

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-05979-RS
ADDRESS: 648 26 ROAD

MAY, 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

June 19, 1985

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-05979-RS, is a single-family residence located at 648 26 Road, 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, 292 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$29,961. Remedial action on this property will take approximately 14 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 648 26 Road, Grand Junction, Colorado

Zoning: Residential (R-1-A)

Lot Size: Approximately 43,560 sf (1.00 acre)

Legal Description: Beg W4 cor, Sec 2, 1S, 1W, E 217.8 ft., S 200 ft., W 217.8 ft., N to beg., City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 4 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:	Underground
Sewer:	Underground
Water:	Underground
Cable TV:	Overhead

Bordering Properties:

North:	F.5 Road
South:	Single-family residence
East:	Single-family residence
West:	26 Road

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-family residence with attached carport
Size:	Approximately 2,680 sf
Construction Date:	1955
Construction:	Single-story wood-frame with wood siding and brick veneer
Foundation:	Concrete stem wall on spread footing
Footing Depth:	Approximately 25" to bottom of footing from grade
Basement:	None
Crawl Space:	Yes; full
Condition:	Good

Other Structures:

Type:	Above-ground swimming pool with wood deck
Size:	Approximately 1,118 sf
Construction:	Vinyl pool liner over steel side walls; wood deck supported on wood frame with plywood panel side walls
Foundation:	Continuous pool base (cement, vermiculite, zanolite) beneath pool; continuous concrete spread footing at steel-framed side wall; concrete pads at 4x4 posts supporting deck
Condition:	Good
Type:	Metal shed
Size:	Approximately 127 sf
Construction:	Metal-frame; metal wall and roof panels
Foundation:	Concrete slab-on-grade; no thickened edge
Condition:	Excellent
Type:	Pumphouse
Size:	Approximately 31 sf
Construction:	Wood-frame with wood siding
Foundation:	Concrete slab-on-grade; no thickened edge
Condition:	Good
Type:	South storage shed
Size:	Approximately 48 sf
Construction:	Metal frame; metal wall and roof panels
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-05979-RS on January 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 under and around the pool. The records also show contamination in the east sidewalk, southwest of the primary structure, and in the northwest corner of the lot. The interior appears to be free from contamination.

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, and deconvolution graphs are included in the Appendix (Section 6.0).

3.2 Gamma Exposure-Rate Surveys

3.2.1 Exterior Findings

Background Readings: 11 to 14 uR/h
Highest Outside Gamma Reading (HOG): 285 uR/h

Exterior radium concentration measurements are presented in Appendix Tables 3.1a and 3.1b. Grid point survey results are shown in Appendix Figures 3.1a and 3.1b. Appendix Figures 3.2b and 3.2c present the ranges of elevated gamma readings and indicate areas of possible contamination.

3.2.2 Interior Findings

Background Readings: 11 to 14 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. Appendix Figures 3.3a and 3.3b show interior exposure-rates and locations of these measurements. Appendix Figure 3.2a presents the ranges of elevated gamma readings and indicates areas of possible contamination.

3.3 Boreholes, Soil Samples, and Other Measurements

Areas which displayed elevated gamma levels were further investigated; these areas are shown in Appendix Figures 3.4a and 3.4b. Data from these investigations are included in Appendix Tables 3.1a, 3.1b, 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 Figures 3.5a, 3.5b, and 3.5c 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) An 18-inch-high soil embankment surrounds the pool. The embankment is contaminated, as well as the soil beneath. The estimated total depth of contamination is 30 inches (approximately 684 sf).
- (AREA B) An area of contamination underlies the pool. The estimated depth of contamination is 12 inches based on the information collected in Area F (approximately 720 sf).
- (AREA C) A deposit underlies the concrete slab of a metal shed. The estimated total depth of contamination is 12 inches, based on information collected in Area F (approximately 130 sf).
- (AREA D) A region of contamination lies beneath the concrete slab of the pool pump house. The concrete slab is 4 inches thick. The total estimated depth of contamination is 12 inches, based on the information collected in Area F (approximately 32 sf).
- (AREA E) A region of contamination underlies the concrete slabs of the patio and adjacent walks. The total depth of contamination is 12 inches (approximately 680 sf).
- (AREA F) An area which encircles the pool and accompanying deck is contaminated to a depth of 12 inches (approximately 3,778 sf).
- (AREA G) An area that abuts the north end of Area F is contaminated to a depth of 3 inches (approximately 1,268 sf).
- (AREA H) A zone of contamination lies immediately south of the septic tank, west of the primary structure. The depth of contamination is 18 inches (approximately 150 sf).

- (AREA I) An area of contamination abuts the south boundary of Area F. The estimated depth of contamination is 3 inches (approximately 200 sf).
- (AREA J) An area of contamination lies near the northeast corner of the lot. The depth of contamination is 3 inches (approximately 100 sf).
- (AREA K) An area that is contiguous to Area G is contaminated to an estimated depth of 9 inches (approximately 56 sf).
- (AREA L) A deposit which abuts the south end of the east foundation of the primary structure is contaminated to a depth of 3 inches (approximately 128 sf).
- (AREA M) An area of contamination lies immediately north of the driveway and northwest of the primary structure. The depth of contamination is 3 inches (approximately 153 sf).
- (AREA N) An area which lies immediately north of Area M is contaminated to an estimated depth of 12 inches (approximately 28 sf).
- (AREA O) A contaminated area lies immediately west of the primary structure. The depth of contamination is 9 inches (approximately 4 sf).

(AREAS REQUIRING FURTHER INVESTIGATION DURING REMEDIAL ACTION)

- Area B requires further investigation of the vertical extent of contamination. The pool lies atop this area; therefore, no conclusive data could be obtained.
- Area N requires further investigation of the vertical extent of contamination, as conclusive data could not be obtained.

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-05979-RS, includes removal of all areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figure 3.5 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 \$29,961.

This remedial action will result in removal of the identified residual radioactive materials.

Owner preference is construction shall begin no earlier than September 1, 1985.

There are no legal or other complications 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 3.1a	Radium Concentrations at Exterior Locations
Table 3.1b	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 3.1a	Exterior Grid-Point Exposure Rates
Figure 3.1b	Exterior Grid-Point Exposure Rates
Figure 3.2a	Interior Gamma Scan
Figure 3.2b	Exterior Gamma Scan
Figure 3.2c	Exterior Gamma Scan
Figure 3.3a	Interior Gamma Exposure Rates (Ground Floor)
Figure 3.3b	Interior Gamma Exposure Rates and Sample Locations
Figure 3.4a	Exterior Sample Locations
Figure 3.4b	Exterior Sample Locations
Figure 3.5a	Interior Estimated Extent of Contamination
Figure 3.5b	Exterior Estimated Extent of Contamination
Figure 3.5c	Exterior Estimated Extent of Contamination

Official Survey Report

Memo of Understanding

Team Leader Notes

Deconvolution Graphs (Apparent Radium-226 Concentration)

Radium Concentrations at Exterior Locations

DOE ID #GJ-05979-RS

648 26 Road

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
16	156258	03	TC	4.9		*	DC = 3 inches Based on all data available
		06	TC	4.4		*	
		09	TC	4.1		*	
		12	TC	3.9		*	
		15	TC	3.8		*	
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	TC	3.8		*	
		27	TC	3.7		*	
17	166225	00	DS	1.9		*	Buried electrical
		06	DS	2.6		*	
18	169271	00	DS	2.6		*	
		06	DS	<1.0		*	
19	173251	00	DS	2.5		*	
20	180215	00	DS	1.9		*	
21	180230	03	TC	3.6		*	DC = 0 inches
		06	TC	3.8		*	
		09	TC	3.9		*	
		12	TC	3.9		*	
		15	TC	4.0		*	
		18	TC	3.9		*	
		21	TC	3.9		*	
		24	TC	4.0		*	
22	196210	27	TC	3.9		*	DC = 0 inches
		03	TC	3.2		*	
		06	TC	3.4		*	
		09	TC	3.4		*	
		12	TC	3.6		*	
		15	TC	3.6		*	
		18	TC	3.6		*	
		21	TC	3.7		*	
		24	TC	3.5		*	
		27	TC	3.5		*	
		30	TC	3.5		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-05979-RS

648 26 Road

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
23	197230	00	DS	3.7		*	NE corner of sidewalk, off of
		06	DS	1.4		*	
24	198228	00	DS	10.8		*	Taken on concrete
25	200240	03	TC	3.4		*	DC = 3 inches Based on all data available
		06	TC	3.6		*	
		09	TC	3.7		*	
		12	TC	3.8		*	
		15	TC	3.7		*	
		18	TC	3.7		*	
		21	TC	3.7		*	
		24	TC	3.7		*	
26	200270	27	TC	3.7		*	E of carport by trailer DC = 3 inches Based on all data available
		00	DS	2.6		*	
		03	TC	4.4		*	
		06	TC	4.3		*	
		09	TC	4.1		*	
		12	TC	3.9		*	
		15	TC	3.8		*	
		18	TC	3.8		*	
27	214288	21	TC	3.9		*	
		24	TC	3.9		*	
28	225198	00	DS	3.0		*	
		06	DS	7.7		*	
		12	DS	2.4		*	
29	228272	00	DS	3.2		*	
		06	DS	2.9		*	
		12	DS	<1.0		*	
	228272	03	TC	6.4		*	E side of pool DC = 12 inches Based on the deconvolution graph
		06	TC	6.3		*	
		09	TC	5.6		*	
		12	TC	5.1		*	
		15	TC	4.8		*	
		18	TC	4.6		*	
		21	TC	4.6		*	
		24	TC	4.5		*	
		27	TC	4.5		*	
		30	TC	3.1		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-05979-RS

648 26 Road

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
30	240230	00-03	SS			1.7	Concrete core
		03-07	SS			2.0	Concrete core
		07-13	SS			2.3	Sandy soil
		03	TC	3.3		*	Patio
		06	TC	3.5		*	DC = 0 inches
		09	TC	3.5		*	
		12	TC	3.7		*	
		15	TC	3.7		*	
		18	TC	3.7		*	
		21	TC	3.7		*	
		24	TC	3.7		*	
		27	TC	3.8		*	
31	240281	00	DS	1.4		*	
32	250193	00	DS	<1.0		*	Against the chimney
		[48]	GS		1.2	*	Up on the chimney
		00	GS		1.2	*	Concrete on walk
		00	GS		<1.0	*	Concrete next to chimney - horizontal
33	252186	00	DS	<1.0		*	On concrete
		[48]	GS		1.3	*	W of chimney on wall
		00	GS		1.7	*	On concrete
34	255182	00	DS	2.3		*	In front on W side
		06	DS	<1.0		*	
35	266272	03	TC	4.3		*	DC = 12 inches
		06	TC	4.7		*	Based on all data
		09	TC	4.5		*	available
		12	TC	4.2		*	
		15	TC	4.0		*	
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	TC	3.9		*	
36	267238	27	TC	3.8		*	
		03	TC	5.7		*	DC = 12 inches
		06	TC	5.7		*	Based on all data
		09	TC	5.3		*	available
		12	TC	4.7		*	
		15	TC	4.3		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-05979-RS

648 26 Road

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
36	267238	18	TC	4.2		*	
		21	TC	4.1		*	
		24	TC	4.1		*	
		27	TC	4.1		*	
		30	TC	4.0		*	
37	275199	03	TC	3.0		*	DC = 0 inches
		06	TC	3.3		*	
		09	TC	3.4		*	
		12	TC	3.4		*	
		15	TC	3.4		*	
		18	TC	3.3		*	
		21	TC	3.4		*	
		24	TC	3.4		*	
		27	TC	3.4		*	
		30	TC	3.4		*	
		33	TC	3.5		*	
		36	TC	3.5		*	
		39	TC	3.5		*	
		42	TC	3.4		*	
		45	TC	3.4		*	
		48	TC	3.5		*	
		51	TC	3.4		*	
		54	TC	3.5		*	
		57	TC	3.5		*	
38	280260	03	TC	5.6		*	DC = 12 inches Based on all data available
		06	TC	6.3		*	
		09	TC	5.9		*	
		12	TC	5.2		*	
		15	TC	4.5		*	
		18	TC	4.3		*	
		21	TC	4.0		*	
		24	TC	4.0		*	
		27	TC	4.1		*	
39	285227	00	DS	3.2		*	
		06	DS	1.1		*	
40	286284	00	DS	3.1		*	
		06	DS	1.7		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-05979-RS

