

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-01151-AP
ADDRESS: 460 GRAND AVENUE

JULY 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION
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DATE

July 17, 1985

REA01151:REA-702

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-01151-AP, includes two apartment buildings located at 460 Grand 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, 62 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$8,926. Remedial action on this property will take approximately 18 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 460 Grand Avenue, Grand Junction, Colorado

Zoning: Business (B-3)

Lot Size: Approximately 15,500 sf (0.35 acre)

Legal Description: Lots 17, 18, 19, and 20, Block 74, City of Grand Junction, County of Mesa, State of Colorado.

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

Utilities: Utility locations are shown in Appendix Figure 2.2.

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

Bordering Properties:

North:	Alley
South:	Grand Avenue
East:	Fifth Street
West:	Church

2.2 Existing Facilities and Structures

Primary Structure: Building 1

Type:	Single-story apartment building
Size:	Approximately 1,132 sf
Construction Date:	Undetermined
Construction:	Concrete block with wood-frame floor and roof
Foundation:	Concrete stemwall on spread footing
Footing Depth:	Approximately 68" to bottom of footing from grade at basement and 13" at crawl space
Basement:	Yes - west half of structure
Crawl Space:	Yes - east half of structure
Condition:	Good

Primary Structure: Building 2

Type:	Two-story apartment building with basement apartments
Size:	Approximately 11,457 sf
Construction Date:	1937
Construction:	Concrete block and stucco; wood-frame floors and roof
Foundation:	Concrete wall on spread footing
Footing Depth:	Approximately 88" to bottom of footing from grade
Basement:	Yes (full)
Crawl Space:	None
Condition:	Good

Other Structures:

Type:	Metal Shed #1
Size:	Approximately 98 sf
Construction:	Prefabricated metal
Foundation:	Concrete slab-on-grade
Condition:	Fair

Type:	Metal Shed # 2
Size:	Approximately 89 sf
Construction:	Prefabricated metal
Foundation:	None - mudsill
Condition:	Fair

General Remarks:

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

Historical Data:

These structures are not over 50 years old. Therefore, they do 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-01151-AP on May 8, 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 located in the yard and along the city sidewalks.

The Bendix radiologic survey was designed to investigate the entire property, with emphasis on previously identified areas of contamination. Conclusions based upon data analyses are discussed in Section 3.5, Extent of Contamination. Photocopies of the Official Survey Report, Memo of Understanding, team leader notes, 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: 13 to 16 uR/h
Highest Outside Gamma Reading (HOG): 132 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 18 uR/h
Highest Inside Gamma Reading (HIG): 18 uR/h

Interior radium-concentration measurements are presented in Appendix Table 3.2. 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; these areas are shown in Appendix Figure 3.2. Data from these investigations are included in Appendix Tables 3.1 and 3.2.

3.4 Radon/Radon Daughter Concentration (RDC)

The working level was not assessed by CDH. No RDC measurements were taken by Bendix.

3.5 Extent of Contamination

Appendix Figure 3.3 shows identified areas and estimated depths of contamination on this property, based on assessments of all measurements taken. As noted in this figure, areas recommended for remedial action that contain identified residual radioactive materials are:

- (Area A) Surface Material: Concrete
Direction From Primary Structure: Southeast
Other Directions: On the city easement
Total Depth of Contamination: 15 inches
Other (height or thickness): 6-inch-thick concrete
Comments: The concrete sidewalk is contaminated.
Approximate Square Footage: 65
- (Area B) Surface Material: Concrete
Direction From Primary Structure: West
Other Directions: North driveway
Total Depth of Contamination: 6 inches
Other (height or thickness): 6-inch-thick concrete
Comments: The concrete slab is contaminated.
Approximate Square Footage: 680
- (Area C) Surface Material: Gravel and soil
Direction From Primary Structure: West
Other Directions: West of Area B
Total Depth of Contamination: 6 inches
Other (height or thickness): None
Comments: None
Approximate Square Footage: 50
- (Area D) Surface Material: Concrete
Direction From Primary Structure: South
Other Directions: Northwest corner of the two story building
Total Depth of Contamination: 10 inches
Other (height or thickness): 4-inch-thick concrete
Comments: The concrete slab is contaminated.
Approximate Square Footage: 78

(Area E) Surface Material: Concrete
Direction From Primary Structure: south
Other Directions: South and east of the two
story building
Total Depth of Contamination: 12 inches
Other (height or thickness): Average 5 inch-thick
concrete
Comments: The concrete sidewalks are contaminated.
Approximate Square Footage: 830

(Area F) Surface Material: Lawn
Direction From Primary Structure: South and southeast
Other Directions: South and east of the two
story building
Total Depth of Contamination: 12 inches
Other (height or thickness): None
Comments: None
Approximate Square Footage: 326

(AREAS REQUIRING FURTHER INVESTIGATION DURING REMEDIAL ACTION)

The area north and west of Area E, along the hedge, should be closely monitored during remedial action. Due to the fullness of the hedge, this area could not be investigated.

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-01151-AP, 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 \$8,926.

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 3.2	Exterior Sample Locations
Figure 3.3	Estimated Extent of Contamination

Official Survey Report

Memo of Understanding

Team Leader Notes

Deconvolution Graphs (Apparent Radium-226 Concentration)

Exterior Gamma Scan Map

Radium Concentrations at Exterior Locations

DOE ID #GJ-01151-AP

460 Grand 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.		
3	123224	03	TC	3.7		*	DC = 0 inches
		06	TC	4.0		*	
		09	TC	4.0		*	
		12	TC	4.0		*	
		15	TC	3.8		*	
		18	TC	3.7		*	
		21	TC	3.8		*	
		24	TC	3.9		*	
		27	TC	3.9		*	
		30	TC	3.8		*	
4	128254	03	TC	3.0		*	Abandoned leach field DC = 0 inches
		06	TC	3.0		*	
		09	TC	3.0		*	
		12	TC	3.3		*	
		15	TC	3.6		*	
		18	TC	3.8		*	
		21	TC	4.0		*	
		24	TC	4.0		*	
		27	TC	4.0		*	
		30	TC	3.9		*	
5	149223	00-06	SS			9.6	Concrete core
		06-12	SS			1.9	
		03	TC	5.6		*	Sewer line
		06	TC	5.2		*	
		09	TC	4.6		*	DC = 6 inches Based on the soil sample analyses
		12	TC	4.2		*	
		15	TC	3.9		*	
		18	TC	3.7		*	
		21	TC	3.7		*	
		24	TC	3.6		*	
		27	TC	3.7		*	
		30	TC	3.6		*	
		33	TC	3.6		*	
		36	TC	3.7		*	
		39	TC	3.7		*	
6	155213	00	DS	2.8		*	Gas line
		06	DS	1.5		*	
		42	DS	<1.0		*	
		00-06	SS			1.7	

Radium Concentrations at Exterior Locations

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
7	160190	00	DS	1.4		*	Background
		00-06	SS			1.5	
		03	TC	3.1		*	DC = 0 inches
		06	TC	3.4		*	
		09	TC	3.5		*	
		12	TC	3.5		*	
		15	TC	3.6		*	
		18	TC	3.7		*	
		21	TC	3.7		*	
		24	TC	3.8		*	
		27	TC	3.8		*	
		30	TC	3.8		*	
		33	TC	3.7		*	
		36	TC	3.6		*	
8	176283	00-06	SS			12.9	Concrete core
		06-12	SS			90.5	
		06	TC	25.2		*	No data taken
		09	TC	24.5		*	at the 3-inch
		12	TC	15.1		*	increment
		15	TC	9.7		*	
		18	TC	7.0		*	DC = 15 inches
		21	TC	5.6		*	Based on the
		24	TC	5.0		*	deconvolution graph
		27	TC	4.8		*	
		30	TC	4.7		*	
		33	TC	4.7		*	
9	181217	00-04	SS			89.9	Concrete core
		04-10	SS			6.4	
		03	TC	19.3		*	Northwest corner
		06	TC	11.4		*	of the apartment
		09	TC	7.3		*	building
		12	TC	5.4		*	
		15	TC	4.5		*	DC = 10 inches
		18	TC	4.1		*	Based on all
		21	TC	4.0		*	available data
		24	TC	4.0		*	
		27	TC	3.9		*	
		30	TC	3.9		*	
		33	TC	3.9		*	
		36	TC	4.0		*	

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.		
10	200270	03	TC	2.8		*	East yard
		06	TC	3.2		*	
		09	TC	3.4		*	DC = 0 inches
		12	TC	3.4		*	
		15	TC	3.5		*	
		18	TC	3.6		*	
		21	TC	3.6		*	
		24	TC	3.8		*	
		27	TC	3.8		*	
		30	TC	3.8		*	
		33	TC	3.9		*	
		36	TC	3.9		*	
11	230286	00	DS	1.8		*	Along the sidewalk
		06	DS	7.6		*	Horizontal
		12	DS	3.6		*	Horizontal
		12	DS	1.0		*	
12	240270	03	TC	3.0		*	Abandoned
		06	TC	3.4		*	leach field
		09	TC	3.5		*	East yard
		12	TC	3.6		*	
		15	TC	3.6		*	DC = 0 inches
		18	TC	3.6		*	
		21	TC	3.6		*	
		24	TC	3.7		*	
		27	TC	3.9		*	
		30	TC	3.9		*	
		33	TC	3.9		*	
13	248282	00-04	SS			12.7	Concrete core
		04-10	SS			29.2	
		06	TC	20.7		*	No data taken
		09	TC	13.8		*	at the 3 inch
		12	TC	9.0		*	increment
		15	TC	6.6		*	
		18	TC	5.2		*	DC = 12 inches
		21	TC	4.6		*	Based on the
		24	TC	4.3		*	deconvolution graph
		27	TC	4.3		*	
		30	TC	4.3		*	
		33	TC	4.3		*	
		36	TC	4.3		*	

