RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-03667-RS
ADDRESS: 2313 BUNTING AVENUE

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
Grand Junction, Colorado 81502

APPROVED BY Michael K Tucker
M. TUCKER
DOE PROJECT ENGINEER

DATE August 20, 1985

REA03667:REA-KL017

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-03667-RS, is a single-family residence located at 2313 Bunting 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, 11 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is $1,243. Remedial action on this property will take approximately 7 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 2313 Bunting Avenue, Grand Junction, Colorado

Zoning: Residential multi-family (RMF 32)

Lot Size: Approximately 6,930 sf (0.16 acres)

Legal Description: Lot 2, Block 3, Teller Acres, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 2 miles north of the State of Colorado Tailings Repository. Appendix Figure 2.1 shows the property location relative to its surroundings.

Utilities: Utility locations are shown in Appendix Figure 2.2.

Electrical:	Overhead
Gas:	Underground
Telephone:	Overhead
Sewer:	Underground
Water:	Underground
Cable TV:	Overhead

Bordering Properties:

North:	Bunting Avenue
South:	Commercial parking lot and alley
East:	Single-family residence
West:	Single-family residence

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-family residence
Size:	Approximately 988 sf
Construction Date:	1948
Construction:	One-story, wood-frame with an imitation brick design, built over a crawl space
Foundation:	6" concrete stemwall and spread footing
Footing Depth:	Approximately 9" to bottom of footing from grade
Basement:	None
Crawl Space:	Approximately 15" clearance from bottom of joist to grade
Condition:	Fair

Other Structures:

Type:	Detached garage
Size:	Approximately 240 sf
Construction:	Wood-framed, gable roof with asphalt roofing
Foundation:	Slab-on-grade with 8" thickened edge
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-03667-RS on May 15, 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 north and south yards and in the flower beds.

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): 44 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 17 uR/h
Highest Inside Gamma Reading (HIG): 17 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) In the northeast corner of the property, the depth of contamination is 6 inches (approximately 52 sf).

(AREA B) Immediately north of the primary structure, the contamination is 9 inches in depth (approximately 90 sf).

(AREA C) Immediately south of the primary structure, in a flower bed, the contamination is 6 inches deep (approximately 16 sf).

(AREA D) At the northeast corner of the garage, in a small flower bed, the depth of contamination is 6 inches (approximately 9 sf).

(AREA E) In the yard south of the primary structure and east of Area F, the contamination is 6 inches deep (approximately 150 sf).

(AREA F) In the southwest yard, adjacent to the east side of the garage, the estimated depth of contamination is 6 inches, based on the information collected in Area E (approximately 213 sf).

(AREA G) In the southwest corner of the property, the depth of contamination is 6 inches (approximately 18 sf).

(AREAS REQUIRING FURTHER INVESTIGATION DURING REMEDIAL ACTION)

The sidewalk in the south yard may have contamination beneath its concrete surface. The gamma survey did not show any elevated readings, but there are tailings deposits on both sides.

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-03667-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 $1,243.

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 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

Table 3.1
Radium Concentrations at Exterior Locations
DOE ID #GJ-03667-RS 2313 Bunting 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	154267	00	DS	3.9		*	DC = 6 inches
		06	DS	1.7		*	
2	155276	00	DS	6.0		*	Northeast of the
		06	DS	1.6		*	primary structure
3	155279	03	TC	3.2		*	Northeast corner
		06	TC	3.3		*	of the property
		09	TC	3.4		*	
		12	TC	3.6		*	DC = 0 inches
		15	TC	3.7		*	
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	TC	3.8		*	
		27	TC	3.7		*	
		30	TC	3.7		*	
		33	TC	3.6		*	
		36	TC	3.5		*	
		39	TC	3.5		*	
4	180270	03	TC	3.0		*	DC = 0 inches
		06	TC	3.3		*	
		09	TC	3.6		*	
		12	TC	3.8		*	
		15	TC	3.9		*	
		18	TC	4.0		*	
		21	TC	4.0		*	
		24	TC	4.0		*	
		27	TC	4.0		*	
		30	TC	4.0		*	
		33	TC	3.8		*	
		36	TC	3.7		*	
5	182261	03	TC	3.0		*	North of primary
		06	TC	3.4		*	structure
		09	TC	3.6		*	
		12	TC	3.7		*	DC = 0 inches
		15	TC	3.9		*	
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	TC	3.8		*	
		27	TC	3.7		*	
		30	TC	3.7		*	
		33	TC	3.7		*	

Table 3.1
Radium Concentrations at Exterior Locations

DOE ID #GJ-03667-RS 2313 Bunting 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
5	182261	36	TC	3.6		*	
		39	TC	3.5		*	
		42	TC	3.6		*	
6	187249	03	TC	3.0		*	Water line
		06	TC	3.2		*	
		09	TC	3.3		*	DC = 0 inches
		12	TC	3.4		*	
		15	TC	3.5		*	
		18	TC	3.6		*	
		21	TC	3.7		*	
		24	TC	3.9		*	
		27	TC	3.9		*	
		30	TC	3.9		*	
		33	TC	3.9		*	
		36	TC	3.9		*	
		39	TC	3.9		*	
		42	TC	3.8		*	
		45	TC	3.8		*	
		48	TC	3.7		*	
		51	TC	3.6		*	
		54	TC	3.5		*	
		57	TC	3.3		*	
		60	TC	3.3		*	
		63	TC	3.3		*	
7	188266	03	TC	12.6		*	North of primary
		06	TC	9.7		*	structure
		09	TC	6.7		*	
		12	TC	4.9		*	DC = 9 inches
		15	TC	4.4		*	Based on the
		18	TC	4.0		*	deconvolution graph
		21	TC	4.0		*	
		24	TC	3.9		*	
		27	TC	3.9		*	
		30	TC	3.8		*	
		33	TC	3.8		*	
		36	TC	3.7		*	
8	189260	00	GS		3.5	*	Northeast of front steps

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
9	189269	00	DS	1.0		*	Horizontal against
		04	DS	<1.0		*	foundation
		[05]	GS		4.5	*	5" up foundation
		00	GS		5.9	*	
10	189278	03	TC	2.8		*	East of primary
		06	TC	3.2		*	structure
		09	TC	3.5		*	
		12	TC	3.7		*	DC = 0 inches
		15	TC	3.8		*	
		18	TC	3.9		*	
		21	TC	3.9		*	
		24	TC	3.9		*	
		27	TC	3.9		*	
		30	TC	3.8		*	
		33	TC	3.7		*	
11	190230	00	DS	1.2		*	West of the
		06	DS	<1.0		*	driveway
12	191245	00	DS	1.1		*	North of primary structure
		00-00	SS			4.1	Moist dirt, bricks and concrete
13	191254	00	DS	<1.0		*	North of primary structure
14	192272	00	DS	1.9		*	Northeast side of
		06	DS	<1.0		*	primary structure
15	210275	00	DS	1.6		*	East yard
		06	DS	1.3		*	
16	216230	00	DS	1.1		*	Gravel driveway
		06	DS	<1.0		*	
17	217250	00	DS	2.7		*	South of primary
		06	DS	1.2		*	structure
18	218242	03	TC	3.2		*	Southwest side of
		06	TC	3.5		*	primary structure
		09	TC	3.7		*	DC = 0 inches

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
18	218242	12	TC	3.8		*	
		15	TC	3.9		*	
		18	TC	3.8		*	
		21	TC	3.9		*	
		24	TC	3.9		*	
		27	TC	3.8		*	
		30	TC	3.8		*	
		33	TC	3.6		*	
		36	TC	3.4		*	
		39	TC	3.5		*	
		42	TC	3.4		*	
		45	TC	3.4		*	
		48	TC	3.4		*	
		51	TC	3.4		*	
		54	TC	3.3		*	
		57	TC	3.4		*	
		60	TC	3.3		*	
		63	TC	3.3		*	
19	220251	00	DS	8.1		*	Southwest side of
		06	DS	1.9		*	back steps
20	228260	00	DS	1.9		*	Gas line
		06	DS	<1.0		*	
21	229270	03	TC	3.0		*	Southeast corner of
		06	TC	3.4		*	primary structure
		09	TC	3.5		*	
		12	TC	3.7		*	DC = 0 inches
		15	TC	3.8		*	
		18	TC	3.9		*	
		21	TC	3.8		*	
		24	TC	3.9		*	
		27	TC	3.9		*	
		30	TC	3.8		*	
		33	TC	3.7		*	
		36	TC	3.6		*	
		39	TC	3.7		*	
		42	TC	3.7		*	
		45	TC	3.5		*	
		48	TC	3.6		*	
		51	TC	3.5		*	

Table 3.1
Radium Concentrations at Exterior Locations

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
21	229270	54	TC	3.5		*	
		57	TC	3.4		*	
		60	TC	3.4		*	
		63	TC	3.5		*	
		66	TC	3.5		*	
		69	TC	3.4		*	
		72	TC	3.4		*	
		75	TC	3.3		*	
22	230260	20	DS	1.5		*	Gas line
23	232243	00	DS	5.2		*	East side of garage
		06	DS	2.3		*	
		12	DS	<1.0		*	DC = 6 inches
24	237258	03	TC	4.6		*	Sewer line
		06	TC	4.6		*	
		09	TC	4.2		*	DC = 6 inches
		12	TC	3.9		*	Based on all
		15	TC	3.9		*	available data
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	TC	3.7		*	
		27	TC	3.7		*	
		30	TC	3.7		*	
		33	TC	3.7		*	
		36	TC	3.7		*	
		39	TC	3.6		*	
		42	TC	3.4		*	
		45	TC	3.5		*	
		48	TC	3.4		*	
		51	TC	3.4		*	
		54	TC	3.3		*	
		57	TC	3.2		*	
		60	TC	3.2		*	
		63	TC	3.2		*	
		66	TC	3.2		*	
		69	TC	3.2		*	