648 26 Road

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
41	291217	03	TC	3.0		*	DC = 0 inches
		06	TC	3.2		*	
		09	TC	3.3		*	
		12	TC	3.2		*	
		15	TC	3.3		*	
		18	TC	3.3		*	
		21	TC	3.3		*	
42	294246	00	DS	8.6		*	19 feet E of SE corner of structure
43	294250	00	DS	6.5		*	23 feet E of SE corner of structure
44	300270	03	TC	6.8		*	DC = 12 inches Based on all data available
		06	TC	8.1		*	
		09	TC	8.0		*	
		12	TC	6.6		*	
		15	TC	5.5		*	
		18	TC	4.9		*	
		21	TC	4.7		*	
		24	TC	4.5		*	
		27	TC	4.3		*	
		30	TC	4.2		*	
45	315260	00	DS	2.4		*	20 feet W of shed
46	321229	00	DS	<1.0		*	
47	321268	00	DS	2.2		*	

Tool Types: GB = GAD-6 Borehole
 GS = GAD-6 Surface
 DS = Delta Scanner
 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 = 01-15-85
 Team Leader = PAT

Radium Concentrations at Exterior Locations

DOE ID #GJ-05979-RS

648 26 Road

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
48	159235	06	DS	7.5		*	
		10	DS	2.7		*	
49	168234	03	TC	2.9		*	Hit tree roots
		06	TC	3.3		*	DC = 3 inches
		09	TC	3.4		*	Based on all data
		12	TC	3.4		*	available
		15	TC	3.3		*	
		18	TC	3.3		*	
50	168252	00	DS	<1.0		*	
51	171239	00	DS	<1.0		*	
		13	DS	1.5		*	
52	249306	03	TC	3.3		*	Water line
		06	TC	3.3		*	DC = 0 inches
		09	TC	3.5		*	
		12	TC	3.5		*	
		15	TC	3.6		*	
		18	TC	3.5		*	
		21	TC	3.4		*	
		24	TC	3.5		*	
53	274284	27	TC	3.4		*	
		03	TC	3.1		*	Septic tank
		06	TC	3.3		*	DC = 0 inches
		09	TC	3.4		*	
		12	TC	3.5		*	
		15	TC	3.6		*	
		18	TC	3.6		*	
		21	TC	3.6		*	
		24	TC	3.6		*	
		27	TC	3.6		*	
		30	TC	3.7		*	
		33	TC	3.6		*	
		36	TC	3.6		*	
		39	TC	3.6		*	
		42	TC	3.6		*	
		45	TC	3.6		*	
		48	TC	3.7		*	
		51	TC	3.6		*	
		54	TC	3.7		*	
		57	TC	3.6		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-05979-RS

648 26 Road

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
53	274284	60	TC	3.6		*	
		63	TC	3.7		*	
		66	TC	3.8		*	
		69	TC	3.8		*	
		72	TC	3.8		*	
		75	TC	3.8		*	
		78	TC	3.8		*	
		81	TC	3.9		*	
		84	TC	4.0		*	
		87	TC	4.1		*	
54	278298	00	DS	<1.0		*	
55	288298	03	TC	19.8		*	DC = 18 inches Based on the deconvolution graph
		06	TC	31.7		*	
		09	TC	42.3		*	
		12	TC	35.2		*	
		15	TC	21.2		*	
		18	TC	13.4		*	
		21	TC	9.4		*	
		24	TC	7.4		*	
		27	TC	6.3		*	
		30	TC	5.5		*	
		33	TC	5.0		*	
		36	TC	4.7		*	
		39	TC	4.5		*	
56	290240	00	DS	<1.0		*	Background Dry DC = 0 inches
		00-06	SS			2.3	
		03	TC	3.1		*	
		06	TC	3.5		*	
		09	TC	3.5		*	
		12	TC	3.6		*	
		15	TC	3.7		*	
		18	TC	3.7		*	
		21	TC	3.8		*	
		24	TC	3.7		*	
		27	TC	3.7		*	
		30	TC	3.7		*	
57	302243	00	DS	2.7		*	
58	302299	00	DS	2.5		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-05979-RS

648 26 Road

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
59	307296	03	TC	41.4		*	DC = 18 inches Based on the deconvolution graph
		06	TC	56.9		*	
		09	TC	53.2		*	
		12	TC	35.0		*	
		15	TC	20.2		*	
		18	TC	12.5		*	
		21	TC	8.9		*	
		24	TC	7.0		*	
		27	TC	5.9		*	
		30	TC	5.3		*	
		33	TC	4.8		*	
		36	TC	4.6		*	
		39	TC	4.5		*	
		42	TC	4.4		*	
		45	TC	4.4		*	
		48	TC	4.5		*	
		51	TC	4.7		*	
		54	TC	5.0		*	
60	321229	00	DS	<1.0		*	

Tool Types: GB = GAD-6 Borehole
 GS = GAD-6 Surface
 DS = Delta Scanner
 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 = 01-15-85
 Team Leader = PAT

Radium Concentrations at Interior Locations

DOE ID #GJ-05979-RS

648 26 Road

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	85.2		*	Under deck
2		00	DS	154.5		*	
3		00	DS	151.1		*	
4		00	DS	109.8		*	
5		00	DS	179.9		*	
6		00	DS	196.9		*	
7		00	DS	86.7		*	
8		00	DS	39.3		*	
9		00	DS	2.1		*	
10		00	DS	1.6		*	
11		00	DS	41.3		*	
12		00	DS	25.2		*	
13		00	DS	115.7		*	
14		00	DS	160.0		*	
15		00	DS	114.3		*	

Tool Types: GB = GAD-6 Borehole
 GS = GAD-6 Surface
 DS = Delta Scanner
 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 = 01-15-85
 Team Leader = PAT

Location *	Number of Readings Taken at Waist Level	Range at Waist Level (uR/h)	Mean at Waist Level (uR/h)	Number of Readings Taken at Surface	Range at Surface (uR/h)	Mean Surface (uR/h)
ROOM A	09	12-18	14	08	11-16	13
ROOM B	03	13-18	15	03	13-16	15
ROOM C	02	12-12	12	02	11-13	12
ROOM D	05	11-14	12	05	11-13	12
ROOM E	09	11-12	12	09	12-13	12
ROOM F	07	11-13	12	07	11-14	12
ROOM G	20	10-15	13	19	11-14	12
ROOM H	07	10-12	11	07	11-13	11
ROOM I	07	10-13	12	06	11-12	12
ROOM J	07	10-14	12	07	11-14	13
ROOM K	09	11-13	12	09	11-13	12
SHED A	02	14-16	15	02	15-15	15
SHED B	01	13-13	13	01	12-12	12
METAL SHED	07	15-49	24	05	15-53	26
PUMP HOUSE	03	40-78	60	03	38-86	62
POOL	00	-	-	04	36-271	151
S STORAGE SHED	03	13-13	13	03	13-15	14

=====

* Exposure Rates and Room Locations Shown in Appendix Figures 3.3a and 3.3.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-05979-RS

Page 1 of 3

<u>AREA</u>	<u>CALCULATIONS(ft)</u>		<u>SF</u>		<u>DEPTH(ft)</u>		<u>CF</u>		<u>CUBIC YARDS</u>
EXTERIOR									
	Concrete								
C	13 x 10	=	130	x	0.3	=	39		
D	4 x 8	=	32	x	0.3	=	10		
*E	50 x 11	=	550						
	26 x 5	=	130						
			680	x	0.7	=	476		
	Volume of Concrete						=	525	= 525/27 = 19
	Contaminated Fill								
A	114 x 6	=	684	x	2.5	=	1,710		
B	16 x 32	=	512						
	32 x 2	=	64						
	36 x 4	=	144						
			720	x	1.0	=	720		
C	13 x 10	=	130	x	0.7	=	91		
D	4 x 8	=	32	x	0.7	=	22		
*E	50 x 11	=	550						
	26 x 5	=	130						
			680	x	0.3	=	204		

Table 4.1
Contaminated Material Calculations
DOE ID No. GJ-05979-RS

Page 2 of 3

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
F	22 x 48	= 1,056			
	20 x 7	= 140			
	10 x 10	= 100			
	50 x 7	= 350			
	37 x 40	= 1,480			
	26 x 6	= 156			
	12 x 18	= 216			
	40 x 7	= 280			
		<hr/>			
		3,778	x 1.0	= 3,778	
G	26 x 22	= 572			
	16 x 21	= 336			
	30 x 12	= 360			
		<hr/>			
		1,268	x 0.3	= 380	
H	30 x 5	= 150	x 1.5	= 225	
I	10 x 20	= 200	x 0.3	= 60	
J	10 x 10	= 100	x 0.3	= 30	
K	8 x 7	= 56	x 0.8	= 45	
L	8 x 12	= 96			
	4 x 8	= 32			
		<hr/>			
		128	x 0.3	= 38	
M	17 x 9	= 153	x 0.3	= 46	

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-05979-RS

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
N	4 x 7 =	28	x 1.0 =	28	
O	4 x 1 =	4	x 0.8 =	3	
Volume of Fill				= 7,380	= 7,380/27 = 273
TOTAL VOLUME - EXTERIOR				=	= 292

*Area E has two 4" slabs of Concrete, one poured on top of the other, as a patio.

See Appendix Figures 3.5a, 3.5b, and 3.5c For Areas

=====

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-05979-RS

Page 1 of 2

EXTERIOR

Remove identified residual radioactive material	
243 cy @ \$14.50/cy (machine)	\$ 3,524
30 cy @ \$100/cy (manual)	3,000
Remove 4" concrete slab	
842 sf @ \$1.48/sf	1,246
Undermine wood-frame walls of pumphouse	
24 lf @ \$3/lf	72
Remove pool liner	
Lump sum	360
Remove/replace pool pumps, filter, and heater	
Lump sum	500
Remove/replace metal shed, intact	
Lump sum	400
Remove plywood panels at pool deck	
Lump sum	150
Replace roadbase	
142 cy @ \$11.50/cy	1,633
Replace topsoil	
103 cy @ \$9.50/cy	979
Replace sand fill beneath pool liner	
27 cy @ \$20/cy	540
Replace 3/4" washed gravel	
1 cy @ \$15/cy	15
Replace 4" concrete slab	
162 sf @ \$1.50/sf	243
Replace 5" concrete slab	
680 sf @ \$3.25/sf	2,210
Replace plywood panels at pool deck, seal and stain to match deck	
Lump sum	1,145
Replace pool base at pool (cement, vermiculite, zonolite); replace pool liner	
Lump sum	3,200

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-05979-RS

Page 2 of 2

Remove/replace railroad ties	
Lump sum	50
Remove/replace sprinkler system	
240 sf @ \$.40/sf	96
Remove/replace wood stair to pool deck	
Lump sum	100
Replace sod	
794 sf @ \$0.50/sf	397
Replace decorative lava rock	
36 sf @ \$2.50/sf	90
Replace flowers and shrubs	
530 sf @ \$3.00/sf	1,590
<hr/>	
TOTAL EXTERIOR	\$ 21,540
TOTAL INTERIOR	0
ACCESS CONTROL	250
<hr/>	
SUBTOTAL	\$ 21,790
CONTINGENCY @ 10%	2,179
<hr/>	
SUBTOTAL	\$ 23,969
CONTRACTOR OVERHEAD & PROFIT @ 25%	5,992
<hr/>	
GRAND TOTAL	\$ 29,961

