

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-00477-MR
ADDRESS: 450 NORTH 16TH STREET

AUGUST 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

M. TUCKER
DOE PROJECT ENGINEER

DATE

August 29, 1985

REA00477:REA-621

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-00477-MR, is a single-family residence located at 450 North 16th 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, 15 cu. yd.; interior, 1 cu. yd. (not included in remedial action).

Area A will not be included in this remedial action as discussed in Section 4.0 of this REA.

Estimated cost to perform remedial action is \$1,515. Remedial action on this property will take approximately 5 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 450 North 16th Street, Grand Junction, Colorado

Zoning: Residential (RSF-8)

Lot Size: Approximately 6,750 sf (0.15 acres)

Legal Description: Lots 3 and 4, Block 2, Slocomb Addition, and 15.0 feet adjoining said lots on the west, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 1 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:	Single-family residence
South:	Single-family residence
East:	Alley
West:	North 16th Street

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-story residence with attached covered patio
Size:	Approximately 1,200 sf
Construction Date:	1947
Construction:	Wood-frame
Foundation:	Concrete wall on spread footing
Footing Depth:	Approximately 72" to bottom of footing from grade
Basement:	Yes - full
Crawl Space:	None
Condition:	Good

Other Structures:

Type:	Shed/carport
Size:	Approximately 280 sf
Construction:	Wood-frame
Foundation:	Concrete slab-on-grade
Condition:	Good

Type:	Covered patio (attached)
Size:	Approximately 320 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-00477-MR on July 23, 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 to determine areas of potential contamination identified during previous radiologic assessments of this property.

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 (EOG): 69 uR/h

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

3.2.2 Interior Findings

Background Readings: 14 to 17
Highest Inside Gamma Reading (HIG): 73 uR/h

Interior radium-concentration measurements are presented in Appendix Table 3.2. Interior gamma exposure-rate survey results are shown in Appendix Figures 3.2a and 3.2b. 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; the locations and types of these investigations are shown in Appendix Figures 3.2a and 3.3. Data from these investigations is included in Appendix Tables 3.1 and 3.2.

3.4 Radon/Radon Daughter Concentration (RDC)

Determined by CDH: 0.011 gross working level (WL). No RDC measurements were taken by Bendix.

3.5 Extent of Contamination

Appendix Figures 3.4a and 3.4b show identified areas and estimated depths of contamination on this property, based on assessments of all measurements taken. As noted in these figures, areas recommended for remedial action that contain identified residual radioactive materials are:

- (Area A) Surface Material: Concrete
Direction From Primary Structure: Interior
Other Directions: Basement
Other (height or thickness): 58 inches high by 18 inches wide
Comments: Cinder block wall capped with a 3-inch-thick concrete slab
Approximate Square Footage: 60 - this area is excluded from remedial action.
- (Area B) Surface Material: Decorative rock
Direction From Primary Structure: West
Total Depth of Contamination: 21 inches
Approximate Square Footage: 52
- (Area C) Surface Material: Lawn
Direction From Primary Structure: East
Total Depth of Contamination: 75 inches
Comments: The sewer line is in this area
Approximate Square Footage: 48

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-00477-MR, includes removal of select areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figures 3.4a and 3.4b) and transport of removed material to the disposal site.

Remedial action will not be performed on Area A of this property because the levels of radioactivity in these areas do not exceed the EPA Standards (40 CFR 192), as described below:

- (1) Indoor radon-decay products shall not exceed a working level of 0.03, nor, to the extent possible, a working level of 0.02. (At this property the gross working level, as determined by CDH, is 0.011.)
- (2) Indoor gamma radiation shall not exceed 20 microroentgens per hour (uR/h) above background levels. (At this location the interior background readings were found to be between 14 and 17 uR/h, with the highest mean surface gamma reading at 24 uR/h.)

An indoor RDC measurement will be completed on this property. If the RDC measurement exceeds EPA Standards then the REA will be revised and remedial action accomplished in Area A in accordance with the Vicinity Property Management and Implementation Manual.

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 \$1,515.

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 3.2a	Interior Gamma Exposure Rates and Sample Locations
Figure 3.2b	Interior Gamma Exposure Rates
Figure 3.3	Exterior Sample Locations
Figure 3.4a	Interior Estimated Extent of Contamination
Figure 3.4b	Exterior Estimated Extent of Contamination

Official Survey Report

Team Leader Notes

Deconvolution Graphs (Apparent Radium-226 Concentration)

Exterior Gamma Scan Map

Radium Concentrations at Exterior Locations

DOE ID #GJ-00477-MR

450 North 16th Street

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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	178255	00	DS	52.5		*	West of primary structure
		03	TC	33.6		*	
		06	TC	47.2		*	
		09	TC	57.1		*	
		12	TC	55.1		*	
		15	TC	44.0		*	
		18	TC	29.4		*	
		21	TC	18.7		*	
		24	TC	12.9		*	
		27	TC	9.7		*	
		30	TC	7.7		*	DC = 21 inches Based on the deconvolution graph
		33	TC	6.4		*	
		36	TC	5.5		*	
		39	TC	5.1		*	
		42	TC	4.7		*	
		45	TC	4.5		*	
		48	TC	4.4		*	
		51	TC	4.2		*	
		54	TC	4.2		*	
		57	TC	4.1		*	
8	183226	00	DS	<1.0		*	Water line
		03	TC	2.9		*	
		06	TC	3.1		*	DC = 0 inches
		09	TC	3.3		*	
		12	TC	3.4		*	
		15	TC	3.6		*	
		18	TC	3.7		*	
		21	TC	3.9		*	
		24	TC	4.0		*	
		27	TC	4.0		*	
		30	TC	4.0		*	
		33	TC	4.0		*	
		36	TC	3.9		*	
		39	TC	3.9		*	
		42	TC	4.1		*	
		45	TC	4.1		*	
		48	TC	4.0		*	
		51	TC	4.1		*	
		54	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	183226	57	TC	4.1		*	
		60	TC	4.0		*	
9	185219	00	DS	2.2		*	Southwest corner of primary structure
10	207219	00	DS	1.6		*	Background
		03	TC	3.8		*	Southeast corner of primary structure
		06	TC	3.9		*	
		09	TC	3.9		*	
		12	TC	3.8		*	DC = 0 inches
		15	TC	3.9		*	
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	TC	3.8		*	
		27	TC	3.8		*	
		30	TC	3.8		*	
		33	TC	3.8		*	
		36	TC	3.9		*	
		39	TC	3.9		*	
		42	TC	4.0		*	
		45	TC	4.0		*	
		48	TC	4.0		*	
		51	TC	4.0		*	
		54	TC	3.9		*	
		57	TC	3.9		*	
11	207261	00	DS	1.3		*	
		03	TC	3.3		*	Northeast corner of primary structure
		06	TC	3.5		*	
		09	TC	3.7		*	
		12	TC	3.8		*	DC = 0 inches
		15	TC	3.7		*	
		18	TC	3.9		*	
		21	TC	4.0		*	
		24	TC	4.1		*	
		27	TC	4.0		*	
		30	TC	4.1		*	
		33	TC	4.1		*	
		36	TC	4.5		*	

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	207261	39	TC	4.2		*	
		42	TC	4.2		*	
		45	TC	4.1		*	
		48	TC	4.1		*	
		51	TC	4.0		*	
		54	TC	4.0		*	
		57	TC	4.0		*	
		60	TC	3.9		*	
		63	TC	3.8		*	
		66	TC	3.8		*	
		69	TC	3.7		*	
12	210253	00	DS	4.1		*	Sewer line
		03	TC	5.6		*	Adjacent to
		06	TC	6.5		*	primary structure
		09	TC	7.0		*	
		12	TC	7.6		*	
		15	TC	8.2		*	
		18	TC	9.1		*	
		21	TC	9.9		*	
		24	TC	10.4		*	
		27	TC	10.9		*	
		30	TC	11.7		*	
		33	TC	12.4		*	
		36	TC	13.5		*	
		39	TC	14.5		*	
		42	TC	15.6		*	
		45	TC	14.7		*	
		48	TC	13.2		*	
		51	TC	12.0		*	
		54	TC	11.0		*	
		57	TC	9.6		*	
		60	TC	8.3		*	
		63	TC	7.6		*	
		66	TC	7.2		*	
		69	TC	7.1		*	
		72	TC	6.2		*	
		75	TC	5.3		*	DC = 75 inches
		78	TC	4.6		*	Based on the
		81	TC	4.3		*	deconvolution graph
		84	TC	4.1		*	
		87	TC	4.0		*	
		90	TC	3.9		*	
		93	TC	3.9		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-00477-MR