Table 3.1
Radium Concentrations at Exterior Locations
DOE ID #GJ-03667-RS 2313 Bunting Avenue

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
25	242262	00	DS	4.9		*	Backyard
		06	DS	1.5		*	DC = 6 inches
26	246227	00	DS	3.3		*	West side of garage
		06	DS	1.3		*	Point source removed
27	246266	03	TC	3.3		*	South of primary structure
		06	TC	3.7		*	
		09	TC	3.7		*	DC = 0 inches
		12	TC	3.7		*	
		15	TC	3.8		*	
		18	TC	3.8		*	
		21	TC	3.9		*	
		24	TC	3.9		*	
		27	TC	3.9		*	
		30	TC	3.8		*	
		33	TC	3.7		*	
		36	TC	3.5		*	
		39	TC	3.5		*	
28	247278	00	DS	<1.0		*	Southeast back
		06	DS	<1.0		*	fence
29	257243	03	TC	3.3		*	Southwest corner of
		06	TC	3.7		*	backyard
		09	TC	4.0		*	
		12	TC	4.0		*	DC = 0 inches
		15	TC	3.9		*	
		18	TC	3.9		*	
		21	TC	3.9		*	
		24	TC	3.8		*	
		27	TC	3.7		*	
		30	TC	3.7		*	
		33	TC	3.7		*	
		36	TC	3.7		*	
		39	TC	3.6		*	
30	259258	00	DS	2.1		*	Backyard wood fence
		06	DS	1.1		*	

Table 3.1
Radium Concentrations at Exterior Locations
DOE ID #GJ-03667-RS 2313 Bunting 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
31	259279	00	DS	<1.0		*	Background
		00	GS		1.7	*	
		03	TC	3.2		*	DC = 0 inches
		06	TC	3.5		*	
		09	TC	3.7		*	
		12	TC	3.8		*	
		15	TC	4.0		*	
		18	TC	3.9		*	
		21	TC	4.0		*	
		24	TC	4.0		*	
		27	TC	4.0		*	
		30	TC	3.8		*	
32	279226	00	DS	4.9		*	Southwest of garage
		06	DS	1.5		*	
33	281228	00	GS		2.5	*	Horizontal against brick inside planter
34	284226	00	DS	1.3		*	Inside bricked
		06	DS	1.6		*	planter
		00	GS		2.4	*	

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 = 05-15-85
Team Leader = JH

Table 3.2
Summary of Interior Gamma Exposure Rates

DOE ID #GJ-03667-RS 2513 Bunting 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)
GROUND FLOOR	*	*	*	*	14-17	*
GARAGE	*	*	*	*	14-15	*

* The historical data indicate the absence of interior contamination at this property. This information was investigated by performing walking gamma scans.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-03667-RS

AREA	CALCULATIONS(ft)		SF		DEPTH(ft)		CF				CUBIC YARDS
EXTERIOR											
Contaminated Fill											
A	13 x 4	=	52	x	0.5	=	26				
B	15 x 6	=	90	x	0.8	=	72				
C	8 x 4/2	=	16	x	0.5	=	8				
D	3 x 3	=	9	x	0.5	=	5				
E	15 x 10	=	150	x	0.5	=	75				
F	14 x 12	=	168								
	4 x 9	=	36								
	3 x 3	=	9								
			213	x	0.5	=	107				
G	6 x 3	=	18	x	0.5	=	9				
TOTAL VOLUME - EXTERIOR						=	302	=	302/27	=	11

See Appendix Figure 3.3 For Areas

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-03667-RS

EXTERIOR		
Remove identified residual radioactive material 11 cy @ $18.50/cy (manual)		$ 204
Replace excavated areas with topsoil 11 cy @ $9.50/cy		105
Replace excavated lawn area with sod 500 sf @ $0.25/sf		125
Replace shrubs (5-gallon size) 5 ea @ $20/ea		100
Support existing fence 10 lf @ $2.60/lf		26
	TOTAL EXTERIOR	$ 560
	TOTAL INTERIOR	0
	ACCESS CONTROL	150
	SUBTOTAL	$ 710
	CONTINGENCY @ 25%	178
	SUBTOTAL	$ 888
	CONTRACTOR OVERHEAD & PROFIT @ 40%	355
	GRAND TOTAL	$ 1,243

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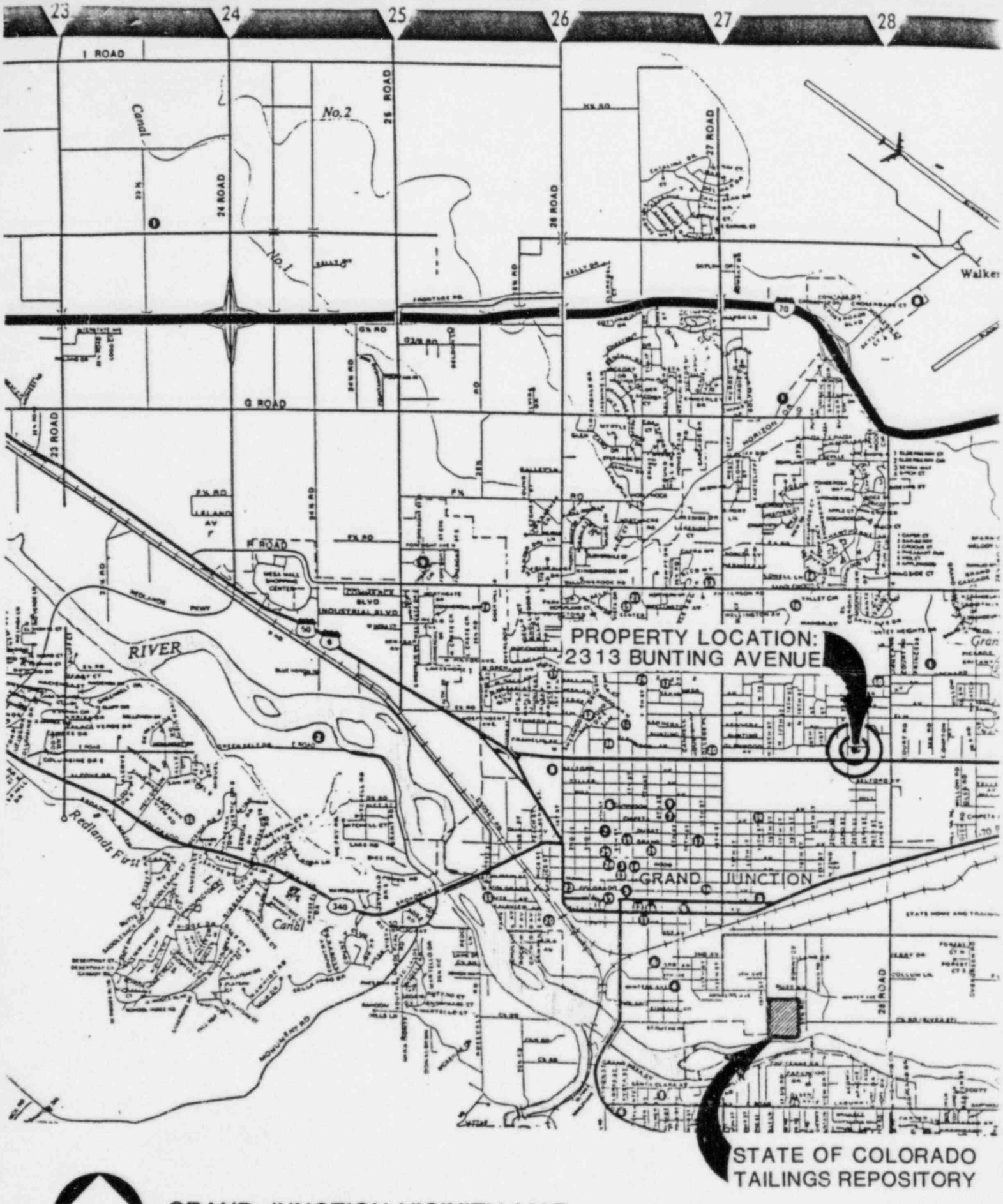
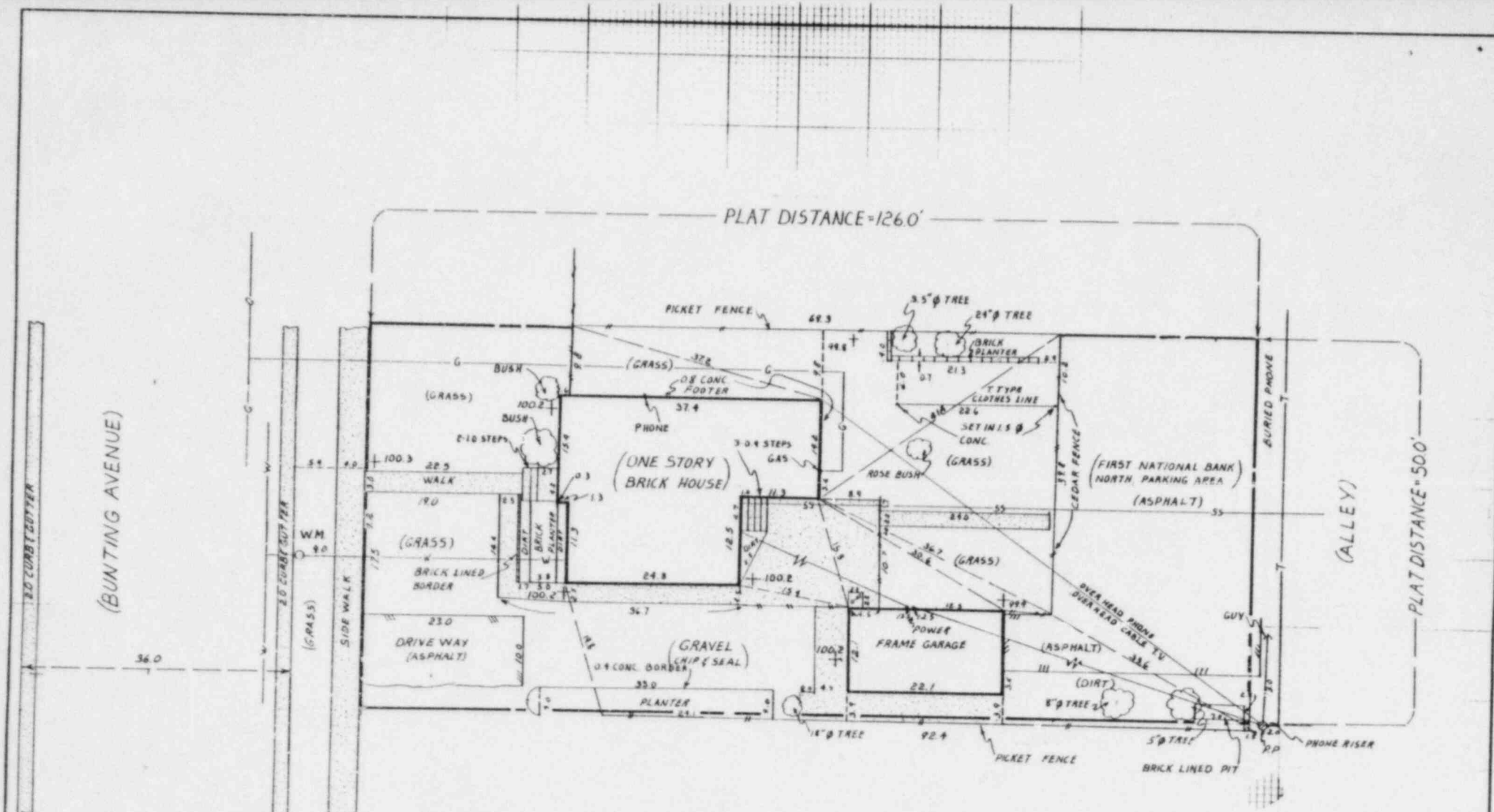