=====

RDJ053085
REA05979/REA-GE001/LMR

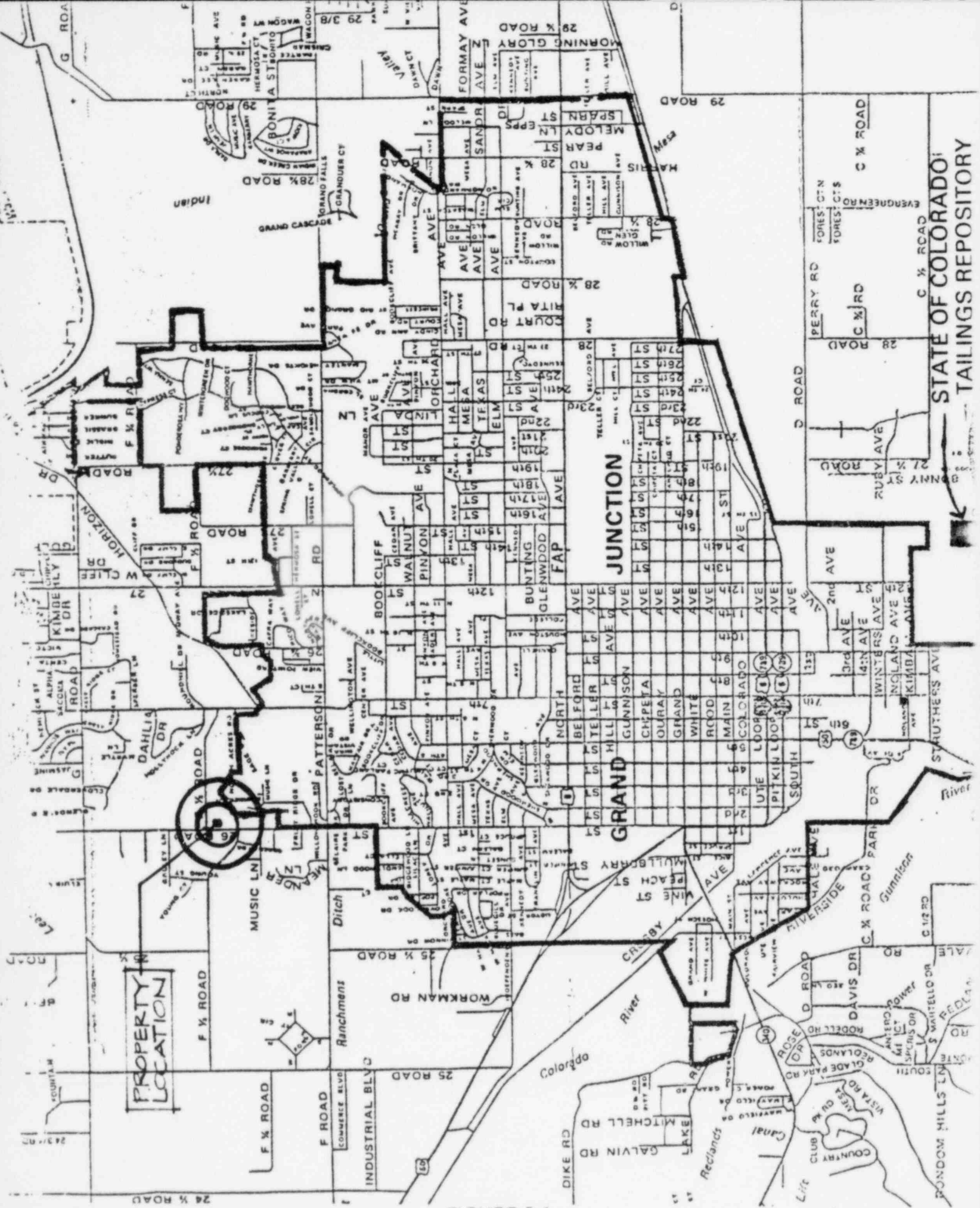


FIGURE 2.1
VICINITY MAP

STATE OF COLORADO
TAILINGS REPOSITORY

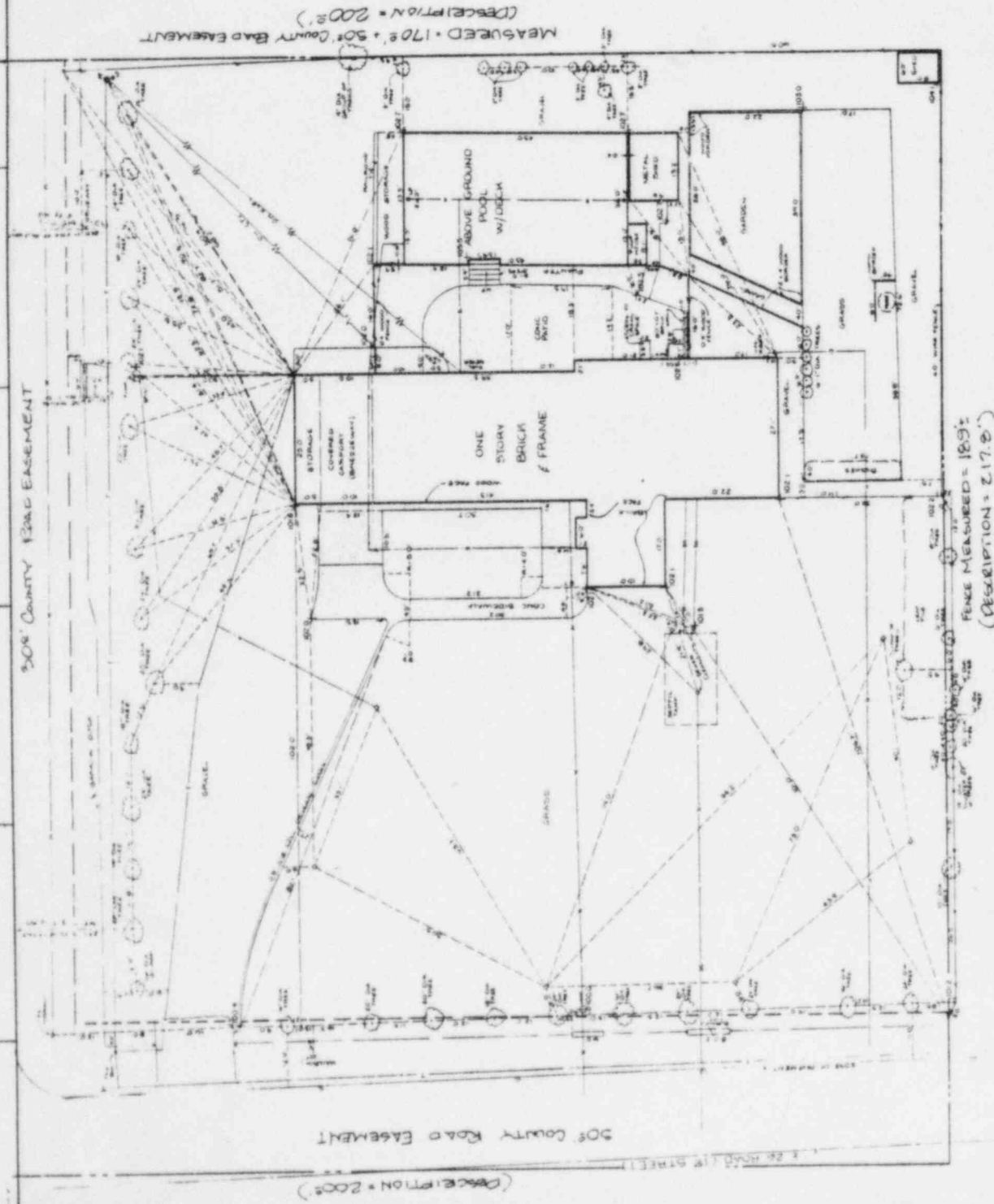


FIGURE 2.2
SITE PLAN



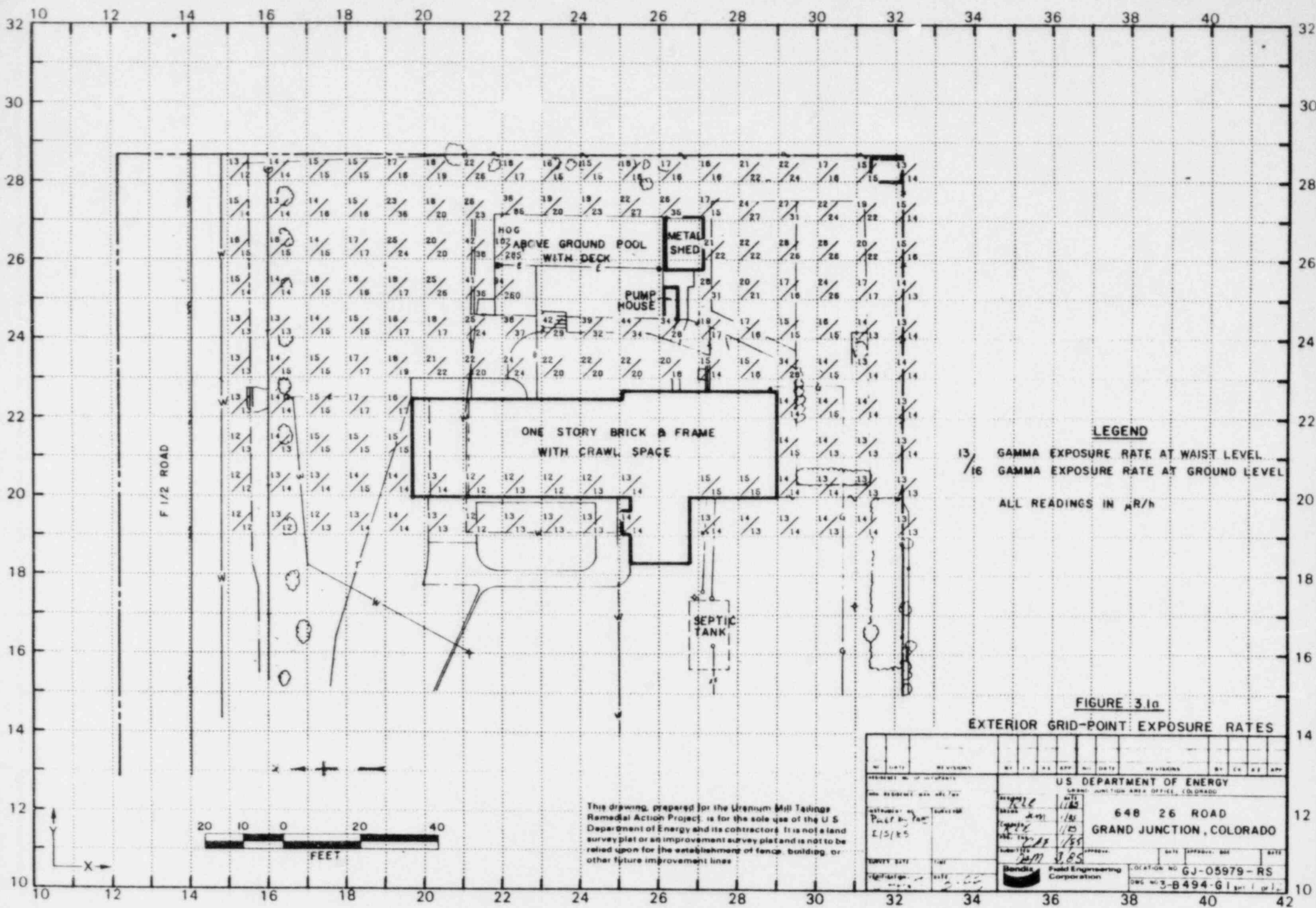
SCALE IN FEET
0 10 20 30 40 50 60 70 80 90 100

This drawing is prepared for the purpose of showing the location of the proposed building and pool. It is not intended to show the location of the building and pool. The location of the building and pool is shown on the site plan. The location of the building and pool is shown on the site plan.