450 North 16th Street

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
12	210253	96	TC	4.0		*	
		99	TC	4.0		*	
		102	TC	4.0		*	
13	224253	00	DS	1.1		*	East of primary
		03	TC	3.0		*	structure
		06	TC	3.3		*	Sewer line
		09	TC	3.5		*	
		12	TC	3.7		*	DC = 0 inches
		15	TC	3.7		*	
		18	TC	3.7		*	
		21	TC	3.7		*	
		24	TC	3.8		*	
		27	TC	3.8		*	
		30	TC	3.8		*	
		33	TC	3.8		*	
		36	TC	3.8		*	
		39	TC	3.8		*	
		42	TC	3.8		*	
		45	TC	3.9		*	
		48	TC	3.9		*	
		51	TC	3.9		*	
14	228237	00	DS	1.6		*	Gas line
		18	DS	1.8		*	

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 = 07-23-85
 Team Leader = DGD

Radium Concentrations at Interior Locations

DOE ID #GJ-00477-MR

450 North 16th Street

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
1		00	DS	<1.0		*	On floor
2		[58]	DS	34.4		*	On wall-cap
		[30]	DS	20.4		*	On wall
3		[58]	DS	5.6		*	On wall-cap
4		00	DS	1.5		*	On floor
5		[58]	DS	4.6		*	On wall-cap
6		00	DS	<1.0		*	On floor

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 = 07-23-85
 Team Leader = DGD

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	09	18-73	29	09	18-40	24
Room B	07	15-18	17	07	16-18	17
Room C	05	15-17	16	05	16-17	16
Room D	05	16-17	16	05	17-17	17
Room E	05	16-17	17	05	16-18	17
Room F	05	14-17	16	05	16-17	16
Room G	09	14-19	16	09	14-23	18
Ground Floor	*	*	*	*	13-16	*
Shed	*	*	*	*	14-15	*

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* A walking gamma scan was performed on the ground floor and in the shed to confirm the absence of interior contamination. Exposure rates and room locations are shown in Appendix Figures 3.2a and 3.2b.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-00477-MR

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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>
INTERIOR					
	Concrete				
A	1.5 x 40	= 60	x 0.3	= 18	
	TOTAL VOLUME - INTERIOR			= 18	= 18/27 = 1
EXTERIOR					
	Contaminated Fill				
B	4 x 13	= 52	x 1.8	= 94	
C	6 x 8	= 48	x 6.3	= 302	
	TOTAL VOLUME - EXTERIOR			= 396	= 396/27 = 15

See Appendix Figures 3.4a and 3.4b For Areas

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EXTERIOR

Remove/replace decorative rock 52 sf @ \$.50/sf	\$ 26
Remove identified residual radioactive material 10 cy @ \$14.50/cy	160
4 cy @ \$44/cy	176
Replace areas with roadbase 10 cy @ \$11.50/cy	127
Replace areas with topsoil 4 cy @ \$9.50/cy	38
Replace area with sod 50 sf @ \$.50/sf	25
Replace trees Lump sum	200
<hr/>	
TOTAL EXTERIOR	\$ 752
TOTAL INTERIOR	0
ACCESS CONTROL	150
<hr/>	
SUBTOTAL	\$ 902
CONTINGENCY @ 20%	180
<hr/>	
SUBTOTAL	\$ 1,082
CONTRACTOR OVERHEAD & PROFIT @ 40%	433
<hr/>	
GRAND TOTAL	\$ 1,515

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RR082785
REA00477/REA-621/LMR

LOTS 3 AND 4 BLOCK 2 SLOCOMB ADDITION
AND 15.0 FEET ADJOINING SAID LOTS ON THE WEST,
CITY OF GRAND JUNCTION, COLORADO

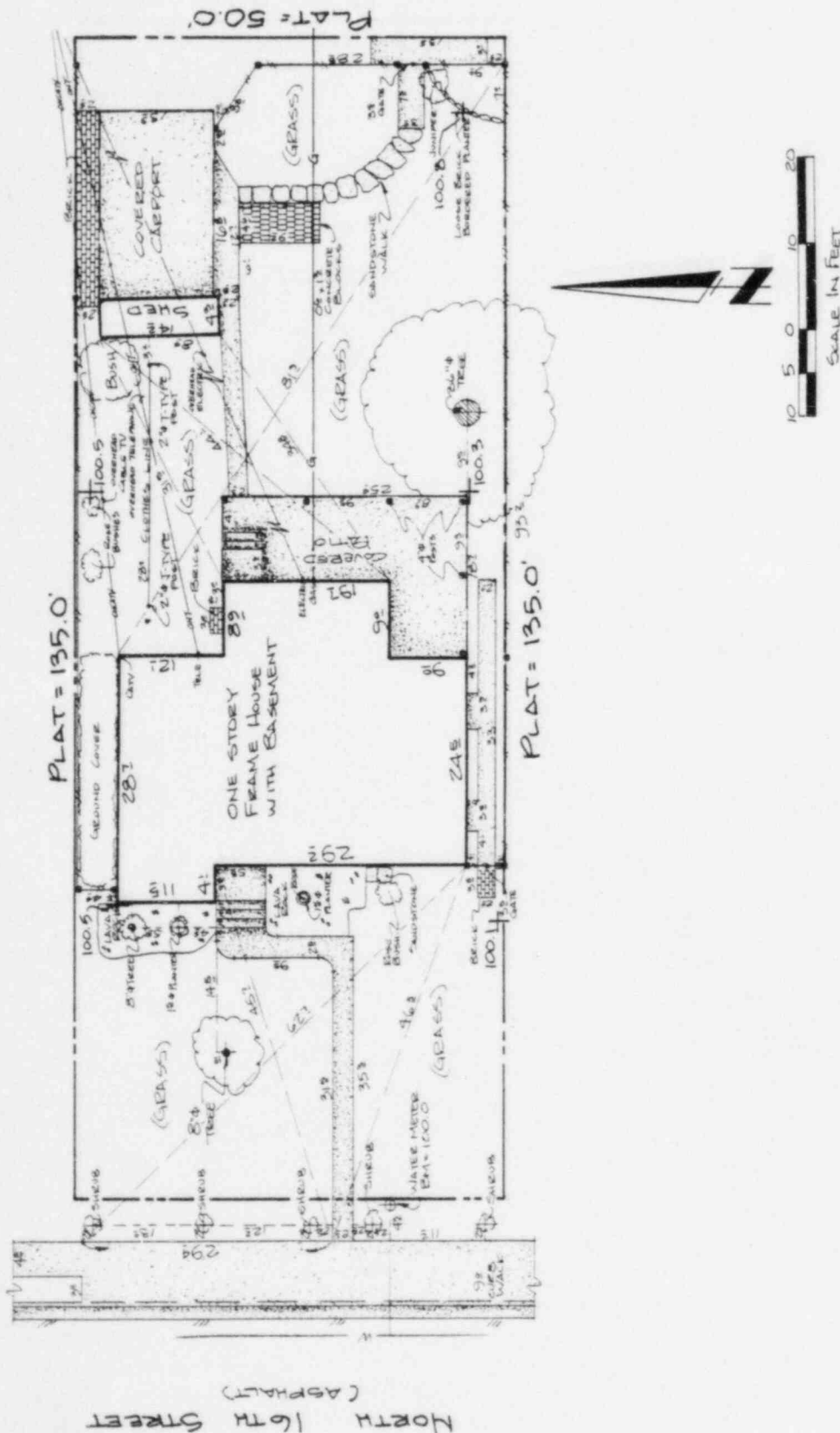
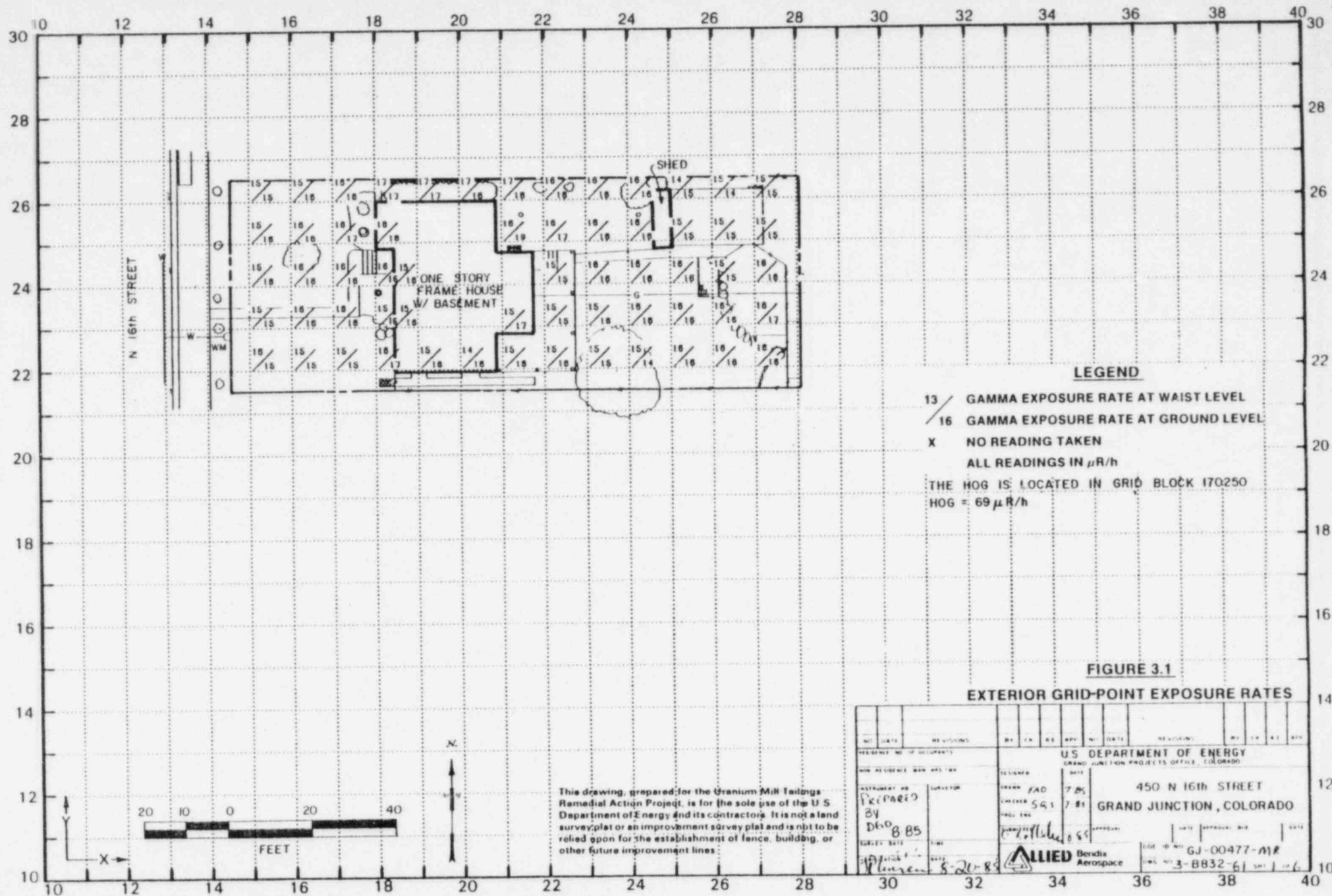