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.		
14	276290	00	DS	17.7		*	On sidewalk
		12	DS	36.7		*	Horizontal
		12	DS	2.6		*	
15	278199	00-06	SS			13.0	Concrete core
		06-12	SS			57.1	
		03	TC	33.4		*	On city sidewalk
		06	TC	32.7		*	
		09	TC	20.2		*	DC = 12 inches
		12	TC	12.9		*	Based on the
		15	TC	9.3		*	deconvolution graph
		18	TC	7.3		*	
		21	TC	6.3		*	
		24	TC	5.7		*	
		27	TC	5.4		*	
		30	TC	5.0		*	
		33	TC	4.8		*	
		36	TC	4.6		*	
		39	TC	4.6		*	
		42	TC	4.3		*	
16	280250	00-05	SS			11.8	Concrete core
		05-11	SS			44.1	
		03	TC	23.4		*	City sidewalk
		06	TC	31.2		*	
		09	TC	21.3		*	DC = 12 inches
		12	TC	13.0		*	Based on the
		15	TC	9.1		*	deconvolution graph
		18	TC	6.9		*	
		21	TC	5.8		*	
		24	TC	5.1		*	
		27	TC	4.7		*	
		30	TC	4.3		*	
		33	TC	4.2		*	
		36	TC	4.2		*	
		39	TC	4.2		*	
		42	TC	4.2		*	
17	280282	00-04	SS			9.0	Concrete core
		04-10	SS			74.1	
		03	TC	34.8		*	City sidewalk
		06	TC	46.6		*	
		09	TC	30.7		*	
		12	TC	17.1		*	

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.		
17	280282	15	TC	10.7		*	DC = 12 inches Based on the deconvolution graph
		18	TC	7.5		*	
		21	TC	6.0		*	
		24	TC	5.4		*	
		27	TC	5.2		*	
		30	TC	4.7		*	
		33	TC	4.6		*	
		36	TC	4.5		*	
		39	TC	4.4		*	
		42	TC	4.4		*	
18	282203	00	DS	7.4		*	Southwest of sidewalk
		06	DS	6.2		*	
		12	DS	2.8		*	
		18	DS	1.7		*	
19	282238	00	DS	4.2		*	South sidewalk
		06	DS	2.2		*	
20	290280	00	DS	3.7		*	East sidewalk Horizontal
		08	DS	11.9		*	

Measurement Types: GB = GAD-6 Borehole
GS = GAD-6 Surface
DS = Delta Scintillometer
TC = Total Count Borehole
SS = Soil Sample
BH = Combined GAD-6 and
Total Count Borehole

Notes: DC = Depth of Contamination
* = No Soil Sample Taken
[n] = Reading Taken n-Inches
Above Floor or Ground
Date of Survey = 05-08-85
Team Leader = RRV

Radium Concentrations at Interior 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.		
1		00	DS	1.3		*	On the floor
		[15]	DS	5.4		*	Horizontally
		[17]	DS	3.3		*	against bricks
		00-00	SS			2.9	Brick and mortar from under furnace
2		00	DS	<1.0		*	On the floor
		00	DS	3.3		*	Horizontally
		[12]	DS	2.6		*	against bricks

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 = 05-08-85
 Team Leader = RRV

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 of south building	*	*	*	*	14-18	*
Furnace room of north building	09	14-17	16	09	16-21	18
Basement of north building	*	*	*	*	16-18	*
=====	=====	=====	=====	=====	=====	=====

* Walking gamma scans were performed to confirm the absence of interior contamination at this location.

Table 4.1
Area and Volume Calculations
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<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
EXTERIOR					
	Concrete				
A	13 x 5 =	65	x 0.5 =	33	
B	50 x 11 =	550			
	10 x 13 =	130			
		<hr/>			
		680	x 0.5 =	340	
D	10 x 6 =	60	x 0.3 =	18	
E	68 x 5 =	340			
	5 x 86 =	430			
	4 x 15 =	60			
		<hr/>			
		830	= 0.4 =	332	
				<hr/>	
	Volume of Concrete			= 723	= 723/27 = 27
	Contaminated Fill				
A	13 x 5 =	65	x 0.8 =	52	
C	50 x 1 =	50	x 0.5 =	25	
D	10 x 6 =	60	x 0.5 =	30 (under concrete)	
	6 x 3 =	18	x 0.8 =	14	
		<hr/>			
		78			
E	68 x 5 =	340			
	5 x 86 =	430			
	4 x 15 =	60			
		<hr/>			
		830	x 0.6 =	498	

Table 4.1
Area and Volume Calculations
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F	42 x 1	=	42						
	3 x 13	=	39						
	2 x 11	=	22						
	15 x 3	=	45						
	18 x 1	=	18						
	2 x 34	=	68						
	2 x 46	=	92						
			326	x	1.0	=	326		
	Volume of fill					=	945	=	945/27 = <u>35</u>
	TOTAL VOLUME - EXTERIOR							=	62

See Appendix Figure 3.3 For Areas

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Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-01151-AP

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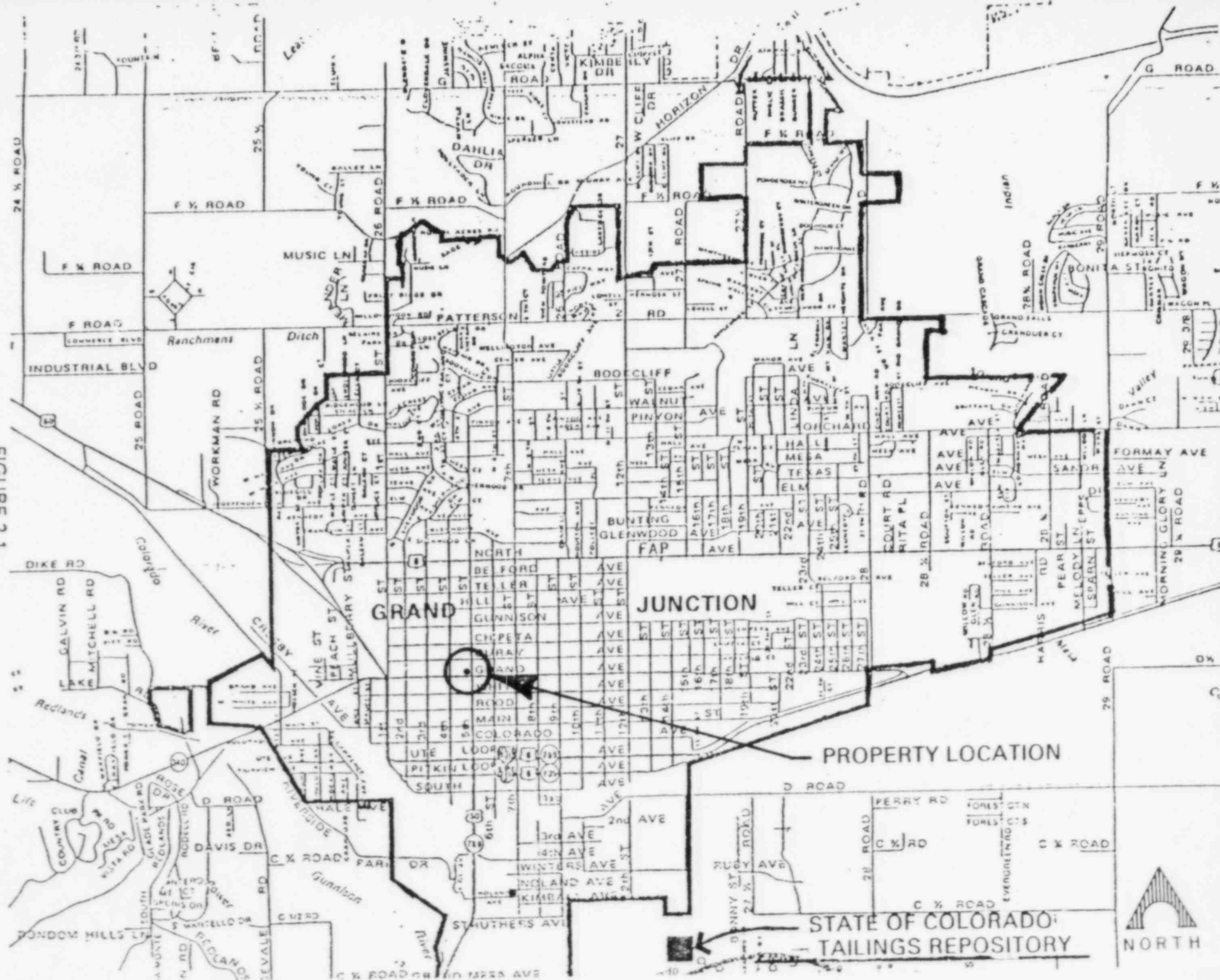
EXTERIOR

