

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-04250-RS
ADDRESS: 1345 MESA AVENUE

AUGUST 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENLIX FIELD ENGINEERING CORPORATION
P.O. Box 1569
Grand Junction, Colorado 81502

APPROVED BY

Michael K. Tucker *CDH*

M. TUCKER
DOE PROJECT ENGINEER

DATE

August 14, 1985

REA04250:REA-615

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PDR WASTE PDR
WM-54

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-04250-RS, is a single-family residence located at 1345 Mesa 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, 14 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$4,096. Remedial action on this property will take approximately 10 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 1345 Mesa Avenue, Grand Junction, Colorado

Zoning: Residential (RSF-8)

Lot Size: Approximately 6,450 sf (0.15 acres)

Legal Description: Lot 12, Block 1, Prospect Park, except north and south 10 feet, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 2 mile(s) 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:	Mesa Avenue
South:	Alley
East:	Single-family residence
West:	Single-family residence

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-story residence
Size:	Approximately 826 sf
Construction Date:	1951
Construction:	Wood-frame
Foundation:	Not determined
Footing Depth:	Not determined
Basement:	None
Crawl Space:	Yes - under entire living area
Condition:	Good

Other Structures:

Type:	Garage
Size:	Approximately 290 sf
Construction:	Wood-frame
Foundation:	Concrete slab-on-grade
Condition:	Good

General Remarks:

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

Historical Data:

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

3.0 RADIOLOGIC SURVEY

3.1 Introduction

Radiologic data were collected by Bendix at DOE ID No. GJ-04250-RS on July 10, 1985. Data collection methods were performed in accordance with procedures fully described in the Radiologic Support Operations Procedures Manual GJ-07(84) (Bendix Field Engineering Corporation, 1984). These data were evaluated to determine the areal and vertical extent of uranium mill tailings contamination at this property as well as any other contaminated material that may have originated from the millsite.

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

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 16 uR/h
Highest Outside Gamma Reading (HOG): 24 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: 14 to 16 uR/h
Highest Inside Gamma Reading (HIG): 16 uR/h

Interior gamma exposure-rate measurements are summarized in Appendix Table 3.2.

3.3 Boreholes, Soil Samples, and Other Measurements

Areas which displayed elevated gamma levels were further investigated; these areas are shown in Appendix Figure 3.2. 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 3.3 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: Concrete
Direction From Primary Structure: West
Other Directions: Along west property line
Total Depth of Contamination: 6 inches
Other (height or thickness): 6-inch-thick concrete
Comments: The concrete driveway is contaminated.
Approximate Square Footage: 748

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-04250-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.

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 \$4,096.

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 Office, 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 Sample Locations
Figure 3.3	Exterior Estimated Extent of Contamination

Official Survey Report

Team Leader Notes

Deconvolution Graphs (Apparent Radium-226 Concentration)

Exterior Gamma Scan Map

Radium Concentrations at Exterior Locations

DOE ID #GJ-04250-RS

1345 Mesa Avenue

Page 1 of 2

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
1	140245	00	DS	<1.0		*	
2	150253	00	DS	1.1		*	North of driveway
3	167268	00	DS	1.2		*	Water line and north foundation
		03	TC	3.0		*	DC = 0 inches
		06	TC	3.3		*	
		09	TC	3.5		*	
		12	TC	3.5		*	
		15	TC	3.5		*	
		18	TC	3.6		*	
		21	TC	3.6		*	
		24	TC	3.6		*	
		27	TC	3.5		*	
		30	TC	3.6		*	
		33	TC	3.6		*	
		36	TC	3.5		*	
		39	TC	3.6		*	
		42	TC	3.4		*	
		45	TC	3.4		*	
		48	TC	3.5		*	
		51	TC	3.4		*	
		54	TC	3.4		*	
		57	TC	3.3		*	
4	170245	00	DS	6.6		*	Concrete driveway
		03	TC	5.7		*	DC = 6 inches
		06	TC	5.5		*	Based on all available data
		09	TC	4.7		*	
		12	TC	4.2		*	
		15	TC	3.8		*	
		18	TC	3.7		*	
		21	TC	3.6		*	
		24	TC	3.6		*	
		27	TC	3.6		*	
		30	TC	3.5		*	
		33	TC	3.5		*	
		36	TC	3.5		*	
		39	TC	3.4		*	
		42	TC	3.4		*	
5	180284	00	DS	1.7		*	East of primary structure
		03	TC	2.9		*	DC = 0 inches
		06	TC	3.3		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-04250-RS