GRAND JUNCTION VICINITY MAP

FIGURE 2.1



LOT 2, BLOCK 3, TELLER ACRES
CITY OF GRAND JUNCTION
MESA COUNTY, COLORADO

FIGURE 2.2 SITE PLAN

10' 5' 0 10' 20'
SCALE IN FEET

This drawing, prepared for the Uranium Mill Tailings Remedial Action Project, is for the sole use of the U.S. Department of Energy and its contractors. It is not a land survey plat or an improvement survey plat and is not to be relied upon for the establishment of fence, building, or other future improvement lines.

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECT OFFICE, COLORADO	DOE ID NO. GJ-03667-RS
ADDRESS 2313 BUNTING AVE GRAND JUNCTION, COLORADO	ALLIED Remedial Action Contractor
SURV. R.L.B. / DRAFT I.R.G.	CK. W.C.F. 5-10-95
DRAWING NO. 3-C-663-F1	SHEET 1 OF 1

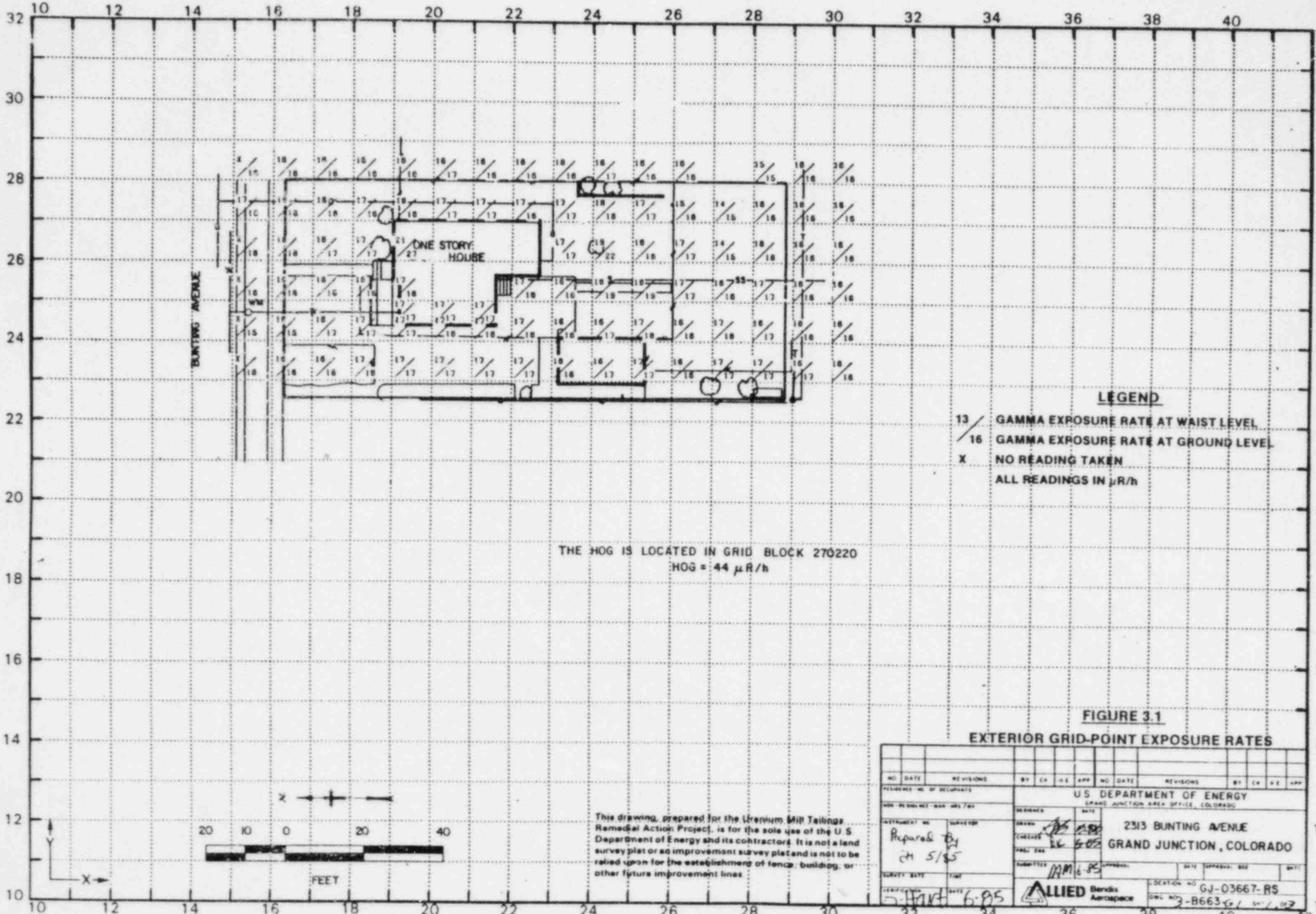
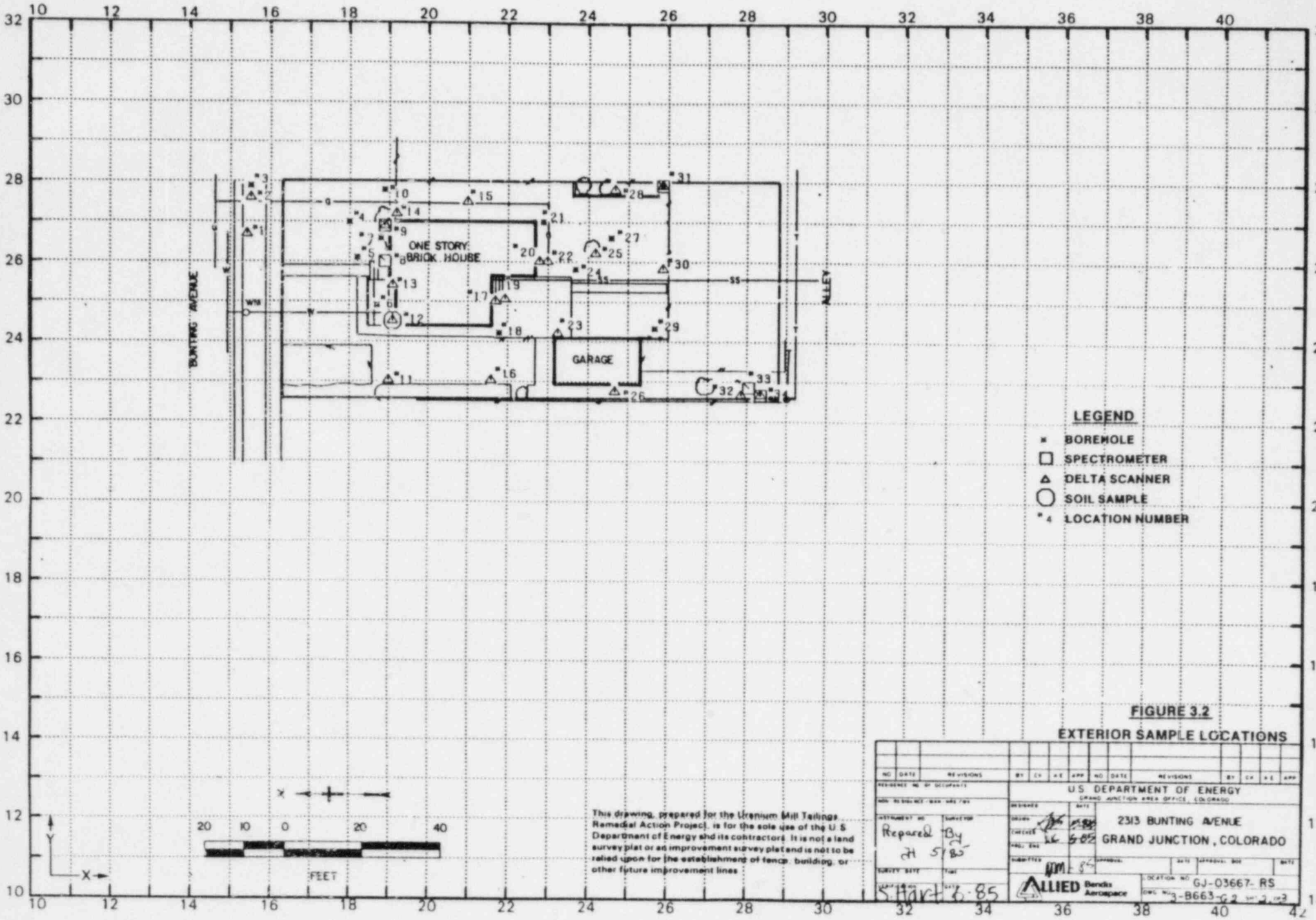