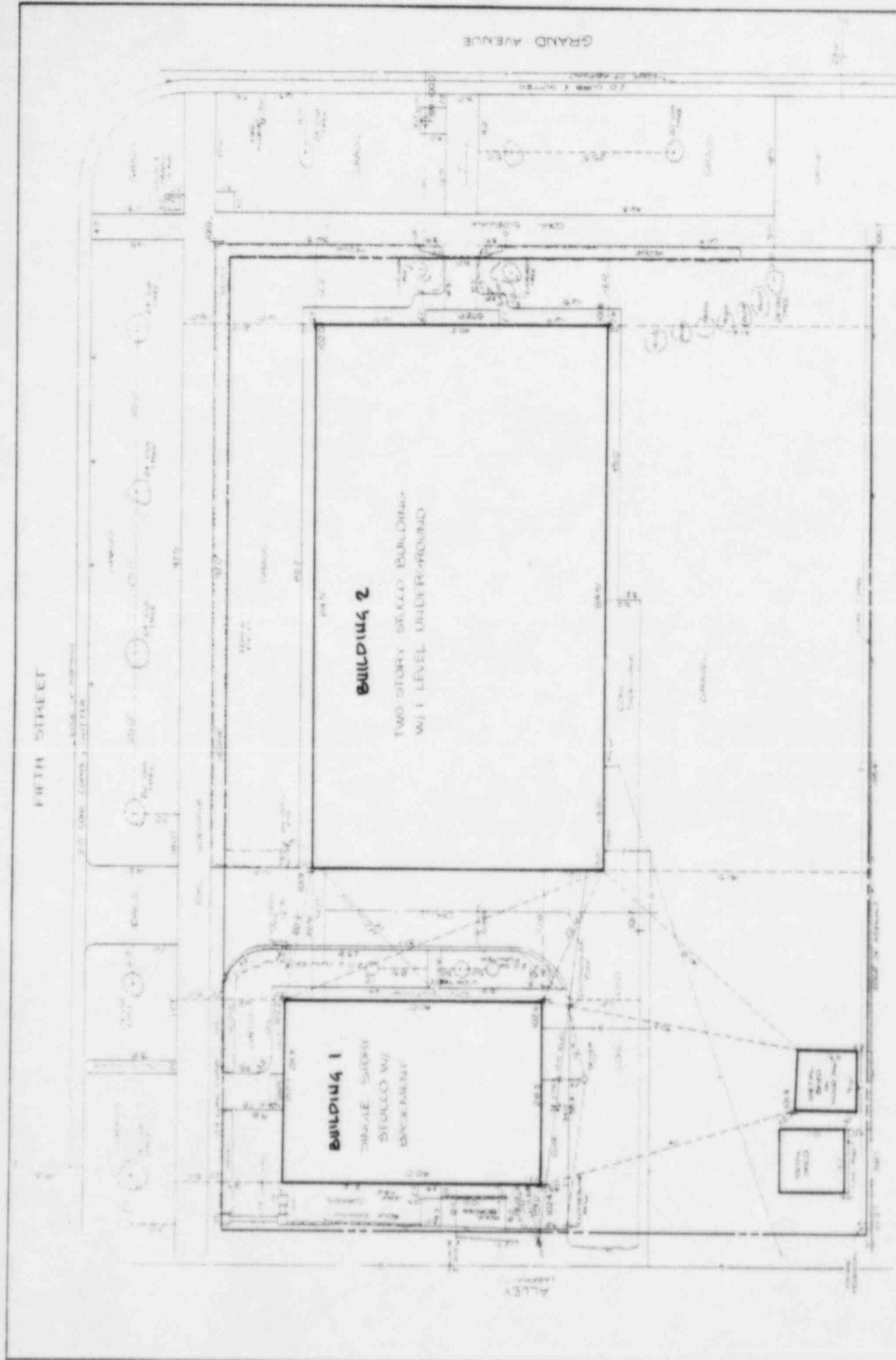
Remove/replace concrete - 6" thick 745 sf @ \$4/sf	\$ 2,980
Remove/replace concrete - 4" thick 890 sf @ \$3/sf	2,670
Remove identified residual radioactive material 35 cy @ \$14.50/cy (machine - open)	508
Replace areas with topsoil 12 cy @ \$9.50/cy	114
Replace areas with compacted roadbase 23 cy @ \$11.50/cy	265
Replace areas with sod 326 sf @ \$.35/sf	114
<hr/>	
TOTAL EXTERIOR	\$ 6,651
TOTAL INTERIOR	0
ACCESS CONTROL	150
<hr/>	
SUBTOTAL	\$ 6,801
CONTINGENCY @ 5%	340
<hr/>	
SUBTOTAL	\$ 7,141
CONTRACTOR OVERHEAD & PROFIT @ 25%	1,785
<hr/>	
GRAND TOTAL	\$ 8,926

=====

FAV071285
REA01151/REA-701/AP

FIGURE 2.1
VICINITY MAP





LOTS 17 TO 20 OF BLOCK 74,
GRAND JUNCTION
CITY OF GRAND JUNCTION
MESA COUNTY, COLORADO

NOTE: SEE CITY OF GRAND JUNCTION
SUBDIVISION DEPARTMENT FOR
ADDITIONAL PLANS AND SPECIFICATIONS.