1345 Mesa Avenue

Page 2 of 2

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
5	180284	09	TC	3.5		*	
		12	TC	3.6		*	
		15	TC	3.6		*	
		18	TC	3.6		*	
		21	TC	3.6		*	
		24	TC	3.6		*	
		27	TC	3.5		*	
		30	TC	3.5		*	
		33	TC	3.5		*	
6	202266	00	DS	<1.0		*	Sewer line
		03	TC	2.8		*	DC = 0 inches
		06	TC	3.1		*	
		09	TC	3.3		*	
		12	TC	3.4		*	
		15	TC	3.5		*	
		18	TC	3.5		*	
		21	TC	3.5		*	
		24	TC	3.5		*	
		27	TC	3.5		*	
		30	TC	3.6		*	
		33	TC	3.5		*	
		36	TC	3.5		*	
		39	TC	3.5		*	
		42	TC	3.5		*	
		45	TC	3.5		*	
		48	TC	3.5		*	
		51	TC	3.4		*	
		54	TC	3.5		*	
		57	TC	3.5		*	
7	202269	00	DS	1.0		*	Gas line
		17	DS	<1.0		*	
8	205246	00	DS	1.0		*	North of garage

Measurement GB = GAD-6 Borehole
Types: 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 = 07-10-85
Team Leader = MJH

Table 3.2

Summary of Interior Gamma Exposure Rates

DOE ID No GJ-04250-RS

1345 Mesa Avenue

Page 1 of 1

Location	Number of Readings Taken at Waist Level	Range at Waist Level (uR/h)	Mean at Waist Level (uR/h)	Number of Readings Taken at Surface	Range at Surface (uR/h)	Mean Surface (uR/h)
Crawl Space	*	*	*	*	15-17	*
Ground Floor	*	*	*	*	14-16	*
Garage	*	*	*	*	14-15	*

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

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-04250-RS

Page 1 of 1

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
EXTERIOR					
	Concrete				
A	28 x 13	=	364		
	32 x 12	=	384		
			748 x 0.5	= 374	
	Volume of Concrete			= 374	= 374/27 = 14
	TOTAL VOLUME - EXTERIOR				= 14

See Appendix Figure 3.3 For Areas

=====

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-04250-RS

Page 1 of 1

EXTERIOR

Remove/replace concrete driveway slab 748 sf @ \$3.50/sf	\$ 2,618
Replace areas with compacted roadbase 6 cy @ \$11.50/cy	69
	<hr/>
TOTAL EXTERIOR	\$ 2,687
TOTAL INTERIOR	0
ACCESS CONTROL	100
	<hr/>
SUBTOTAL	\$ 2,787
CONTINGENCY @ 5%	139
	<hr/>
SUBTOTAL	\$ 2,926
CONTRACTOR OVERHEAD & PROFIT @ 40%	1,170
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GRAND TOTAL	\$ 4,096

