

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-12375-RM  
ADDRESS: 2890 ORCHARD AVENUE

AUGUST 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION  
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APPROVED BY

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DATE

*August 19, 1985*

REA12375:REA-617

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## **1.0 EXECUTIVE SUMMARY**

### **1.1 Introduction**

The location, DOE ID No. GJ-12375-RM, is a duplex residence located at 2890 Orchard 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, 95 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$4,598. Remedial action on this property will take approximately 14 days to complete.

## 2.0 PROPERTY DESCRIPTION

### 2.1 General Description

Address: 2890 Orchard Avenue, Grand Junction, Colorado

Zoning: Residential (R-4)

Lot Size: Approximately 86,600 sf (2.0 acres)

Legal Description: Beginning 513 feet west of east 1/4 corner, Section 7, 1S 1E, west 121 feet, north 716 feet to Grand Valley Canal, easterly along canal to a point north of beginning, south to beginning, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 3 mile(s) northeast 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:	Grand Valley Canal
South:	Orchard Avenue
East:	Single-family residence
West:	Single-family residence

### 2.2 Existing Facilities and Structures

Primary Structure:

Type:	Two-story residence with attached carport
Size:	Approximately 2,000 sf
Construction Date:	1970s
Construction:	Wood-frame
Foundation:	Concrete stemwall on spread footing
Footing Depth:	Approximately 24" to bottom of footing from grade
Basement:	Yes - partial
Crawl Space:	Yes - partial
Condition:	Good



Other Structures:

Type:	Garage
Size:	Approximately 480 sf
Construction:	Wood-frame
Foundation:	Monolithic concrete slab-on-grade
Condition:	Good

Type:	Carport/shed
Size:	Approximately 600 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-12375-RM on July 5, 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 along Orchard Avenue, in the rock garden in the southeast corner of the property, in the yard east of the primary structure, associated with the sidewalk in the north yard, and in the pasture north of 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, 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): 875 uR/h

Exterior radium-concentration measurements are presented in Appendix Tables 3.1a, 3.1b, and 3.1c. Exterior exposure-rate survey results are shown in Appendix Figures 3.1a, 3.1b, and 3.1c.

##### **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 Figures 3.2a, 3.2b, and 3.2c. Data from these investigations are included in Appendix Tables 3.1a, 3.1b, and 3.1c.

### 3.4 Radon/Radon Daughter Concentration (RDC)

Determined by CDH: 0.005 gross working level (WL). No additional RDC measurements were taken by Bendix.

### 3.5 Extent of Contamination

Appendix Figures 3.3a, 3.3b, and 3.3c 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: Gravel  
Direction From Primary Structure: South  
Other Directions: Along Orchard Avenue  
Total Depth of Contamination: 12 inches  
Approximate Square Footage: 168
- (Area B) Surface Material: Gravel  
Direction From Primary Structure: South  
Other Directions: Along Orchard Avenue  
Total Depth of Contamination: 9 inches  
Approximate Square Footage: 140
- (Area C) Surface Material: Gravel  
Direction From Primary Structure: Southeast  
Other Directions: In driveway and along Orchard Avenue  
Total Depth of Contamination: 6 inches  
Approximate Square Footage: 646
- (Area D) Surface Material: Soil and rocks  
Direction From Primary Structure: Southeast  
Other Directions: In rock garden along east property line  
Total Depth of Contamination: 12 inches  
Approximate Square Footage: 300
- (Area E) Surface Material: Gravel  
Direction From Primary Structure: East  
Other Directions: North of Area C  
Total Depth of Contamination: 9 inches  
Approximate Square Footage: 378
- (Area F) Surface Material: Soil  
Direction From Primary Structure: East  
Other Directions: Along east property line  
Total Depth of Contamination: 6 inches  
Approximate Square Footage: 63

- (Area G) Surface Material: Lawn  
Direction From Primary Structure: Northeast  
Other Directions: Along edges of the sidewalk  
Total Depth of Contamination: 6 inches  
Approximate Square Footage: 286
- (Area H) Surface Material: Concrete  
Direction From Primary Structure: North and east  
Total Depth of Contamination: 9 inches  
Other (height or thickness): Concrete is 4 inches thick  
Approximate Square Footage: 232
- (Area I) Surface Material: Soil  
Direction From Primary Structure: Northeast  
Other Directions: Along the east property line  
Total Depth of Contamination: 18 inches  
Approximate Square Footage: 80
- (Area J) Surface Material: Soil and wild grasses  
Direction From Primary Structure: North  
Other Directions: In pasture and orchard area  
Total Depth of Contamination: 8 inches  
Comments: There are several pieces of flagstone scattered throughout this area.  
Approximate Square Footage: 898
- (Area K) Surface Material: Soil and wild grasses  
Direction From Primary Structure: North  
Other Directions: In pasture and orchard area  
Total Depth of Contamination: 6 inches  
Approximate Square Footage: 81
- (Area L) Surface Material: Soil  
Direction From Primary Structure: Northwest  
Other Directions: Along west property line  
Total Depth of Contamination: 6 inches  
Approximate Square Footage: 42
- (Area M) Surface Material: Soil  
Direction From Primary Structure: Northwest  
Other Directions: North of Area L  
Total Depth of Contamination: 12 inches  
Approximate Square Footage: 160
- (Area N) Surface Material: Soil and wild grasses  
Direction From Primary Structure: North  
Other Directions: In pasture near north fence line  
Total Depth of Contamination: 6 inches  
Approximate Square Footage: 12

#### **4.0 RECOMMENDED REMEDIAL ACTION**

##### **4.1 Decontamination and Restoration**

The recommended remedial action for this property, DOE ID No. GJ-12375-RM, includes removal of all areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figures 3.3a, 3.3b, and 3.3c) 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 \$4,598.

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 3.1a	Radium Concentrations at Exterior Locations
Table 3.1b	Radium Concentrations at Exterior Locations
Table 3.1c	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 3.1a	Exterior Exposure Rates
Figure 3.1b	Exterior Exposure Rates
Figure 3.1c	Exterior Exposure Rates
Figure 3.2a	Exterior Sample Locations
Figure 3.2b	Exterior Sample Locations
Figure 3.2c	Exterior Sample Locations
Figure 3.3a	Exterior Estimated Extent of Contamination
Figure 3.3b	Exterior Estimated Extent of Contamination
Figure 3.3c	Exterior Estimated Extent of Contamination

Official Survey Report

Team Leader Notes

Deconvolution Graphs (Apparent Radium-226 Concentration)

Exterior Gamma Scan Maps

## Radium Concentrations at Exterior Locations

DOE ID #GJ-12375-RM

2890 Orchard 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	130270	00	DS	14.9		*	On top flagstone
		02	DS	26.9		*	Under flagstone
		08	DS	<1.0		*	
2	153306	00	DS	29.5		*	Northeast of primary structure
		06	DS	14.8		*	
		09	DS	9.9		*	
		12	DS	4.8		*	
		15	DS	4.9		*	
		18	DS	3.3		*	
3	158296	00	DS	3.7		*	
		06	DS	1.4		*	
4	160296	00	DS	9.1		*	
5	180272	00	DS	9.3		*	On the sidewalk
		03	TC	5.8		*	
		06	TC	5.2		*	
		09	TC	4.5		*	DC = 9 inches Based on the deconvolution graph
		12	TC	4.0		*	
		15	TC	3.8		*	
		18	TC	3.7		*	
		21	TC	3.6		*	
		24	TC	3.6		*	
		27	TC	3.4		*	
		30	TC	3.4		*	
		33	TC	3.3		*	
		36	TC	3.3		*	
6	180274	00	DS	1.3		*	On the grass
7	206307	00	DS	4.8		*	
		06	DS	2.5		*	
8	243302	00	DS	6.8		*	DC = 9 inches Based on the deconvolution graph
		03	TC	6.4		*	
		06	TC	6.1		*	
		09	TC	5.1		*	
		12	TC	4.5		*	
		15	TC	4.1		*	
		18	TC	4.0		*	
		21	TC	3.8		*	
		24	TC	3.7		*	

## Radium Concentrations at Exterior Locations

DOE ID #GJ-12375-RM

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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	243302	27	TC	3.6		*	
		30	TC	3.6		*	
		33	TC	3.6		*	
9	245271	00	DS	1.2		*	Gas line
		23	DS	1.1		*	
10	247245	00	DS	1.7		*	South of primary structure near brick planter
		06	DS	1.8		*	
11	247267	00	DS	2.3		*	South of primary structure on sidewalk
12	267303	00	DS	12.2		*	Southeast of primary structure
		06	DS	2.4		*	
13	270260	00	DS	1.2		*	Background DC = 0 inches
		03	TC	3.1		*	
		06	TC	3.4		*	
		09	TC	3.7		*	
		12	TC	3.8		*	
		15	TC	3.9		*	
		18	TC	3.9		*	
		21	TC	3.9		*	
		24	TC	3.9		*	
		27	TC	3.8		*	
		30	TC	3.7		*	
		33	TC	3.6		*	
		36	TC	3.6		*	
14	275306	00	DS	678.7		*	Southeast of primary structure
		06	DS	61.6		*	
		12	DS	3.3		*	
15	283219	00	DS	1.1		*	
16	285250	00	DS	24.2		*	DC = 12 inches Based on the deconvolution graph
		03	TC	17.9		*	
		06	TC	18.3		*	
		09	TC	12.1		*	
		12	TC	7.9		*	
		15	TC	5.9		*	

## 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.		
16	285250	18	TC	4.8		*	
		21	TC	4.3		*	
		24	TC	4.1		*	
		27	TC	3.9		*	
		30	TC	3.7		*	
		33	TC	3.6		*	
		36	TC	3.5		*	
		39	TC	3.4		*	
		42	TC	3.4		*	
		45	TC	3.4		*	
		48	TC	3.4		*	
		51	TC	3.3		*	
		54	TC	3.3		*	
		57	TC	3.2		*	
		60	TC	3.3		*	
		63	TC	3.2		*	
		66	TC	3.2		*	
		69	TC	3.3		*	
		72	TC	3.3		*	
		75	TC	3.3		*	
		78	TC	3.3		*	
		81	TC	3.3		*	
		84	TC	3.3		*	
		87	TC	3.4		*	
		90	TC	3.5		*	
		93	TC	3.5		*	
		96	TC	3.4		*	
17	288226	00	DS	1.4		*	
18	293262	00	DS	75.5		*	DC = 9 inches Based on the deconvolution graph
		03	TC	5.6		*	
		06	TC	5.5		*	
		09	TC	5.0		*	
		12	TC	4.9		*	
		15	TC	4.5		*	
		18	TC	4.4		*	
		21	TC	4.1		*	
		24	TC	4.0		*	
		27	TC	3.8		*	
		30	TC	3.8		*	
		33	TC	3.7		*	
		36	TC	3.7		*	