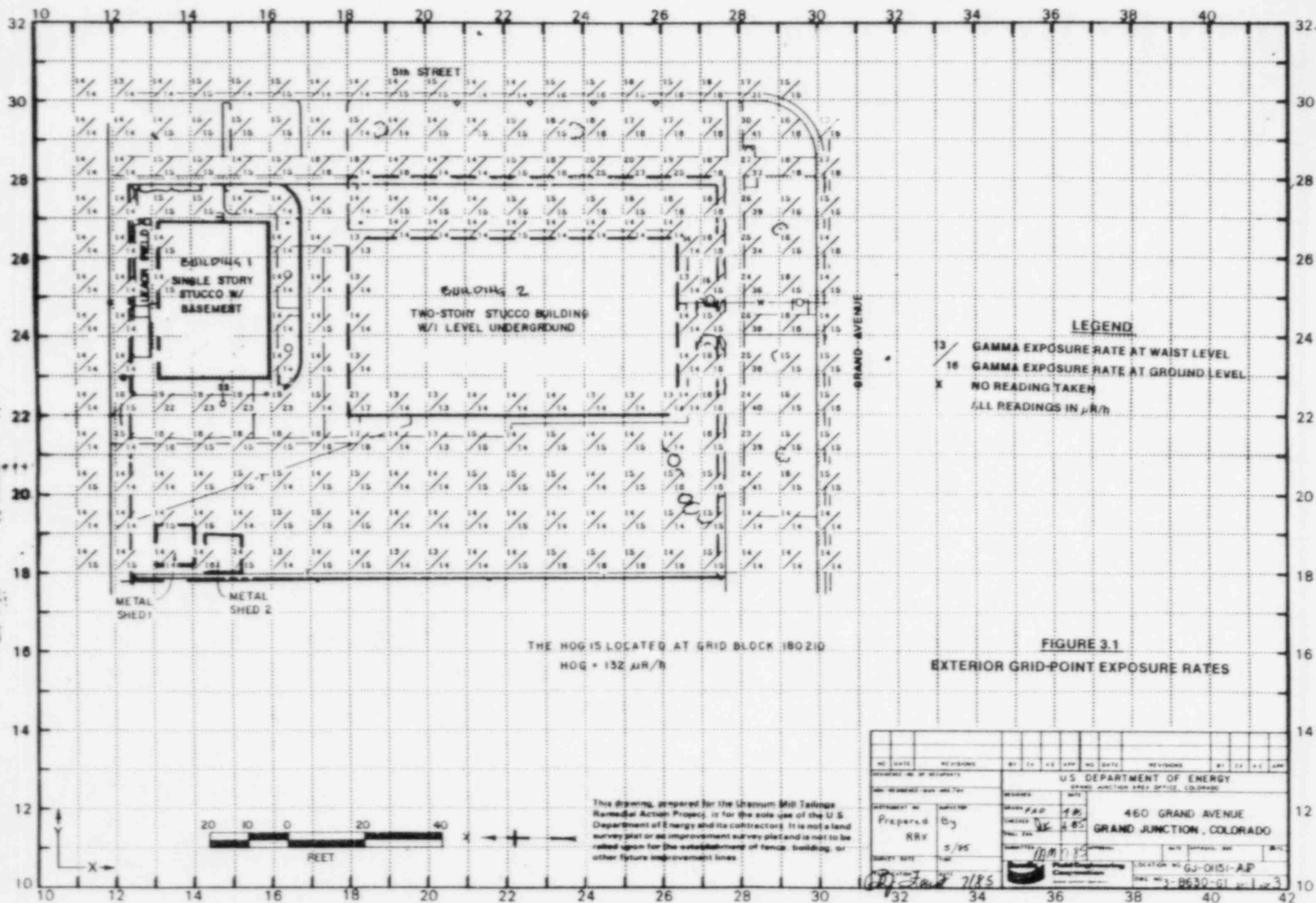
SCALE IN FEET



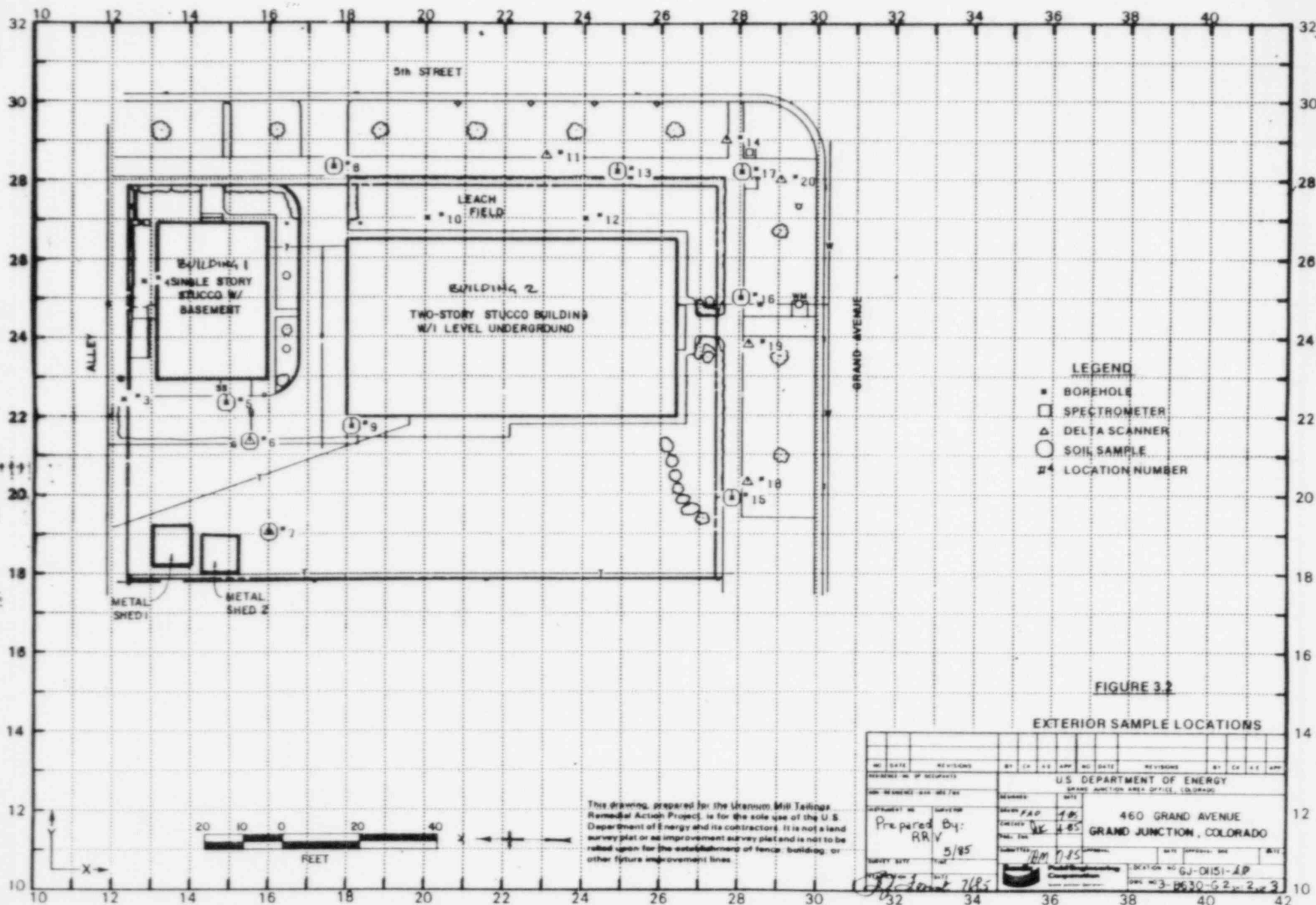
This drawing is prepared for the U.S. Department of Energy
Special Activities Project - for the site plan of the U.S.
Department of Energy, Grand Junction, Colorado. It is not to be
used for any other purpose without the written consent of the
author. It is not to be used for the establishment of future building or
other future improvement lines.

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECT OFFICE, COLORADO	DATE AND NO. 6/30/15/1 AP
ADDRESS: 460 GRAND AVENUE GRAND JUNCTION, COLO	Drawn by: [Signature] Checked by: [Signature] Reviewed by: [Signature]
Utility: RLB/4-18 B5 (Sheet KAS/4-24) EP-2K	
GRAND JUNCTION NO. 5-10630-F1	SHEET 1 OF 1

FIGURE 2.2 SITE PLAN



NO. DATE	REVISIONS	BY	CHK	DATE	NO. DATE	REVISIONS	BY	CHK	DATE
U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO									
ATTACHMENT NO. Prepared By RRY S/V/S DATE 7/85					460 GRAND AVENUE GRAND JUNCTION, COLORADO GJ-OHSI-AIP 3-8530-01-1-3				



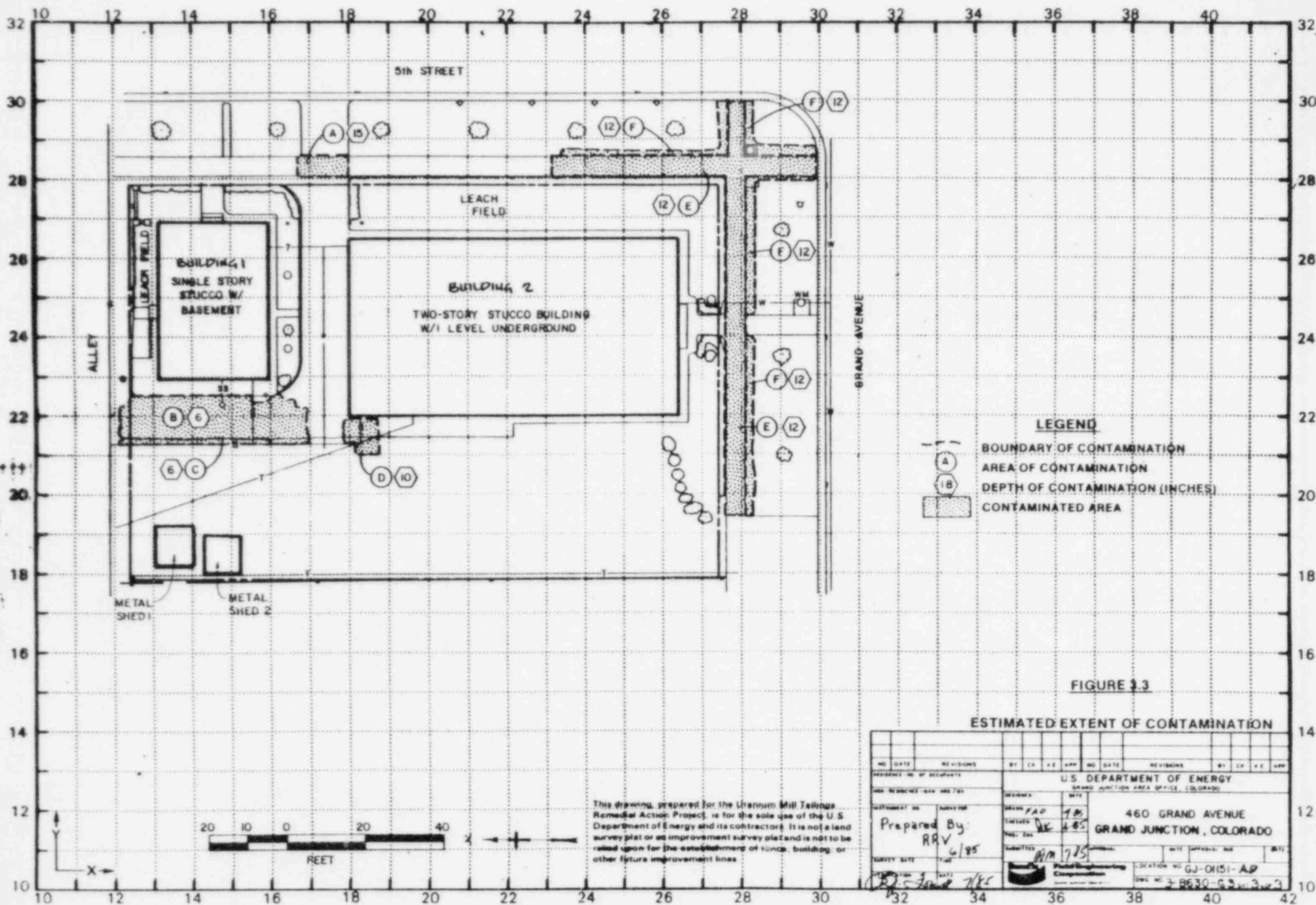


FIGURE 3.3

ESTIMATED EXTENT OF CONTAMINATION

NO. DATE		REVISIONS		BY CH. X.E. APP. NO. DATE		REVISIONS		BY CH. X.E. APP.	
U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO									
PROJECT NO.		SUBJECT		DESIGN		DATE		460 GRAND AVENUE GRAND JUNCTION, COLORADO	
PREPARED BY: RRV		DATE: 6/85		CHECKED BY: JES		DATE: 7/85		DATE APPROVED: DATE	
SURVEY DATE:		DATE:		DRAWN BY: JES		DATE:		LOCATION NO. GJ-0151-AD	
DATE:		DATE:		DATE:		DATE:		DATE:	

3/85

DOE ID NO. GJ-01151-~~RM~~AP

Date June 18, 1985

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

Official Survey Report

Property Address 460 Grand Avenue

Property Owner Reverend Robert J. Strand

Address of Owner (if different from above) 402 Grand Avenue

Report Prepared By Robert R. Vialpando

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

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

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

1 XX 1 In open areas.

1 XX 1 Under or around exterior improvements.

1 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 = 18 uR/h
HOG = 132 uR/h



Bendix
Aerospace

Bendix Field Engineering Corporation
P. O. Box 1569
Grand Junction, CO 81502-1569
Telephone (303) 242-8621
Telex: 454-338

July 3, 1985

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

ATTN: Coleen Campbell

Dear Coleen:

The following is in response to your questions and comments concerning Department of Energy (DOE) Identification (ID) number GJ-01151-~~RM~~ (460 Grand Avenue), received in the mail 3 July, 1985. ~~AP 472~~

1. I see no concern, since the sheds were located in a background area.
2. The water, gas, and sewer lines were investigated, as shown in the Exterior Sample Locations map.