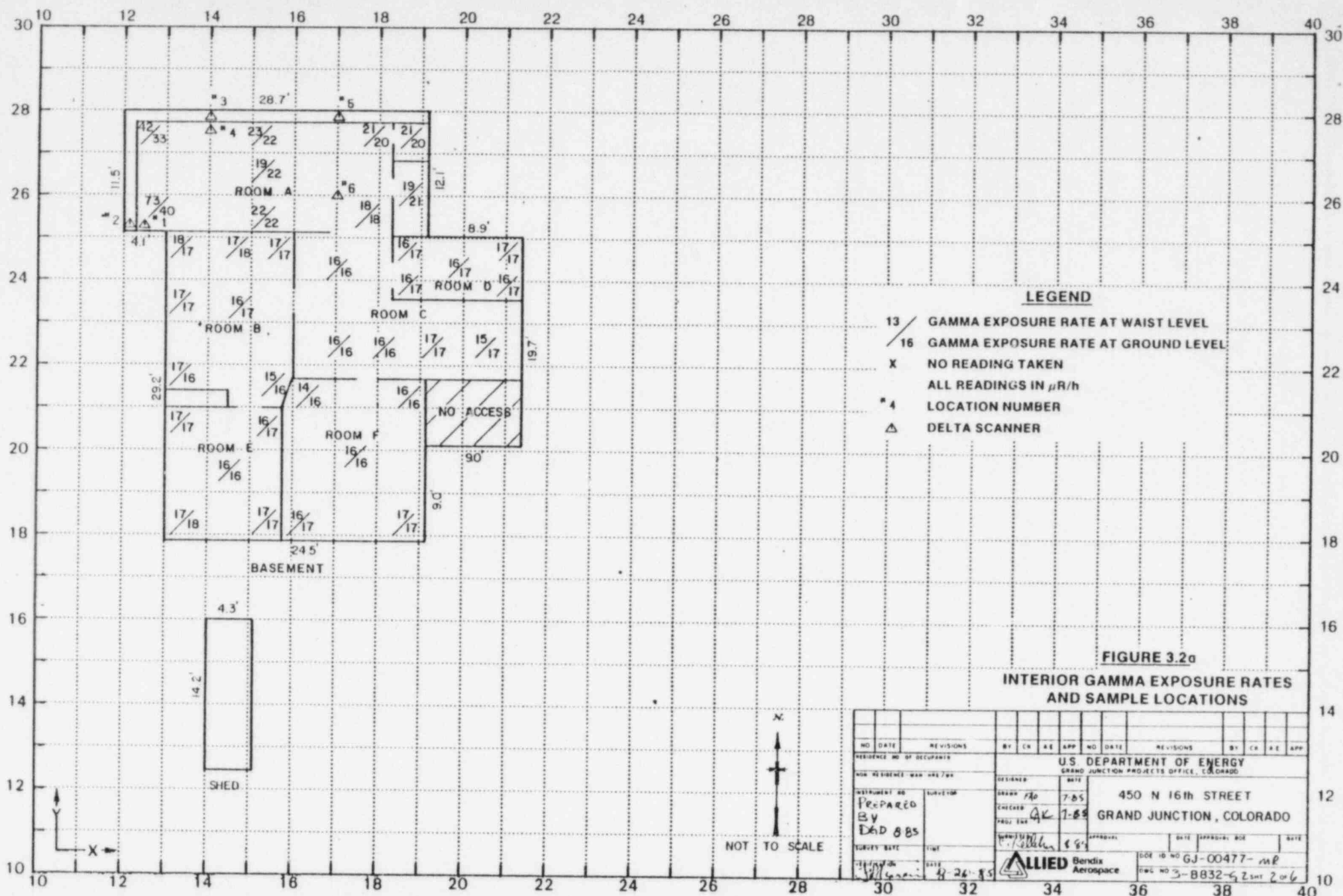
FIGURE 2.2 SITE PLAN

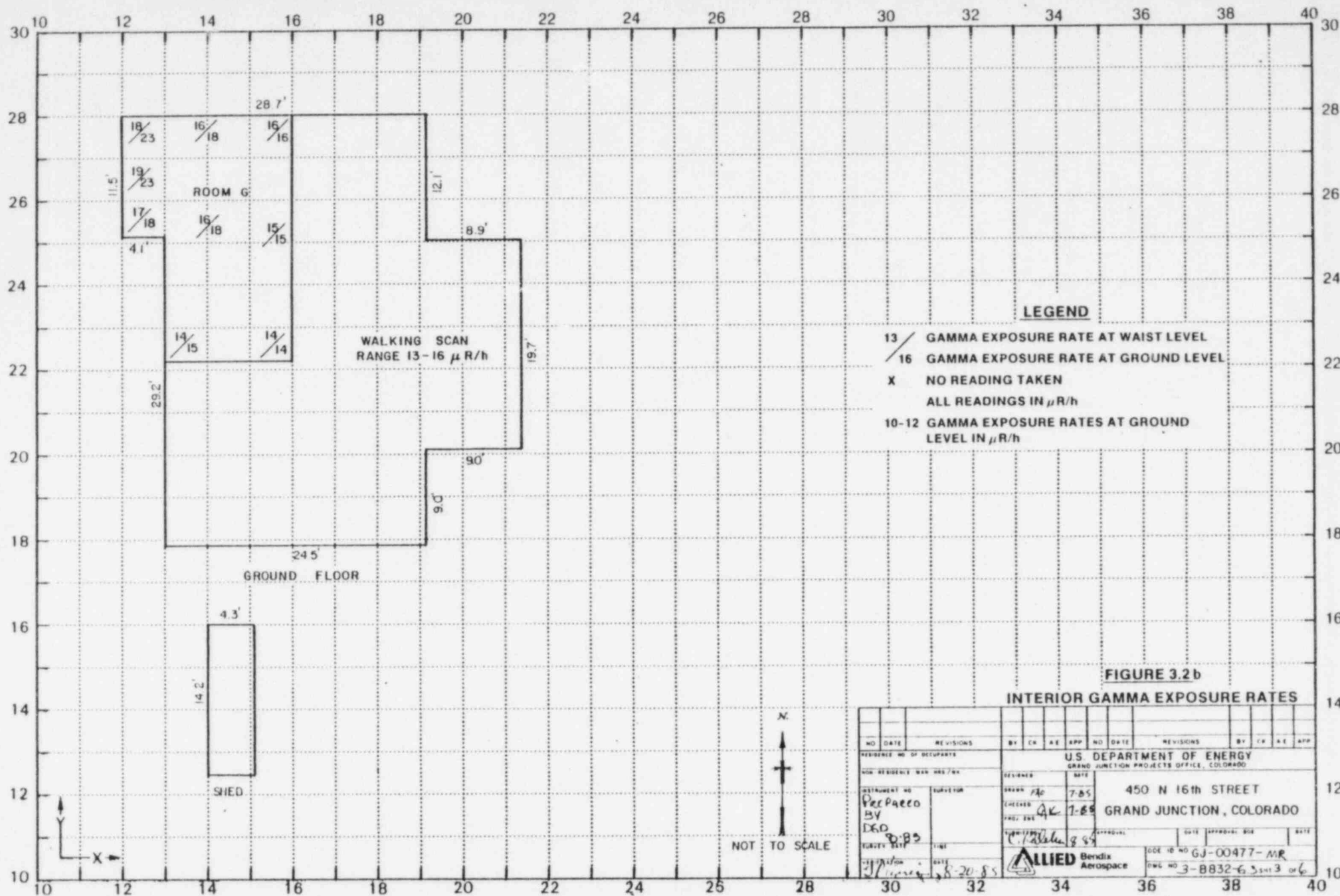
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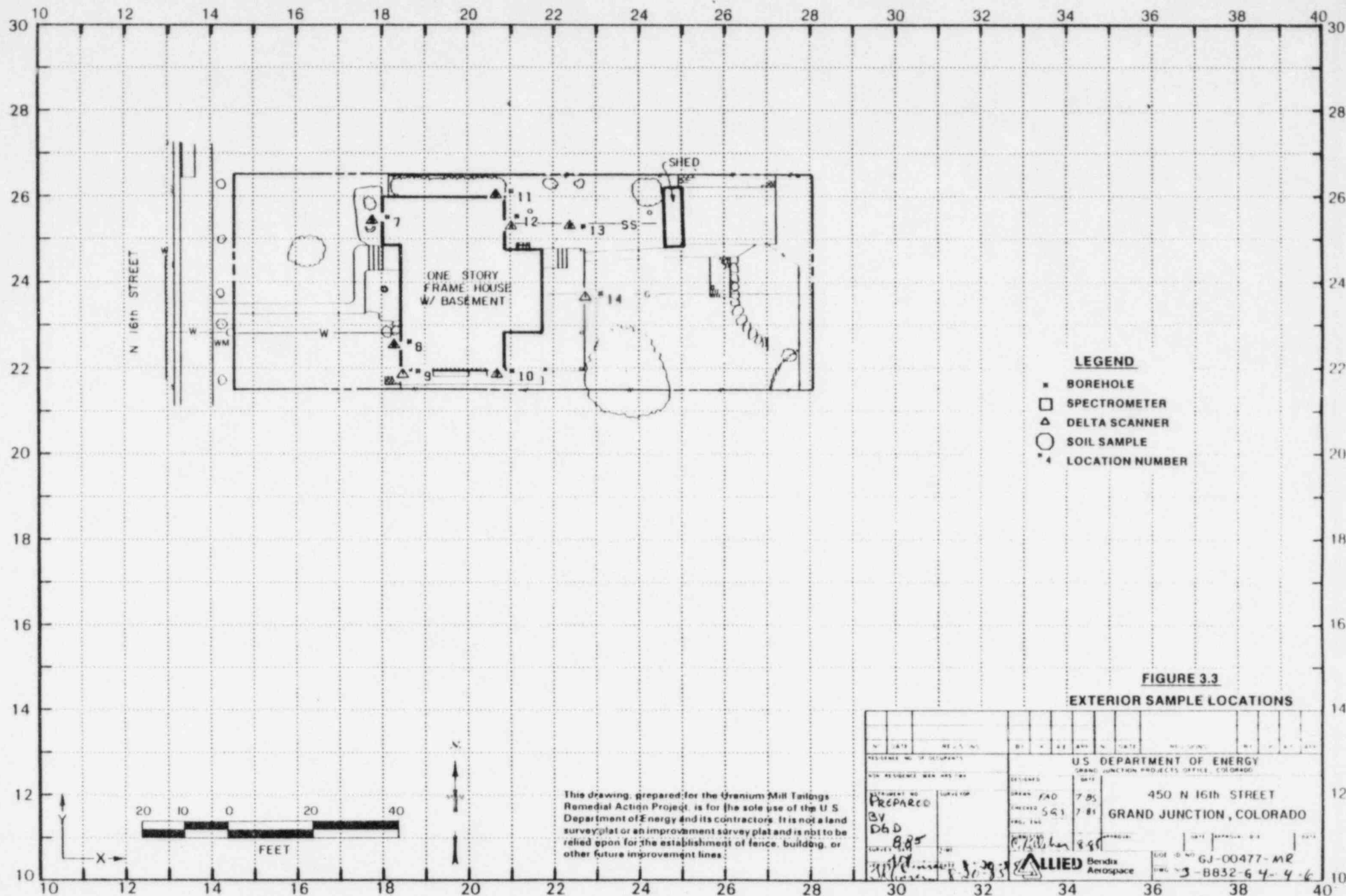
U.S. DEPARTMENT OF ENERGY	DOE ID NO.
GRAND JUNCTION PROJECT OFFICE - COLORADO	GJ00477MR
ADDRESS 450 NORTH 16TH STREET	ALRED
GRAND JUNCTION, COLORADO	ALRED
SURV. 16.85 (1985) (1987) BSK 17.1785	CR 24.75 F. 2.2