U.S. DEPARTMENT OF ENERGY	LOCATION NO.
GRAND JUNCTION AREA OFFICE, CO. 8100974185	8100974185
26 ROAD	26 ROAD
GRAND JUNCTION, CO.	GRAND JUNCTION, CO.
DATE: 10/10/12	DATE: 10/10/12
BY: [Signature]	BY: [Signature]
CHECKED: [Signature]	CHECKED: [Signature]
APPROVED: [Signature]	APPROVED: [Signature]

BEGINNING N. 4 CORNER SECTION 2, 1/4 1/4 EAST 217.8 FEET, SOUTH 200 FEET, WEST 217.8 FEET NORTH TO BEGINNING, CITY OF GRAND JUNCTION, GRAND JUNCTION, COLORADO

FENCE MEASURED = 189' ± (DESCRIPTION = 217.8')



LEGEND

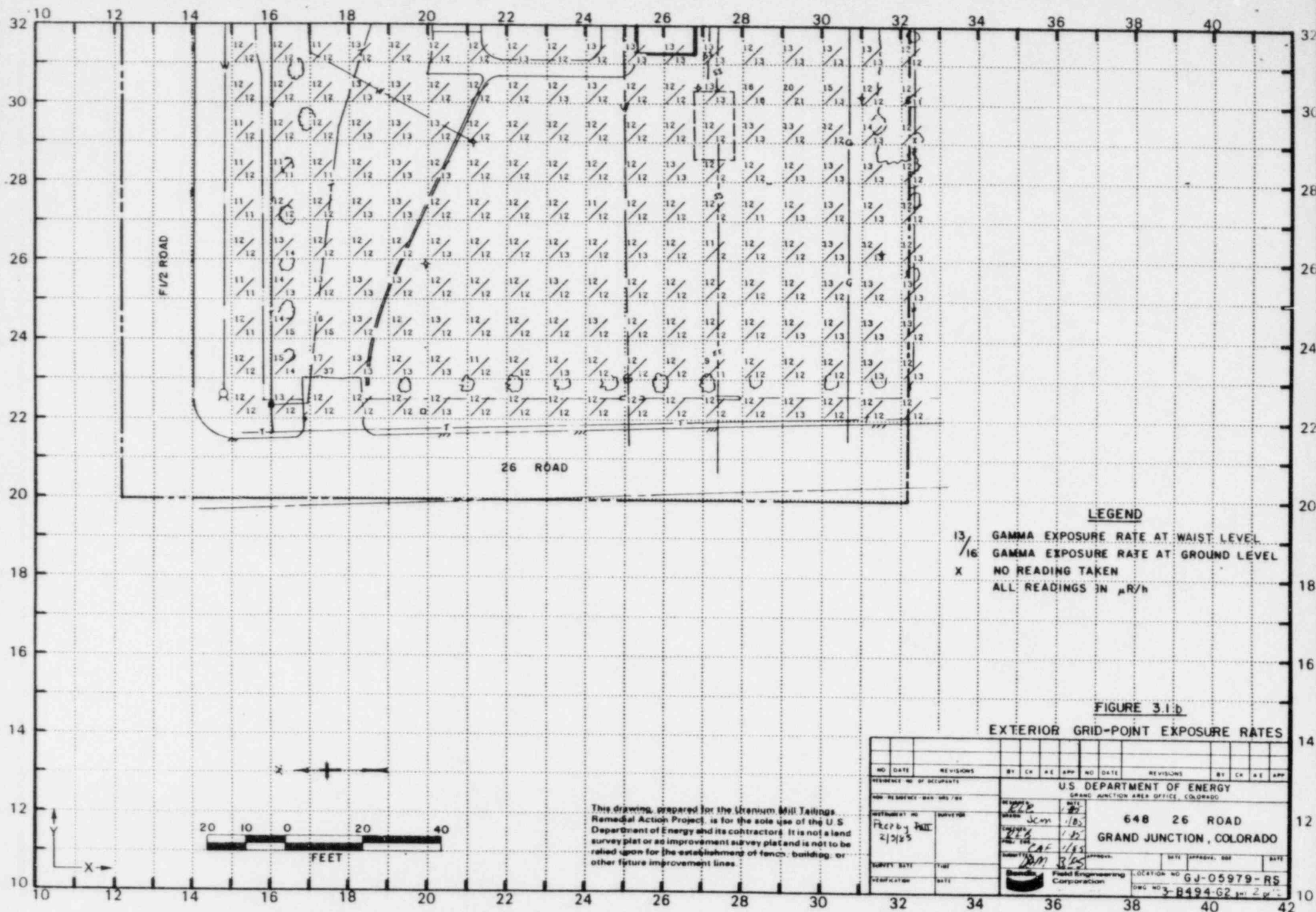
- 13/16 GAMMA EXPOSURE RATE AT WAIST LEVEL
- 13/16 GAMMA EXPOSURE RATE AT GROUND LEVEL
- ALL READINGS IN $\mu\text{R/h}$

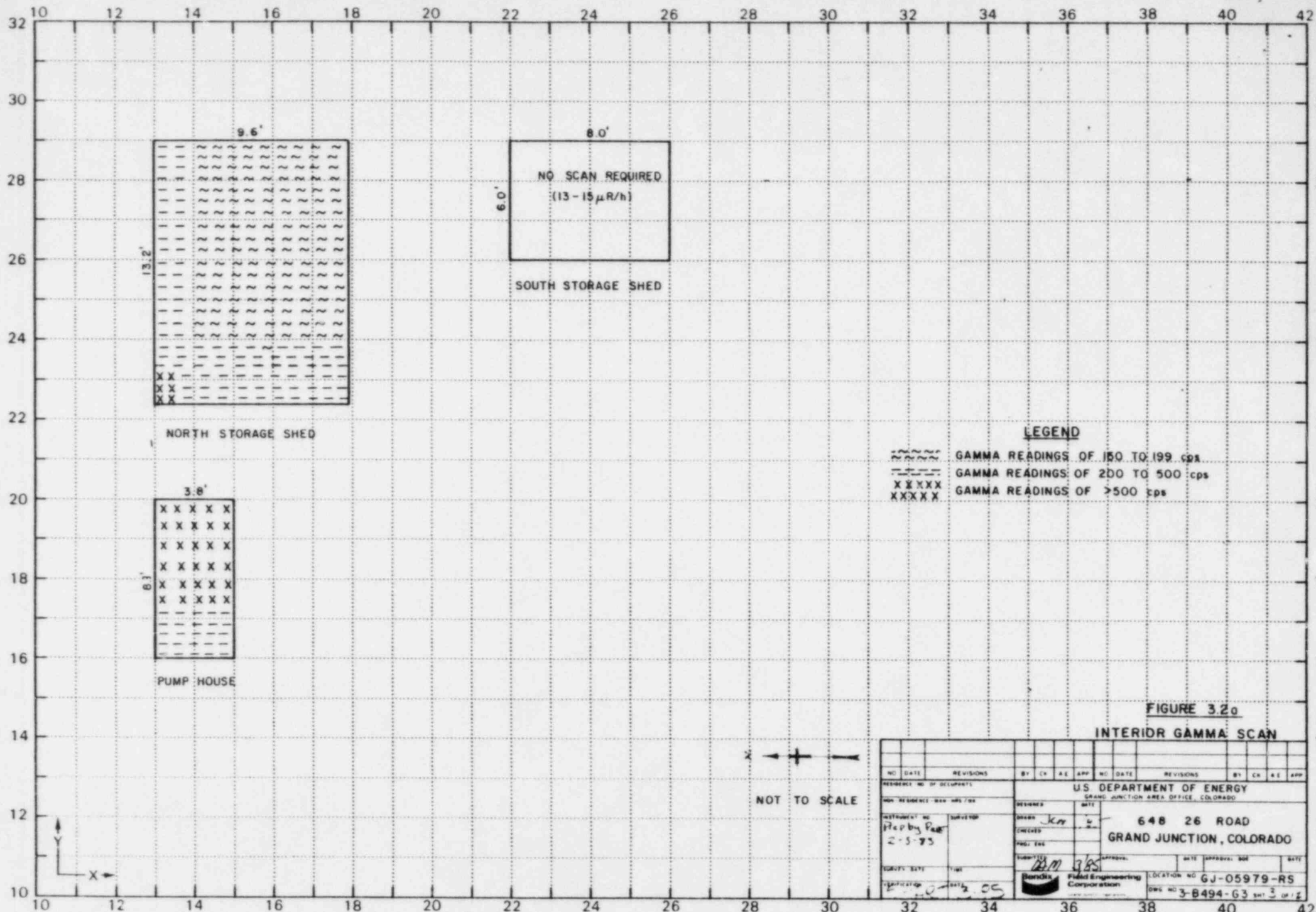
FIGURE 3.1a

EXTERIOR GRID-POINT EXPOSURE RATES

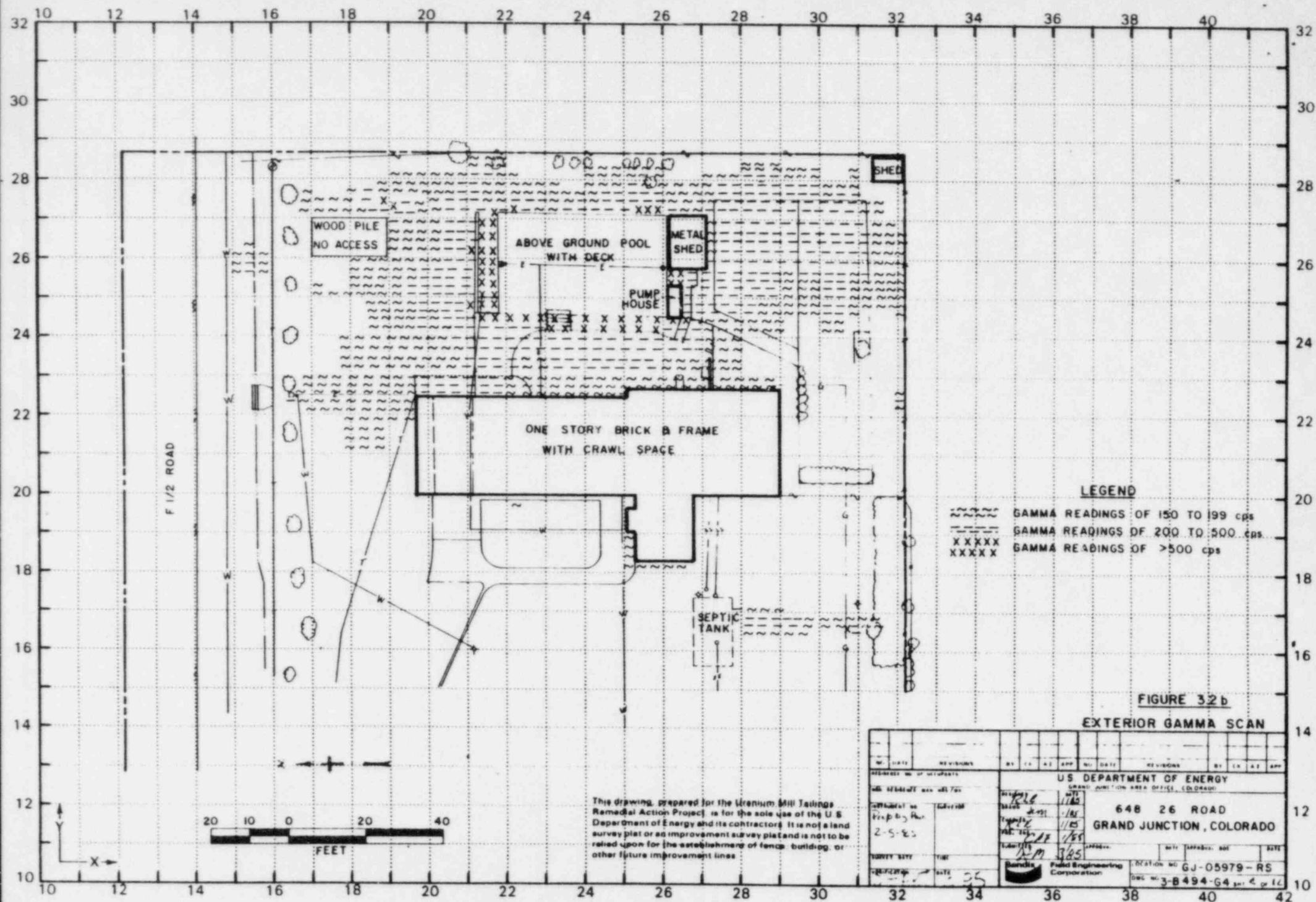
NO. DATE		REVISIONS		NO. DATE		REVISIONS		NO. DATE		REVISIONS	
U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO 648 26 ROAD GRAND JUNCTION, COLORADO											
DRAWN BY: [Signature] CHECKED BY: [Signature] DATE: 1/15/85				SUBMITTED BY: [Signature] DATE: 1/15/85				PROJECT NO.: GJ-05979-RS DWG NO.: 3-B494-G1			