LR080585

REA04250/REA-615/LMR

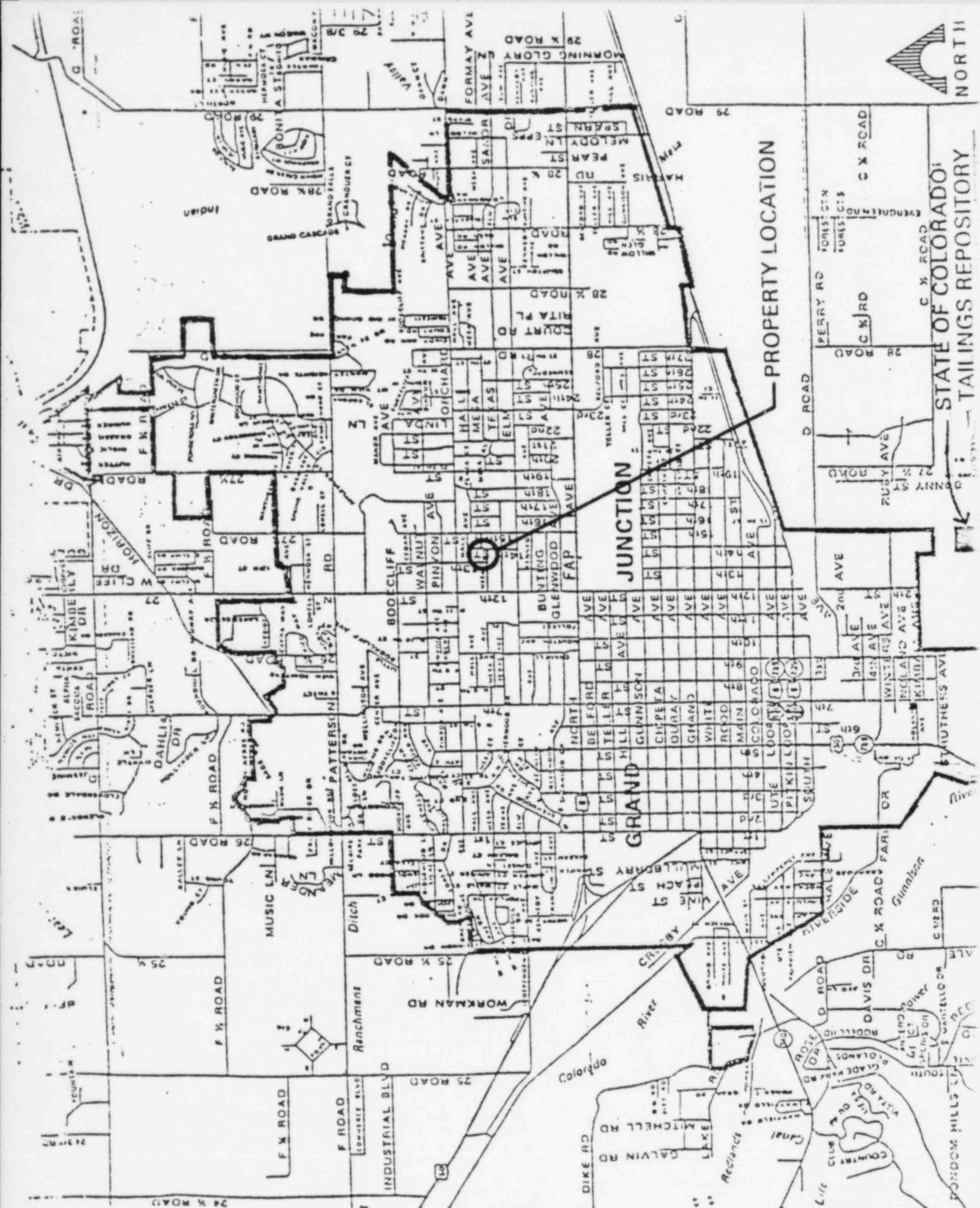