FIGURE 3.1

EXTERIOR GRID-POINT EXPOSURE RATES



This drawing, prepared for the Uranium Mill Tailings Remedial Action Project, is for the sole use of the U.S. Department of Energy and its contractors. It is not a land survey plat or an improvement survey plat and is not to be relied upon for the establishment of fence, building, or other future improvement lines.

FIGURE 3.2

EXTERIOR SAMPLE LOCATIONS

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

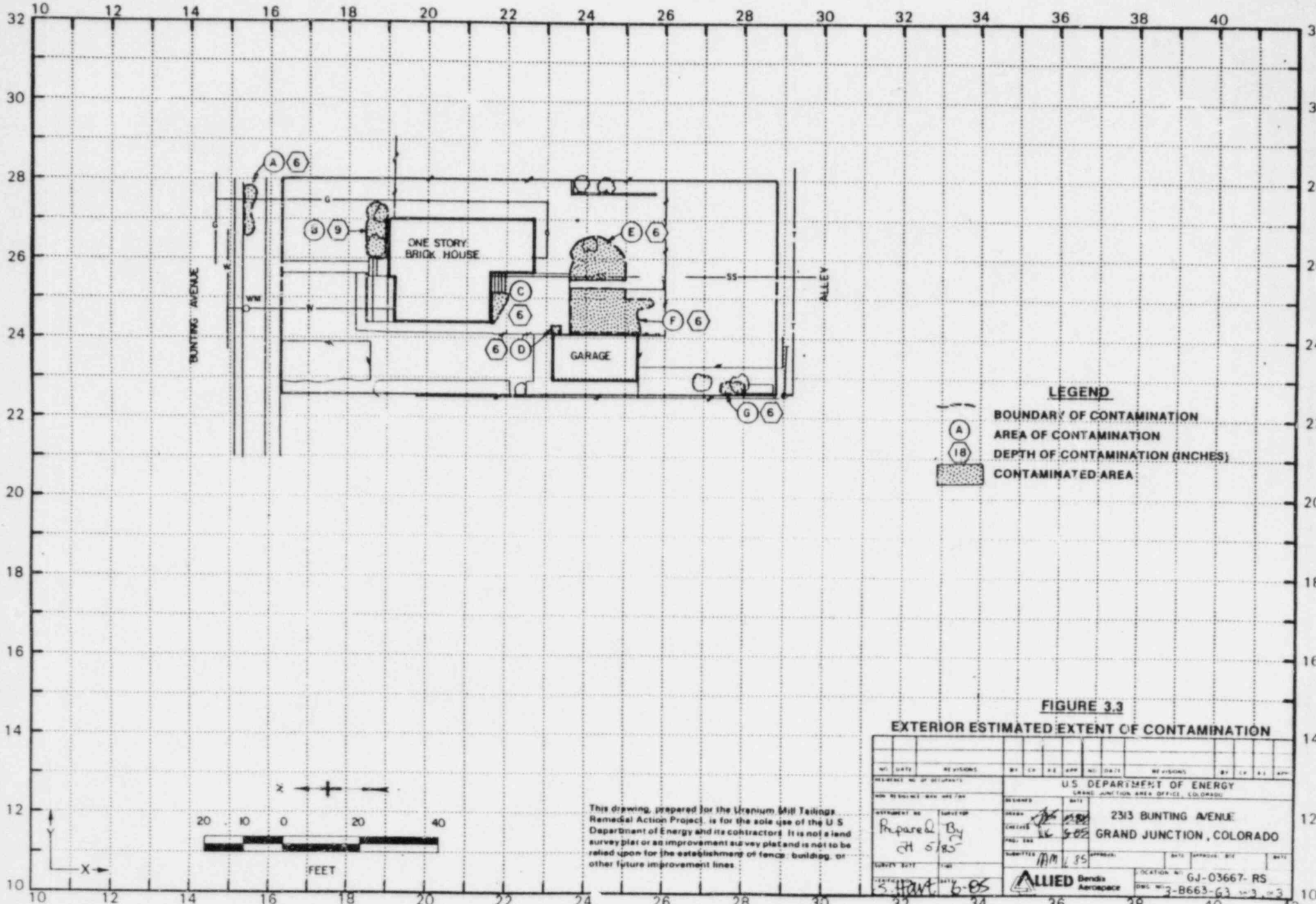
2313 BUNTING AVENUE
GRAND JUNCTION, COLORADO

Prepared By
H. Stark 5/85

S. Hart 5-85

ALLIED Bendix Aerospace

LOCATION NO. GJ-03667-RS
DWG NO. 3-B663-G-2



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.

Prepared By CH 5/85

S. Hart 6-85

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

2313 BUNTING AVENUE
GRAND JUNCTION, COLORADO

ALLIED Bendix Aerospace

GJ-03667-RS

3-B663-63 sh 3 of 3

FIGURE 3.3

EXTERIOR ESTIMATED EXTENT OF CONTAMINATION

3/85

DOE ID NO. GJ-03667-RS Date June ,6 1985

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

Official Survey Report

Property Address 2313 Bunting Avenue Grand Junction , Colorado

Property Owner First National Bank North

Address of Owner (if different from above) _____

Report Prepared By Juna Hebel

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 = 17 uR/h
HOG = 44 uR/h

MEMORANDUM

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado

Date: May 15, 1985

To: Files

From: Juna Hebel

Subject: Team Leader Notes - GJ-03667-RS

Address: 2313 Bunting Avenue

Owner: First National Bank North

Telephone: 243-4100

Occupancy: Two

Survey Date: May 15, 1985

Colorado Department of Health (CDH) and Oak Ridge National Laboratory (ORNL) data indicates contamination to be located in the north and south yards only, and flower beds.

Team Members

J. Hebel (Team Leader)
P. Hardy
S. Southern
H. Mattison
B. Moody
M.E. Dexter
M. Duran
P.J. Bonner

Instruments

Scintillometers - C-1205, C-1149, C-1128, C-1207, C-1208
Delta Scintillometers - C-3942, C-3940, C-3936
Total Count - C-4006, C-4005
Surface Spectrometer - C-2474

At 0845, 15 May, the Bendix team members were met by the tenants, as property approval to survey was verbally given.

The tenants were not aware of an access to the crawl space or the basement.

An interior walking scan was performed in the primary structure, also in the garage. No elevated readings were found in the living quarters or the garage.

On the exterior, the property was laid out in 10- by 10-foot grids. An exterior gamma scan and grid point exposure-rates measurements were taken to verify or deny data taken by CDH or ORNL.

Elevated measurements were detected in the north and south yards. Also on the west side of the garage. These areas were further investigated by delta measurements and auger holes which were then logged with the total count meter. Elevated counts were essentially surface contamination being detected in the north and south yards, and on the west side of the garage. The elevated readings found on the west side of the garage were investigated with delta measurements.

A source point was found, removed, and brought back to the compound to be disposed of properly (repository). The area was rescanned and no elevated readings were detected.

In the north yard, adjacent to the primary structure, delta and spectrometer measurements were taken horizontally and against the foundation. A concrete gutter went around the entire structure 6-inches wide.

In the northwest yard, adjacent to the primary structure, two delta measurements were taken at the surface. A grab soil sample was taken also. This area was enclosed between the primary structure and a brick flower bed (planter).

The soil sample was sent to the petrology laboratory. The analysis on the sample indicates tailings are not present (the sample consisted of soil, brick, and concrete). Based on the mineralogies of the sample suggest a granite material, which could account for the radioactivity of the concrete.

The spectrometer measurements taken against the foundation are inconclusive, most likely shine.

All utility lines were investigated by auger holes that were logged with a total count meter. A surface and subsurface delta were performed over and on top of the gas line. No evidence of contamination was found.

In the south yard, the sewer line and sidewalk should be monitored closely during remedial action for contamination (mostly the top surface).

No evidence of contamination was found around the foundation of the primary structure or around the foundation of the garage.