## Radium Concentrations at Exterior Locations

DOE ID #GJ-12375-RM

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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.		
18	293262	39	TC	3.7		*	
		42	TC	3.5		*	
		45	TC	3.4		*	
		48	TC	3.4		*	
		51	TC	3.3		*	
		54	TC	3.3		*	
		57	TC	3.2		*	
		60	TC	3.2		*	
		63	TC	3.2		*	
		66	TC	3.2		*	
		69	TC	3.3		*	
		72	TC	3.4		*	
		75	TC	3.3		*	
		78	TC	3.4		*	
		81	TC	3.5		*	
		84	TC	3.5		*	
		87	TC	3.6		*	
		90	TC	3.6		*	
		93	TC	3.6		*	
		96	TC	3.5		*	

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 = 07-05-85  
Team Leader = JDG

## 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.		
19	265283	00	DS	133.8		*	By north apple tree
		06	DS	2.1		*	
20	302277	00	DS	232.7		*	
		06	DS	1.9		*	
21	320275	00	DS	61.0		*	
		06	DS	4.8		*	
		12	DS	1.7		*	
22	365275	00	DS	1.8		*	
		06	DS	1.5		*	

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 = 07-05-85  
Team Leader = JDG



## 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.		
23	181256	00	DS	3.3		*	North end of property by fence
		06	DS	1.6		*	
24	245192	00	DS	6.2		*	Northwest part of property
		06	DS	3.9		*	
		12	DS	<1.0		*	
25	270188	00	DS	2.5		*	
		06	DS	1.9		*	

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 = 07-05-85  
Team Leader = JDG

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	*	*	*	*	16-17	*
Ground Floor	*	*	*	*	14-16	*
Garage	No Access					
Shed	*	*	*	*	15-16	*

\* Walking gamma scans were performed to confirm the absence of interior contamination.

Table 4.1  
Area and Volume Calculations  
DOE ID No. GJ-12375-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				
H	8 x 12	= 96			
	2.5 x 41	= 103			
	2 x 30	= 60			
		<hr/>			
		259	x 0.3	= 78	
				<hr/>	
	Volume of Concrete				
				= 78	= 78/27 = 3
	Contaminated Fill				
A	7 x 24	= 168	x 1.0	= 168	
B	7 x 20	= 140	x 0.8	= 112	
C	7 x 17	= 119			
	16 x 22	= 352			
	25 x 7	= 175			
		<hr/>			
		646	x 0.5	= 323	
D	15 x 20	= 300	x 1.0	= 300	
E	18 x 21	= 378	x 0.8	= 302	
F	9 x 7	= 63	x 0.5	= 32	
G	34 x 2	= 68			
	20 x 2	= 40			
	30 x 3	= 90			
	30 x 2	= 60			
	14 x 2	= 28			
		<hr/>			
		286	x 0.5	= 143	

Table 4.1  
Area and Volume Calculations  
DOE ID No. GJ-12375-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>
H	6 x 6 =	36			
	3 x 11 =	33			
	2.5 x 41 =	103			
	2 x 30 =	60			
		<hr/>			
		232	x 0.5 =	116	
I	10 x 8 =	80	x 1.5 =	120	
J	13 x 9 =	117			
	20 x 13 =	260			
	11 x 11 =	121			
	33 x 8 =	264			
	17 x 8 =	136			
		<hr/>			
		898	x 0.7 =	629	
K	3 x 3 =	9			
	9 x 8 =	72			
		<hr/>			
		81	x 0.5 =	41	
L	21 x 2 =	42	x 0.5 =	21	
M	20 x 8 =	160	x 1.0 =	160	
N	4 x 3 =	12	x 0.5 =	6	
				<hr/>	
Volume of Fill				= 2,473 = 2,473/27 =	92
					<hr/>
TOTAL VOLUME - EXTERIOR				=	95

See Appendix Figures 3.3a, 3.3b, and 3.3c For Areas

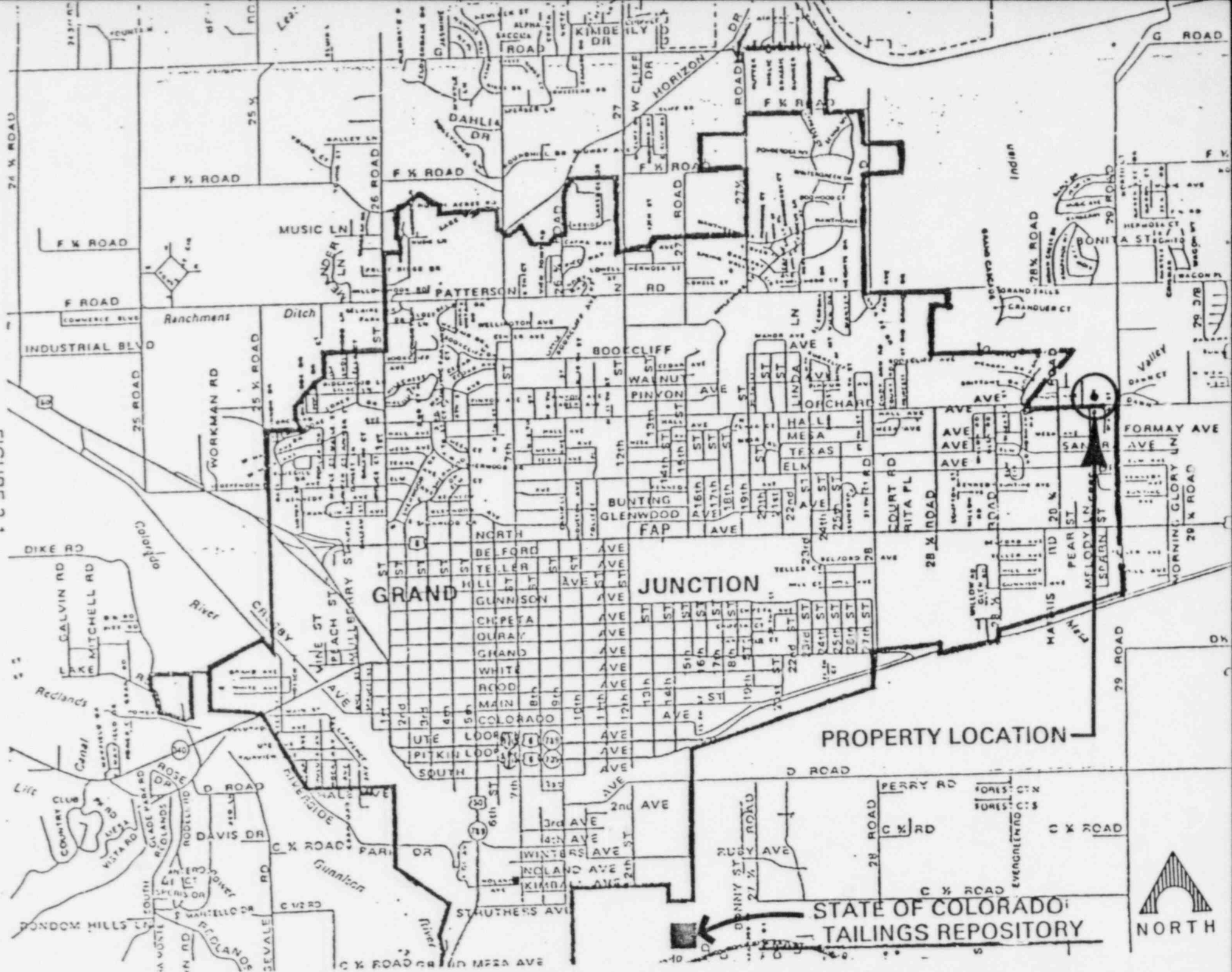
EXTERIOR

Remove/replace concrete walks 259 sf @ \$3/sf	\$ 777
Remove identified residual radioactive material 92 cy @ \$14.50/cy (machine-open)	1,334
Replace areas with roadbase 15 cy @ \$11.50/cy	173
Replace areas with topsoil 77 cy @ \$9.50/cy	732
Replace areas with sod 306 sf @ \$.50/sf	153
Replace plantings Lump sum	100
	<hr/>
TOTAL EXTERIOR	\$ 3,269
TOTAL INTERIOR	0
ACCESS CONTROL	100
	<hr/>
SUBTOTAL	\$ 3,369
CONTINGENCY @ 5%	168
	<hr/>
SUBTOTAL	\$ 3,537
CONTRACTOR OVERHEAD & PROFIT @ 30%	1,061
	<hr/>
GRAND TOTAL	\$ 4,598

