil samples were taken to confirm the presence of contamination.

The structure is divided into two separate apartments. The south apartment has an unfinished basement which appears as though it was put in after the house was built.

No elevated readings were located during the walking scan of the interior.

All personnel were frisked before leaving the site.

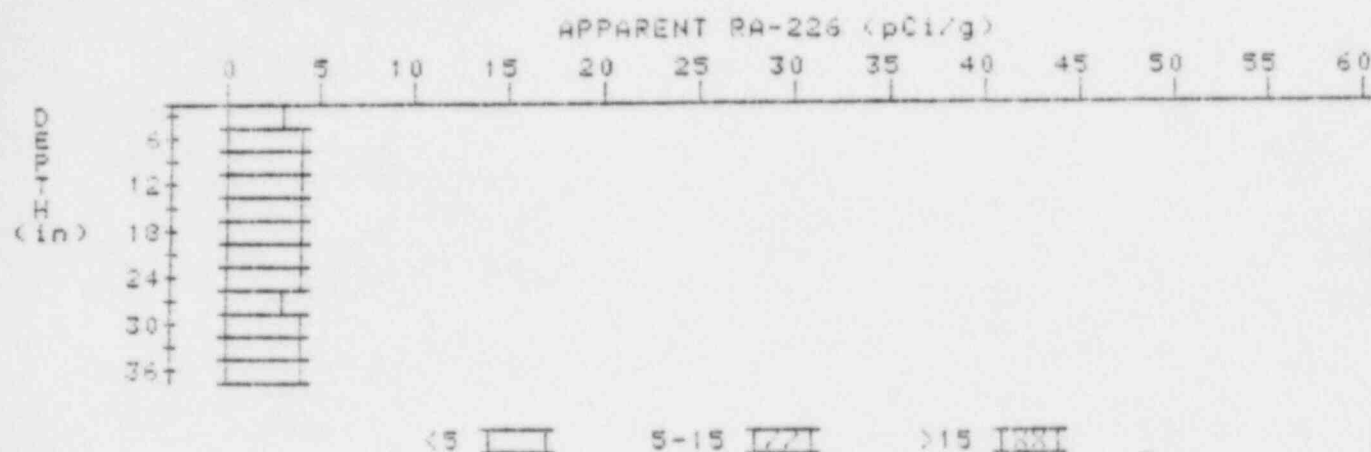
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

1

PROPERTY NUMBER: GJ-04370-RH

HOLE NUMBER: 1

LOCATION: 155235



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.4	3.6
9	3.7	4.1
12	3.8	3.6
15	4.0	4.4
18	4.0	4.0
21	4.0	4.0
24	4.0	4.4
27	3.8	3.4
30	3.8	3.8
33	3.8	3.8
36	3.8	3.8

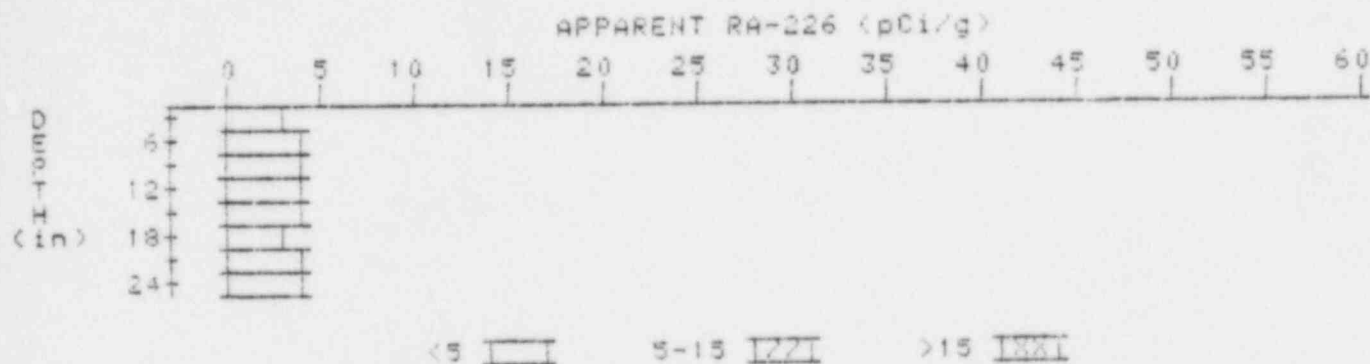
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