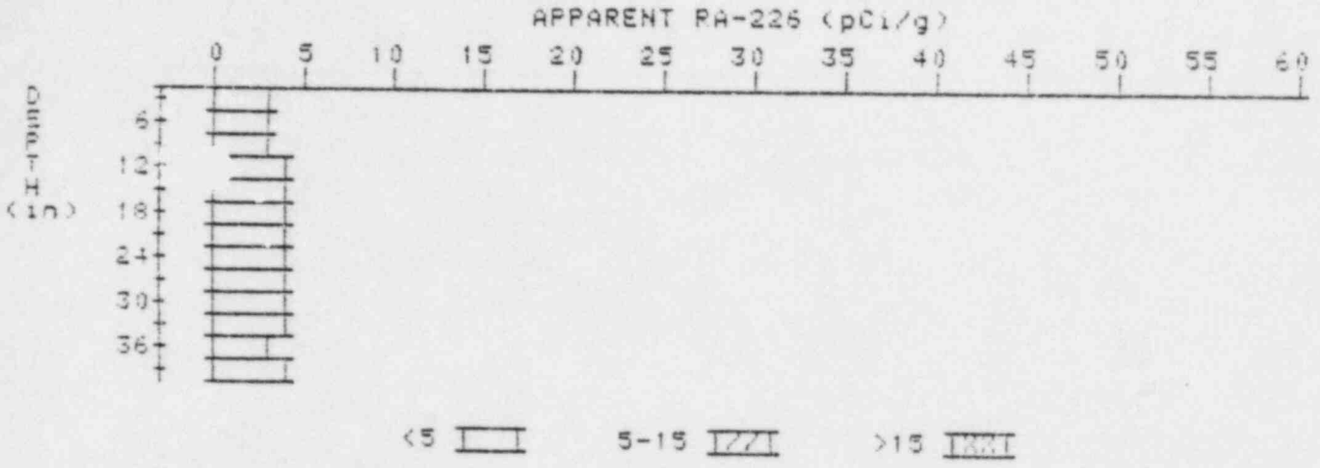
All actions and work details were performed in a safe manner. No accidents occurred while on the site survey.

Bendix team members were frisked for possible contamination; none was found on persons.

DECON V85.1(850524.0823)

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 3

PROPERTY NUMBER: GJ-03667-RS
HOLE NUMBER: 3
LOCATION: 155279

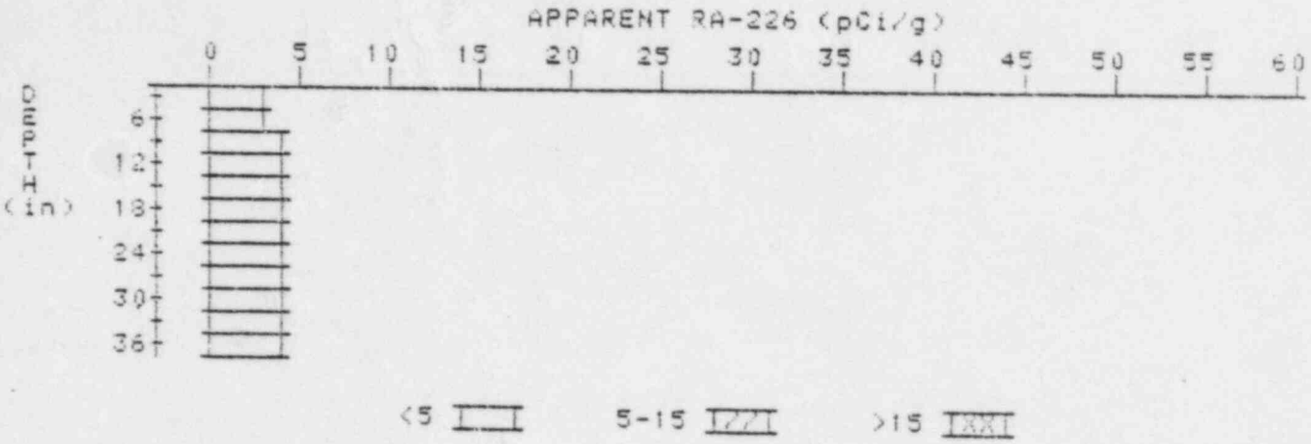


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.2	3.2
6	3.3	3.3
9	3.4	3.2
12	3.6	3.8
15	3.7	3.7
18	3.8	4.0
21	3.8	3.8
24	3.8	4.0
27	3.7	3.5
30	3.7	3.9
33	3.6	3.6
36	3.5	3.3
39	3.5	3.5

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 4

PROPERTY NUMBER: GJ-03667-RS
HOLE NUMBER: 4
LOCATION: 180270



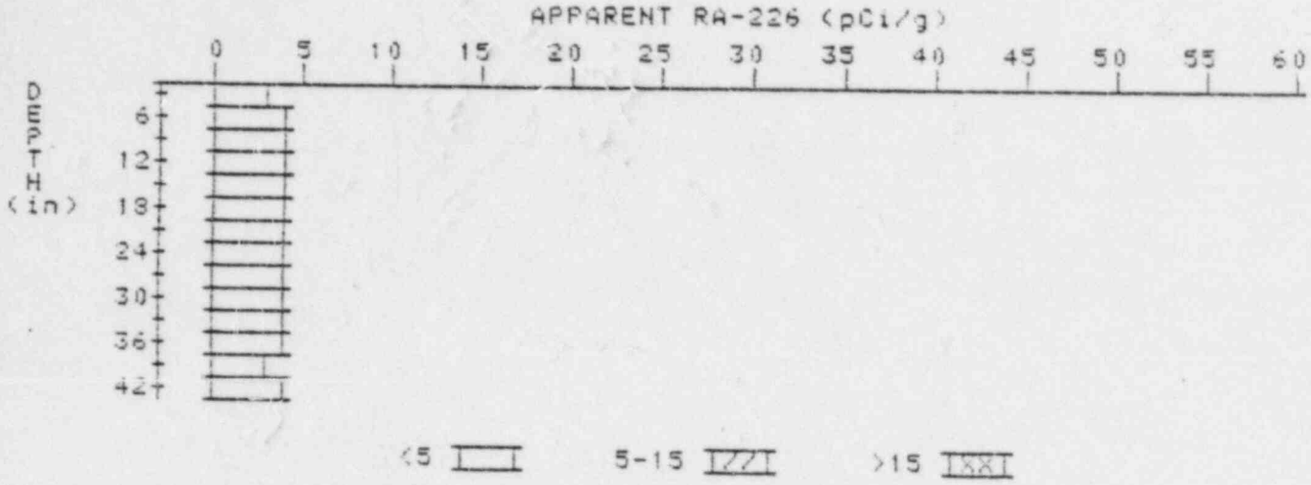
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.3	3.3
9	3.6	3.8
12	3.8	4.0
15	3.9	3.9
18	4.0	4.2
21	4.0	4.0
24	4.0	4.0
27	4.0	4.0
30	4.0	4.4
33	3.8	3.6
36	3.7	3.7

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

5

PROPERTY NUMBER: GJ-03667-RS
HOLE NUMBER: 5
LOCATION: 182261



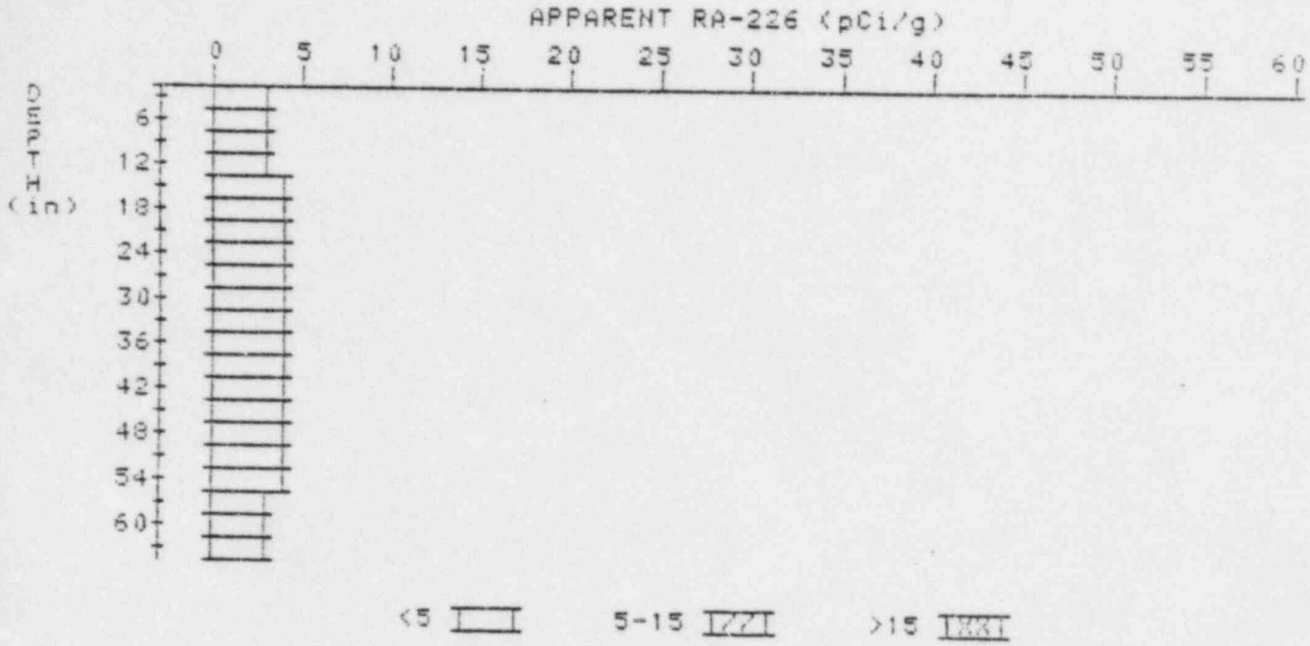
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.4	3.8
9	3.6	3.8
12	3.7	3.5
15	3.9	4.4
18	3.8	3.6
21	3.8	3.8
24	3.8	4.0
27	3.7	3.5
30	3.7	3.7
33	3.7	3.9
36	3.6	3.6
39	3.5	3.1
42	3.6	3.6