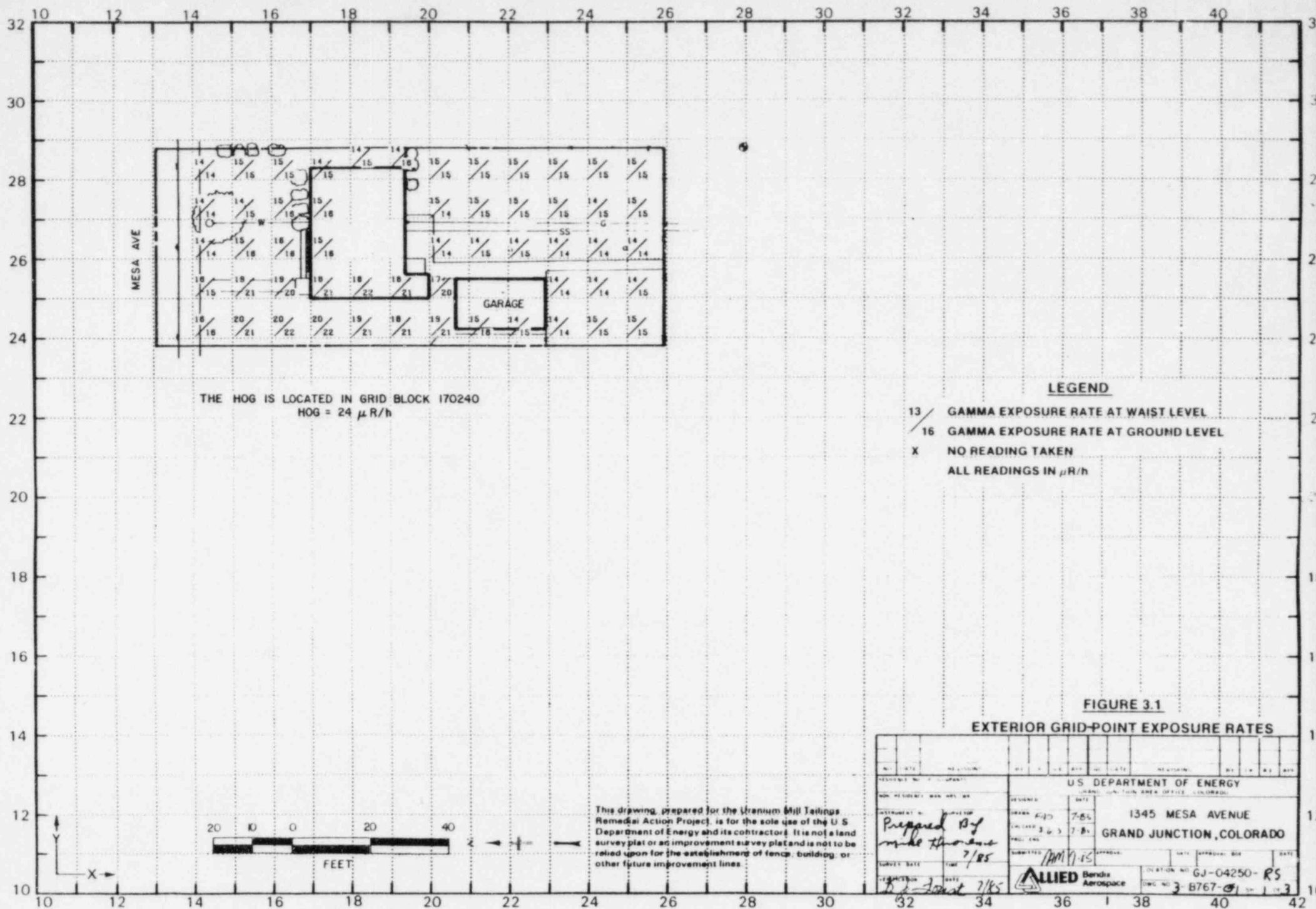
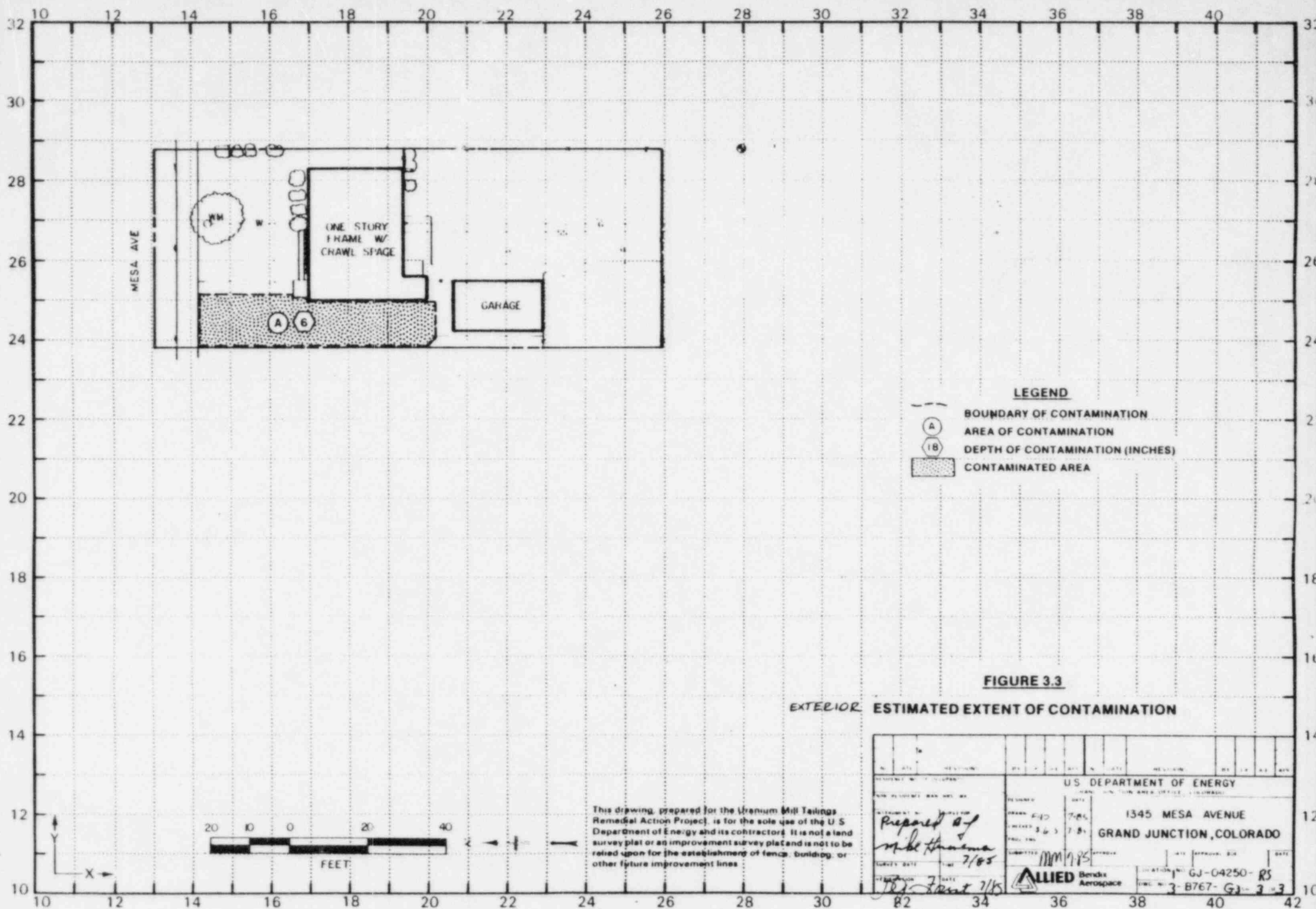