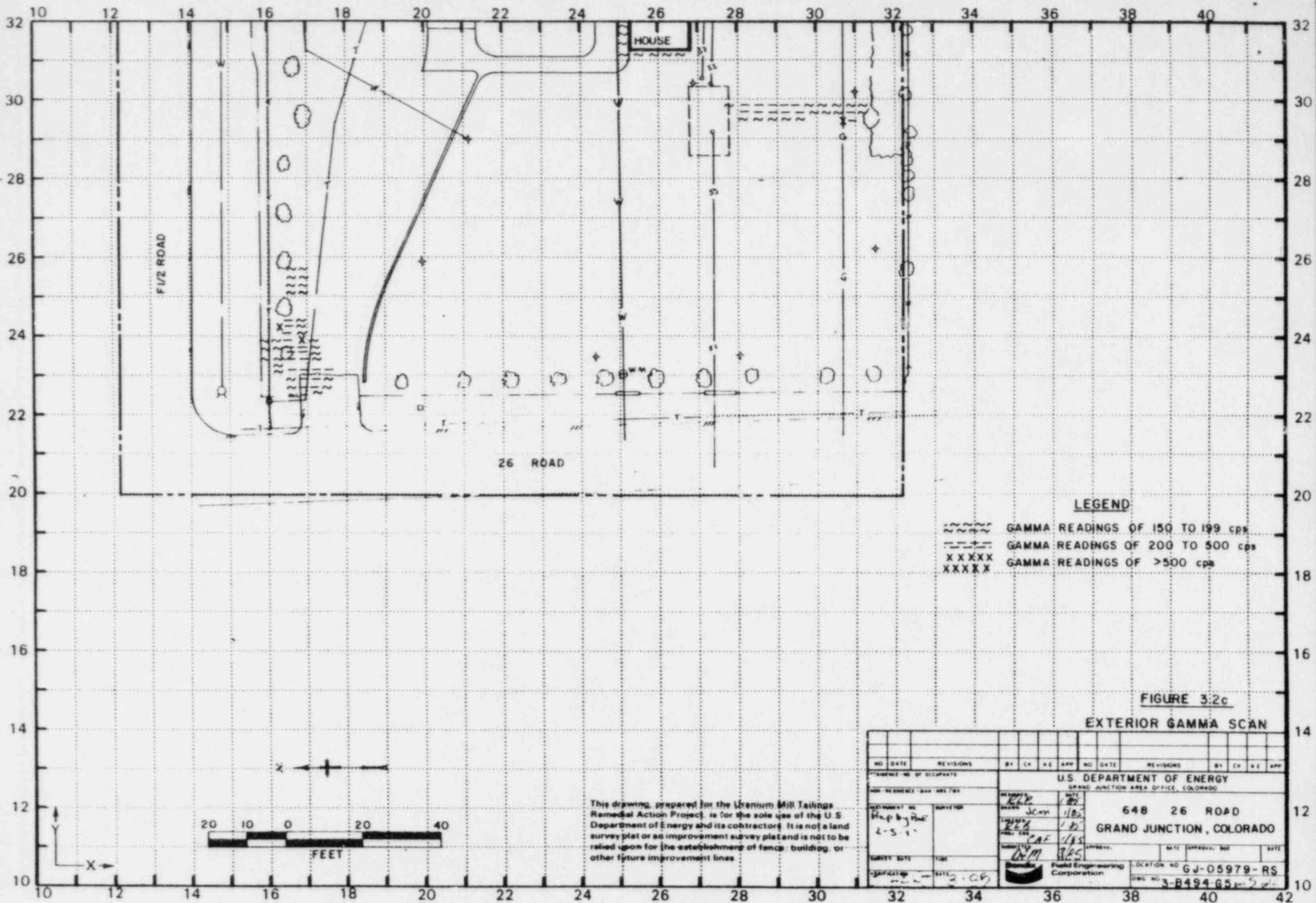
This drawing, prepared for the Uranium Mill Tailings Remedial Action Project, is for the sole use of the U.S. Department of Energy and its contractors. It is not a land survey plat or an improvement survey plat and is not to be relied upon for the establishment of fence, building, or other future improvement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