DRAWING NO. 3-CB52.F1	SHEET 1 OF 1

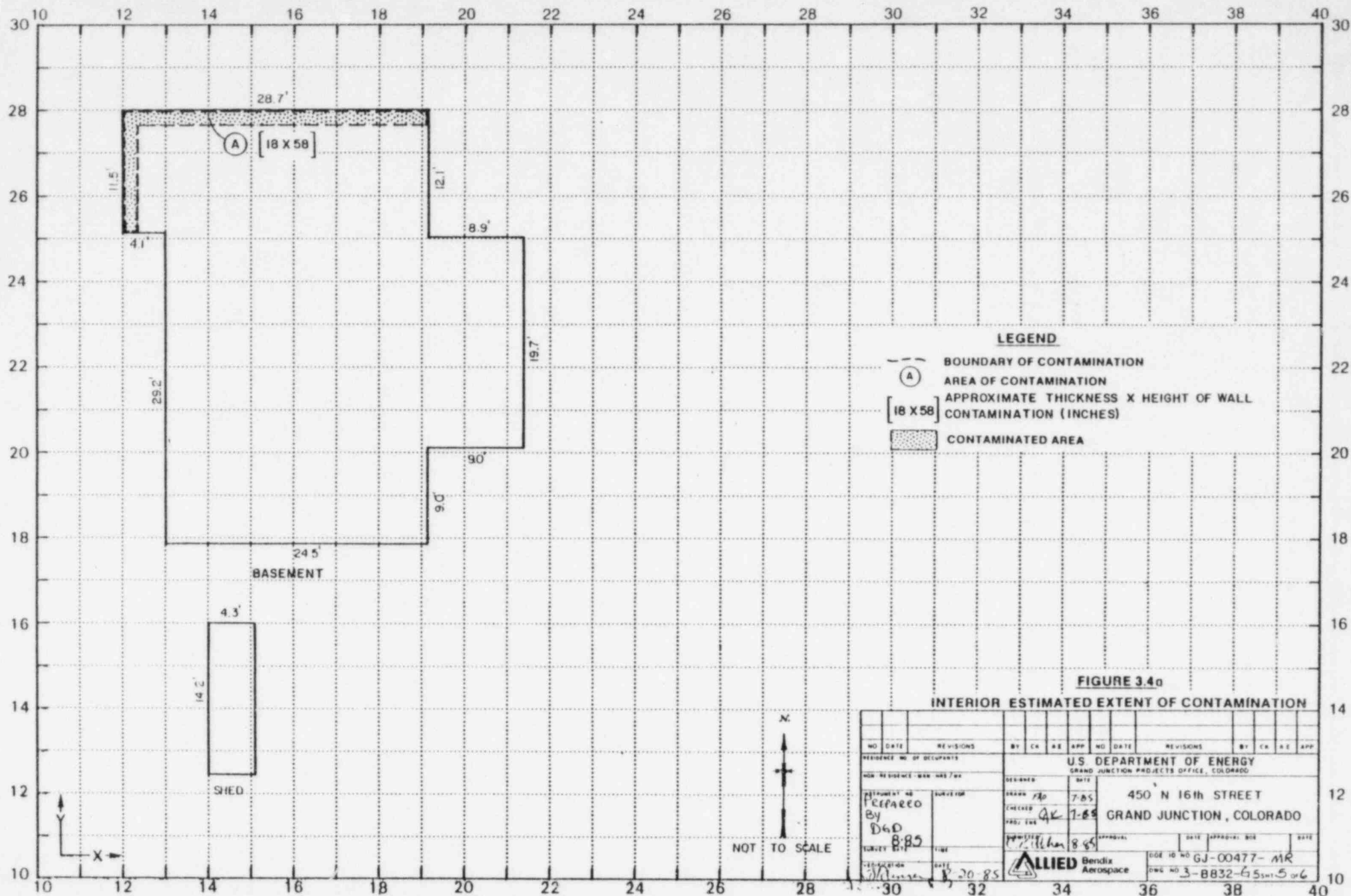
This drawing prepared for the Uranium Mill Tailings Remedial Action Project is for the sole use of the U.S. Department of Energy and its contractors. It is not to be used for any other purpose without the written consent of the U.S. Department of Energy. It is to be used only for the establishment of fence, building, or other future improvement lines.