FIGURE 2.1
VICINITY MAP



NO. 172		NO. 172		NO. 172		NO. 172		NO. 172		NO. 172		NO. 172		NO. 172	
U.S. DEPARTMENT OF ENERGY															
1345 MESA AVENUE GRAND JUNCTION, COLORADO															
DESIGNED BY <i>Prepared By Mike Thomas</i>				DATE 7/85				APPROVED BY <i>[Signature]</i>				DATE 7/85			
SURVEY DATE 7/85				TIME 7/85				DRAWN BY <i>[Signature]</i>				DATE 7/85			
PROJECT NO. GJ-04250-RS				PROJECT NO. GJ-04250-RS				PROJECT NO. GJ-04250-RS				PROJECT NO. GJ-04250-RS			
PROJECT NO. GJ-04250-RS				PROJECT NO. GJ-04250-RS				PROJECT NO. GJ-04250-RS				PROJECT NO. GJ-04250-RS			



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

Official Survey Report

Property Address 1345 Mesa Avenue

Property Owner J. Woods

Address of Owner (if different from above) NA

Report Prepared By Mike Heronema

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

☐ No evidence of residual radioactive material on surveyed property.

☒ Residual radioactive materials found at the following locations:

☐ In open areas.

☒ Under or around exterior improvements.

☐ Under or around a typically nonoccupied structure.

☒ Under or around a typically occupied structure.

II. RESULTS OF RADIOLOGIC ASSESSMENT

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

☒ 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.

HIC = 16 uR/h
HOG = 24 uR/h

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado

Date: July 10, 1985

To: Files

From: *Mike Heronema*
Mike Heronema

Subject: Team Leader Notes - GJ-04250-RS

Address: 1345 Mesa Avenue

Owner: J. Woods

Team Members

M. Heronema (Team Leader)
V. Rothman
A. Raabe
L. Kul

H. Mattison
C. Adams
V. Young

All utilities were investigated with no apparent contamination.

Elevated readings in the concrete driveway were noted and investigated. The concrete itself appears to be contaminated. The depth of the concrete is approximately 6 inches.

Investigation for spillover onto the adjacent properties proved to be negative.

All team members were frisked before eating, drinking, and smoking in a clean designated area, and prior to leaving the property.

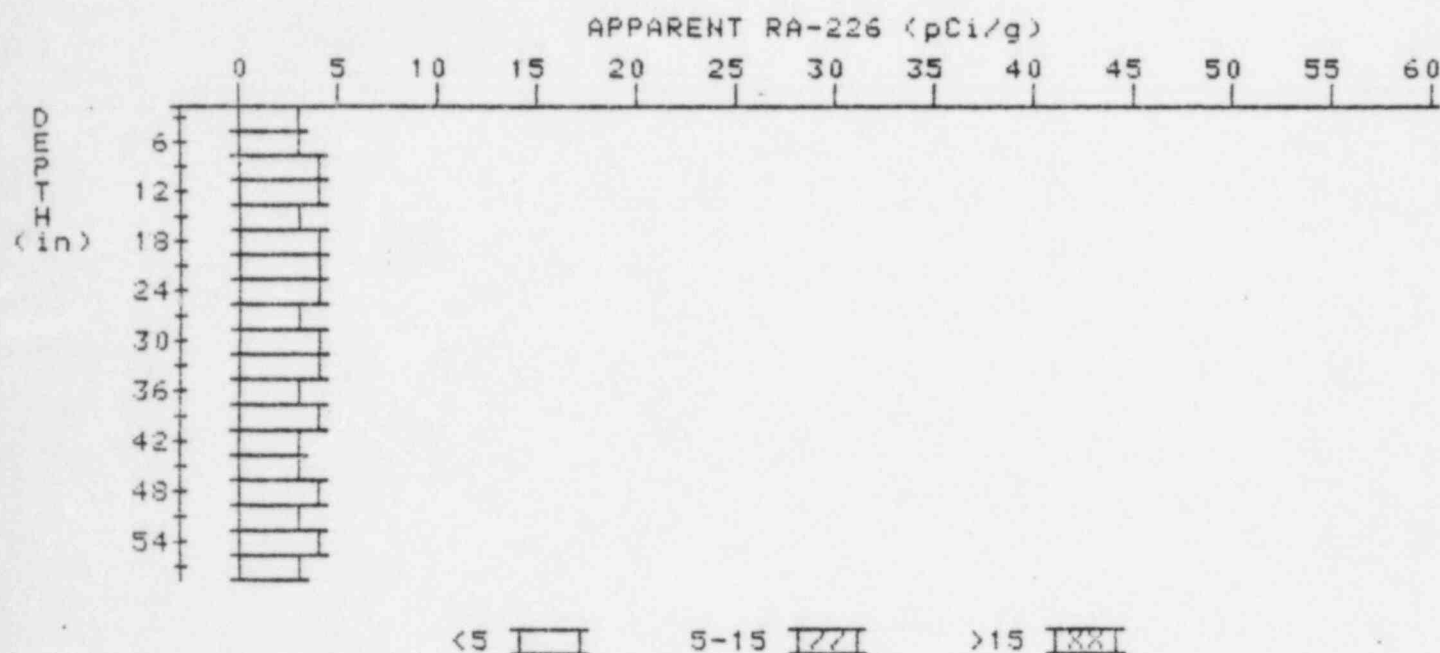
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