2

PROPERTY NUMBER: GJ-04370-RH

HOLE NUMBER: 2

LOCATION: 160210



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

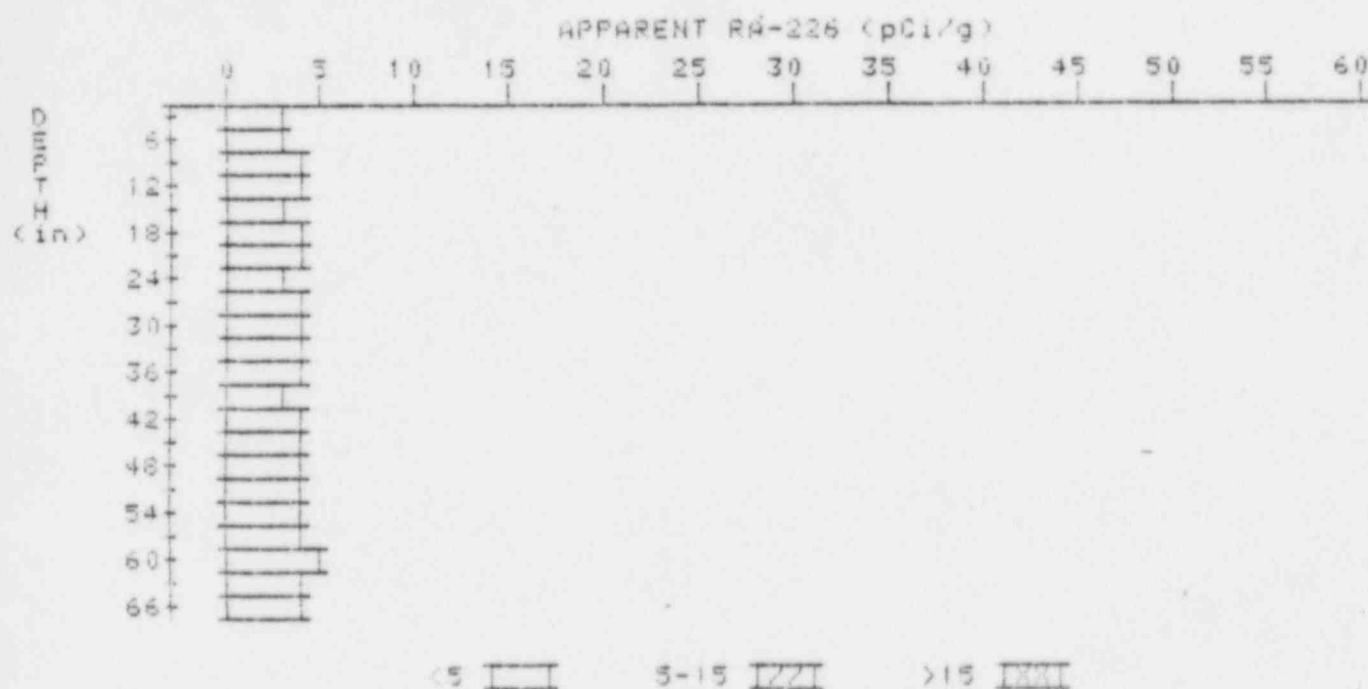
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

3

PROPERTY NUMBER: 2J-04370-24

HOLE NUMBER: 3

LOCATION: 166219



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.2	3.2
6	3.2	2.7
9	3.5	3.9
12	3.6	4.0
15	3.5	3.1
18	3.6	3.8
21	3.6	4.0
24	3.4	2.7
27	3.6	3.8
30	3.7	3.9
33	3.7	3.7
36	3.7	3.9
39	3.6	3.1
42	3.8	4.0
45	3.9	3.9
48	4.0	4.0