Enclosed is a reduced xerox copy of the Exterior Sample Locations map showing utility lines investigated.

Thank you for your time and cooperation. If you should have additional questions or comments you may contact me at 242-8621, extension 472.

Sincerely,

Robert R. Vialpando
RSD Survey Team Leader

RRV:pr

Enclosure

MEMORANDUM

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado

Date: May 8, 1985

To: Files

From: Robert Vialpando

Subject: Team Leader Notes - GJ-01151-RMAP ²⁰²

Address: 460 Grand Avenue

Owner: Robert J. Strand

Telephone: 243-0731

Occupancy: 14 tenants

Date of survey: 8 May 1985, 0830

Team Members

R. Vialpando (Team Leader)

M. Dexter

L. Kula

A. Raabe

D. Bell

D. Dow

H. Mattison

V. Young

Instruments

Scintillometers: C-1196, C-1127, C-1185, C-1206, C-1163, C-12089

Delta Scintillometers: C-3938, C-3942

Total Count Meters: C-3957, C-3959

Surface Spectrometer: C-1372

Colorado Department of Health (CDH) and Oak Ridge National Laboratory (ORNL) data indicates contamination to be located in the yard and city sidewalk.

Team Leader Notes
Robert Vialpando
GJ-01151-RMAF
May 8, 1985
Page 2

The Bendix team was met by Mrs. Ella Grabher, the apartment tenant manager. Approval to survey was verbally given.

An interior gamma scan was performed to verify or deny data taken by CDH and ORNL.

Elevated measurements were detected in the furnace room of the two story stucco building with a one level underground apartment structure. Two delta scintillometer measurement locations were designated along side the brick pedestal of the furnace unit. (The furnace is an old coal burner converted into a gas furnace.) The measurements taken at surface level (concrete slab) revealed low delta count readings. The measurements taken horizontally against the fire brick pedestal revealed high delta count readings. Elevated counts shown against the firebrick is believed to be thorium, and not mill tailings involvement. A sample of the brick and mortar from underneath the furnace was taken for analysis. The remainder of the building showed background readings of 65 to 140 cps. The interior gamma survey of the single story building with the basement showed readings of 80 to 145 cps. The counts of 145 cps were read at window height of the basement level and were believed to be shine from the exterior deposit of contamination.

An exterior gamma survey and grid point exposure-rate measurements were taken to verify or deny data from CDH and ORNL. Bendix team findings were essentially the same as that of CDH and ORNL.

Elevated measurements were detected along the city sidewalks on the south and east boundaries of the property, along the west sidewalk adjacent to the two story building, and on the concrete slab adjacent to the single story building. These areas were investigated by borehole and auger holes, then logged with the total count instruments. Delta scintillometer measurements were taken along the sidewalks and gas line. Measurements taken with the total count meter indicated surface contamination. Cores from the city sidewalks were taken for analysis, along with several soil samples.

Utility lines were investigated by auger holes, then logged with a total count instrument.

Suspected leach fields in the east and north yards were investigated by auger holes, then logged with a total count instrument.

Team Leader Notes
Robert Vialpando
GJ-01151-RMAP
May 8, 1985
Page 3

Mrs. Grabher would not permit the Bendix team to auger holes adjacent to the apartment buildings because of possible water seepage into the apartments on the basement level.

No footing /foundation auger holes were performed.

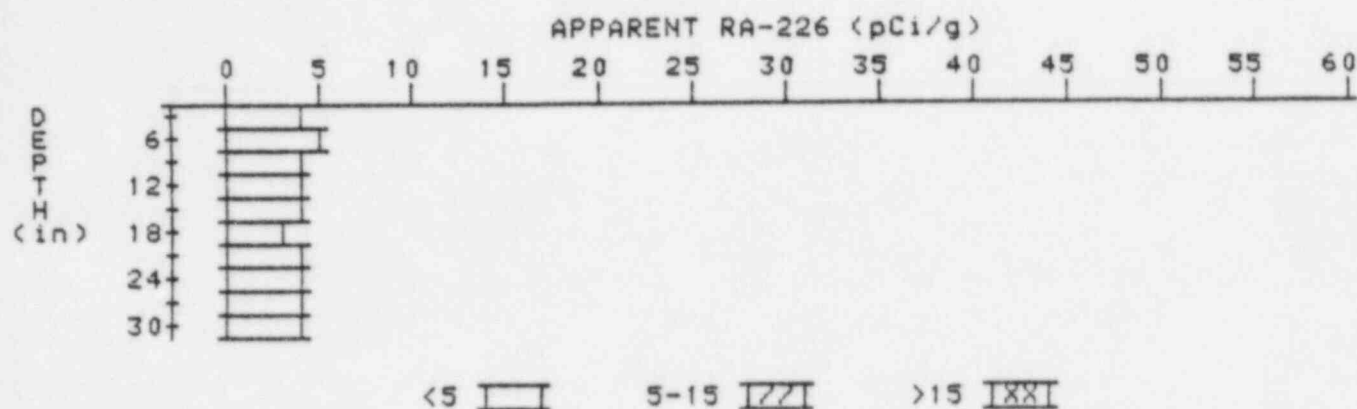
No interior measurements were collected in either of the metal sheds on the west property boundary, Mrs. Grabher was unable to obtain the keys for access.

When the survey was completed, all team members frisked for possible gamma exposure. No contamination was detected on persons. All actions and work details were performed safely. No accidents occurred.

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

3

PROPERTY NUMBER: GJ-01131-AP
HOLE NUMBER: 3
LOCATION: 123224



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.7	3.7
6	4.0	4.5
9	4.0	4.0
12	4.0	4.4
15	3.8	3.6
18	3.7	3.3
21	3.8	3.8
24	3.9	4.1
27	3.9	4.1
30	3.8	3.8

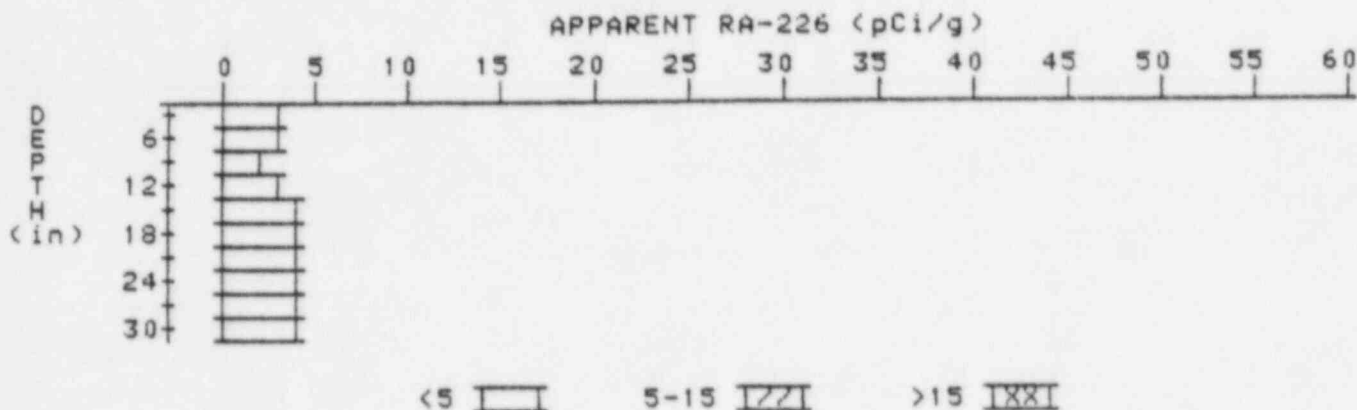
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

4

PROPERTY NUMBER: GJ-01151-AP

HOLE NUMBER: 4

LOCATION: 128254



Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	3.0	3.0
6	3.0	3.0
9	3.0	2.5
12	3.3	3.3
15	3.6	3.8
18	3.8	3.8
21	4.0	4.4
24	4.0	4.0
27	4.0	4.2
30	3.9	3.9

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

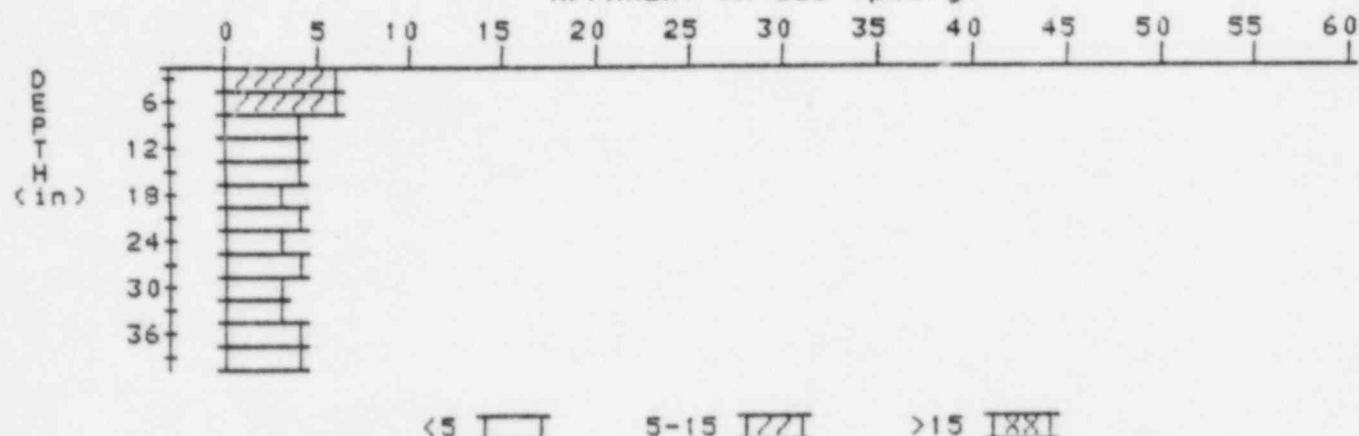
5

PROPERTY NUMBER: GJ-01131-AP

HOLE NUMBER: 5

LOCATION: 149223

APPARENT RA-226 (pCi/g)