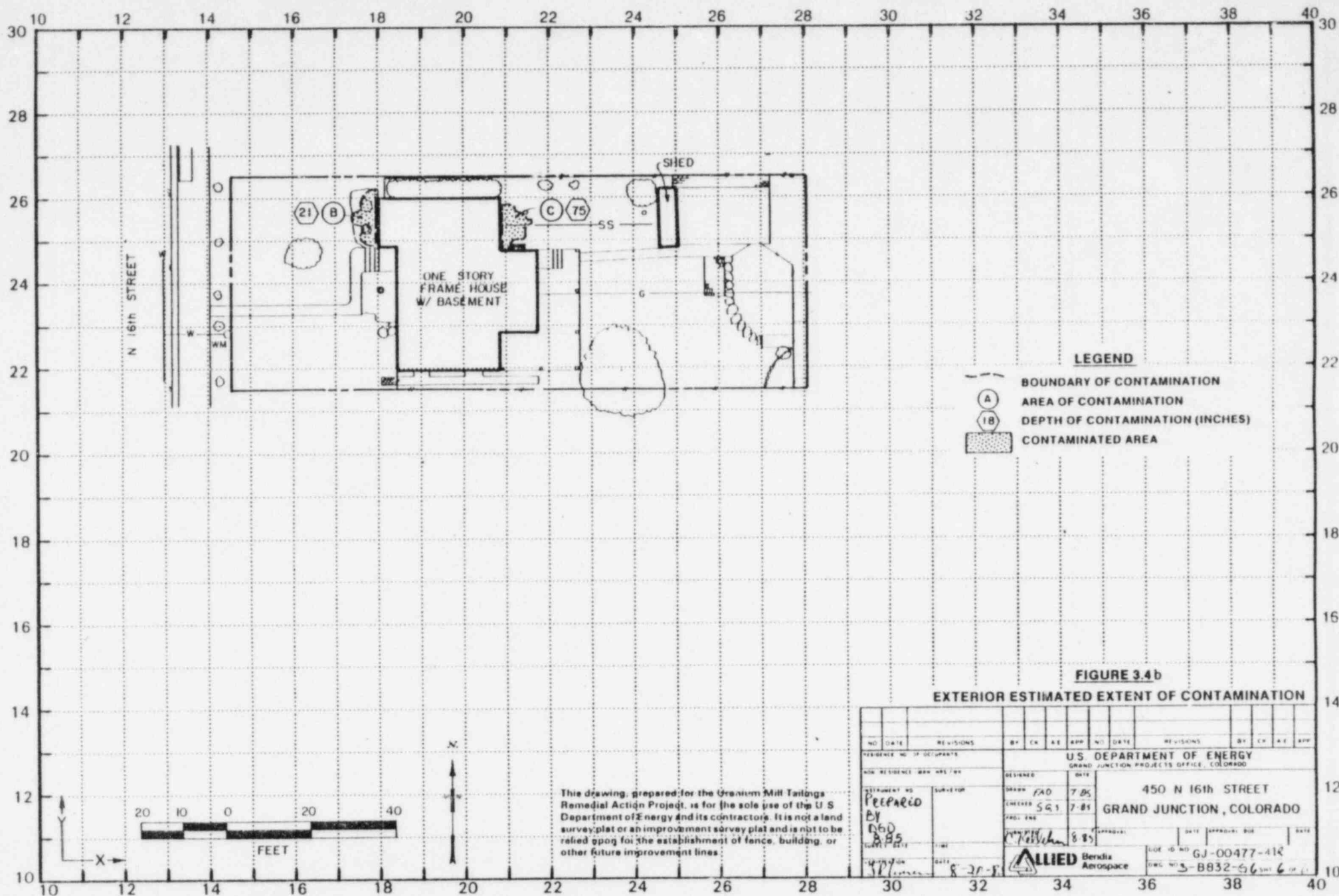












3/85

DOE ID NO. GJ-00477-MR

Date August 13, 1985

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

Official Survey Report

Property Address 450 N. 16th Street

Property Owner Manuel Valdez

Address of Owner (if different from above)

Report Prepared By David Dille

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.

HIG = 73 uR/h
HOG = 69 uR/h

MEMORANDUM

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado

Date: July 23, 1985
To: Files
From: David G. Dille
Subject: Team Leader Notes - GJ-00477-MR

Address: 450 North 16th Street
Owner: Manuel G. and Carmel Valdez
Occupancy: Three
Built: 1947

Colorado Department of Health (CDH) and Oak Ridge National Laboratory (ORNL) data indicates contamination on the west side of the primary structure and in the interior.

Team Members

D. Dille (Team Leader)	P. Hardy
M. Dexter	M. Gilfillan
M. Duran	H. Lucero

Instruments

See Equipment Summary sheet

Team members scanned the entire property.

Delta measurements were taken on the gas line and on all auger holes. The sewer line exits the primary structure on the east side, approximately 6 feet south from the northeast corner. Auger holes were also conducted near the sewer and water lines.

Team Leader Notes
David G. Dille
GJ-00477-MR
July 23, 1985
Page 2

Contamination on the interior appears to be associated with the concrete-capped cinder block retaining wall, which is 58-inches high by 18-inches wide.

All team members were alpha scanned before leaving the property.