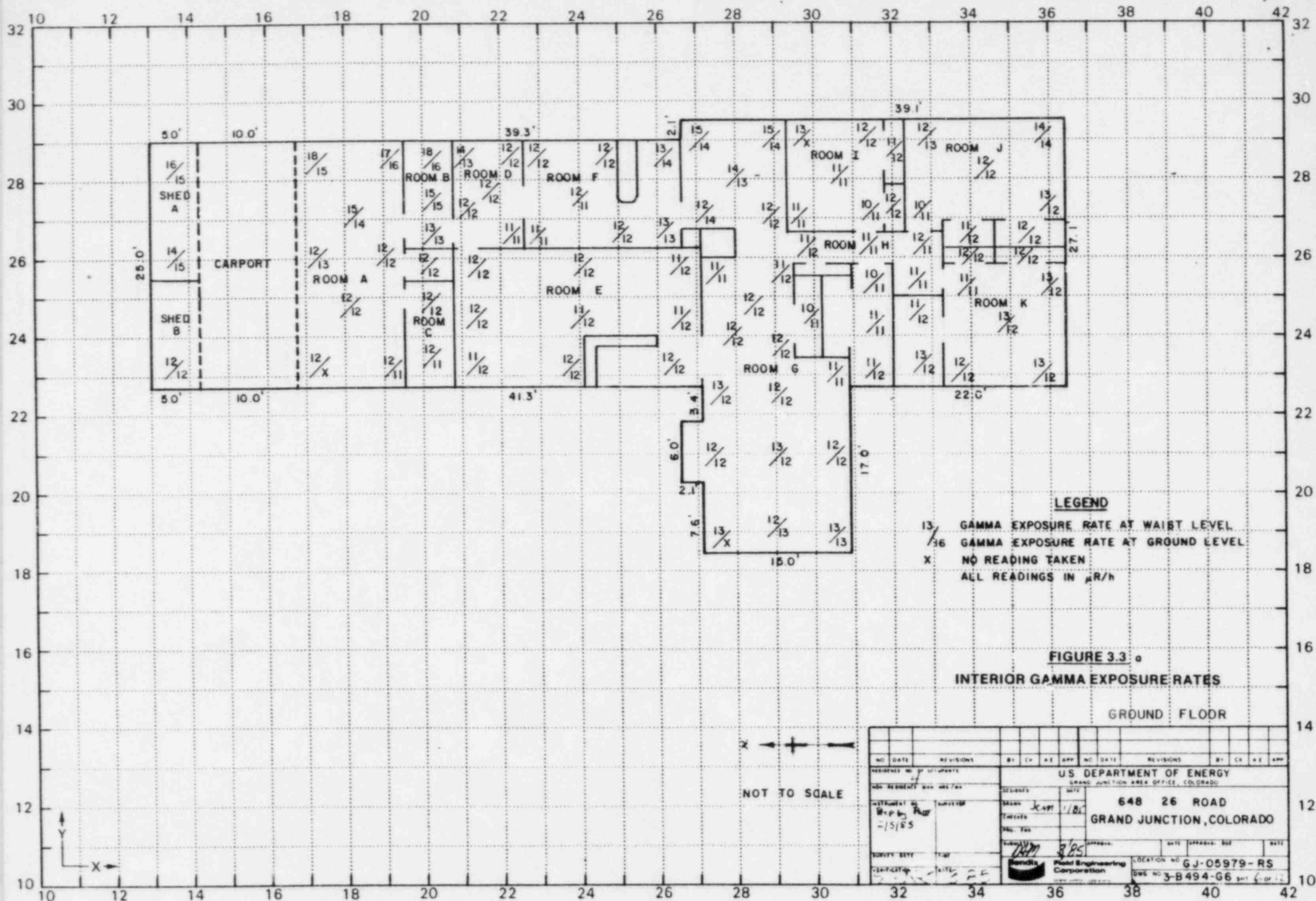


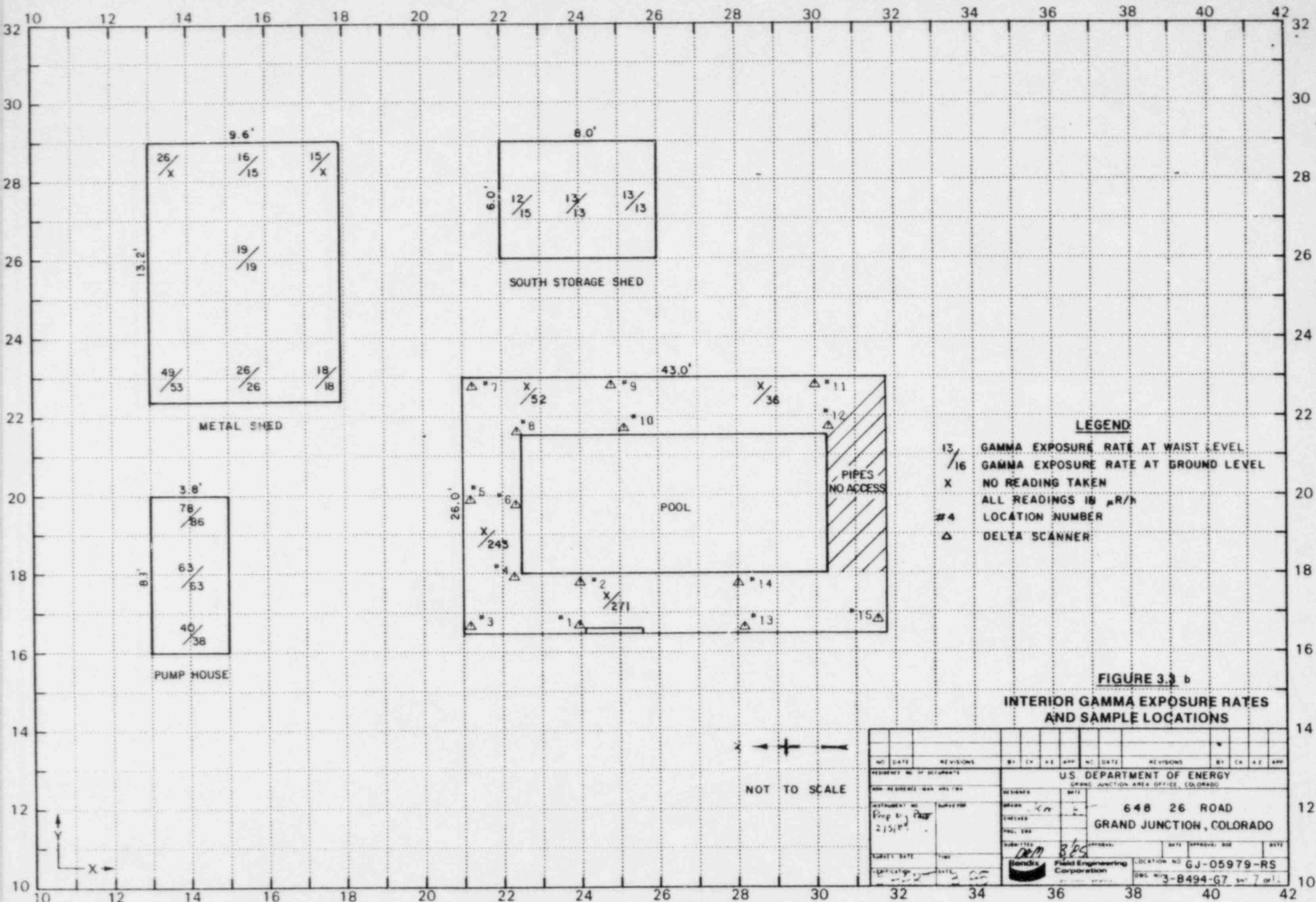


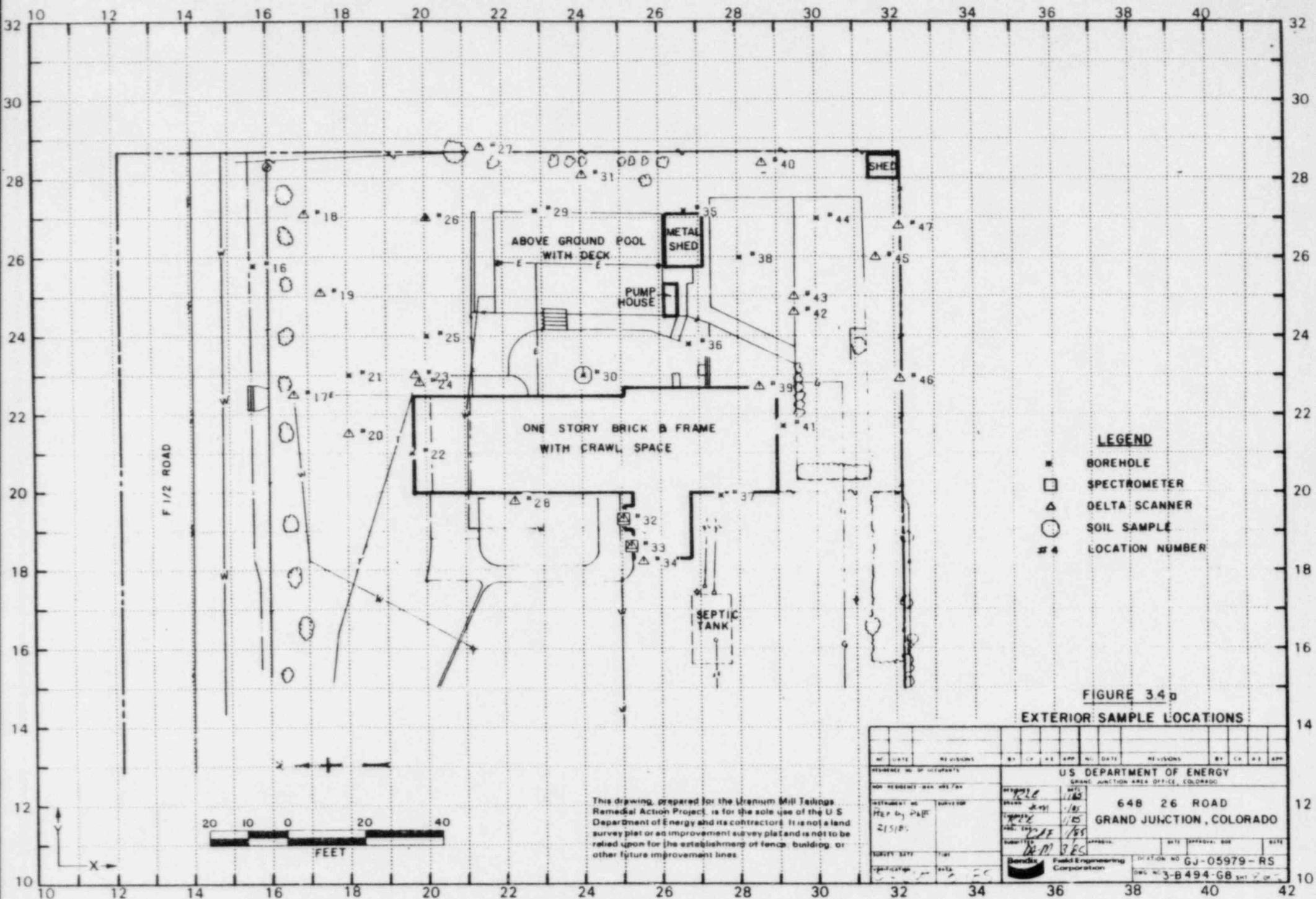
NO	DATE	REVISIONS	BY	CK	AE	APP	NO	DATE	REVISIONS	BY	CK	AE	APP
RESIDENT NO OF DELEGATE							U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO						
MIN RESIDENCE NO. HRS / DA							DESIGNED <i>JK</i> DATE <i>2-5-73</i>						
INSTRUMENT NO. <i>Perby Pae</i>							CHECKED <i>JK</i>						
DATE SITE							SUBMITTED <i>JK</i> DATE <i>2-5-73</i>						
TIME							APPROVED <i>JK</i> DATE <i>2-5-73</i>						
LOCATION NO. <i>648 26 ROAD</i>							LOCATION NO. <i>GJ-05979-RS</i>						
DWS NO. <i>3-8494-63</i>							DWS NO. <i>3-8494-63</i>						