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

6

PROPERTY NUMBER: GJ-03667-RS
HOLE NUMBER: 6
LOCATION: 187249



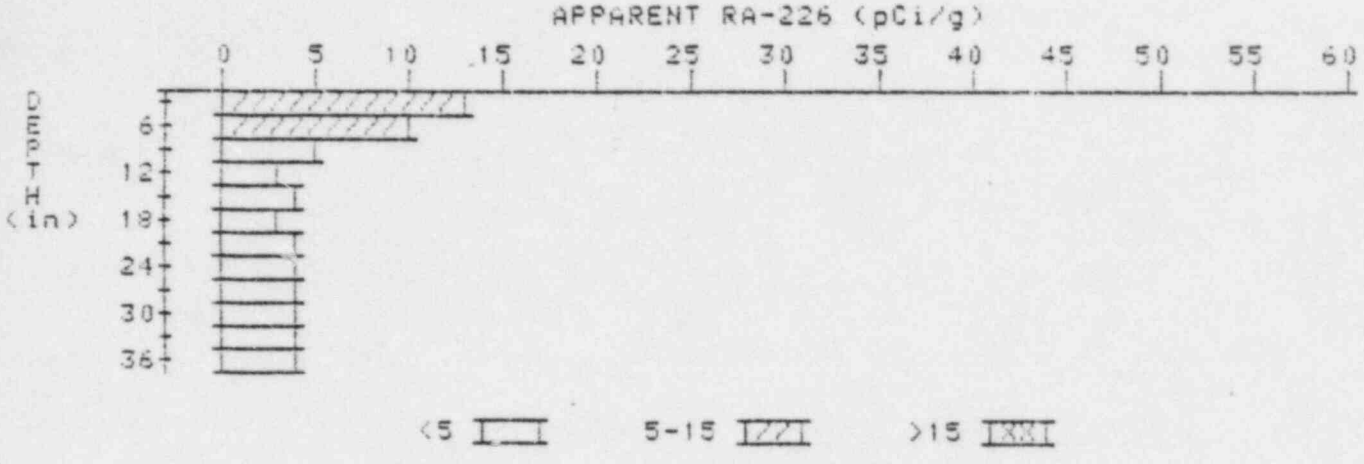
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.2	3.4
9	3.3	3.3
12	3.4	3.4
15	3.5	3.5
18	3.6	3.6
21	3.7	3.5
24	3.9	4.3
27	3.9	3.9
30	3.9	3.9
33	3.9	3.9
36	3.9	3.9
39	3.9	4.1
42	3.8	3.6
45	3.8	4.0
48	3.7	3.7
51	3.6	3.6

54	3.5	3.7
57	3.3	2.9
60	3.3	3.3
63	3.3	3.3

DECON V85.1(850524.0823)

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 7

PROPERTY NUMBER: GJ-03667-RS
HOLE NUMBER: 7
LOCATION: 188266

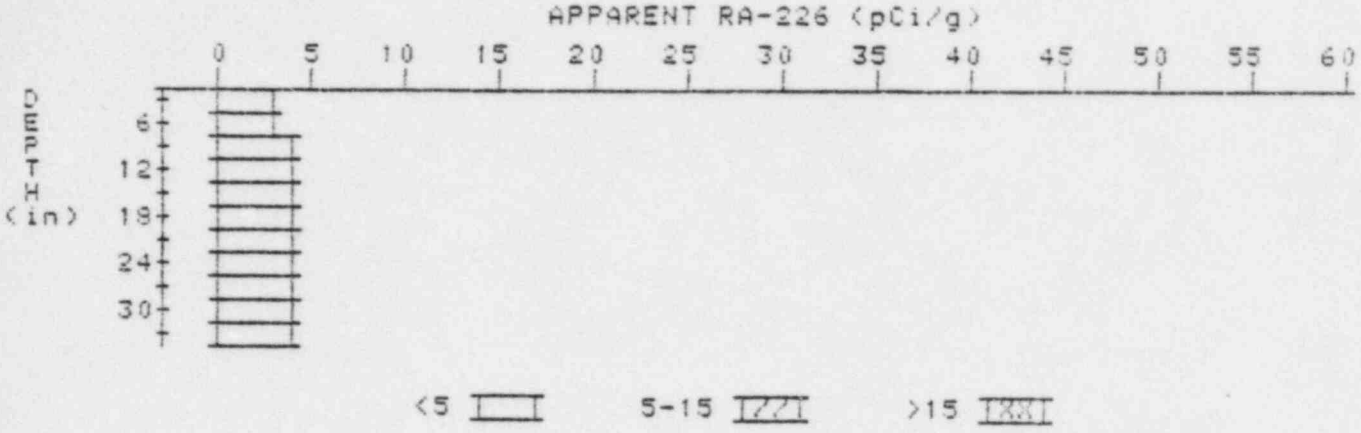


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	12.6	12.6
6	9.7	9.9
9	6.7	4.6
12	4.9	2.6
15	4.4	4.2
18	4.0	3.3
21	4.0	4.2
24	3.9	3.7
27	3.9	4.1
30	3.8	3.6
33	3.8	4.0
36	3.7	3.7

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION 10 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03667-RS
HOLE NUMBER: 10
LOCATION: 189278

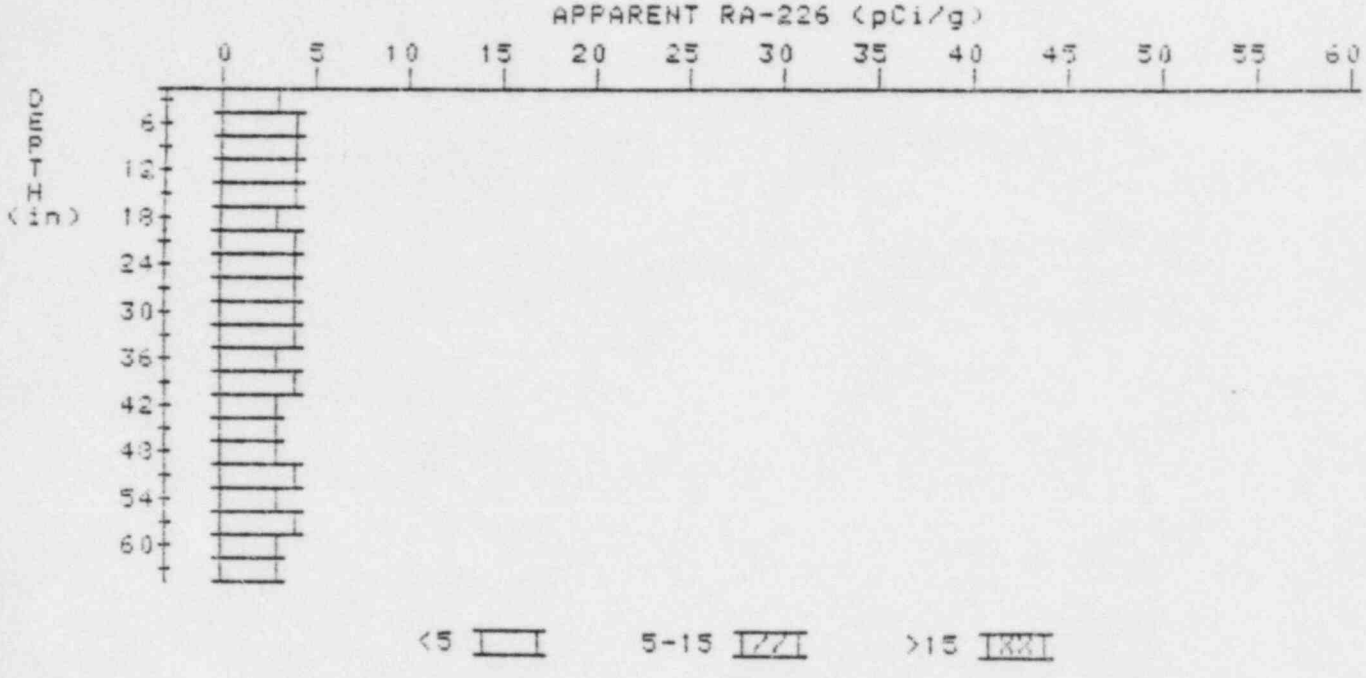


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.8	2.8
6	3.2	3.4
9	3.5	3.7
12	3.7	3.9
15	3.8	3.8
18	3.9	4.1
21	3.9	3.9
24	3.9	3.9
27	3.9	4.1
30	3.8	3.8
33	3.7	3.7

DECON V85.1(850524.0823)

APPARENT RADIUM-226 CONCENTRATION 18
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03667-RS
HOLE NUMBER: 18
LOCATION: 218242