=====

RR081285  
REAL2375/REA-617/LMR

FIGURE 2.1  
VICINITY MAP





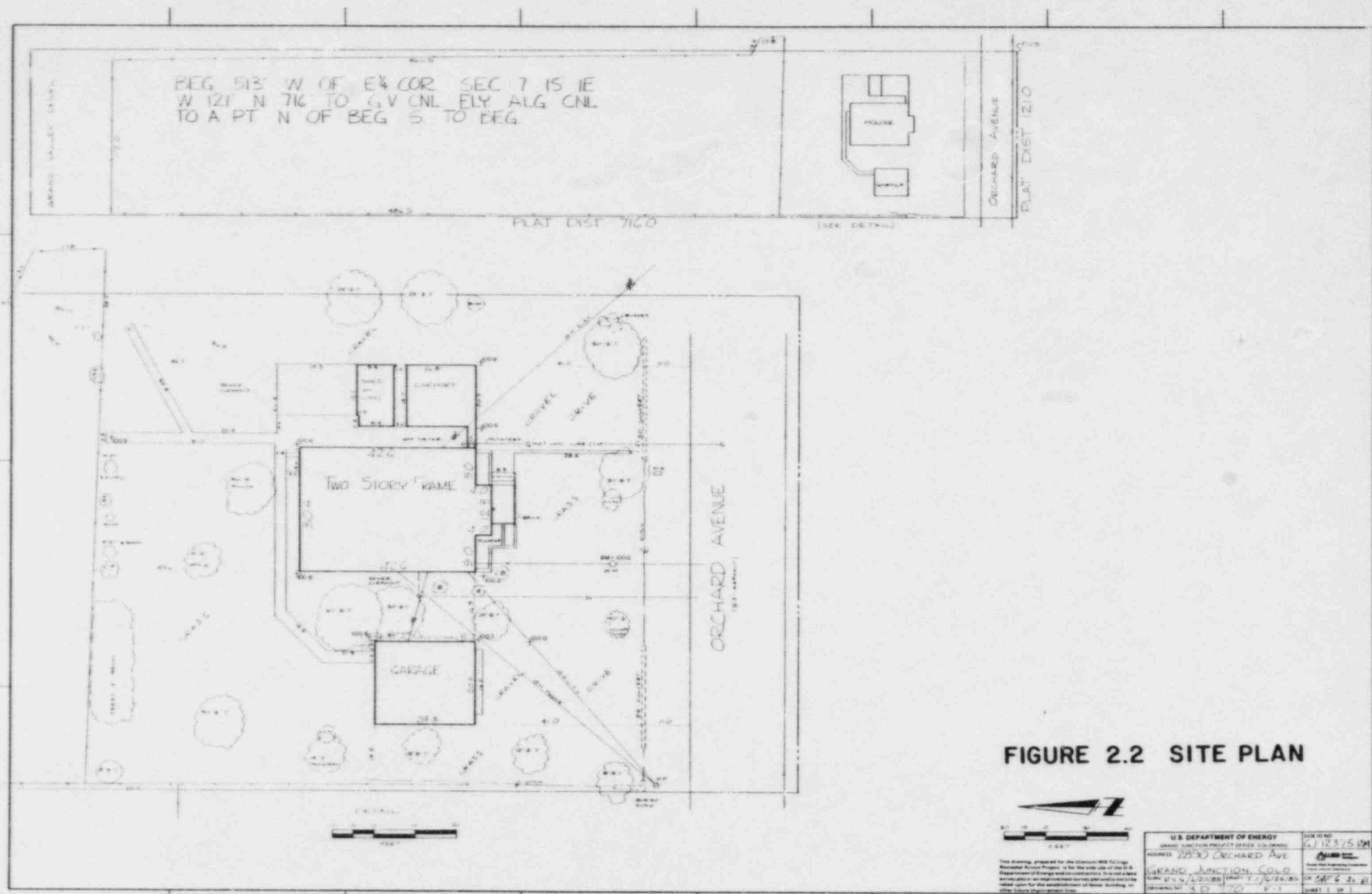
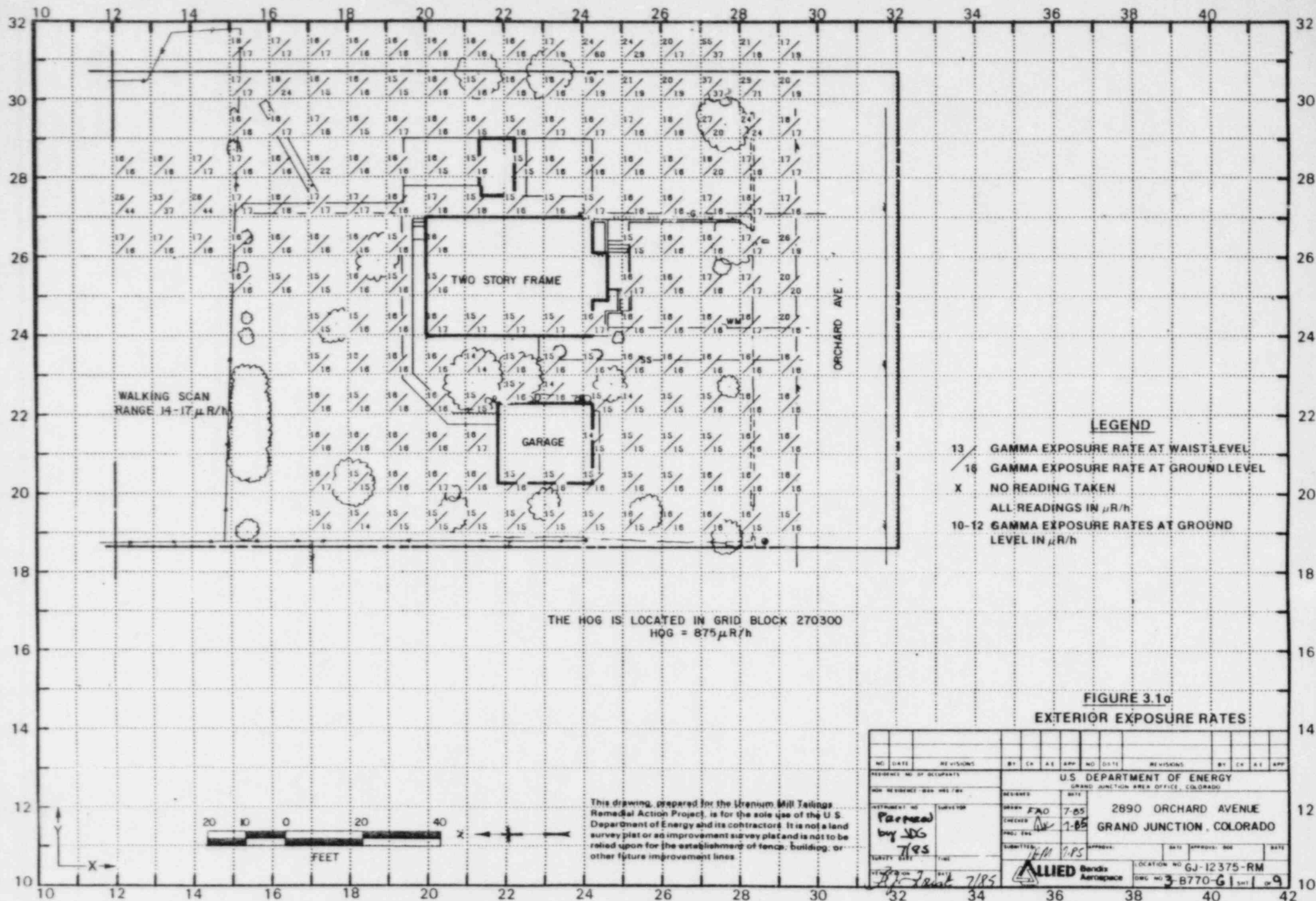
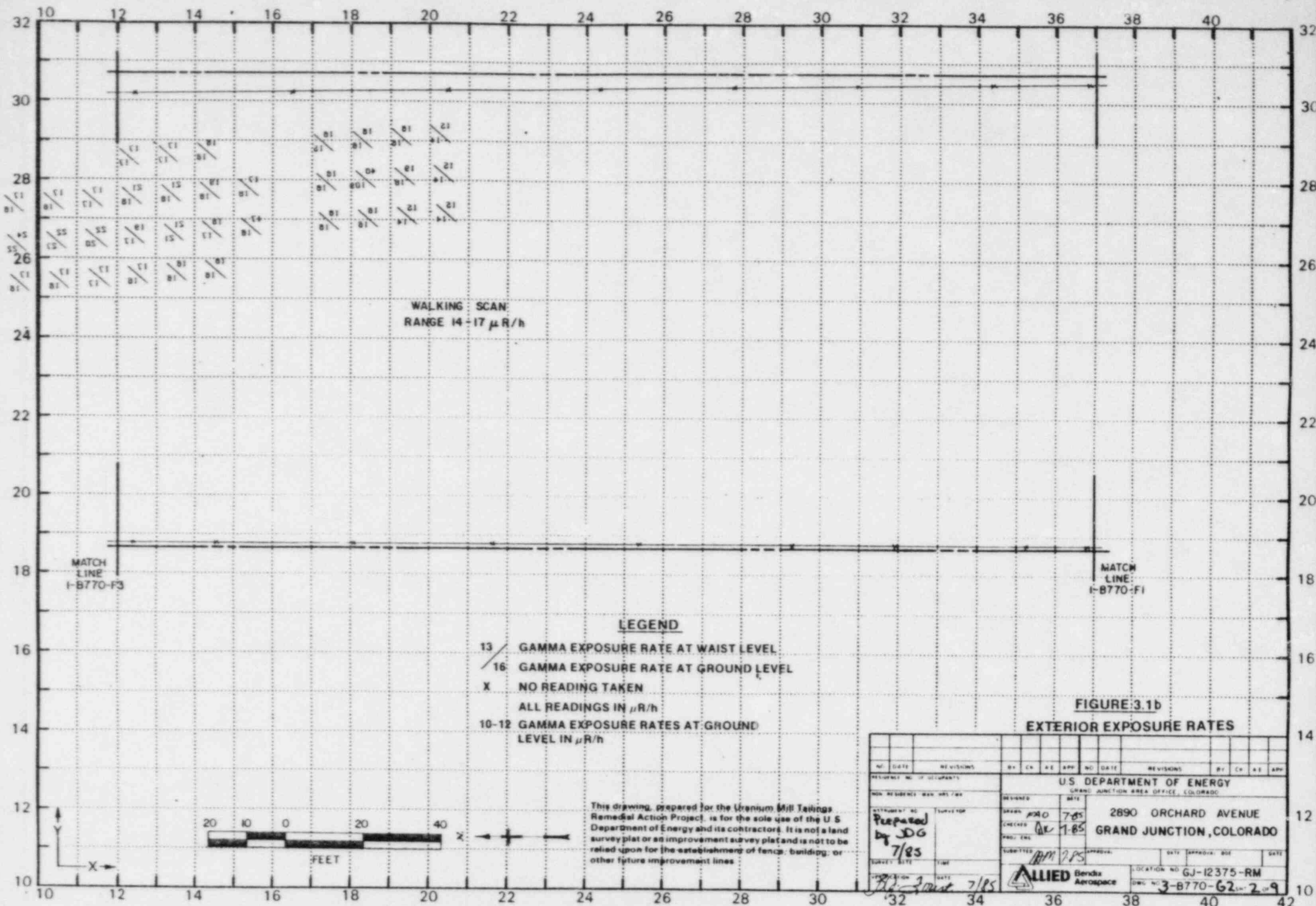
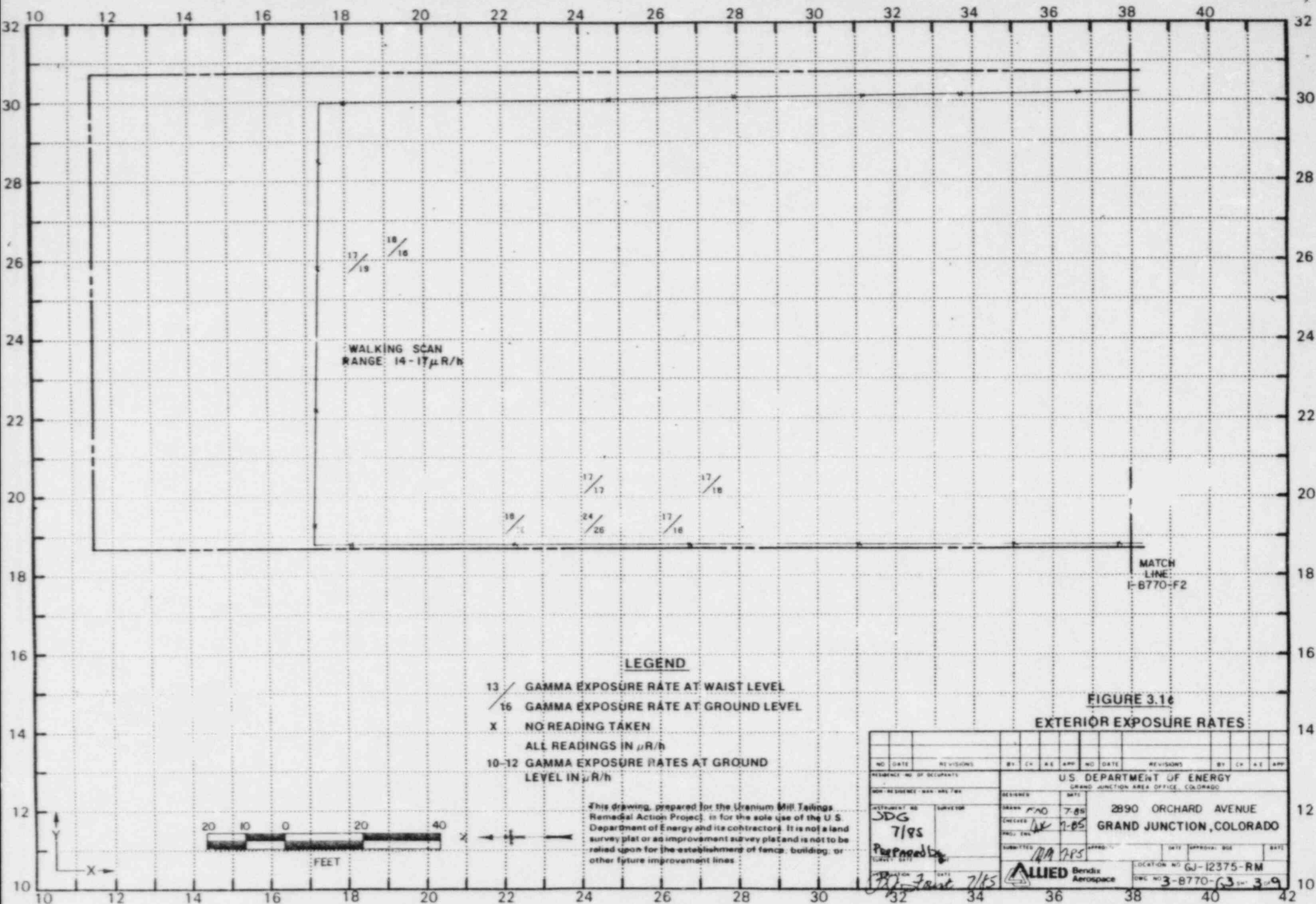