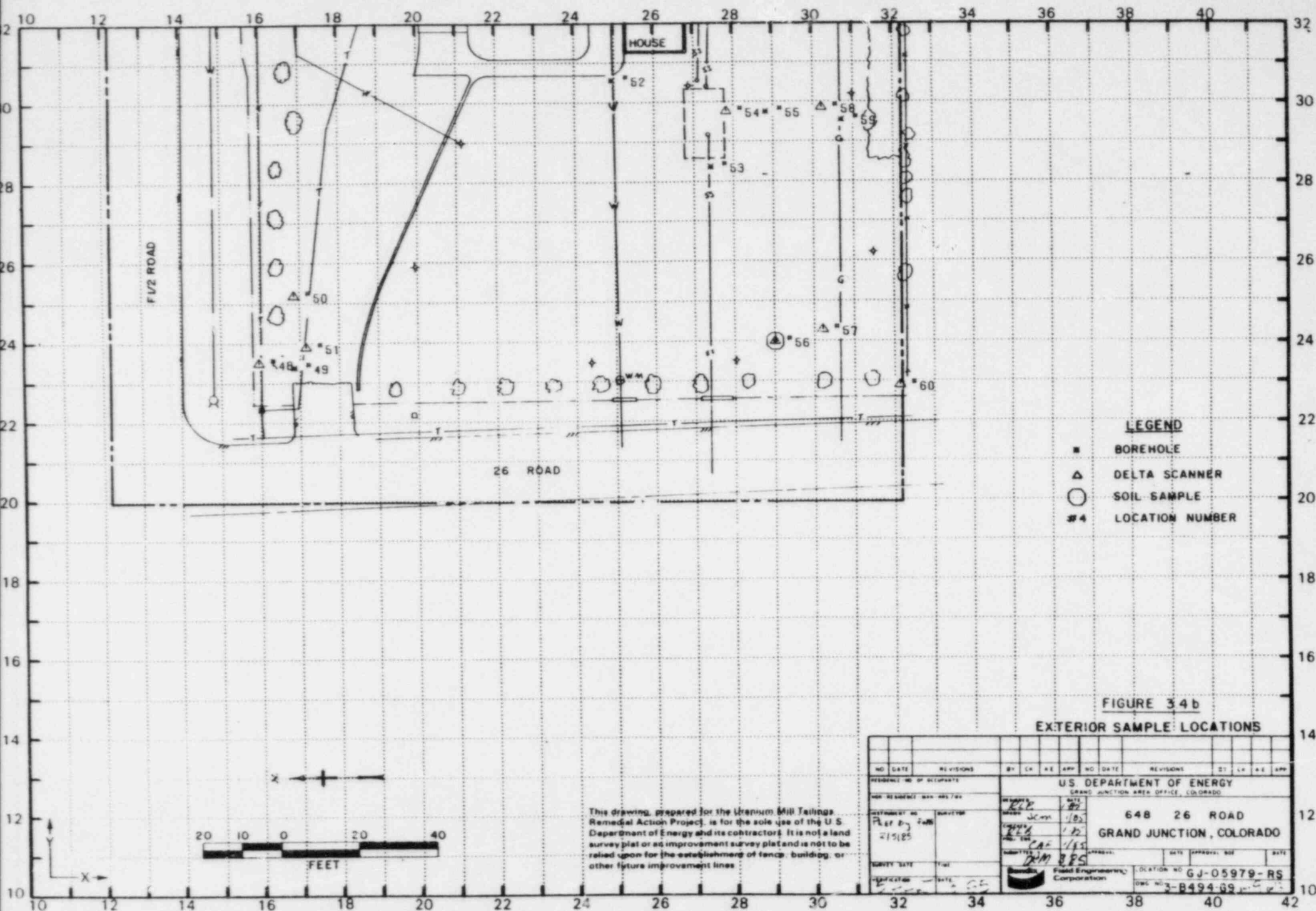




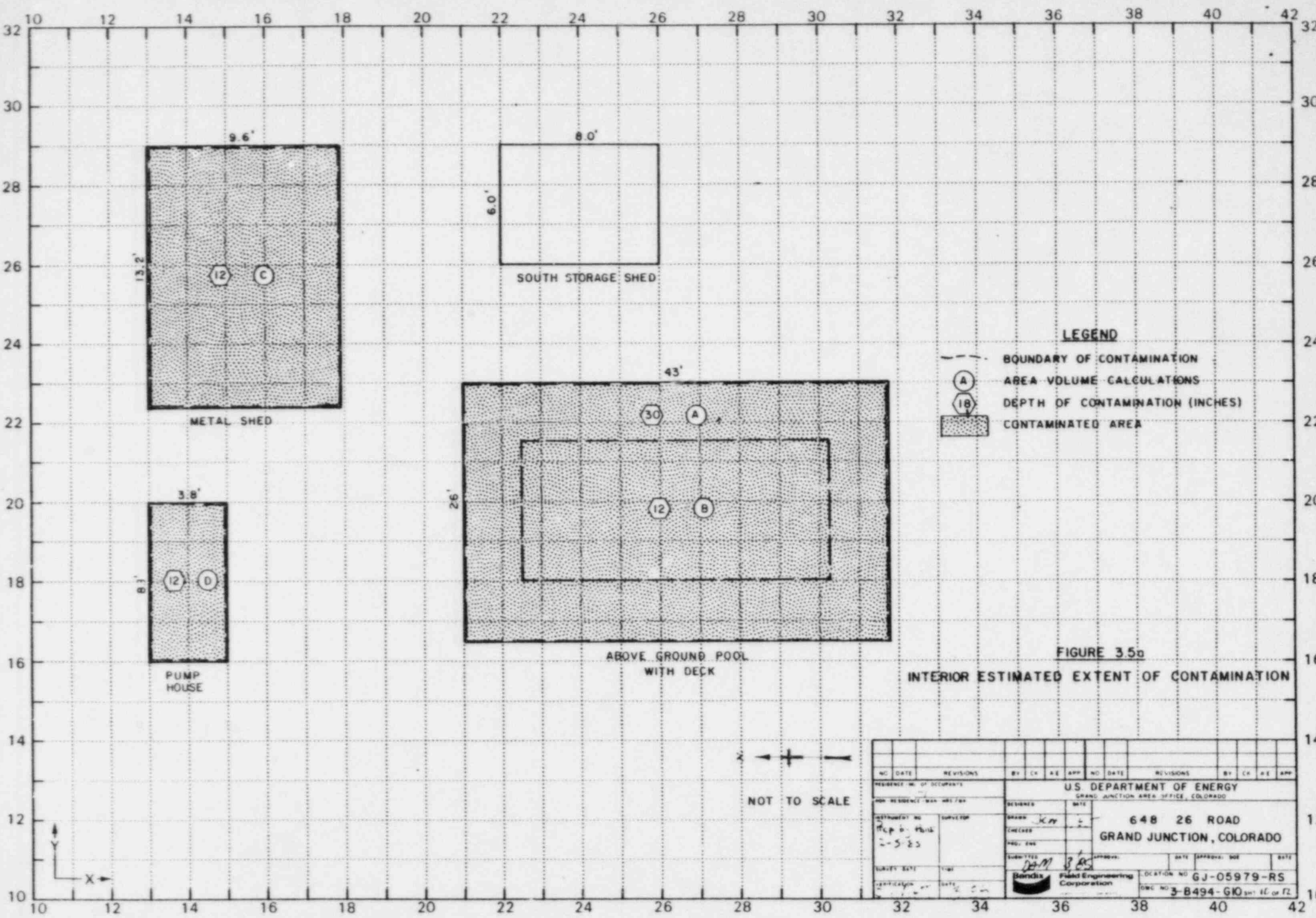




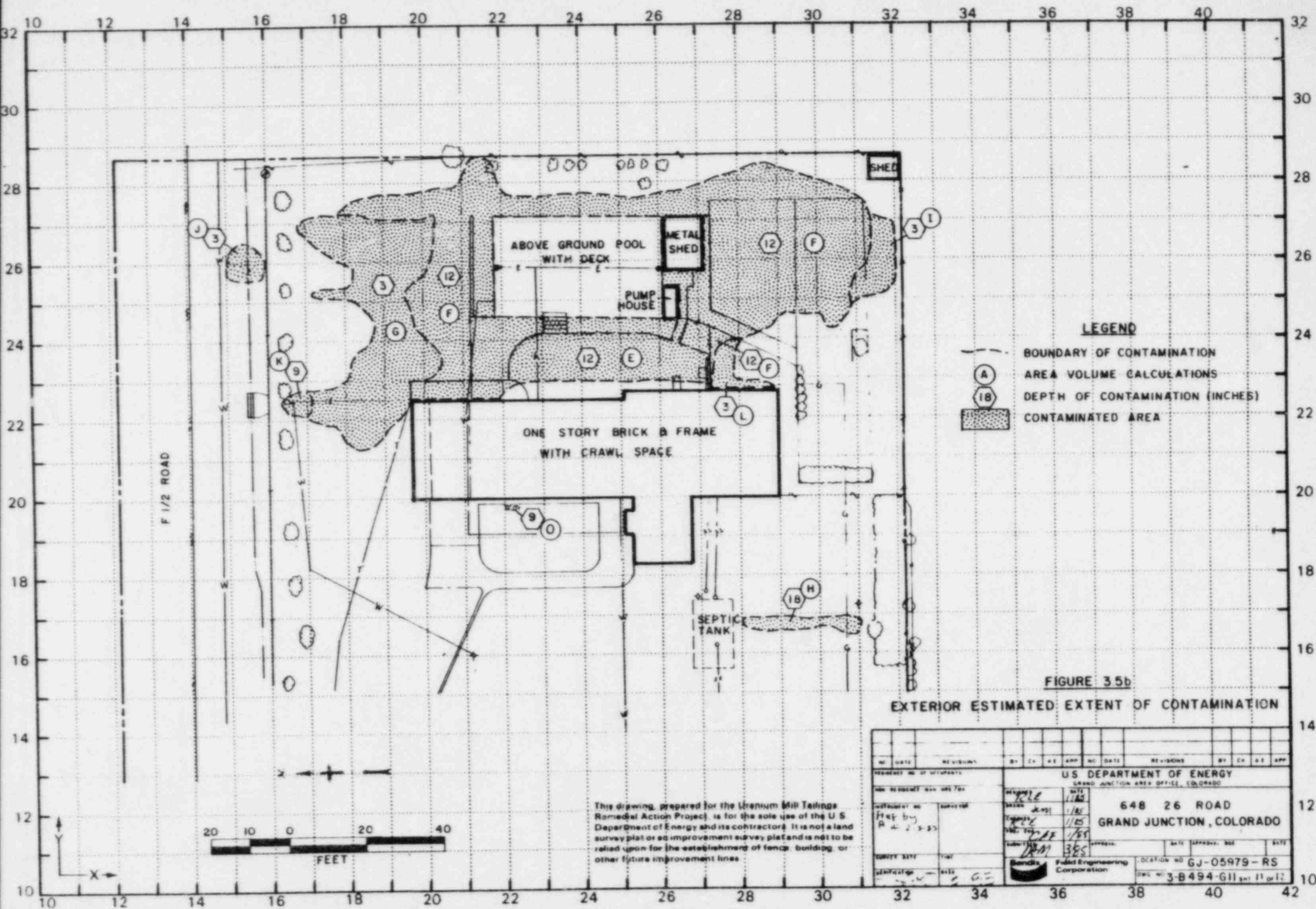
NO. REVISIONS		BY	DATE	NO. REVISIONS		BY	DATE
PREPARED BY: [Signature]							
U.S. DEPARTMENT OF ENERGY				648 26 ROAD			
GRAND JUNCTION AREA OFFICE, COLORADO				GRAND JUNCTION, COLORADO			
DRAWN BY: [Signature]		CHECKED BY: [Signature]		APPROVED BY: [Signature]		DATE: [Date]	
SURVEY DATE: [Date]		SCALE: [Scale]		FIELD ENGINEERING CORPORATION		DRAWING NO. GJ-05979-RS	
PROJECT NO. [Number]		SHEET NO. [Number]		TOTAL SHEETS [Number]		DATE: [Date]	

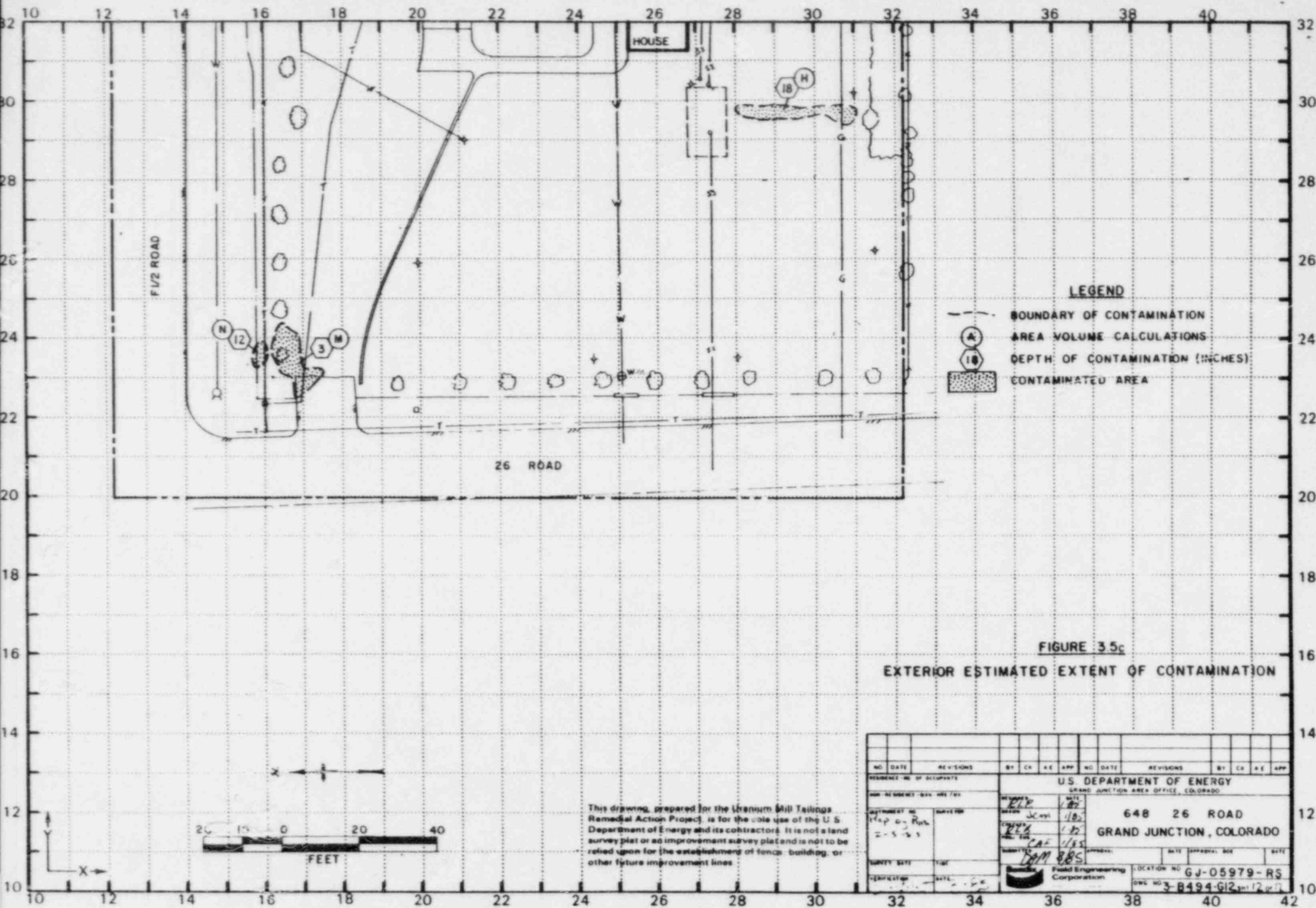


REVISIONS										REVISIONS									
NO.	DATE	BY	CHK	APP.	NO.	DATE	BY	CHK	APP.	NO.	DATE	BY	CHK	APP.					
RESIDENCE NO. OF OCCUPANTS										U.S. DEPARTMENT OF ENERGY									
HOM. RESIDENCE (DAY AND NIGHT)										GRAND JUNCTION AREA OFFICE, COLORADO									
INSTRUMENT NO.										DATE									
215185										1/82									
SURVEY DATE										DATE									
1/82										1/82									
SURVEYOR										DATE									
J. E. JONES										1/82									
FIELD ENGINEERING CORPORATION										DATE									
LOCATION NO.										DATE									
GJ-05979-RS										1/82									
DOW NO.										DATE									
3-B494-69										1/82									



NO.	DATE	REVISIONS	BY	CHK	RE	APP	NO.	DATE	REVISIONS	BY	CHK	RE	APP
RESIDENT NO. OF OCCUPANTS							U.S. DEPARTMENT OF ENERGY						
NON-RESIDENT NO. AND FIRM							GRAND JUNCTION AREA OFFICE, COLORADO						
DESIGNER							DATE						
DRAWN							648 26 ROAD						
CHECKED							GRAND JUNCTION, COLORADO						
PROJ. ENG.													
SUBMITTED							DATE						
APPROVED							DATE						
SURVEY DATE							TIME						
LOCATION NO.							GJ-05979-RS						
DATE							DWC NO. 3-B494-G10 SH. 16 OF 12						





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

Official Survey Report

Property Address 648 26 Road

Property Owner J. and D. Petty

Address of Owner (if different from above) _____

Report Prepared By P. A. Trujillo IV

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

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

1XXXX1 Residual radioactive materials found at the following locations:

1XXXX1 In open areas.

1XXXX1 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.

1XXXX1 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 = 285 uR/h

Bendix

Field Engineering Corporation

Field Engineering
Grand Junction, CO 81502
Tel (303) 241-1001
A Subsidiary of
The Bendix Corporation

March 6, 1985

Colorado Department of Health
222 South 6th Street
Grand Junction, Colorado 81502

ATTN: Coleen Campbell

Dear Coleen:

Regarding the issues discussed at the Technical Review on Department of Energy (DOE) Identification (ID) number GJ-05979-RS (648 26 Road).

- 1) CDH (Q): Area 'N' depth of contamination is listed as three inches, this appears to be too shallow.

Bendix (A): Area 'N' will be assessed at six inches with instructions to investigate during remedial action as a tree root was struck.