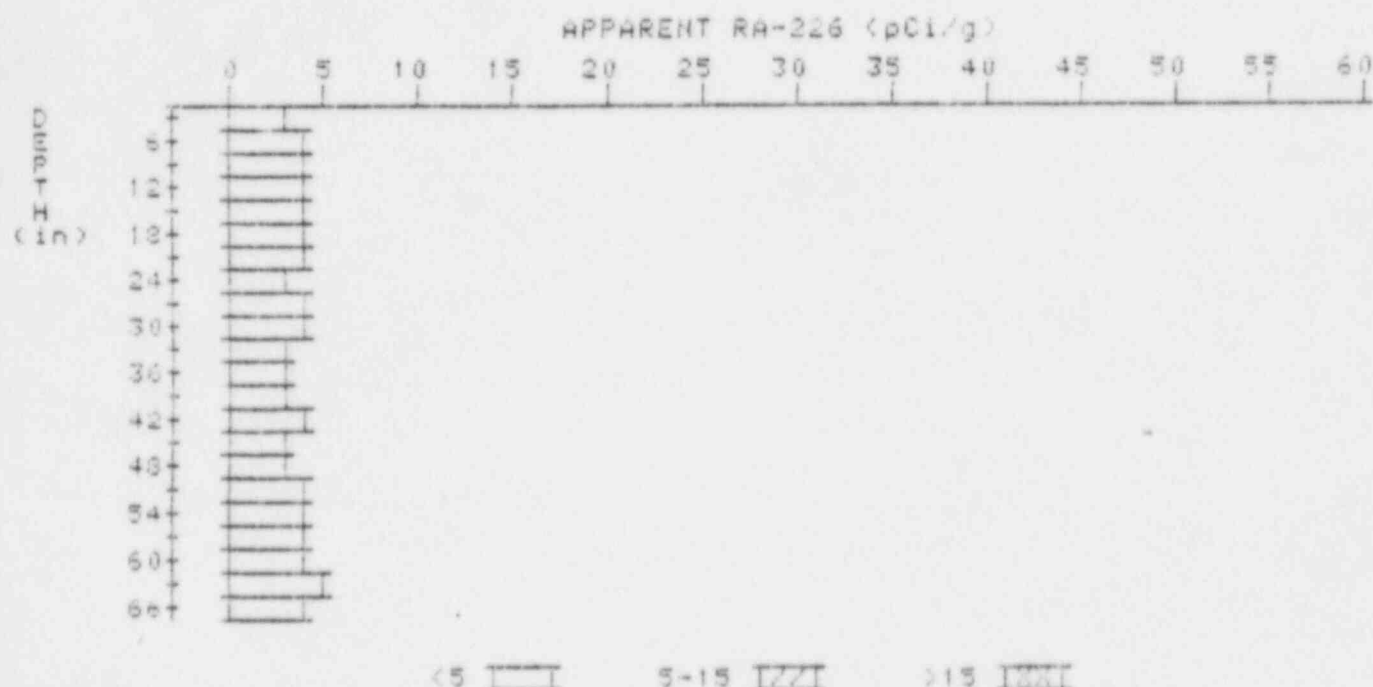
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

5

PROPERTY NUMBER: GJ-04370-RH

HOLE NUMBER: 5

LOCATION: 182236



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.1	3.1
6	3.4	3.8
9	3.8	3.5
12	3.6	3.5
15	3.7	3.9
18	3.7	3.8
21	3.8	4.3
24	3.5	3.8
27	3.5	3.6
30	3.6	4.0
33	3.4	3.8
36	3.3	3.1
39	3.3	3.1
42	3.4	3.8
45	3.4	3.8
48	3.8	3.6