3

PROPERTY NUMBER: GJ-04250-RS

HOLE NUMBER: 3

LOCATION: 167268



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.3	3.5
9	3.5	3.9
12	3.5	3.5
15	3.5	3.3
18	3.6	3.8
21	3.6	3.6
24	3.6	3.8
27	3.5	3.1
30	3.6	3.8
33	3.6	3.8
36	3.5	3.1
39	3.6	4.1
42	3.4	3.0
45	3.4	3.2
48	3.5	3.9
51	3.4	3.2
54	3.4	3.6

57 C

3.3

3.3

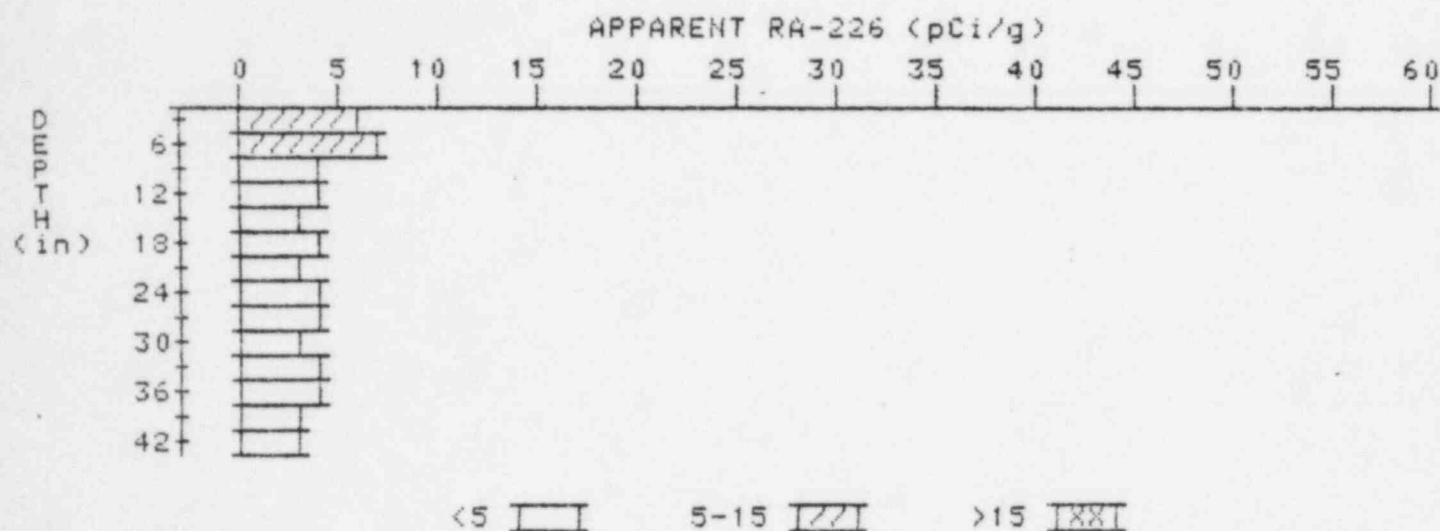
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

4

PROPERTY NUMBER: GJ-04250-RS

HOLE NUMBER: 4

LOCATION: 170245



Depth (in)	Apparent Radium-226 (pCi/g) - Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.7	5.7
6	5.5	6.6
9	4.7	4.2
12	4.2	4.0
15	3.8	3.3
18	3.7	3.7
21	3.6	3.4
24	3.6	3.6
27	3.6	3.8
30	3.5	3.3
33	3.5	3.5
36	3.5	3.7
39	3.4	3.2
42	3.4	3.4

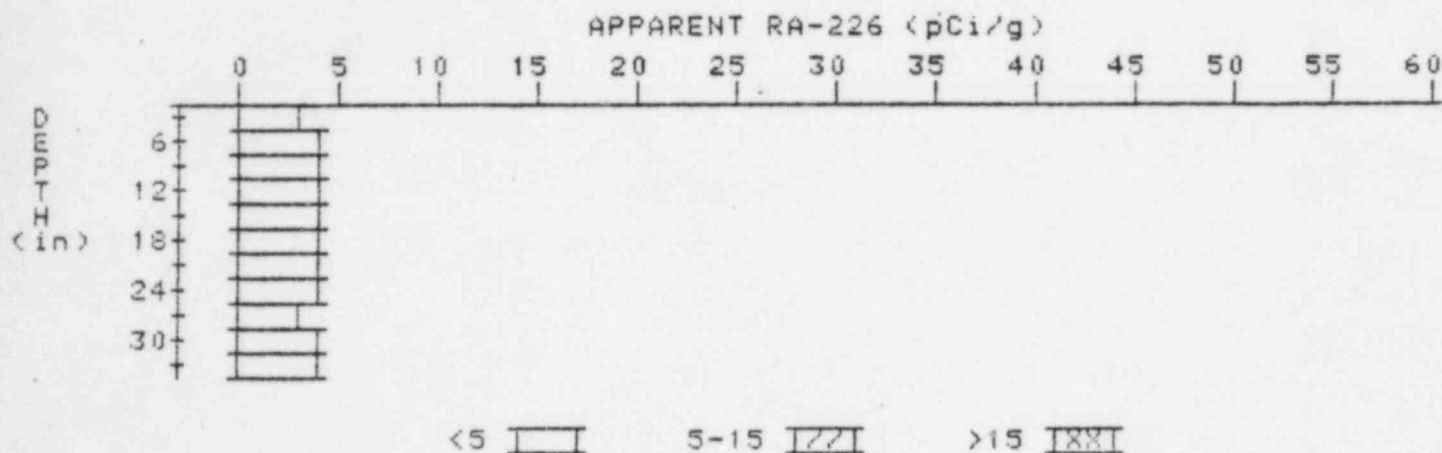
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