FIGURE 2.2 SITE PLAN



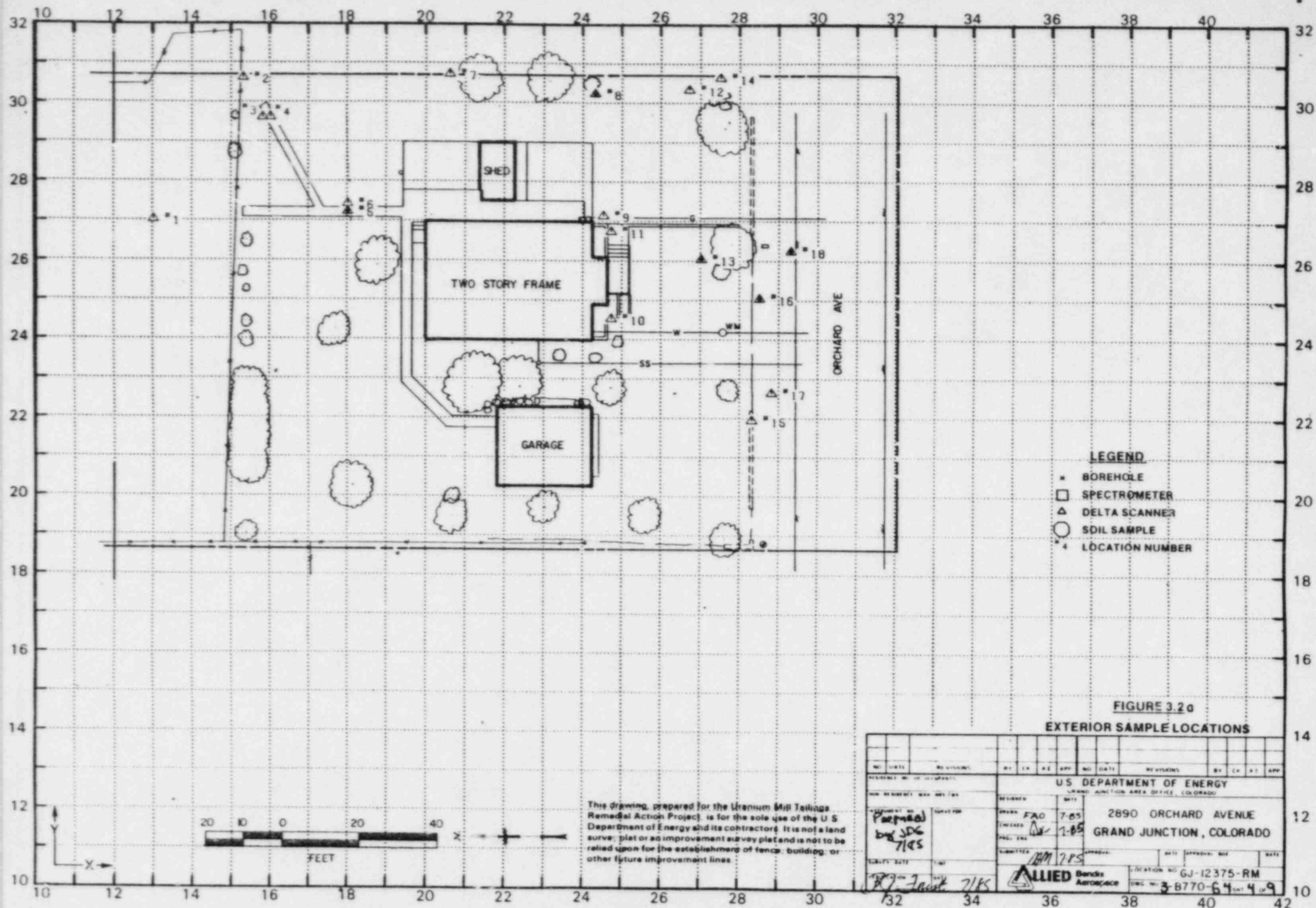




**FIGURE 3.16**  
**EXTERIOR EXPOSURE RATES**

EXTENSION OF OCCUPANCY											
NO. DATE		REVISIONS		BY CH. A.E. APP.		NO. DATE		REVISIONS		BY CH. A.E. APP.	
RESIDENCE NO. OF OCCUPANTS				U.S. DEPARTMENT OF ENERGY							
APR. RESIDENCE NO. AND TYPE				GRAND JUNCTION AREA OFFICE, COLORADO							
APPROVAL NO.		SURVEYOR		DESIGNED		DATE		2890 ORCHARD AVENUE			
JDG				DRAWN		7-85		GRAND JUNCTION, COLORADO			
7/85				CHECKED		7-85					
Prepared by				PROD. ENG.							
SUBMITTAL				APPROVED				DATE		APPROVAL DUE	
7/85				7/85							
LOCATION NO.		DATE		BENDIS Aerospace		LOCATION NO.		6J-12375-RM			
33		34		36		38		40			
33		34		36		38		40			