51
54
57
60
63
66

3.7
3.9
4.1
4.1
4.2
4.1

3.7
3.9
4.5
3.9
4.6
4.1

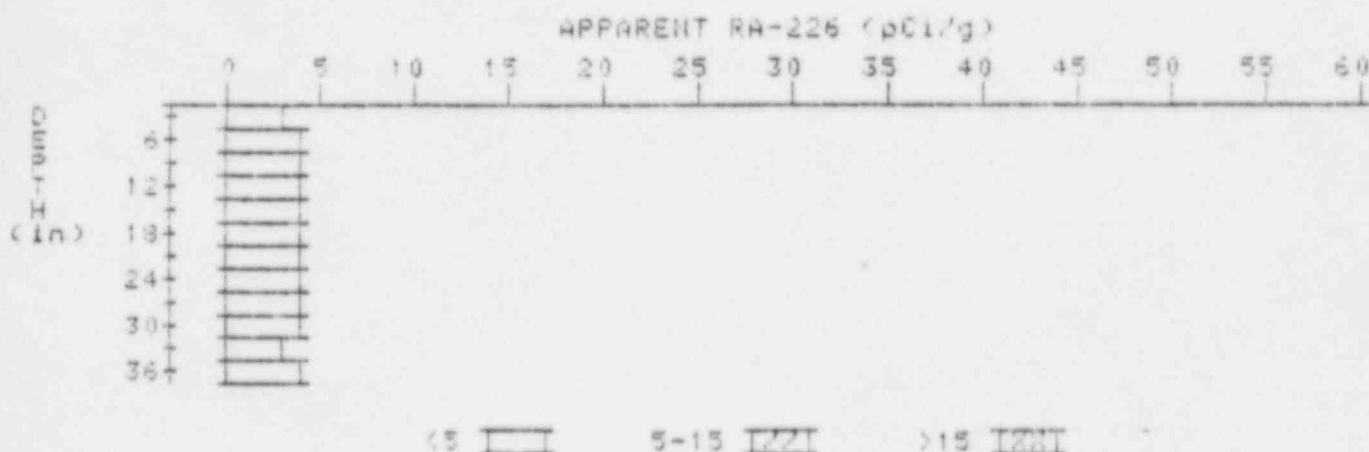
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

6

PROPERTY NUMBER: GJ-04370-RA

HOLE NUMBER: 6

LOCATION: 212212



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.2	3.2
6	3.3	3.7
9	3.7	3.9
12	3.8	4.0
15	3.8	3.8
18	3.8	3.8
21	3.8	4.0
24	3.7	3.5
27	3.7	3.7
30	3.7	4.1
33	3.5	2.8
36	3.7	3.7

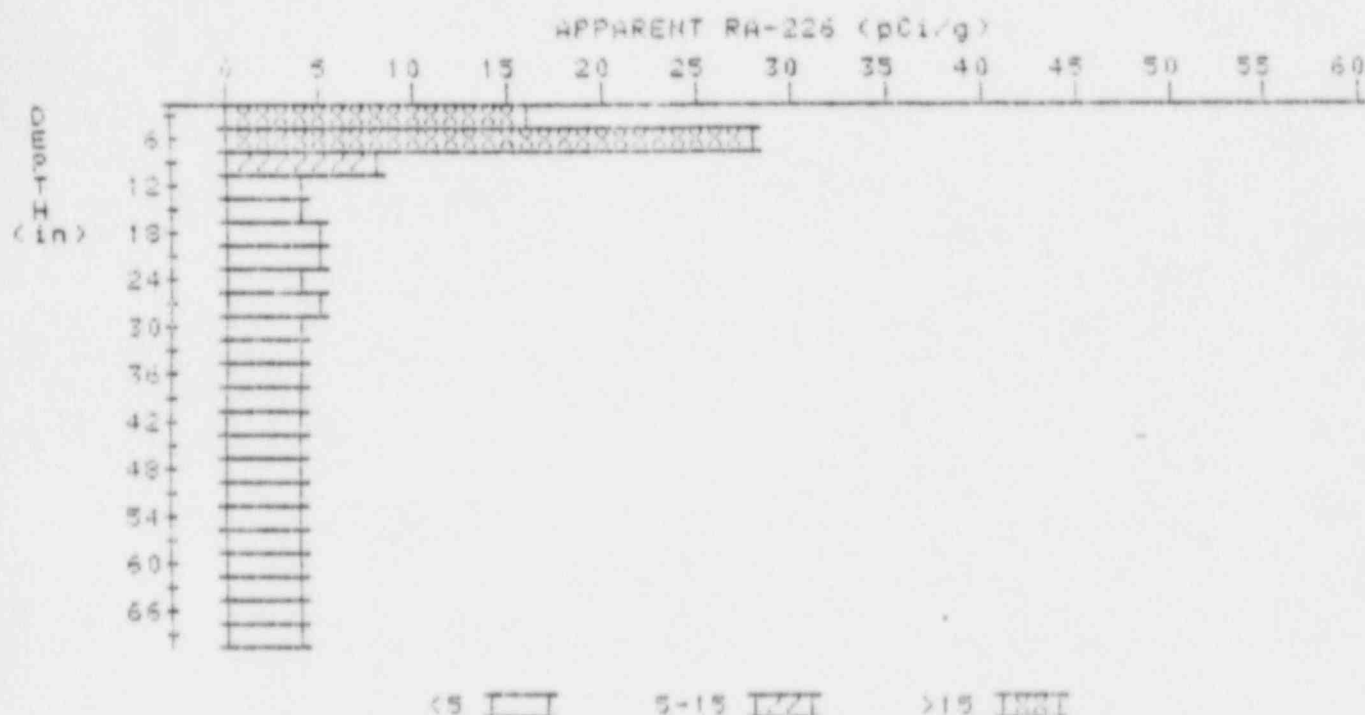
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