5

PROPERTY NUMBER: GJ-04250-RS

HOLE NUMBER: 5

LOCATION: 180284



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.9	2.9
6	3.3	3.7
9	3.5	3.7
12	3.6	3.8
15	3.6	3.6
18	3.6	3.6
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

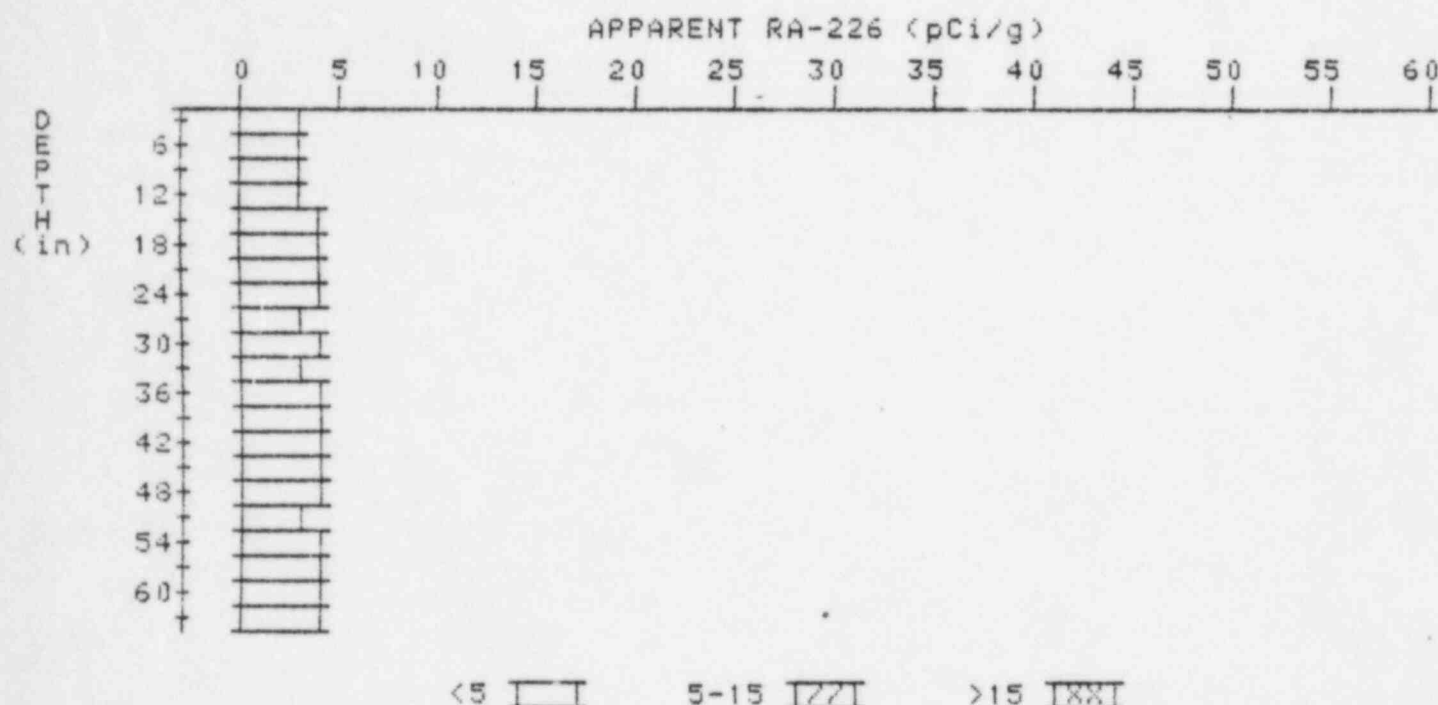
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