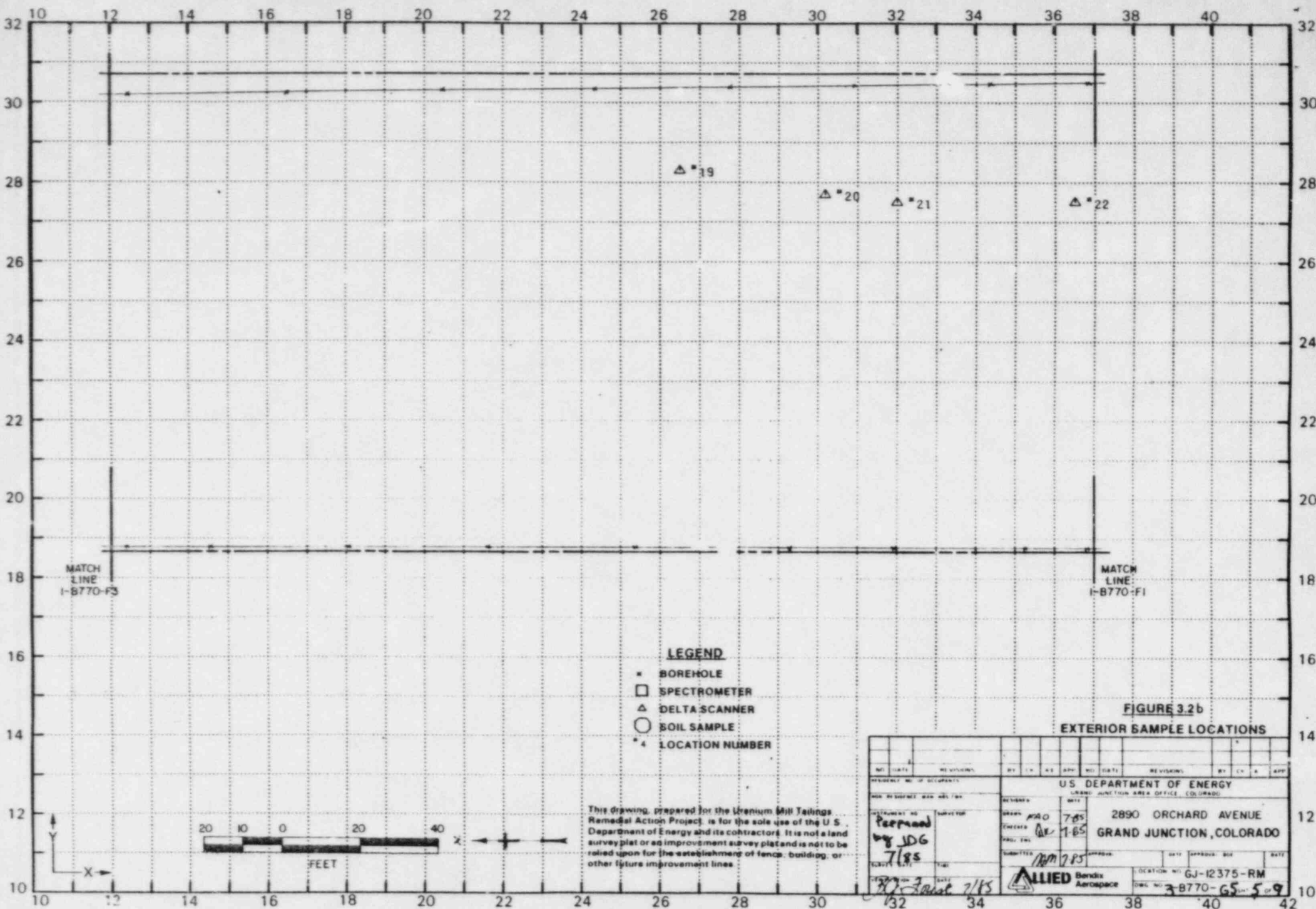


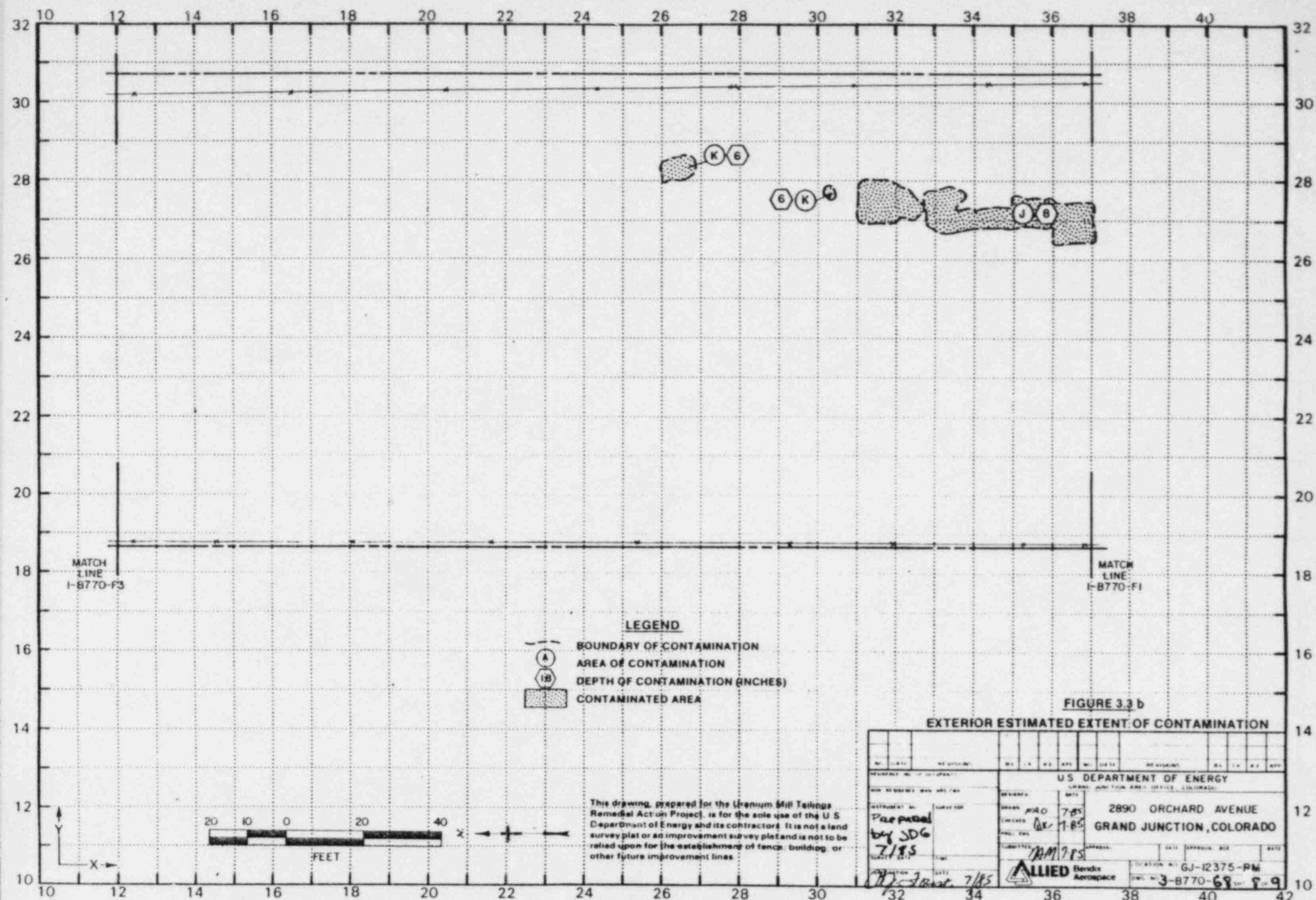
FIGURE 3.2b  
EXTERIOR SAMPLE LOCATIONS

NO. DATE		NO. DATE		NO. DATE		NO. DATE	
REVISIONS				REVISIONS			
U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE (COLORADO)							
2890 ORCHARD AVENUE GRAND JUNCTION, COLORADO				LOCATION NO. GJ-12375-RM Dwg. NO. 3-B770-G5-5 of 9			
INSTRUMENT NO. 7/85 by JDG		SURVEYOR 7/85		DESIGNED 7-85		CHECKED 7-85	
SUBMITTED 7/85		APPROVED 7/85		ALLIED Bendix Aerospace		DATE APPROVED: 8/85	

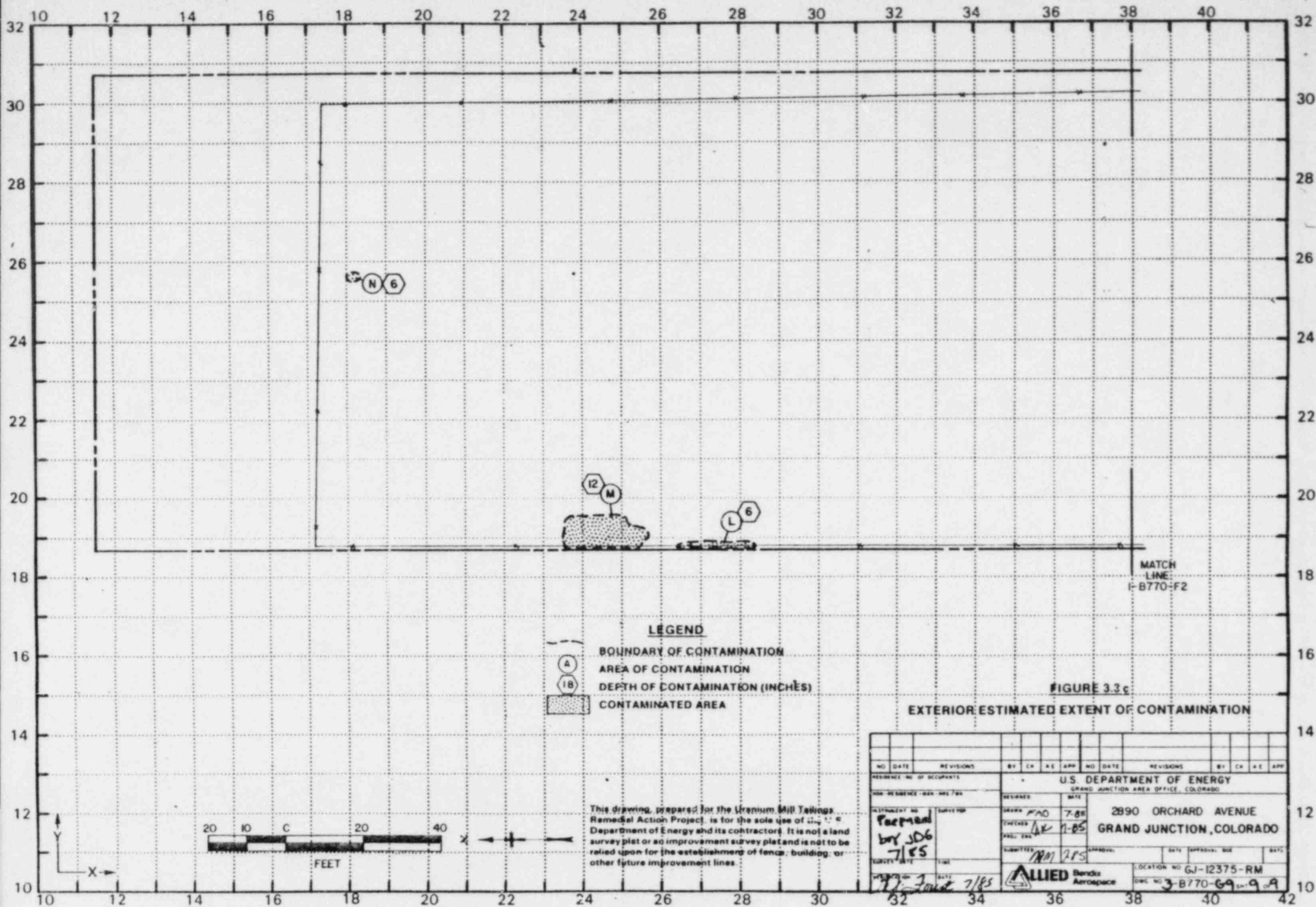








PROJECT NO. 10-10-10-10 DRAWING NO. 10-10-10-10 DATE 10-10-10											
U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO											
2890 ORCHARD AVENUE GRAND JUNCTION, COLORADO											
DRAWN BY SDG CHECKED BY 7/85 DATE 7/85											
APPROVED BY 7/85 DATE 7/85											
ALLIED Bendix Aerospace											
LOCATION NO. GJ-12375-RM Dwg. No. 3-B770-69											





3/85

DOE ID NO. GJ-12375-RM

Date 7-16-85

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

Official Survey Report

Property Address 2890 Orchard Avenue

Property Owner Richard Murphy

Address of Owner (if different from above) PO box 440838 Aurora Colorado

Report Prepared By James D. Garcia

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

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

1 XXXX 1 Residual radioactive materials found at the following locations:

1 XXXX 1 In open areas.

1 XXXX 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.

1 XXXX 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, CJ/CDH

J. Themelis, Mgr. UMTRA Proj. Off.

HIG = 16 uR/h  
HOG = 875 uR/h

MEMORANDUM

ALLIED Bendix  
Aerospace

Bendix Field Engineering Corporation  
Grand Junction Operations  
Grand Junction, Colorado

Date: July 5, 1985

To: Files

From: James D. Garcia

Subject: Team Leader Notes - GJ-12375-RM

Address: 2890 Orchard Avenue

Owner: Richard Murphy

Occupancy: Four

Survey Date: July 5, 1985

Team Members

J. Garcia (Team Leader)  
M. Gilfillan  
M. Johnson  
D. Bell

M. Duran  
R. Wilkins  
D. Clay

Instruments

See Equipment Operational Summary sheet.