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.6	5.6
6	5.2	5.6
9	4.6	4.2
12	4.2	4.0
15	3.9	3.7
18	3.7	3.3
21	3.7	3.9
24	3.6	3.2
27	3.7	4.1
30	3.6	3.4
33	3.6	3.4
36	3.7	3.9
39	3.7	3.7

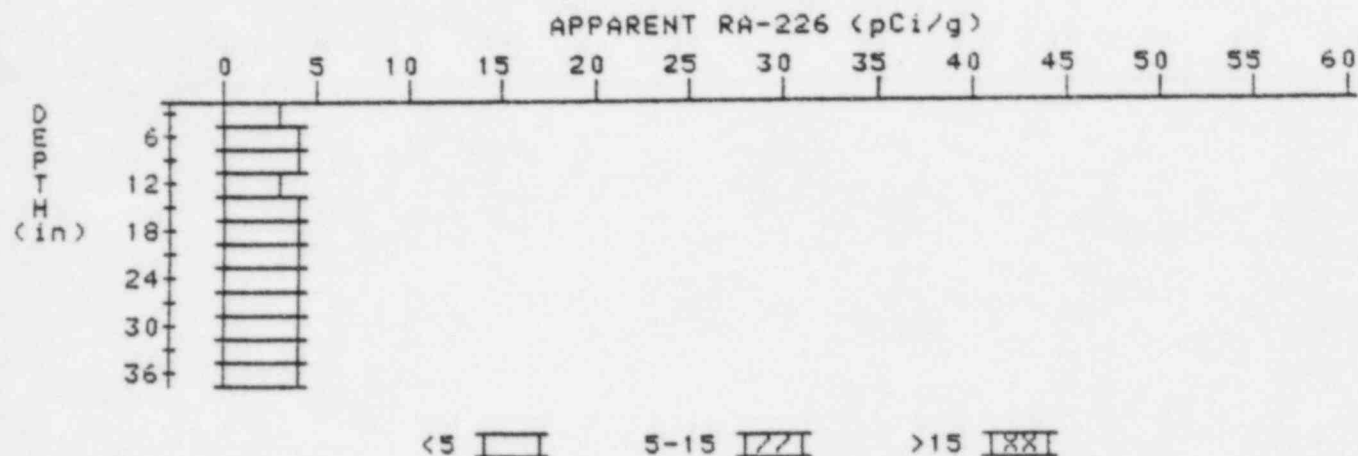
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

7

PROPERTY NUMBER: GJ-01151-AP

HOLE NUMBER: 7

LOCATION: 160190



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

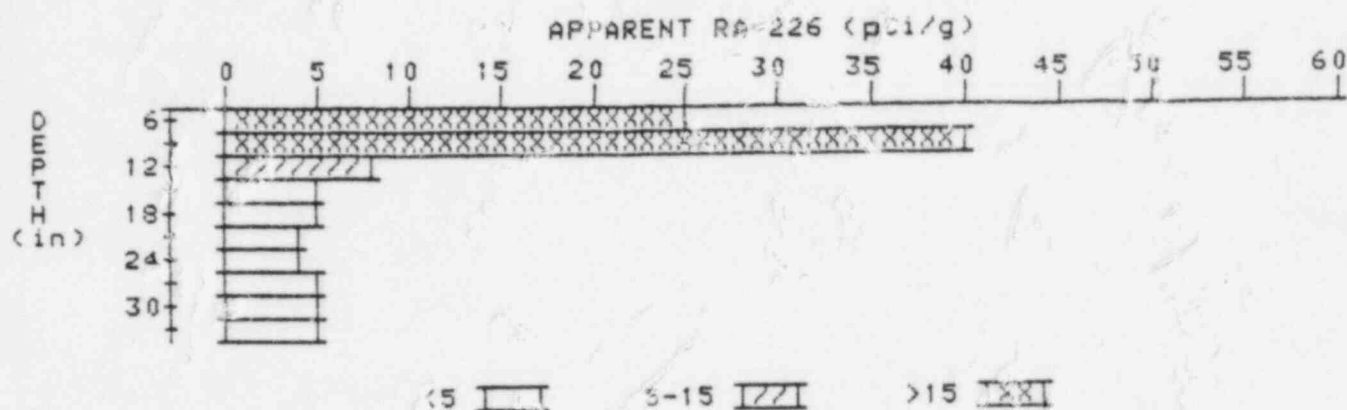
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

8

PROPERTY NUMBER: GJ-01151-AP

HOLE NUMBER: 8

LOCATION: 176283



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
6	25.2	25.2
9	24.5	40.0
12	15.1	8.0
15	9.7	4.9
18	7.0	4.7
21	5.6	4.2
24	5.0	4.3
27	4.8	4.6
30	4.7	4.5
33	4.7	4.7

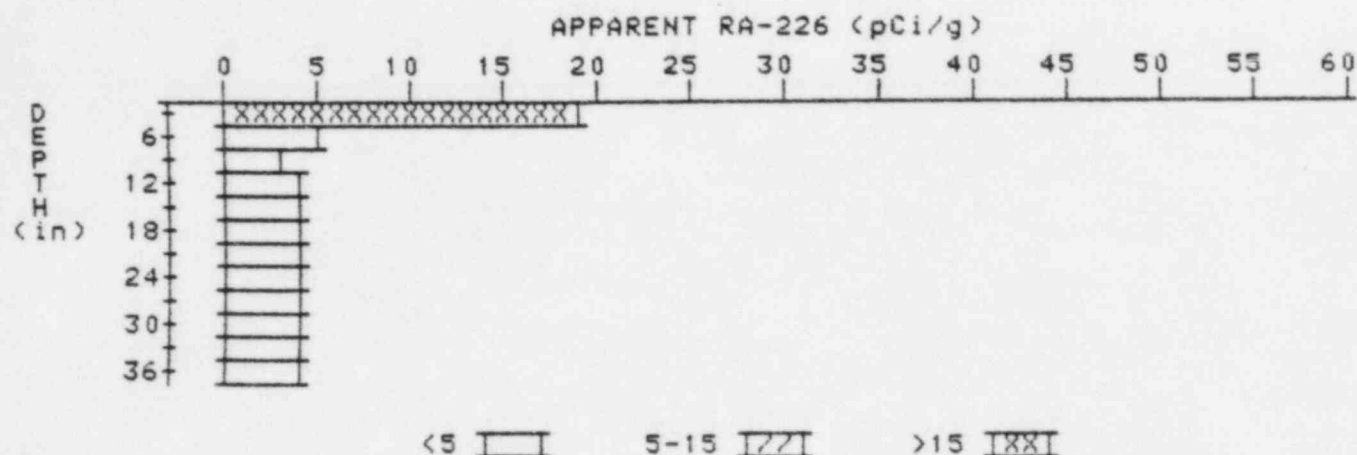
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

9

PROPERTY NUMBER: GJ-01151-AP

HOLE NUMBER: 9

LOCATION: 181217



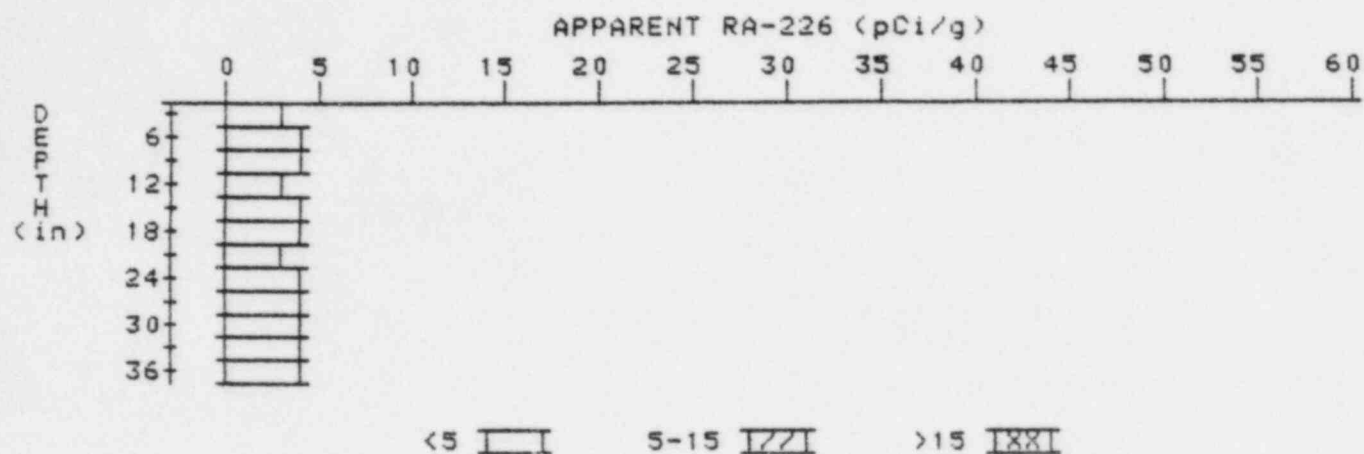
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	19.3	19.3
6	11.4	4.6
9	7.3	3.4
12	5.4	3.6
15	4.5	3.6
18	4.1	3.6
21	4.0	3.8
24	4.0	4.2
27	3.9	3.7
30	3.9	3.9
33	3.9	3.7
36	4.0	4.0