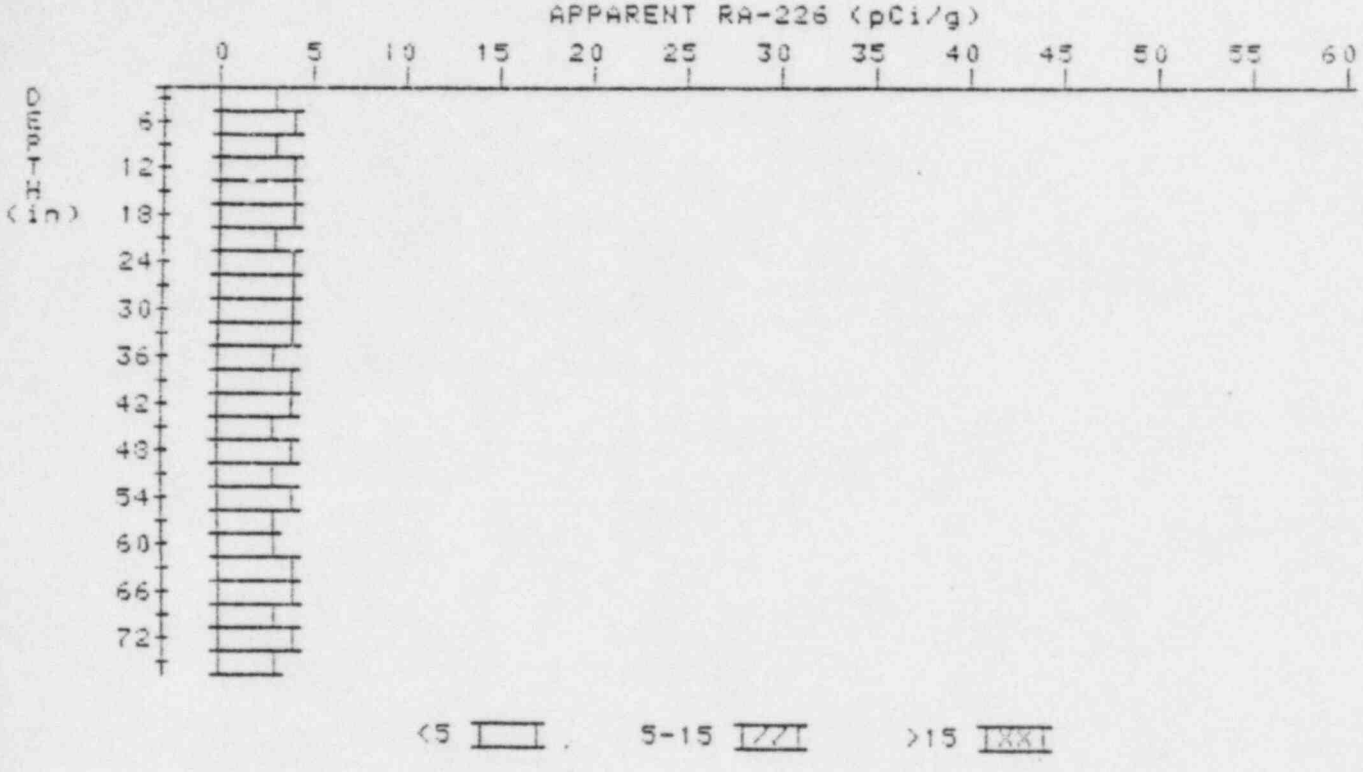
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.2	3.2
6	3.5	3.7
9	3.7	3.9
12	3.8	3.8
15	3.9	4.3
18	3.8	3.4
21	3.9	4.1
24	3.9	4.1
27	3.8	3.6
30	3.9	4.2
33	3.6	3.6
36	3.4	2.9
39	3.5	3.9
42	3.4	3.2
45	3.4	3.4
48	3.4	3.4
51	3.4	3.6

54	3.3	2.9
57	3.4	3.8
60	3.3	3.1
63	3.3	3.3

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION 21
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03667-RS
HOLE NUMBER: 21
LOCATION: 229270



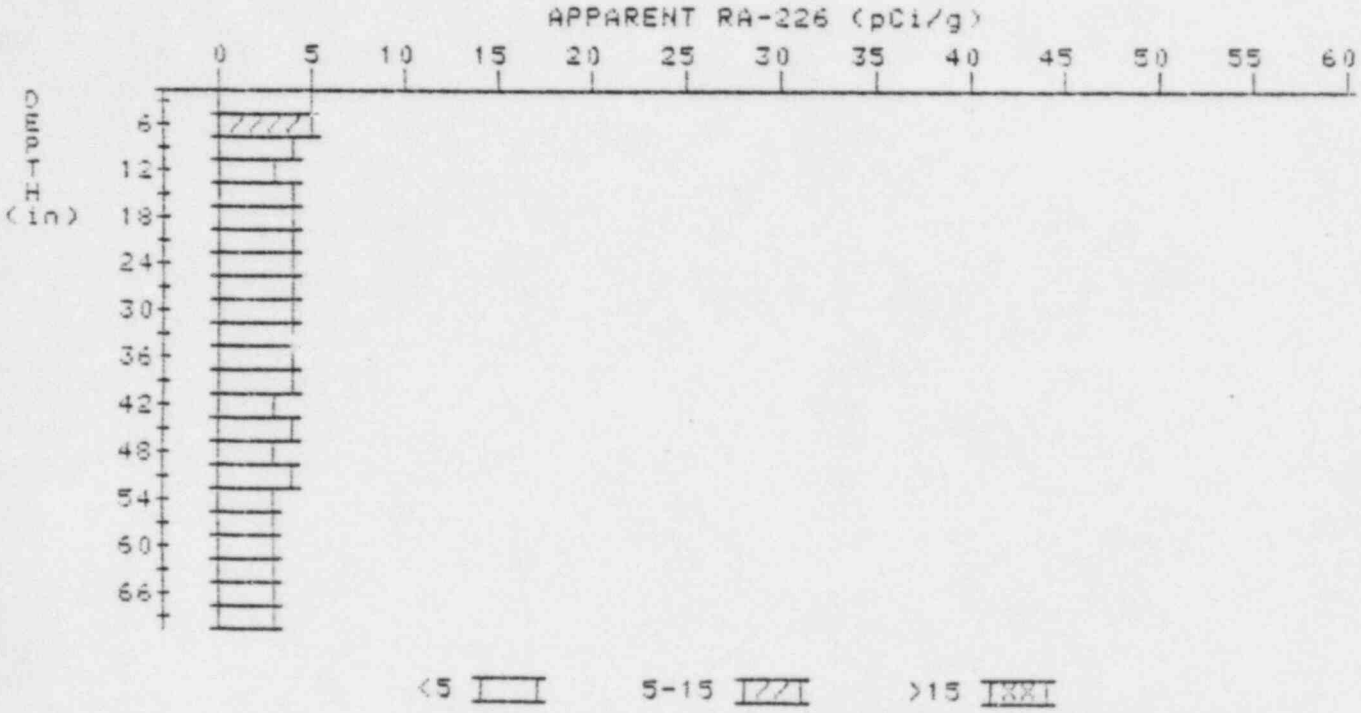
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.4	3.9
9	3.5	3.3
12	3.7	3.9
15	3.8	3.8
18	3.9	4.3
21	3.8	3.4
24	3.9	4.1
27	3.9	4.1
30	3.8	3.8
33	3.7	3.7
36	3.6	3.2
39	3.7	3.9
42	3.7	4.1

45	3.5	3.0
48	3.6	4.0
51	3.5	3.3
54	3.5	3.7
57	3.4	3.2
60	3.4	3.2
63	3.5	3.7
66	3.5	3.7
69	3.4	3.2
72	3.4	3.6
75	3.3	3.3

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION 24
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03667-R3
HOLE NUMBER: 24
LOCATION: 237258



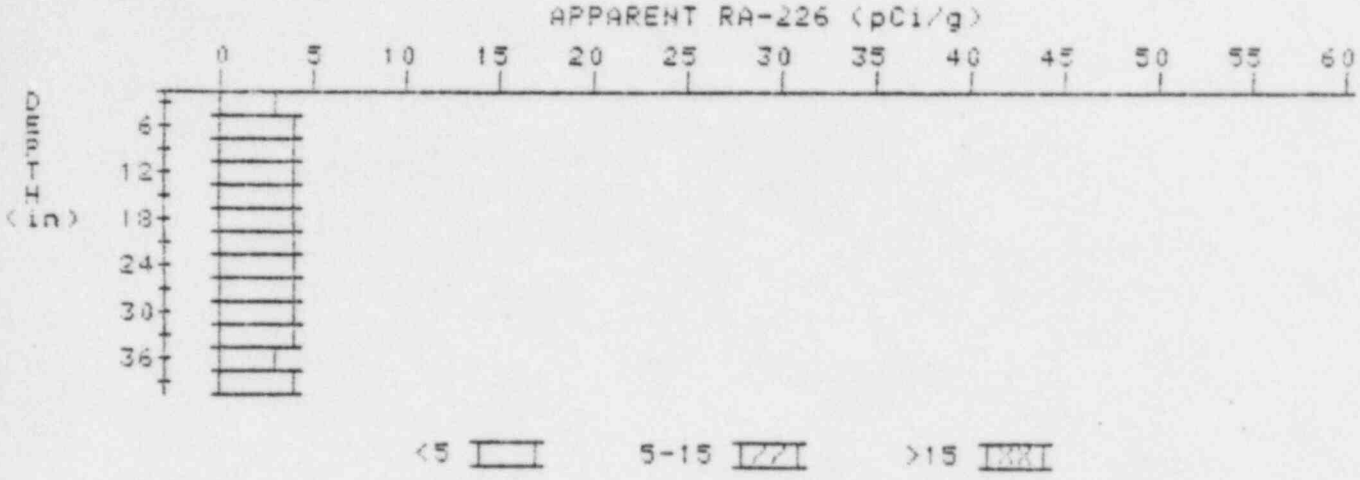
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.6	4.6
6	4.6	5.3
9	4.2	4.0
12	3.9	3.4
15	3.9	4.1
18	3.8	3.6
21	3.8	4.0
24	3.7	3.5
27	3.7	3.7
30	3.7	3.7
33	3.7	3.7
36	3.7	3.9
39	3.6	3.8
42	3.4	2.9
45	3.5	3.9

48	3.4	3.2
51	3.4	3.6
54	3.3	3.3
57	3.2	3.0
60	3.2	3.2
63	3.2	3.2
66	3.2	3.2
69	3.2	3.2

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION 27
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03667-RS
HOLE NUMBER: 27
LOCATION: 246266