The interior survey showed no indication of contamination.

The garage was locked and the tenant living at this address did not have a key. Team members carefully performed a walking scan of the exterior perimeter of the garage and obtained readings of 100 to 120 counts per seconds (cps). While performing the gamma scan, several point sources were discovered in the pasture area and in the rock



Team Leader Notes  
James Garcia  
GJ-12375-RM  
July 5, 1985  
Page 2

garden in the southeast corner of the property. Several point sources were removed from the pasture area; however, the point sources in the rock garden were too numerous to accurately identify, consequently none were removed in this area.

There was an indication of spillover contamination adjacent to the property east of 2890 Orchard Avenue (2892 Orchard Avenue). The homeowner of 2892 Orchard Avenue stated that he received a letter from Colorado Department of Health (CDH) certifying his property as being clean. I checked the CDH information and it stated that no tailings involvement was found. The only elevated readings discovered were caused from an ore sample located in the basement. However, I will include the small amount of spillover contamination found on my property, since there is no real defined property line, such as a fence or other physical boundary.

Two of the team members (D. Clay and M. Johnson) returned to the compound at 11:15 AM in order for them to check out and be released from employment with Bendix. I brought them in, so I was absent from the property for a brief period.

The contamination along the northwest fence line is a spillover from a property which has already been surveyed (GJ-12386-RS).

All team members were frisked and returned to the compound. No injuries occurred while conducting the survey.

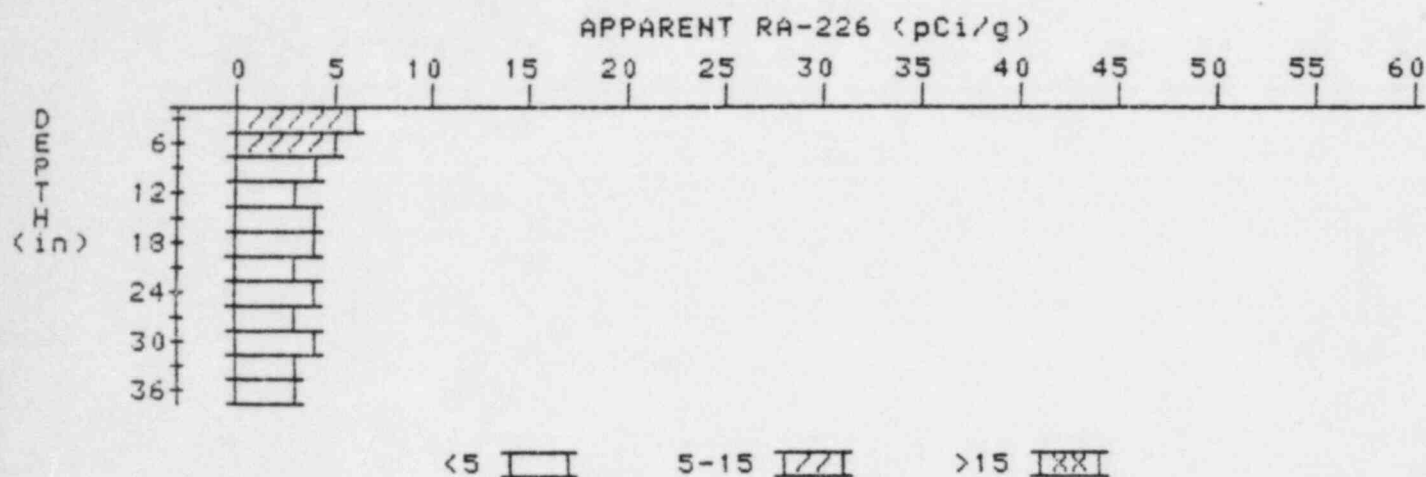
# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

5

PROPERTY NUMBER: GJ-12375-RM

HOLE NUMBER: 5

LOCATION: 180272



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.8	5.8
6	5.2	5.4
9	4.5	4.1
12	4.0	3.5
15	3.8	3.6
18	3.7	3.7
21	3.6	3.4
24	3.6	4.0
27	3.4	3.0
30	3.4	3.6
33	3.3	3.1
36	3.3	3.3

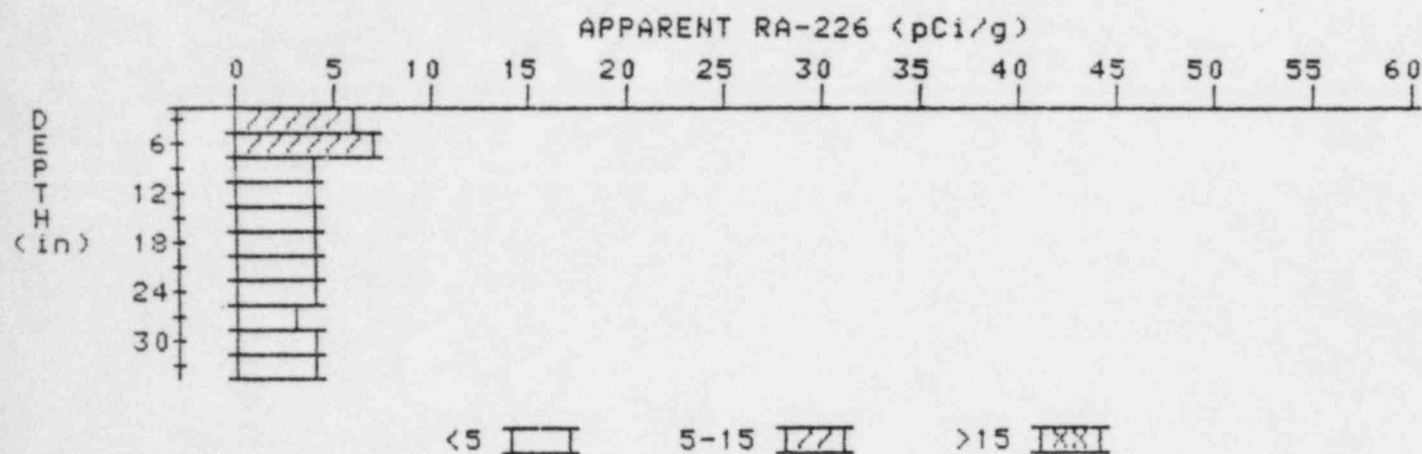
# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

8

PROPERTY NUMBER: GJ-12375-RM

HOLE NUMBER: 8

LOCATION: 243302



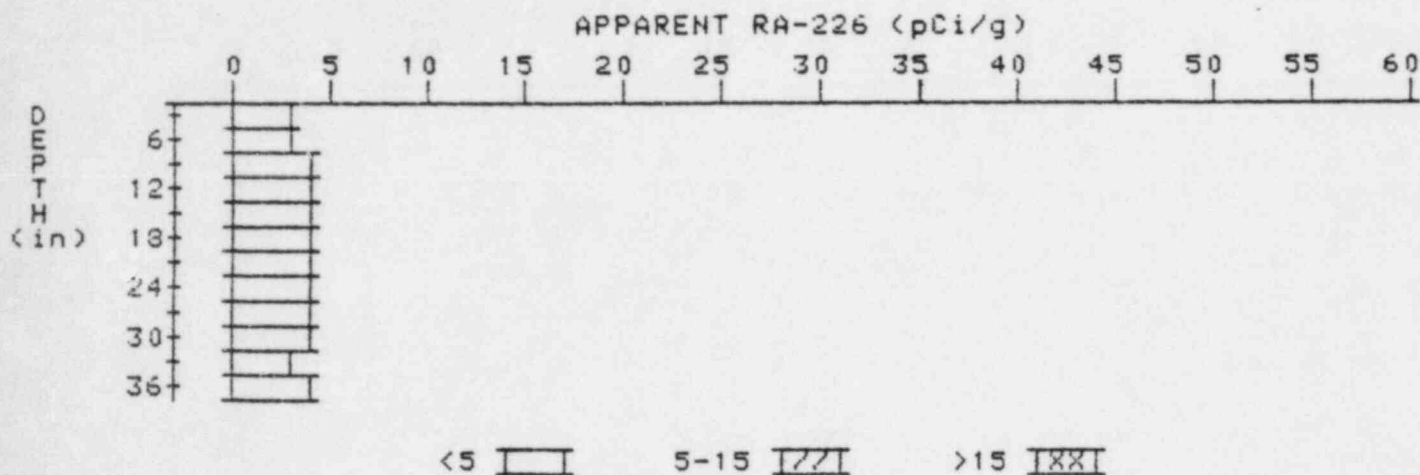
Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	6.4	6.4
6	6.1	7.3
9	5.1	4.4
12	4.5	4.1
15	4.1	3.6
18	4.0	4.2
21	3.8	3.6
24	3.7	3.7
27	3.6	3.4
30	3.6	3.6
33	3.6	3.6