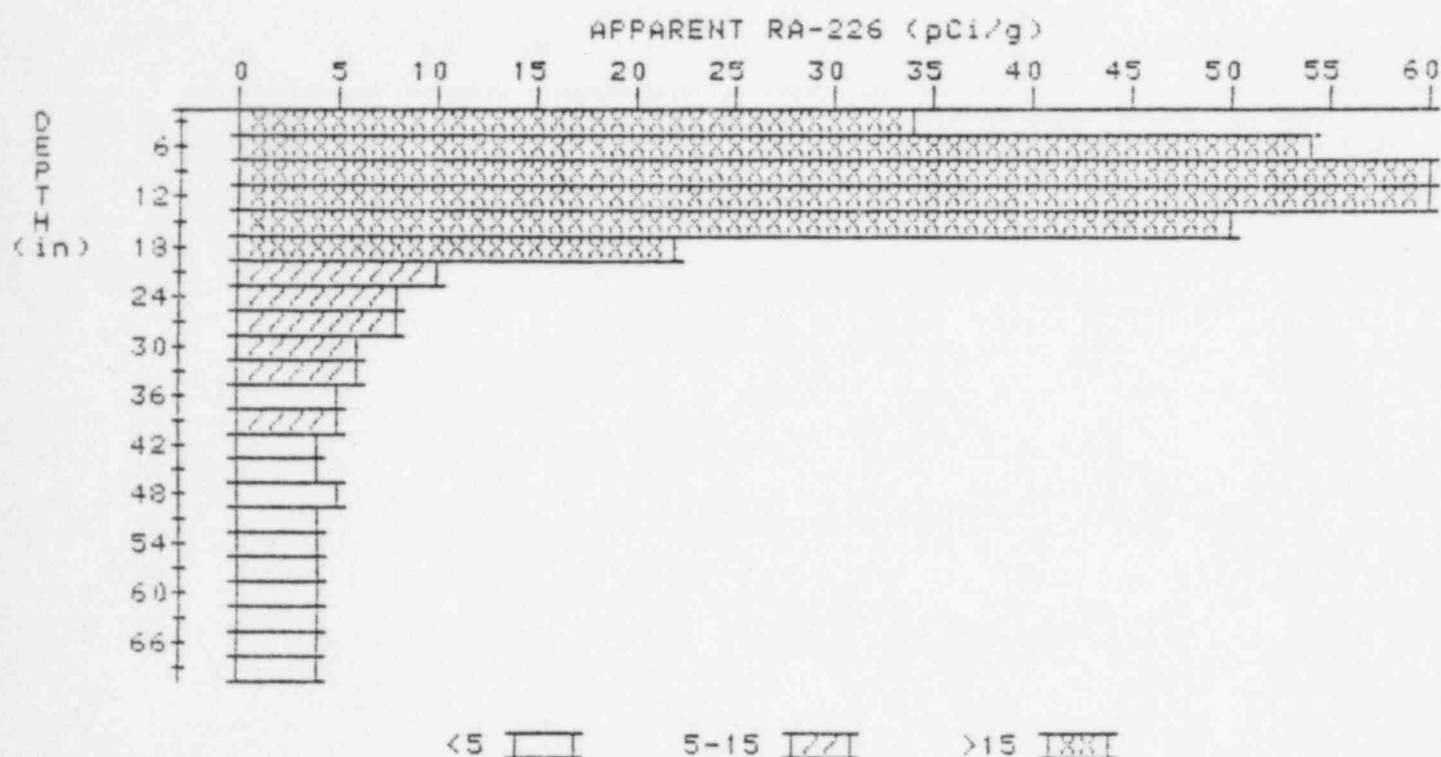
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

7

PROPERTY NUMBER: GJ-00477-MR

HOLE NUMBER: 7

LOCATION: 178255



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	33.6	33.6
6	47.2	53.8
9	57.1	78.3
12	55.1	71.3
15	44.0	50.2
18	29.4	22.5
21	18.7	10.0
24	12.9	8.3
27	9.7	7.6
30	7.7	6.5
33	6.4	5.7
36	5.5	4.6
39	5.1	5.1
42	4.7	4.3
45	4.5	4.3

48
51
54
57
60
63
66
69

4.4
4.2
4.2
4.1
4.0
4.0
4.1
4.4

4.0
5.0
4.4
4.1
5.0
5.0
5.7
4.4

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH




8

PROPERTY NUMBER: GJ-00477-MR

HOLE NUMBER: 8

LOCATION: 183226

APPARENT RA-226 (pCi/g)

<5 5-15 >15 

Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.9	2.9
6	3.1	3.1
9	3.3	3.5
12	3.4	3.2
15	3.6	3.8
18	3.7	3.5
21	3.9	4.1
24	4.0	4.2
27	4.0	4.0
30	4.0	4.0
33	4.0	4.2
36	3.9	3.7
39	3.9	3.5
42	4.1	4.5
45	4.1	4.3
48	4.0	3.6
51	4.1	4.3
54	4.1	4.1

57
60

4.1
4.0

4.3
4.0

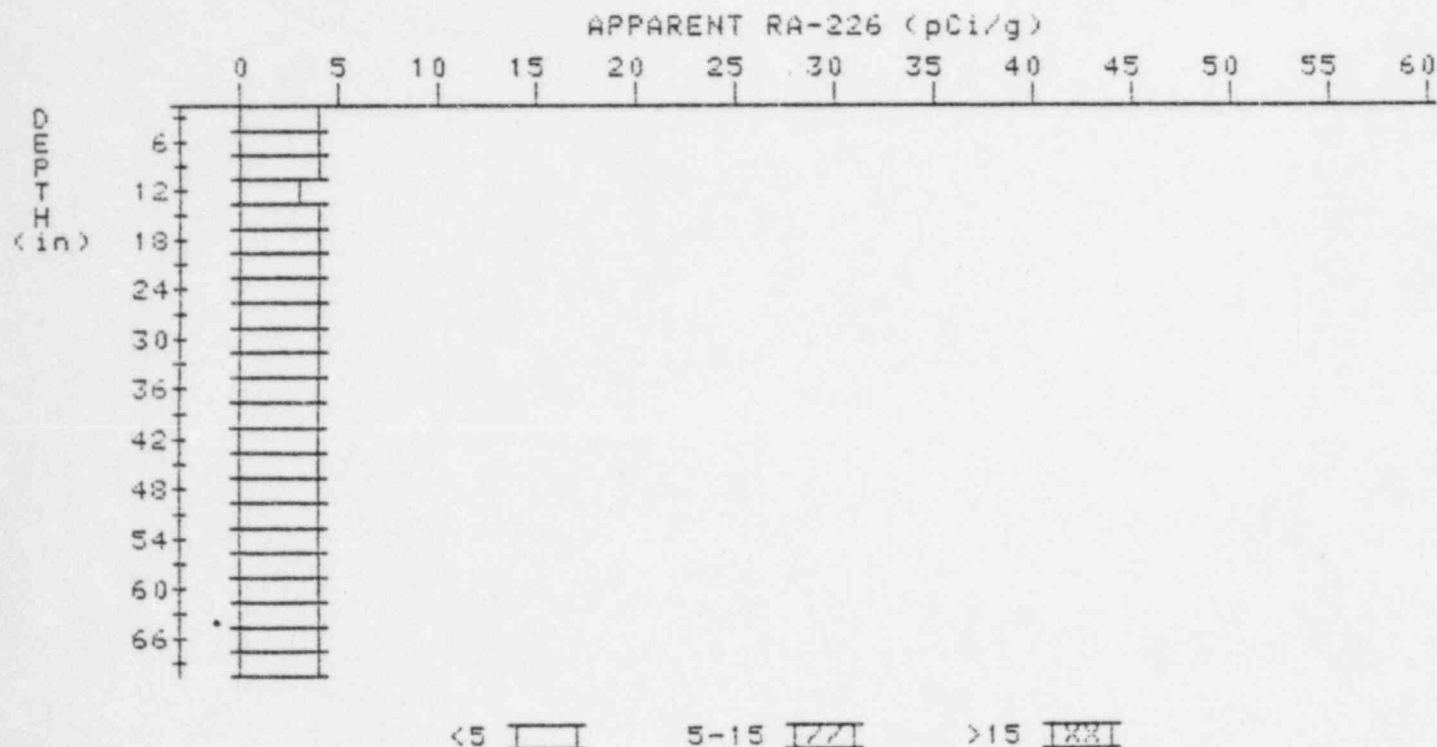
APPARENT RADIUM-226 CONCENTRATION 10

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00477-MR

HOLE NUMBER: 10

LOCATION: 207219



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.8	3.8
6	3.9	4.1
9	3.9	4.1
12	3.8	3.4
15	3.9	4.3
18	3.8	3.6
21	3.8	3.6
24	3.8	3.6
27	3.8	3.6
30	3.8	3.6
33	3.8	3.6
36	3.9	4.1
39	3.9	3.7
42	4.0	4.2
45	4.0	4.0