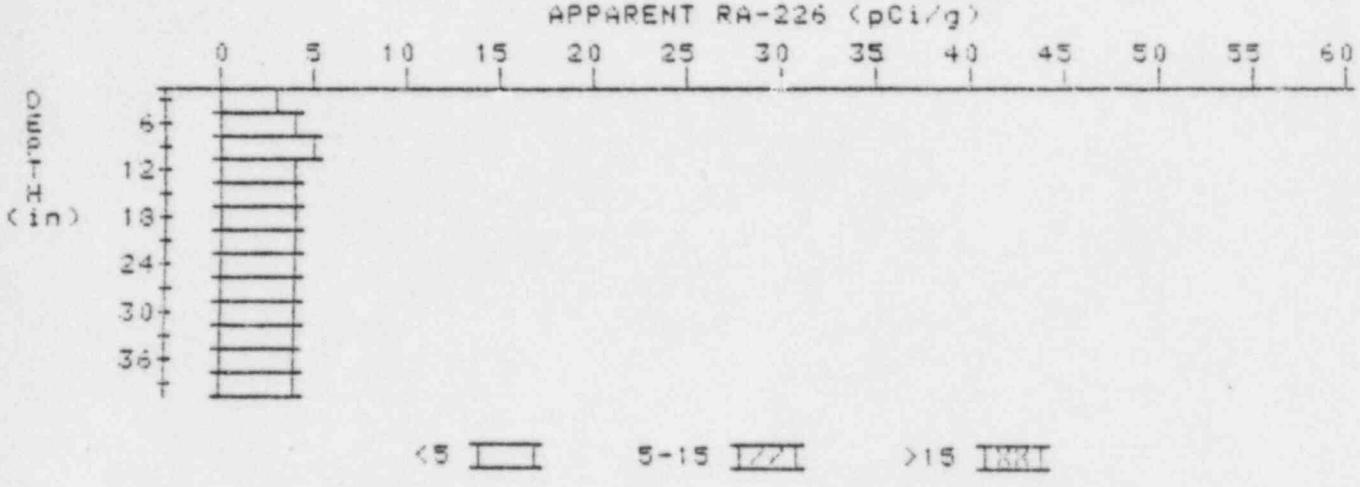


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.7	4.4
9	3.7	3.7
12	3.7	3.5
15	3.8	4.0
18	3.8	3.6
21	3.9	4.1
24	3.9	3.9
27	3.9	4.1
30	3.8	3.8
33	3.7	3.9
36	3.5	3.1
39	3.5	3.5

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION 29
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03667-RS
HOLE NUMBER: 29
LOCATION: 257243

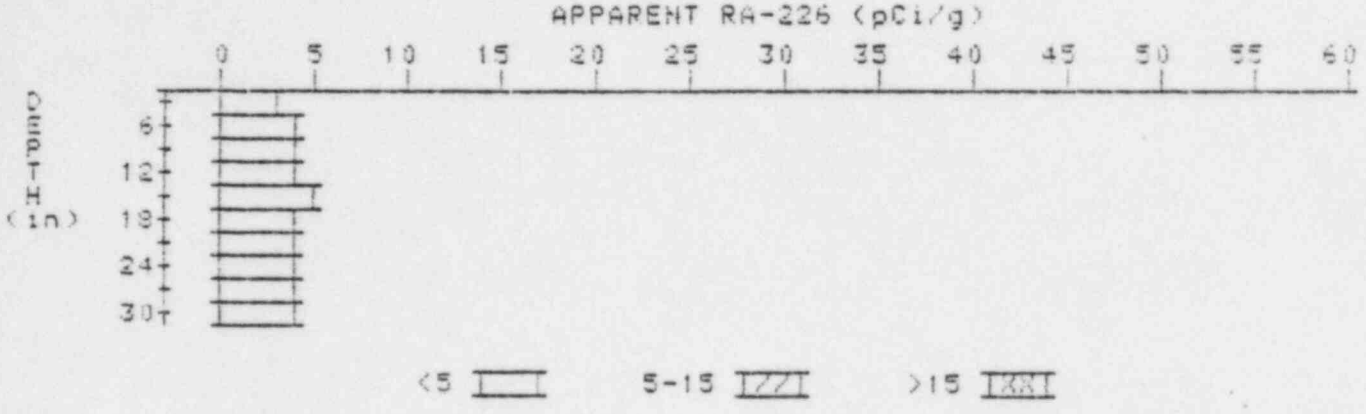


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.7	3.9
9	4.0	4.5
12	4.0	4.2
15	3.9	3.7
18	3.9	3.9
21	3.9	4.1
24	3.8	3.8
27	3.7	3.5
30	3.7	3.7
33	3.7	3.7
36	3.7	3.9
39	3.6	3.6

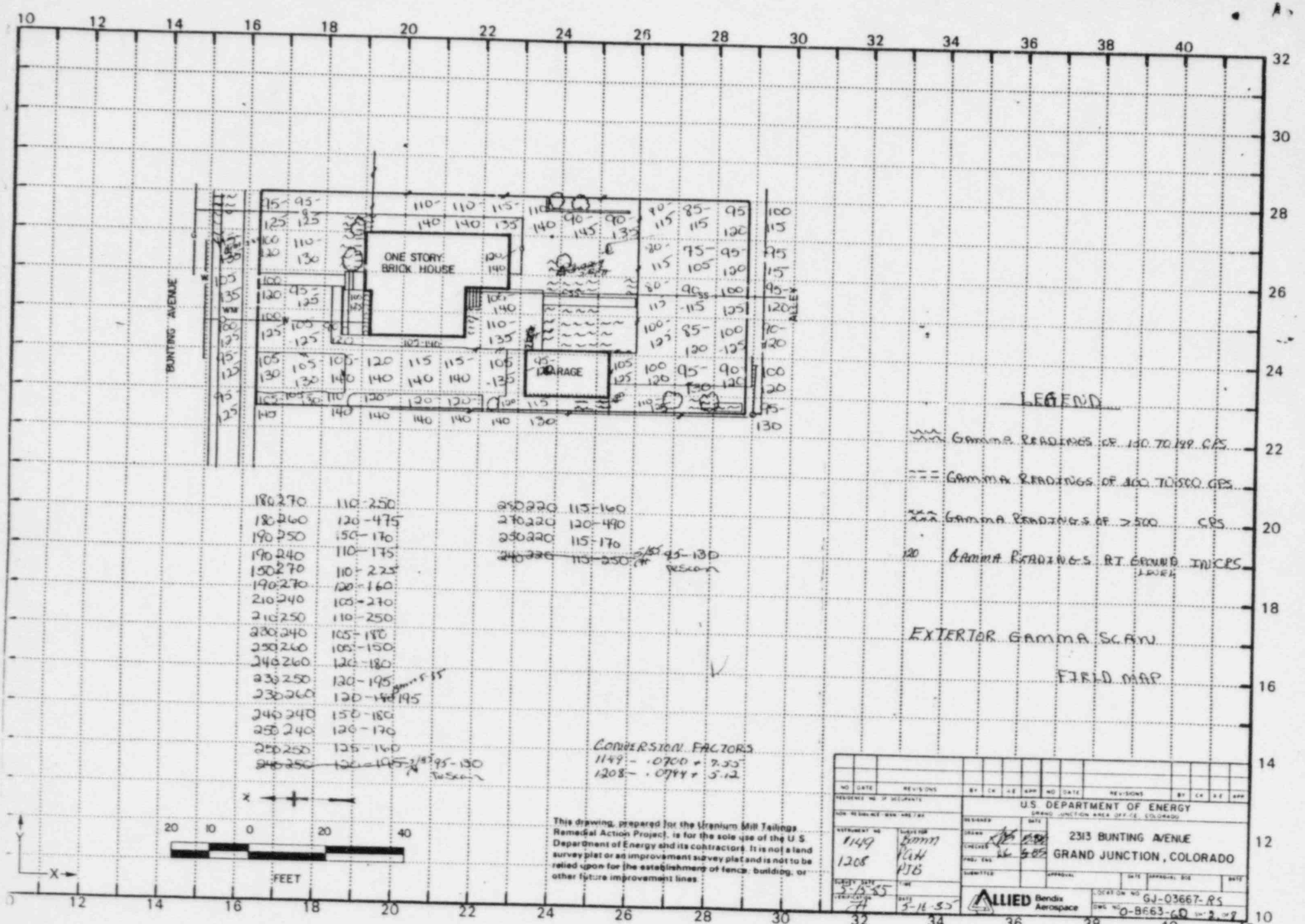
DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION 31
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03667-RS
HOLE NUMBER: 31
LOCATION: 259279



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.2	3.2
6	3.5	3.7
9	3.7	3.9
12	3.8	3.6
15	4.0	4.5
18	3.9	3.5
21	4.0	4.2
24	4.0	4.0
27	4.0	4.4
30	3.8	3.8


ONE STORY BRICK HOUSE
GARAGE
BUNTING AVENUE
ALLEY
LEGEND
Gamma Readings of 150 to 199 CPS
Gamma Readings of 200 to 500 CPS
Gamma Readings of >500 CPS
120 Gamma Readings at Ground Level in CPS
EXTERIOR GAMMA SCAN
FIELD MAP
180 270 110-250
180 260 120-475
190 250 150-170
190 240 110-175
150 270 110-225
190 270 120-160
210 240 105-270
210 250 110-250
230 240 105-180
250 260 105-150
240 260 120-180
230 250 120-195
230 260 120-195
240 240 150-180
250 240 120-170
250 250 125-160
250 220 115-160
270 220 120-490
250 220 115-170
240 220 115-250
95-130
CONVERSION FACTORS
1149 - .0700 = 7.55
1208 - .0794 = 5.12
X
Y
20 10 0 20 40
FEET
This drawing, prepared for the Uranium Mill Tailings Remedial Action Project, is for the sole use of the U.S. Department of Energy and its contractors. It is not a land survey plat or an improvement survey plat and is not to be relied upon for the establishment of fence, building, or other future improvement lines.
U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION AREA OFFICE, COLORADO
2313 BUNTING AVENUE
GRAND JUNCTION, COLORADO
1149
1208
5-13-85
5-14-85
ALLIED Bendix Aerospace
GJ-03667-RS
0-8663-GD