# APPARENT RADIUM-226 CONCENTRATION 13 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-12375-RM

HOLE NUMBER: 13

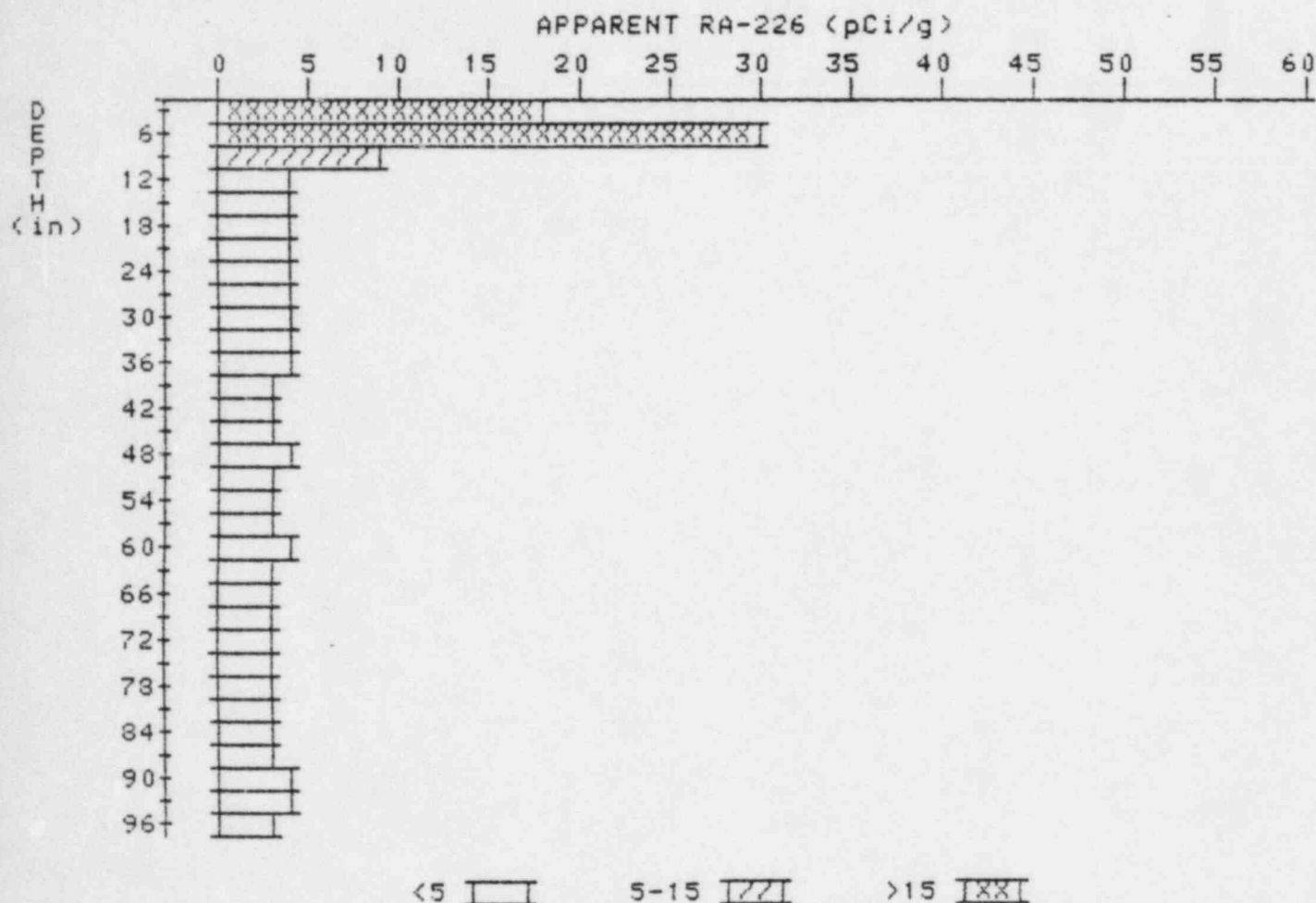
LOCATION: 270260



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.1	3.1
6	3.4	3.4
9	3.7	4.1
12	3.8	3.8
15	3.9	4.1
18	3.9	3.9
21	3.9	3.9
24	3.9	4.1
27	3.8	3.8
30	3.7	3.7
33	3.6	3.4
36	3.6	3.6

# APPARENT RADIUM-226 CONCENTRATION 16 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-12375-RM  
HOLE NUMBER: 16  
LOCATION: 285250



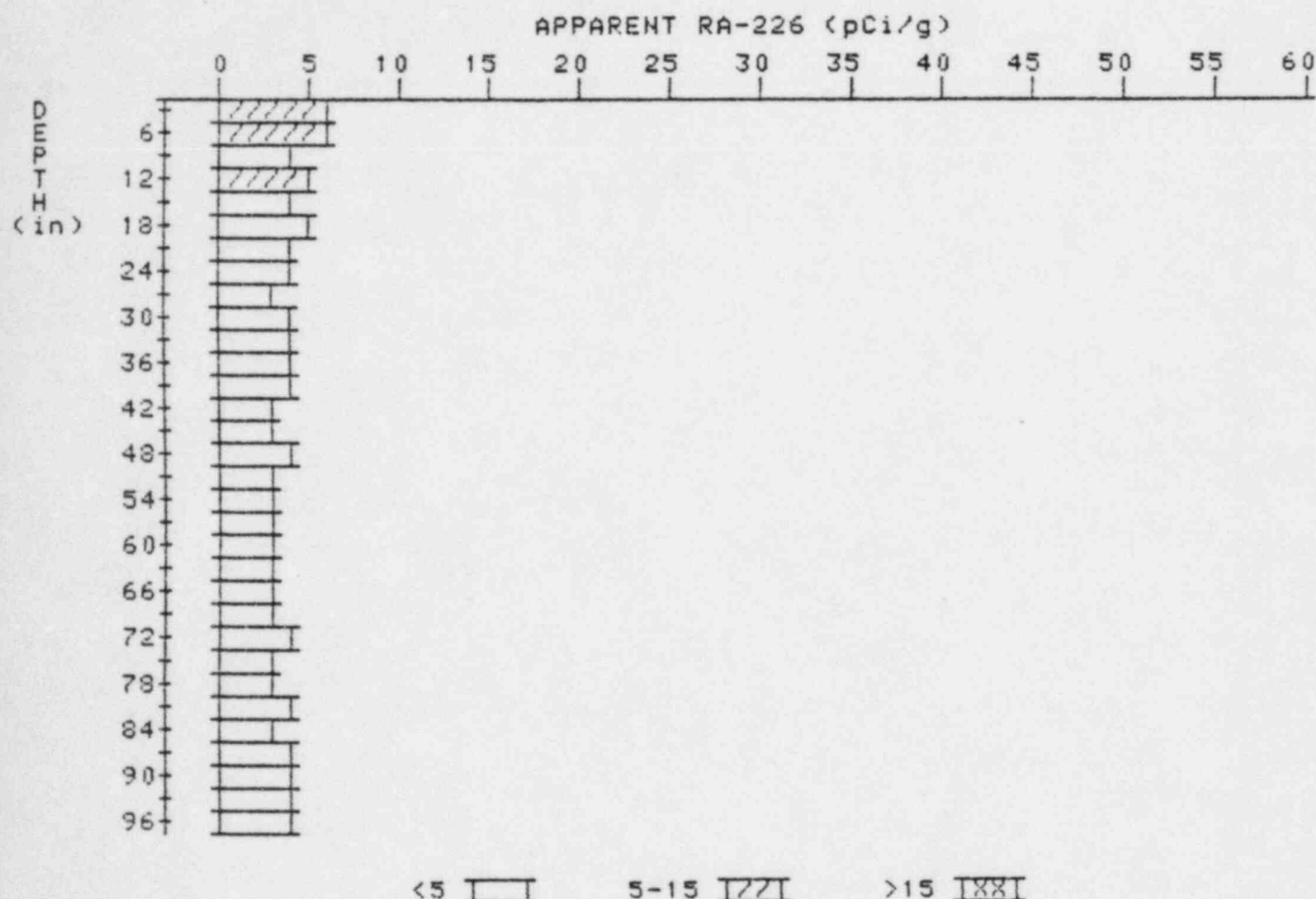
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	17.9	17.9
6	18.3	30.0
9	12.1	8.5
12	7.9	4.0
15	5.9	4.3
18	4.8	3.7
21	4.3	3.8
24	4.1	4.1
27	3.9	3.9

30	3.7	3.5
33	3.6	3.6
36	3.5	3.5
39	3.4	3.2
42	3.4	3.4
45	3.4	3.4
48	3.4	3.6
51	3.3	3.1
54	3.3	3.5
57	3.2	2.8
60	3.3	3.7
63	3.2	3.0
66	3.2	3.0
69	3.3	3.5
72	3.3	3.3
75	3.3	3.3
78	3.3	3.3
81	3.3	3.3
84	3.3	3.1
87	3.4	3.4
90	3.5	3.7
93	3.5	3.7
96	3.4	3.4



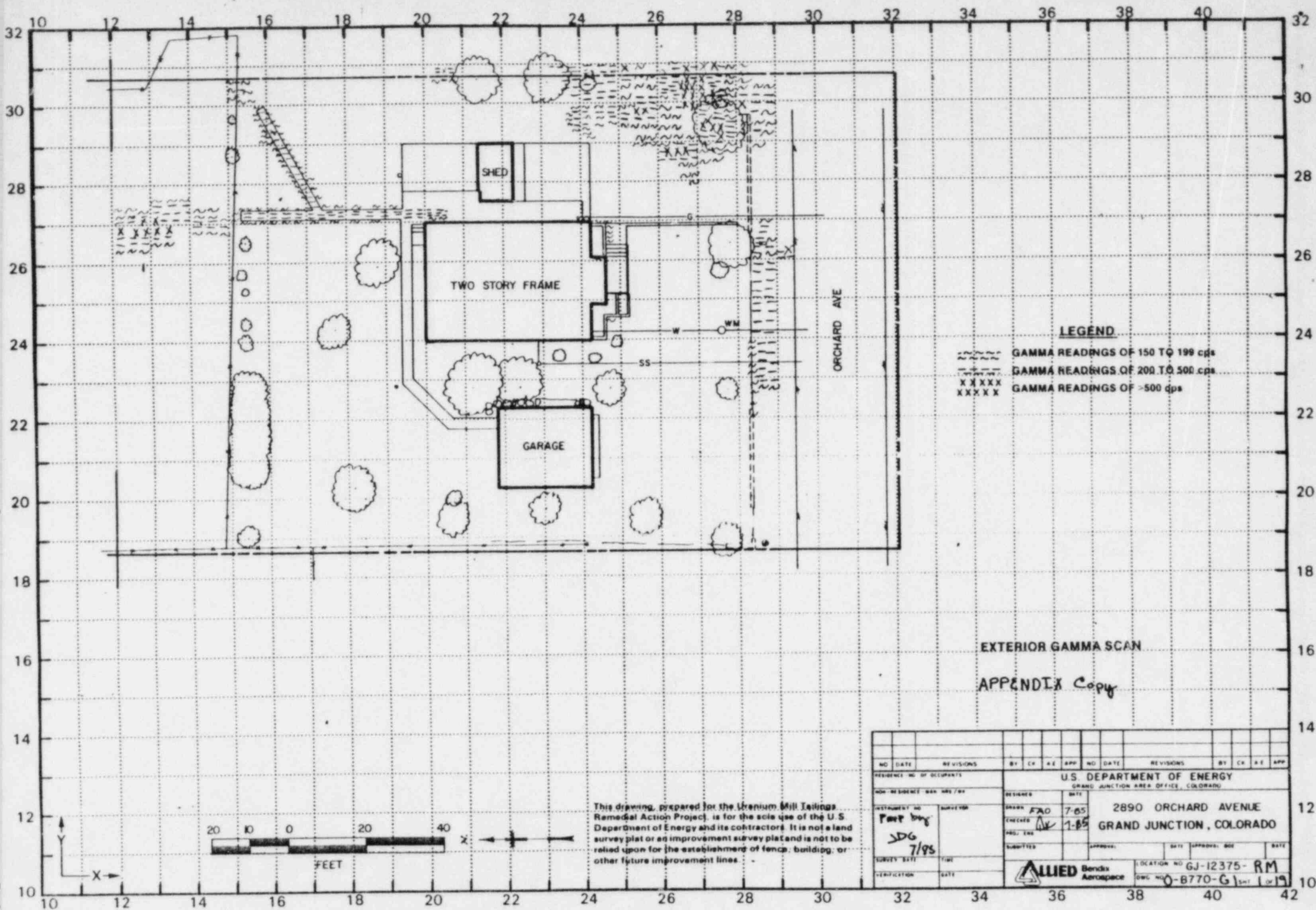
# APPARENT RADIUM-226 CONCENTRATION 18 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-12375-RM  
HOLE NUMBER: 18  
LOCATION: 293262