APPARENT RADIUM-226 CONCENTRATION 10 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01151-AP

HOLE NUMBER: 10

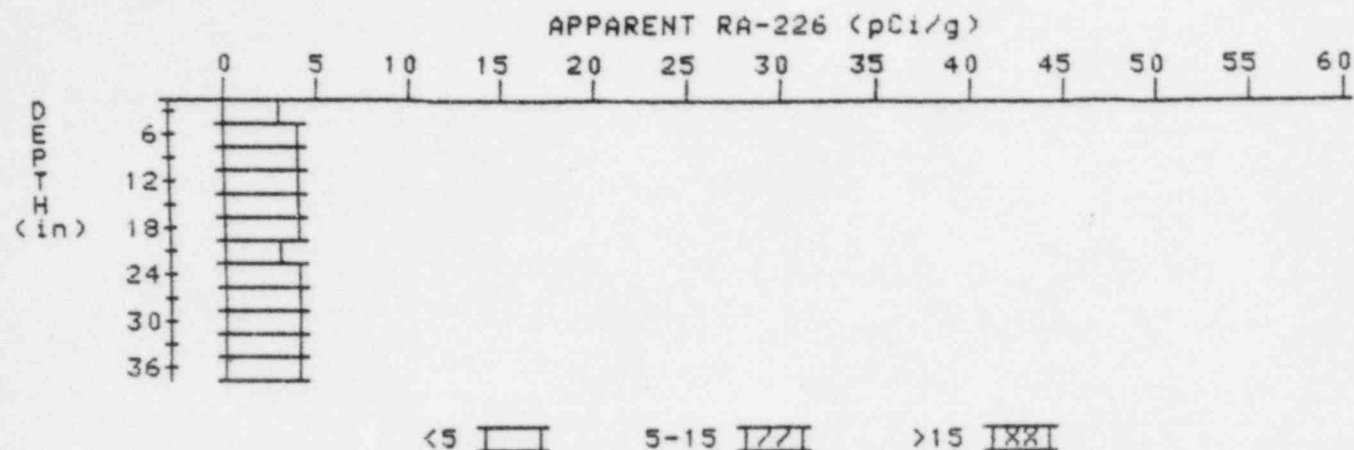
LOCATION: 200270



Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	2.8	2.8
6	3.2	3.6
9	3.4	3.8
12	3.4	3.2
15	3.5	3.5
18	3.6	3.8
21	3.6	3.2
24	3.8	4.2
27	3.8	3.8
30	3.8	3.6
33	3.9	4.1
36	3.9	3.9

APPARENT RADIUM-226 CONCENTRATION 12 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01151-AP
HOLE NUMBER: 12
LOCATION: 240270



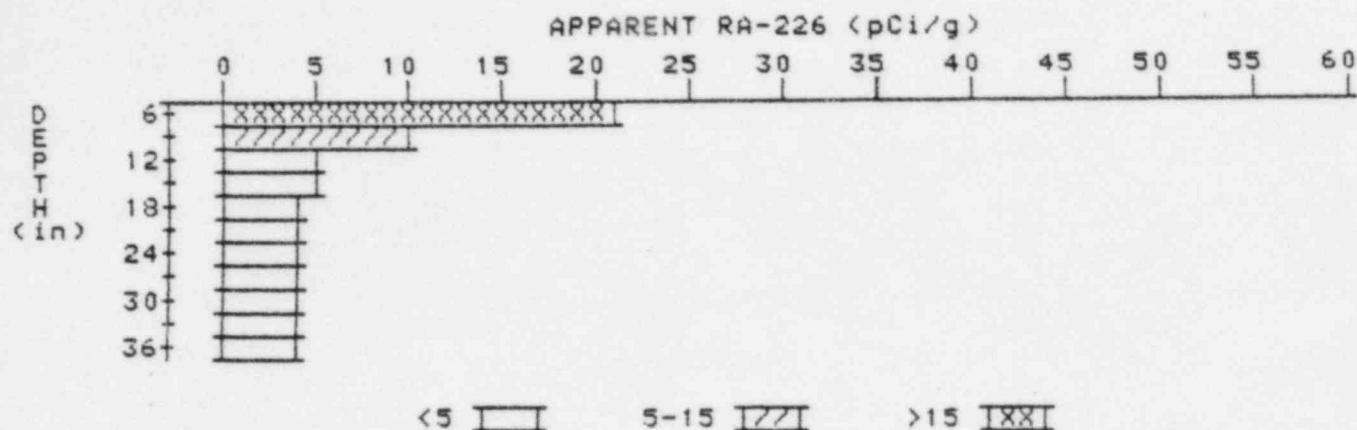
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.4	3.9
9	3.5	3.5
12	3.6	3.8
15	3.6	3.6
18	3.6	3.6
21	3.6	3.4
24	3.7	3.5
27	3.9	4.3
30	3.9	3.9
33	3.9	4.1
36	3.8	3.8

APPARENT RADIUM-226 CONCENTRATION 13 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01151-A7

HOLE NUMBER: 13

LOCATION: 248282



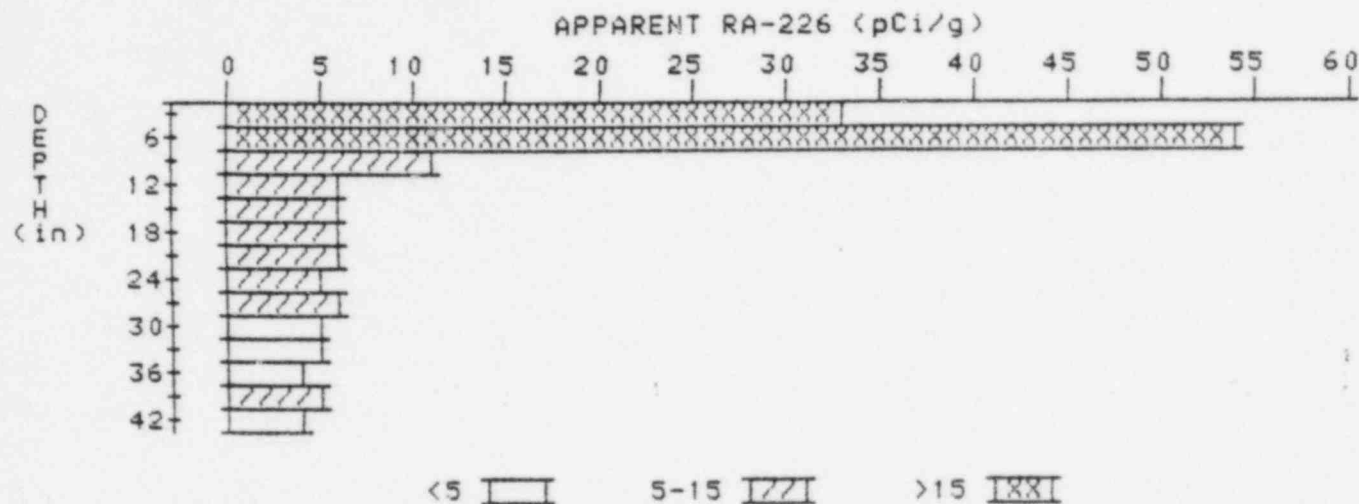
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
6	20.7	20.7
9	13.8	10.1
12	9.0	4.7
15	6.6	4.8
18	5.2	3.8
21	4.6	4.1
24	4.3	3.8
27	4.3	4.3
30	4.3	4.3
33	4.3	4.3
36	4.3	4.3

APPARENT RADIUM-226 CONCENTRATION 15 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01151-AP

HOLE NUMBER: 15

LOCATION: 278199



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	33.4	33.4
6	32.7	53.7
9	20.2	11.0
12	12.9	6.3
15	9.3	6.5
18	7.3	5.5
21	6.3	5.6
24	5.7	5.2
27	5.4	5.6
30	5.0	4.6
33	4.8	4.8
36	4.6	4.2
39	4.6	5.1
42	4.3	4.3