7

PROPERTY NUMBER: GJ-84370-94

HOLE NUMBER: 7

LOCATION: 243240



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	15.5	15.5
6	16.5	27.7
9	11.2	8.2
12	7.6	4.0
15	6.0	4.4
18	5.3	4.8
21	4.9	4.7
24	4.6	4.2
27	4.3	4.5
30	4.4	4.4
33	4.3	4.3
36	4.2	4.2
39	4.1	3.9
42	4.1	4.1
45	4.1	3.9

48
31
34
57
60
53
56
69

4.8
4.8
4.6
4.5
4.2
4.1
4.1
4.0

4.4
4.0
4.5
4.5
4.2
3.9
4.3
4.0

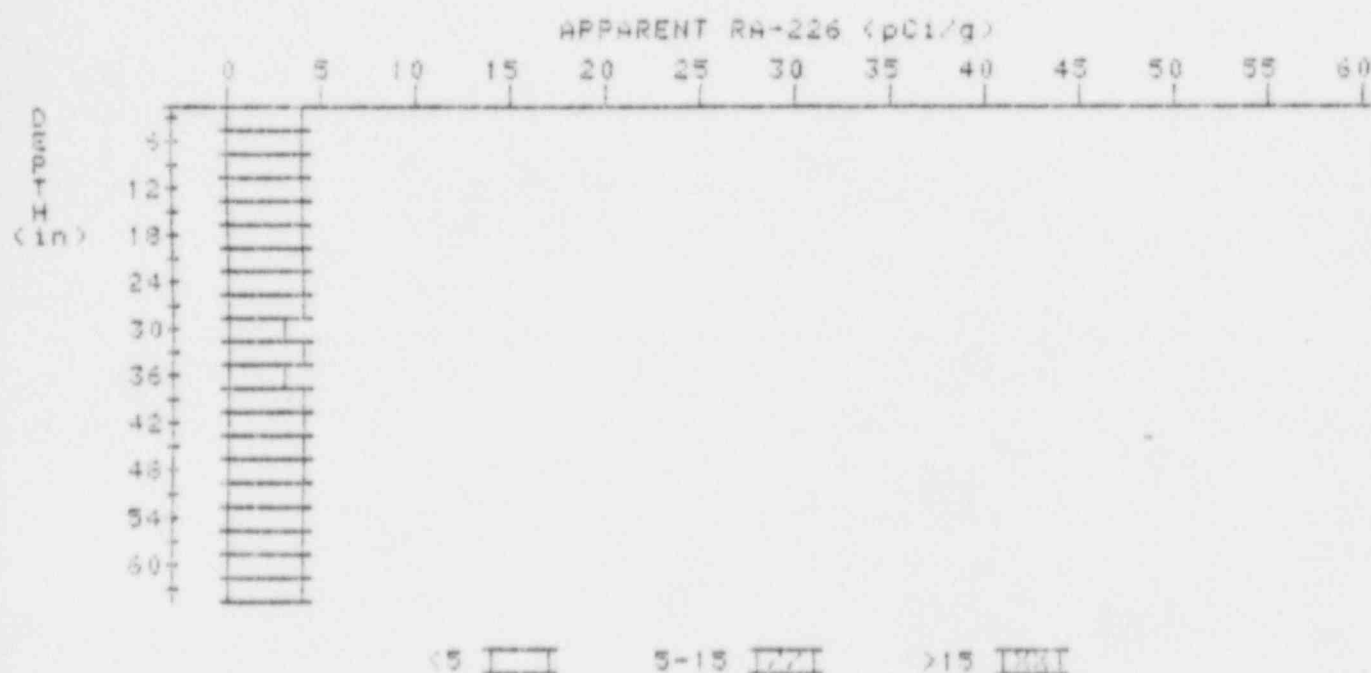
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