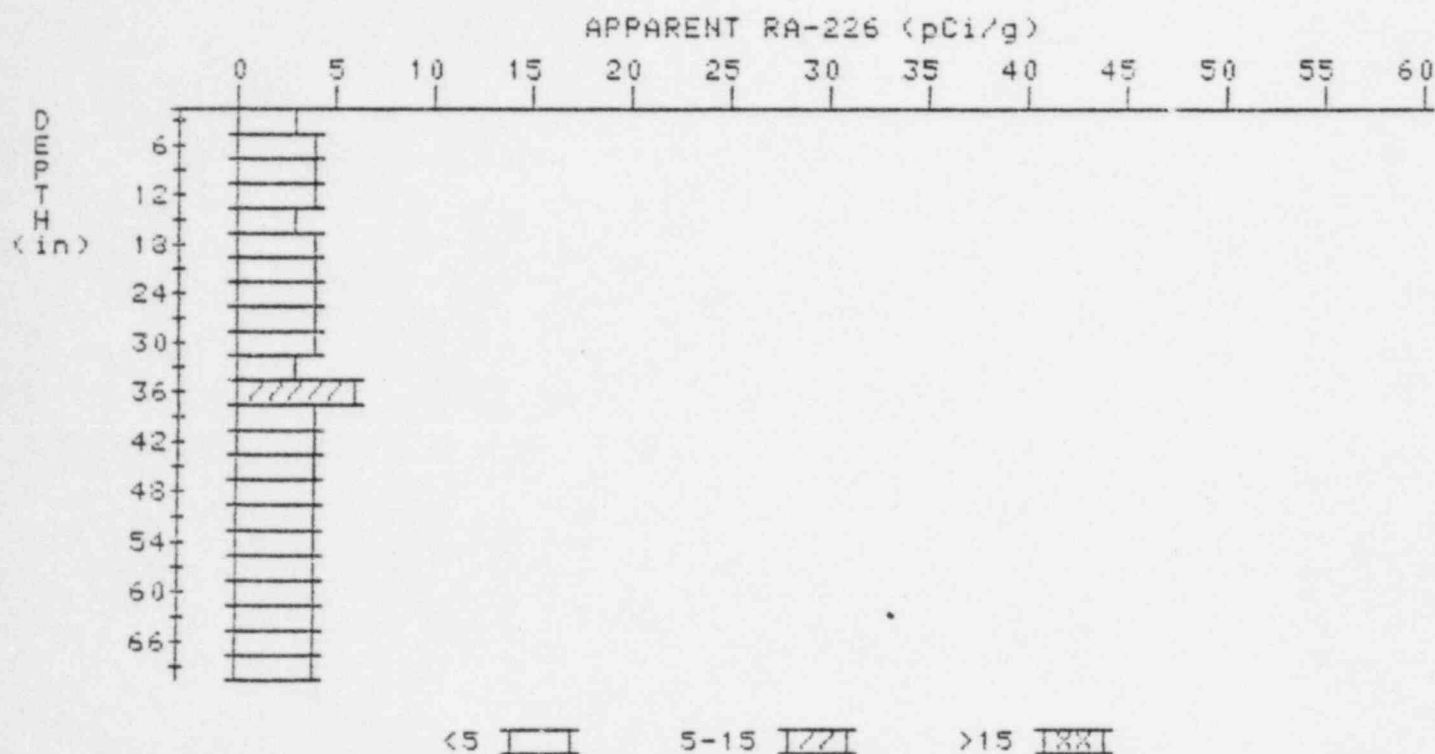
48
51
54
57
60
63
66
69

4.0
4.0
3.9
3.9
3.8
3.8
3.8
3.8

4.0
4.2
3.7
4.1
3.6
3.8
3.8
3.8

APPARENT RADIUM-226 CONCENTRATION 11 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00477-MR
HOLE NUMBER: 11
LOCATION: 207261



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.5	3.5
9	3.7	3.9
12	3.8	4.2
15	3.7	3.2
18	3.9	4.1
21	4.0	4.0
24	4.1	4.5
27	4.0	3.6
30	4.1	4.3
33	4.1	3.4
36	4.5	5.7
39	4.2	3.7
42	4.2	4.4
45	4.1	3.9

48	4.1	4.3
51	4.0	3.8
54	4.0	4.0
57	4.0	4.2
60	3.9	3.9
63	3.8	3.6
66	3.8	4.0
69	3.7	3.7

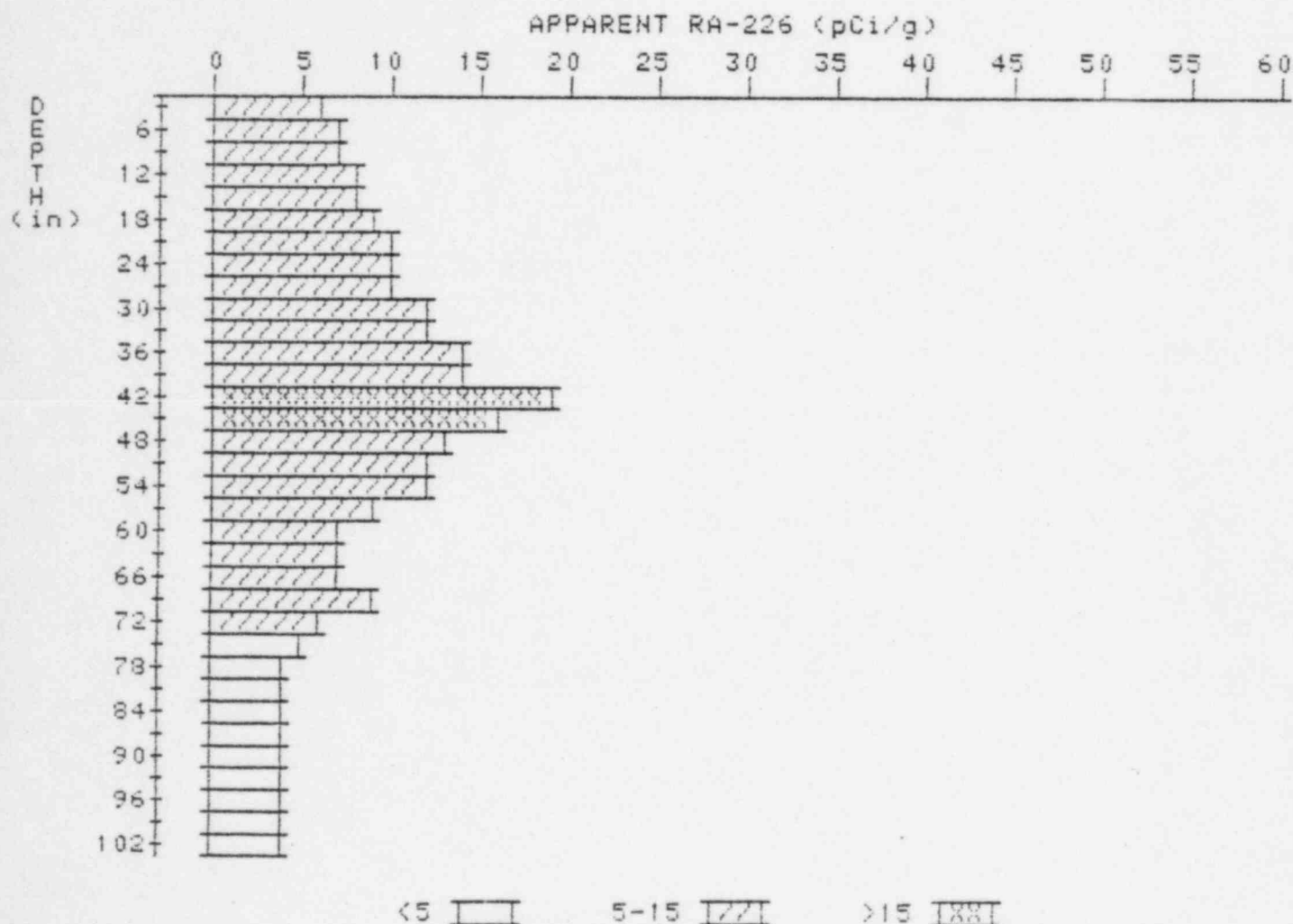
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

12

PROPERTY NUMBER: GJ-00477-MR

HOLE NUMBER: 12

LOCATION: 210253



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.6	5.6
6	6.5	7.2
9	7.0	6.8
12	7.6	7.6
15	8.2	7.7
18	9.1	9.3
21	9.9	10.4

24	10.4	10.4
27	10.9	10.4
30	11.7	11.9
33	12.4	11.7
36	13.5	13.7
39	14.5	14.3
42	15.6	19.2
45	14.7	15.8
48	13.2	12.7
51	12.0	11.6
54	11.0	11.7
57	9.6	9.4
60	8.3	7.2
63	7.6	7.1
66	7.2	6.7
69	7.1	8.5
72	6.2	6.2
75	5.3	4.9
78	4.6	3.9
81	4.3	4.1
84	4.1	3.9
87	4.0	4.0
90	3.9	3.7
93	3.9	3.7
96	4.0	4.2
99	4.0	4.0
102	4.0	4.0