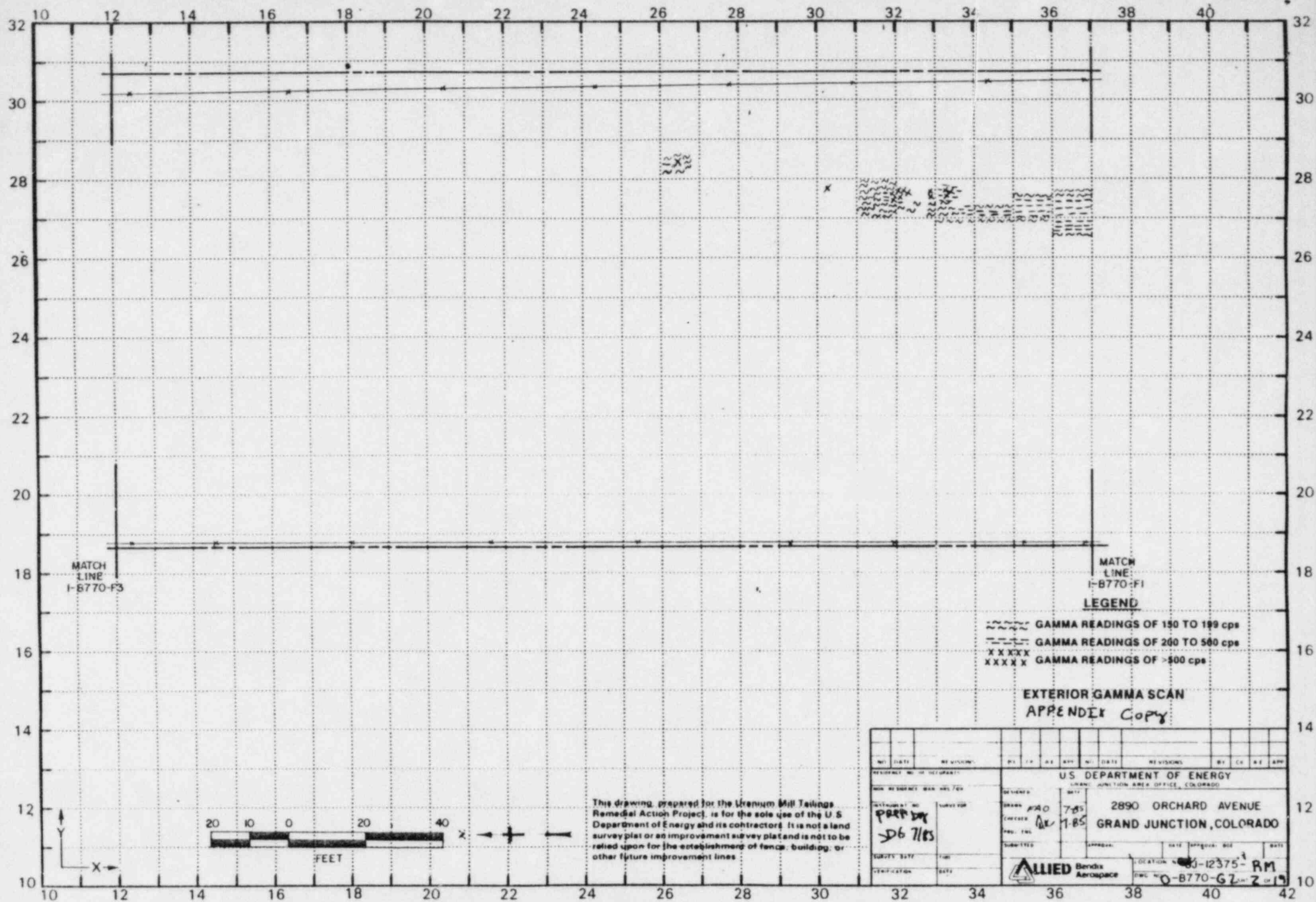
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.6	5.6
6	5.5	6.2
9	5.0	4.3
12	4.9	5.4
15	4.5	4.0
18	4.4	4.8
21	4.1	3.7
24	4.0	4.2
27	3.8	3.4

30	3.8	4.0
33	3.7	3.5
36	3.7	3.7
39	3.7	4.1
42	3.5	3.3
45	3.4	3.2
48	3.4	3.6
51	3.3	3.1
54	3.3	3.5
57	3.2	3.0
60	3.2	3.2
63	3.2	3.2
66	3.2	3.0
69	3.3	3.3
72	3.4	3.8
75	3.3	2.9
78	3.4	3.4
81	3.5	3.7
84	3.5	3.3
87	3.6	3.8
90	3.6	3.6
93	3.6	3.8
96	3.5	3.5

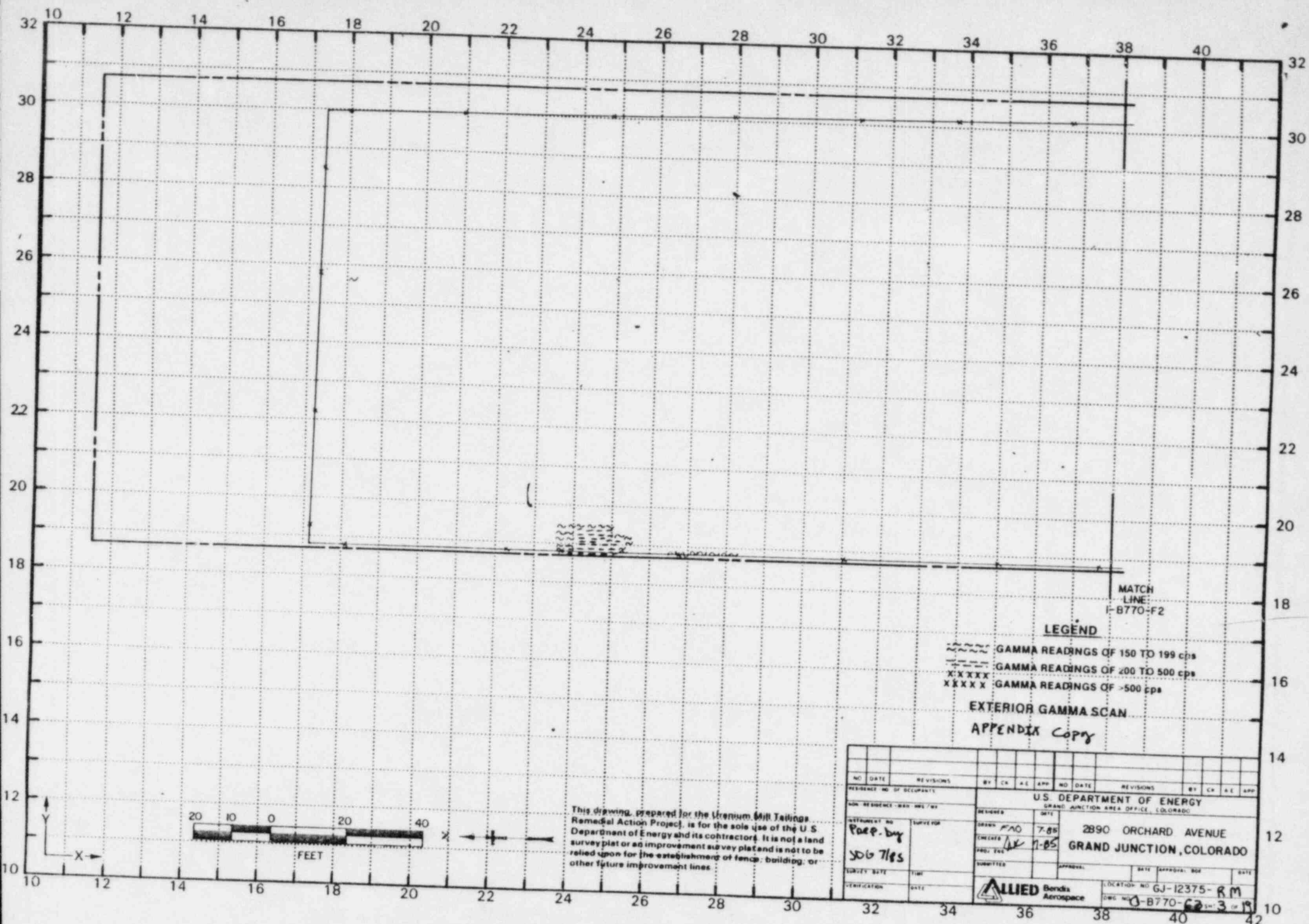


This drawing, prepared for the Uranium Mill Tailings Remedial Action Project, is for the sole use of the U.S. Department of Energy and its contractors. It is not a land survey plat or an improvement survey plat and is not to be relied upon for the establishment of fence, building, or other future improvement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

NO. DATE REVISIONS BY CR A-E APP		NO. DATE REVISIONS BY CR A-E APP	
RESIDENCE NO. OF OCCUPANTS		U.S. DEPARTMENT OF ENERGY	
NON-RESIDENTIAL MAX. HRS./WK.		GRAND JUNCTION AREA OFFICE, COLORADO	
DESIGNER	DATE	2890 ORCHARD AVENUE	
DRINK	7-85	GRAND JUNCTION, COLORADO	
CHECKED	1-85		
NO. ENG.			
QUANTITIES	APPROVE:	DATE	APPROVE: DATE
TITLE			
VERIFICATION	DATE		
		LOCATION NO. GJ-12375-RM DWG. NO. Q-B770-G1 (1 of 19)	







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.