8

PROPERTY NUMBER: GJ-04370-RM

HOLE NUMBER: 8

LOCATION: 244228



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.7	3.7
6	3.7	3.8
9	3.8	4.0
12	3.8	3.8
15	3.8	3.8
18	3.8	3.8
21	3.8	3.8
24	3.8	4.0
27	3.7	3.7
30	3.6	3.8
33	3.7	4.1
36	3.6	3.6
39	3.7	3.8
42	3.9	4.3
45	3.9	3.7
48	4.0	4.0
51	4.1	4.3

54
57
60
63

4.1
4.1
4.0
4.0

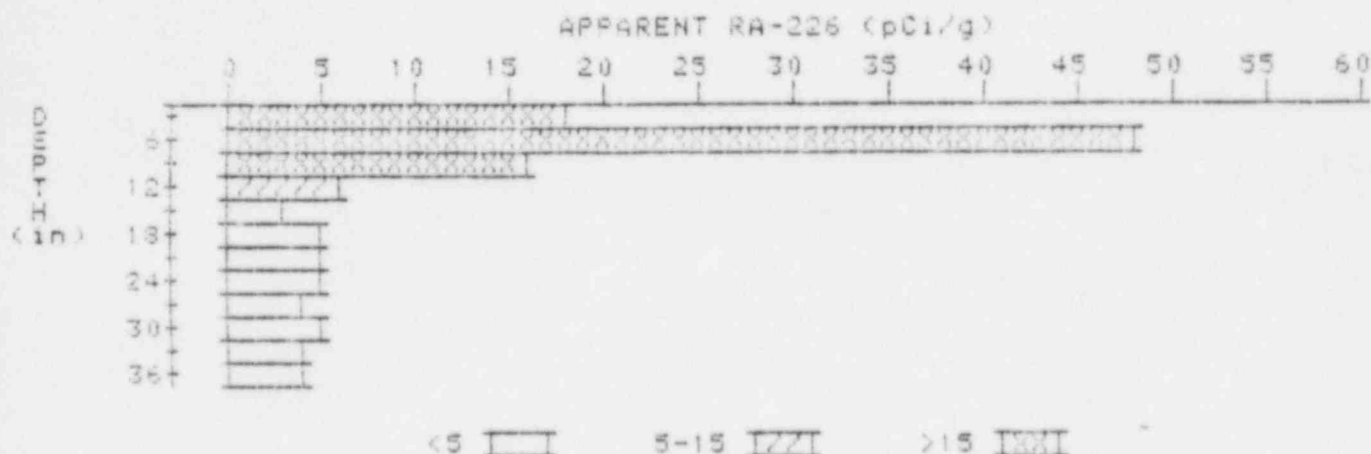
4.1
4.3
3.8
4.0

APPARENT RADIUM-226 CONCENTRATION 10 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-04370-AM

HOLE NUMBER: 10

LOCATION: 246232



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	18.2	18.2
6	24.4	47.9
9	17.4	18.3
12	11.0	6.0
15	7.4	3.5
18	6.0	4.6
21	5.3	4.0
24	4.9	4.9
27	4.5	4.0
30	4.4	4.6
33	4.2	4.0
36	4.1	4.1

APPARENT RADIUM-226 CONCENTRATION 11 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-04370-RH
HOLE NUMBER: 11
LOCATION: 269226



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	29.3	29.3
6	34.3	62.4
9	23.5	19.1
12	15.2	8.4
15	10.7	7.0
18	8.3	6.3
21	7.0	5.9
24	6.3	5.6
27	6.0	6.0
30	5.7	5.7
33	5.4	5.4
36	5.1	4.9
39	4.9	4.7
42	4.8	4.6
45	4.7	4.7

4.0
5.1
5.4
5.7
6.0
6.3
6.6
6.9

4.0
4.7
4.6
4.6
4.4
4.3
4.2
4.1

4.0
5.1
4.6
4.6
4.4
4.3
4.2
4.1