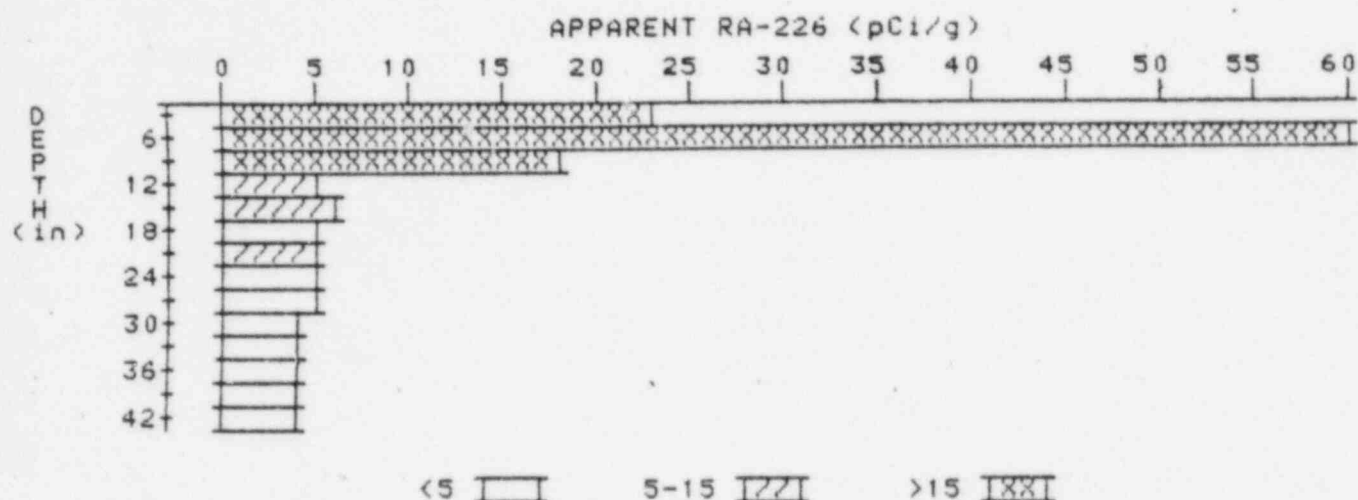
APPARENT RADIUM-226 CONCENTRATION 16

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01151-AP

HOLE NUMBER: 16

LOCATION: 280250



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	23.4	23.4
6	31.2	62.7
9	21.3	18.5
12	13.0	5.2
15	9.1	6.1
18	6.9	4.9
21	5.8	5.1
24	5.1	4.6
27	4.7	4.7
30	4.3	3.8
33	4.2	4.0
36	4.2	4.2
39	4.2	4.2
42	4.2	4.2

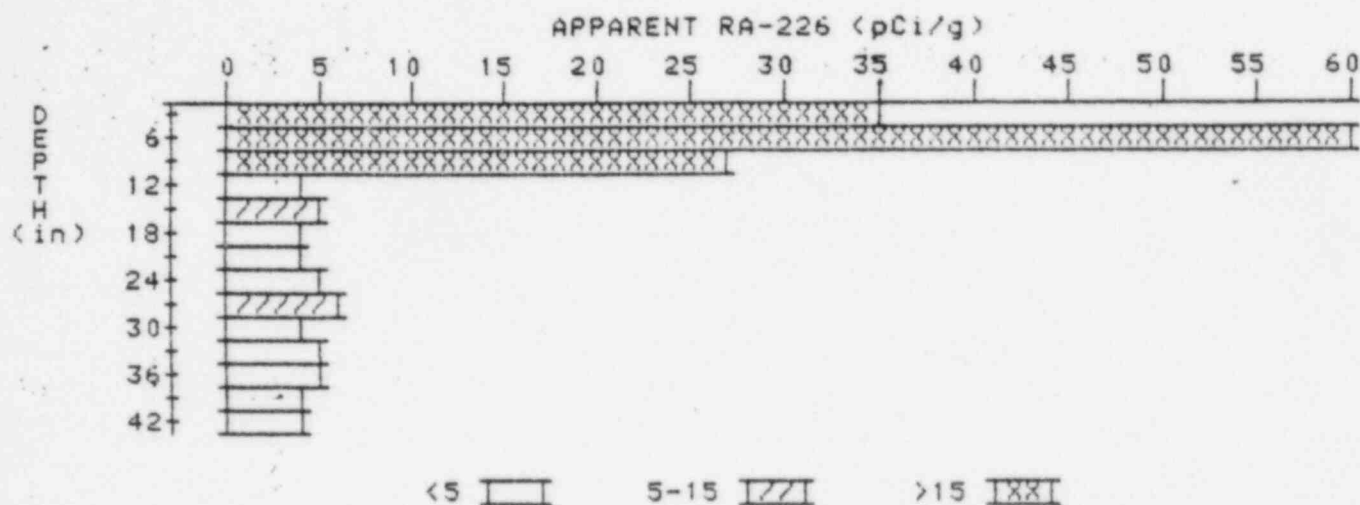
APPARENT RADIUM-226 CONCENTRATION 17

DECONVOLUTION GRAPH

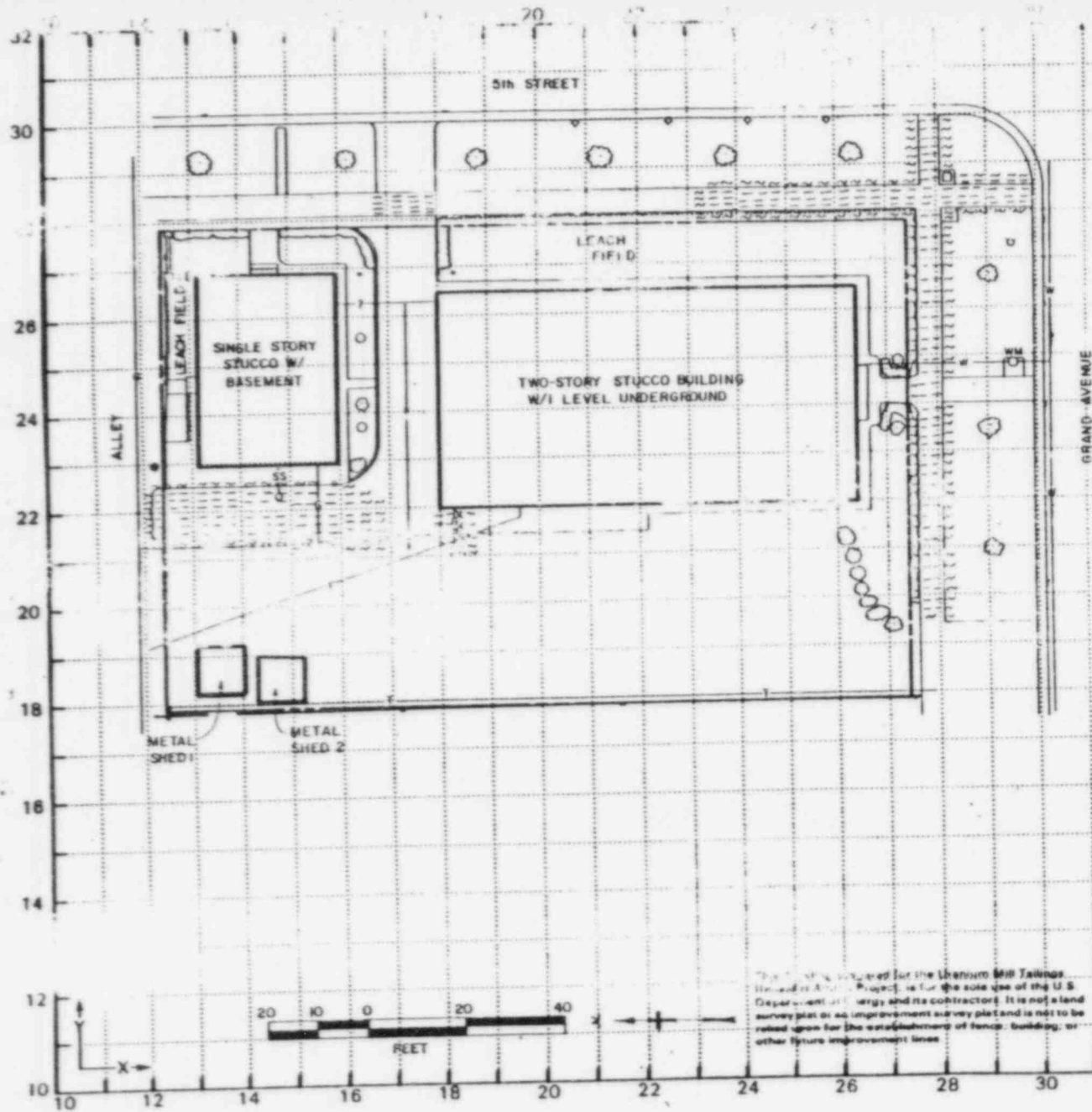
PROPERTY NUMBER: GJ-01151-AP

HOLE NUMBER: 17

LOCATION: 280282



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	34.8	34.8
6	46.6	95.8
9	30.7	26.6
12	17.1	4.3
15	10.7	5.0
18	7.5	4.5
21	6.0	4.4
24	5.4	4.7
27	5.2	5.7
30	4.7	4.0
33	4.6	4.6
36	4.5	4.5
39	4.4	4.2
42	4.4	4.4

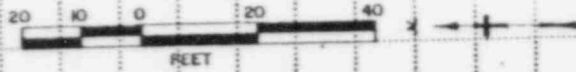


LEGEND

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

EXTERIOR Gamma SURVEY

APPENDIX Copy



This drawing is 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	CHK	DATE	NO.	DATE	REVISIONS	BY	CHK	DATE
<p>U.S. DEPARTMENT OF ENERGY</p> <p>460 GRAND AVENUE</p> <p>GRAND JUNCTION, COLORADO</p> <p>63-0151 AP</p> <p>Q-8530-8</p>											
<p>Prepared By: RRV</p> <p>5/85</p>						<p>460 GRAND AVENUE</p> <p>GRAND JUNCTION, COLORADO</p> <p>63-0151 AP</p> <p>Q-8530-8</p>					