6

PROPERTY NUMBER: GJ-04250-RS

HOLE NUMBER: 6

LOCATION: 202266

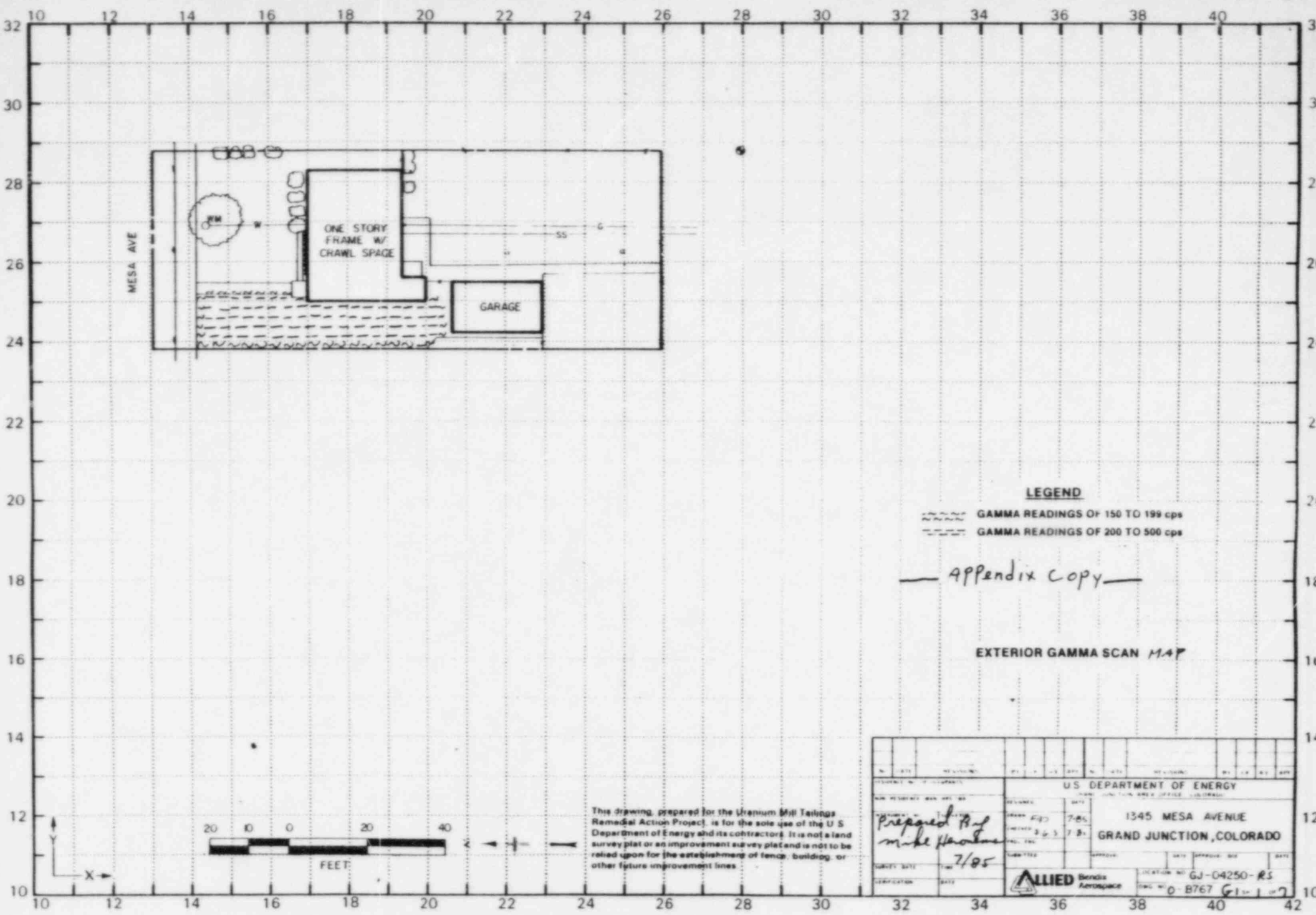


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.8	2.8
6	3.1	3.3
9	3.3	3.5
12	3.4	3.4
15	3.5	3.7
18	3.5	3.5
21	3.5	3.5
24	3.5	3.5
27	3.5	3.5
30	3.6	4.0
33	3.5	3.5
36	3.5	3.5
39	3.5	3.5
42	3.5	3.5
45	3.5	3.5
48	3.5	3.7
51	3.4	3.0

54
57
60
63

3.5
3.5
3.5
3.5

3.7
3.5
3.5
3.5



LEGEND

- GAMMA READINGS OF 150 TO 199 cps
- GAMMA READINGS OF 200 TO 500 cps

— Appendix Copy —

EXTERIOR GAMMA SCAN MAP

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	
1345 MESA AVENUE GRAND JUNCTION, COLORADO	
APPROVED BY: <i>Prepared By Mike Hawkins</i>	DATE: 7/85
CHECKED BY: <i>7/85</i>	DATE: 7/85
SUBMITTED BY: <i>7/85</i>	DATE: 7/85
CERTIFICATION BY: <i>7/85</i>	DATE: 7/85
ALLIED Bendix Aerospace	
LOCATION NO: GJ-04250-RS	
Dwg No: 0-B767 G1-1-2	