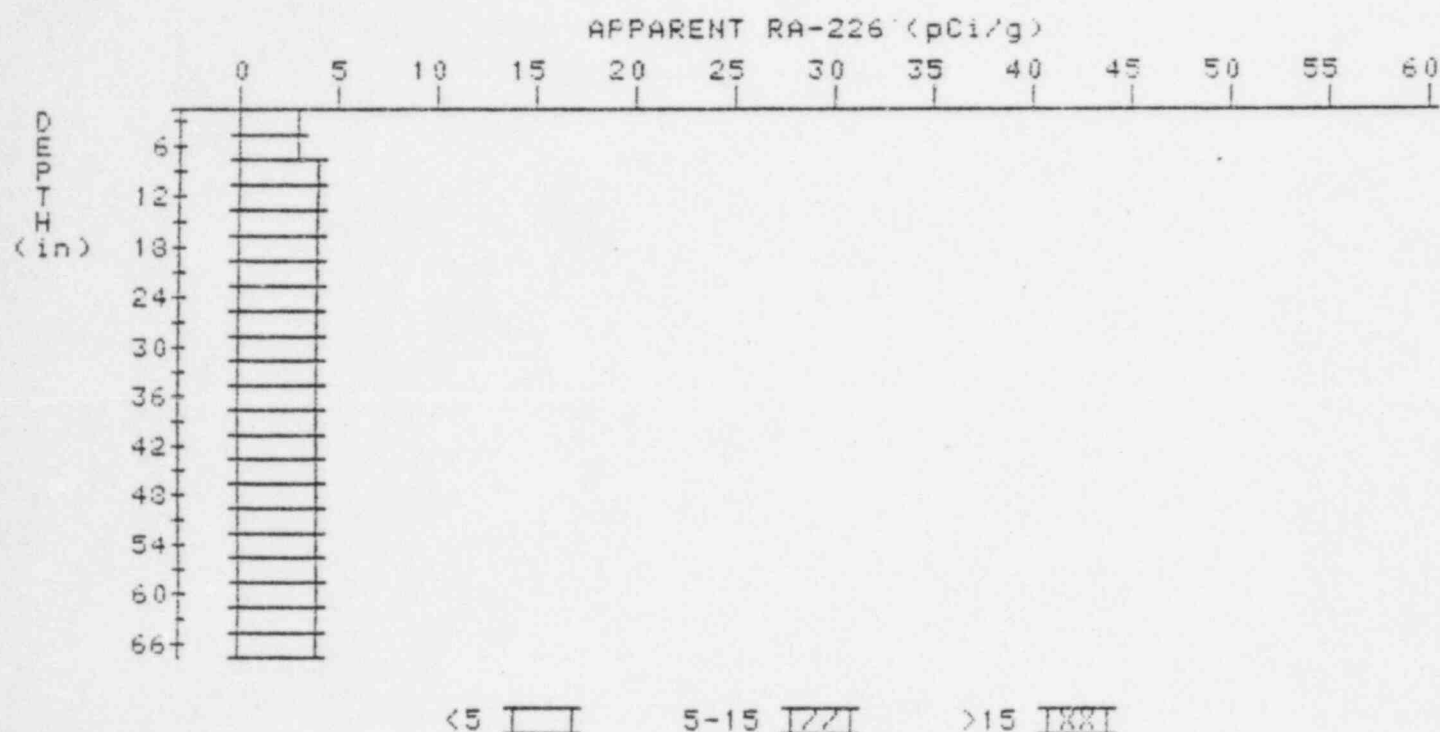
APPARENT RADIUM-226 CONCENTRATION 13

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-00477-MR

HOLE NUMBER: 13

LOCATION: 224253

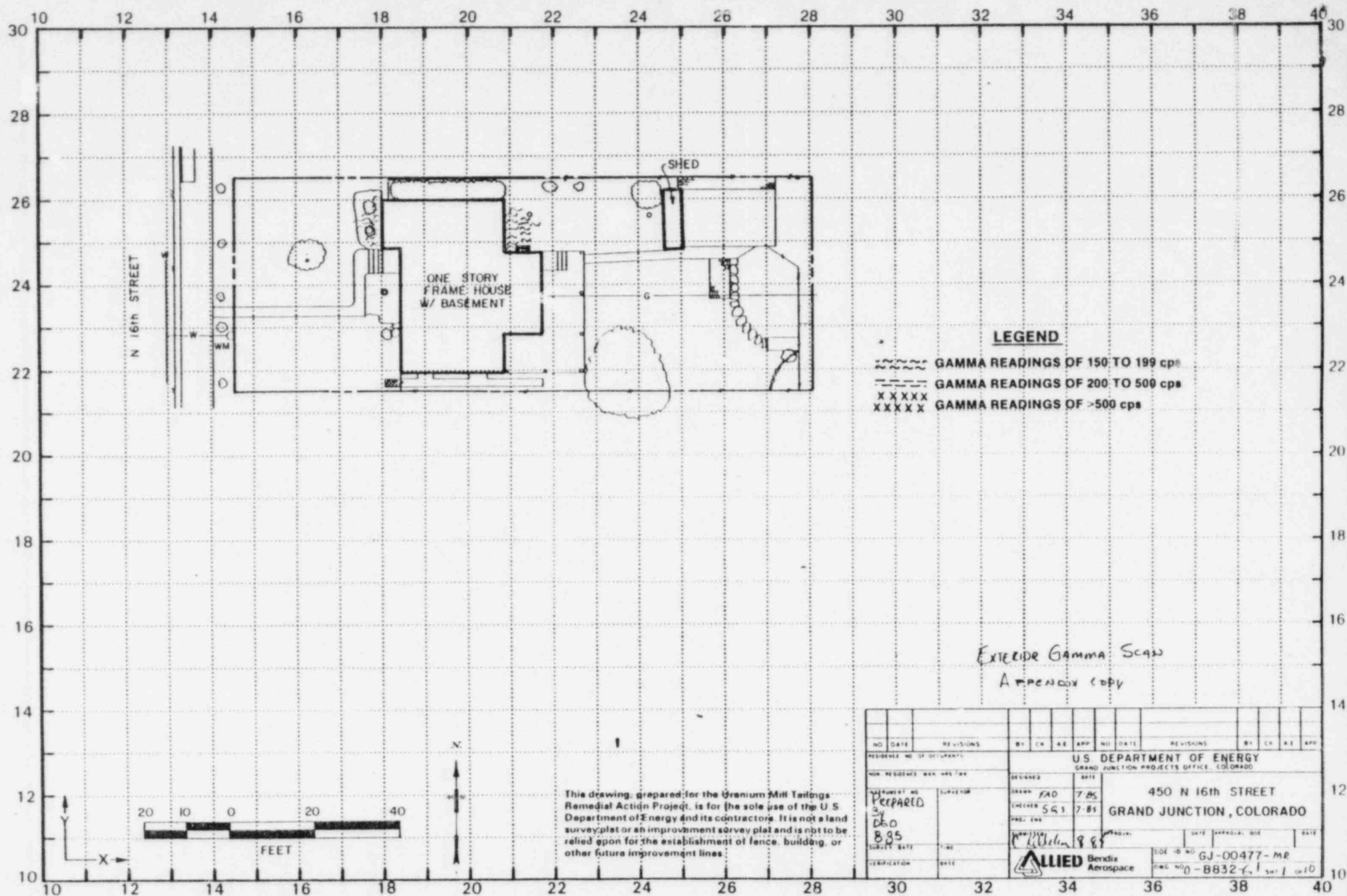


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.3	3.5
9	3.5	3.5
12	3.7	4.1
15	3.7	3.7
18	3.7	3.7
21	3.7	3.5
24	3.8	4.0
27	3.8	3.8
30	3.8	3.8
33	3.8	3.8
36	3.8	3.8
39	3.8	3.8
42	3.8	3.6
45	3.9	4.1
48	3.9	3.9

51
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3.9
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3.9
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3.8

3.9
3.9
3.9
3.9
4.1
3.8



NO. DATE REVISIONS				BY CR AE APP NO. DATE				REVISIONS				BY CR AE APP			
RESIDENT NO. OF OCCUPANTS								U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECTS OFFICE, COLORADO							
NON-RESIDENTS: MAN, WIFE, TAX								DESIGNED DATE							
DRAWN: K. P. PAREL				SURVEYOR				DRAWN: FAD 7-85				450 N 16TH STREET			
CHECKED: S. G. 1				DATE				CHECKED: S. G. 1 7-85				GRAND JUNCTION, COLORADO			
PROJ. ENG.				DATE				PROJ. ENG.				DATE			
SURVEY DATE				TIME				SURVEY DATE				TIME			
CERTIFICATION				DATE				CERTIFICATION				DATE			
ALLIED Bendix Aerospace				DATE				ALLIED Bendix Aerospace				DATE			
CODE NO. GJ-00477-MR				CODE NO. GJ-00477-MR				CODE NO. GJ-00477-MR				CODE NO. GJ-00477-MR			
FIG. NO. 0-BB32-1				FIG. NO. 0-BB32-1				FIG. NO. 0-BB32-1				FIG. NO. 0-BB32-1			