- 2) CDH (Q): Why the elevated gamma recorded at 222198 was not investigated.

Bendix (A): The area was investigated at 222198 however, the Radium Table 3.1a failed to show it. An updated copy will be provided and an additional area will be added to Figure 3.5b, Area 'O'.

- 3) CDH (Q): West edges of Areas 'F' and 'E' seem strange. Delta gamma measurements might help delineate them.

Bendix (A): The gamma scan (Figure 3.2a) was utilized to determine the areal extent of contamination. These gamma measurements seem to be adequate, as the contamination is only the fill underlying concrete.



- 4) CDH (Q): Area 'H' - was any indication of a buried utility line discovered?

Bendix (A): Although the contamination in Area 'H' seems to be the result of a trench dug for a utility line. No line could be discovered.

- 5) CDH (Q): Where is the leach field?

Bendix (A): This information was not available.

- 6) CDH (Q): Some of the depths of contamination as noted in Tables 3.1a and 3.1b are said to be based on all data available. What data specifically?

Bendix (A): The deconvolution graphs data primarily. This is tempered by a number of factors:

- 1) Analysis of undeconvoluted logs.
- 2) Data from surrounding area.
- 3) Historical information from homeowner.
- 4) Standard construction practices.
- 5) Surficial gamma measurements.

These factors contributed to the deduction of these depths.

Thank you for your time and cooperation. If you have any questions or additional comments, please contact me at 242-8621, extension 435.

Very truly yours,

A handwritten signature in black ink, appearing to read "Peter A. Trujillo IV", with a stylized flourish at the end.

Peter A. Trujillo IV
Radiologic Support Department

PAT:pr

Enclosure

INTERNAL
MEMORANDUM

Bendix Field Engineering Corporation
Grand Junction Projects Office

Date: January 15, 1985

To: Files

From: Peter A. Trujillo IV

Subject: GJ-05979-RS (648 26 Road)

Owner: J. and D. Petty
Occupancy: 4

Instruments

See Equipment Summary Sheet.

Team Members

S. Milton	B. Beltz	M. Duran
J. Johnson	P. Egidi	D. Bell
T. Unrein	P. Tuhey	W. McAllister
C. Adams	R. Vialpando	

The Colorado Department of Health (CDH) and Oak Ridge National Laboratory (ORNL) data indicate contamination north and south of the pool and contamination around the pool. There seems to be contamination associated with the east walk, southwest of the primary structure, and in the northwest corner of the lot.

Arrived on the site and began gridding. The property drawing is five feet off (five feet too much) on the north boundary.

The 'X' gridlines 140 (a quarter section of gridblocks) are incorporated with gridline 150, and gridline 320 (a quarter section of gridblocks) are incorporated with gridline 310.

The entire concrete patio (east) appears to be contaminated (not shown on ORNL data). The interior gamma survey showed elevated readings along the east (outer) wall. This is most probably caused by secondary radiation from the patio area.

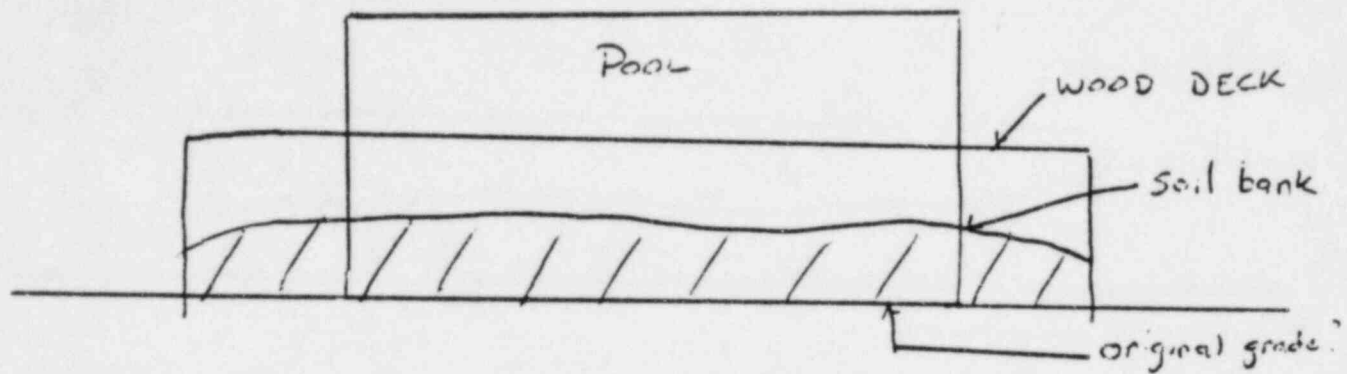
The pool has a raised wooden deck (36 inches high). The pool appears to sit at grade and is surrounded by a soil bank (18 inches high). Because of the low clearance and the frozen ground conditions, subsurface deltas were not feasible (attempts were made with no success). (See attached sketch of pool).

It is highly probable that contamination underlies the pool, to an approximate depth of 12 inches. However, there is no way to confirm this suspicion (the contamination is suspected because the fill surrounding the pool is contaminated to a depth of 12 inches - excluding the embankment).

A hole was dug around an irrigation pump to investigate a buried electrical line. The line was discovered at a depth of 9 inches.

Revisit

On 31 January 1985, a revisit was made to further delineate areas of contamination. Another attempt was made to dig under the pool (with no success). I estimate the pool depth to be 5 feet. Accurate measurements could not be obtained as the pool had a plastic cover over it. It is highly probable that the area where the pool lies was dug out and back filled with tailings. Spectrometer measurements were taken on the brick chimney which exhibits elevated gamma (and caused secondary radiation on the west walk). A cursory review of the data indicated high thorium content in the brick.



Bank Around Pool

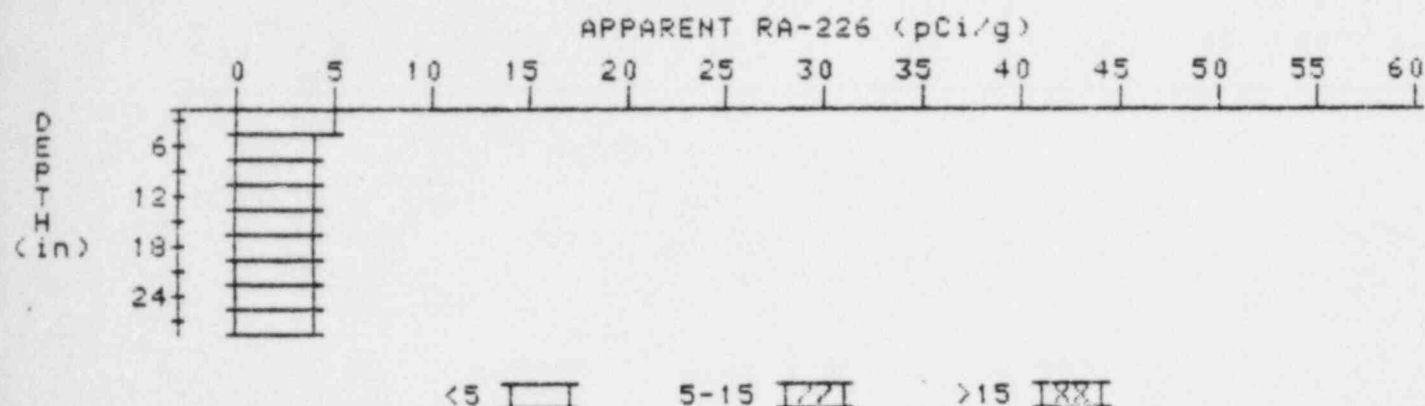
APPARENT RADIUM-226 CONCENTRATION 16

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05979-RS

HOLE NUMBER: 16

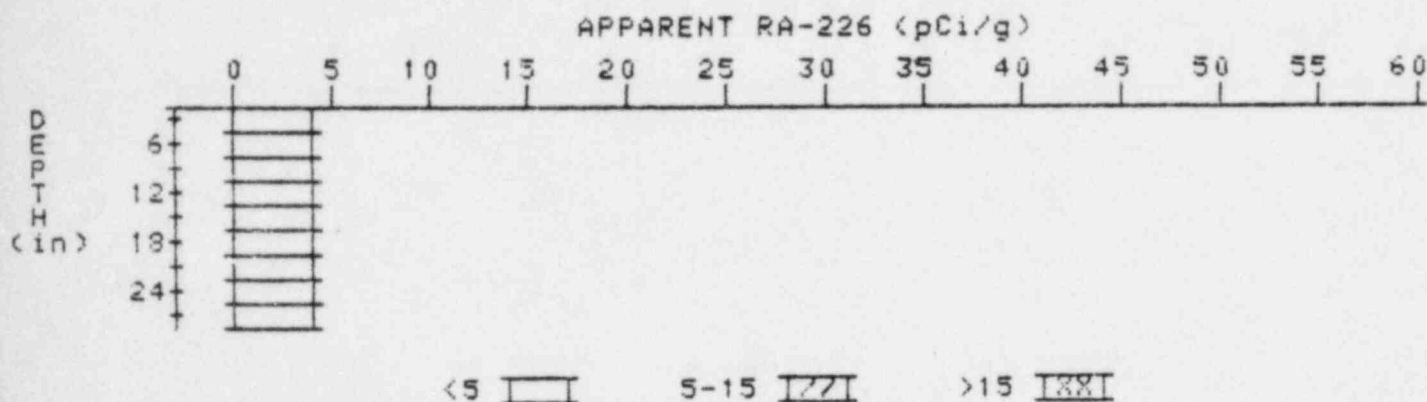
LOCATION: 156253



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.9	4.9
6	4.4	4.0
9	4.1	3.9
12	3.9	3.7
15	3.8	3.6
18	3.8	3.8
21	3.8	3.8
24	3.8	4.0
27	3.7	3.7

APPARENT RADIUM-226 CONCENTRATION 21 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05979-RS
HOLE NUMBER: 21
LOCATION: 180230

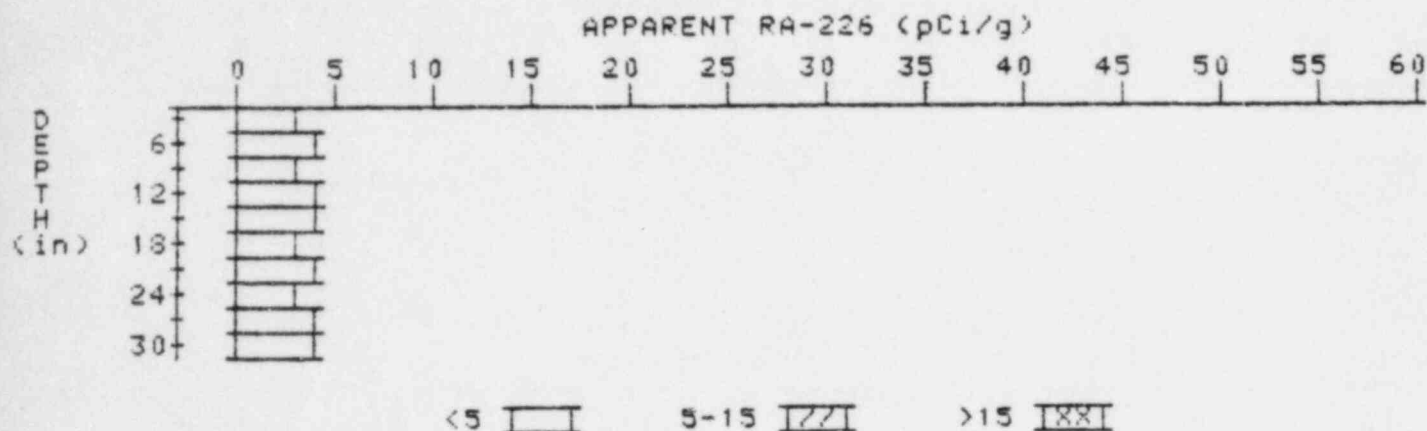


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.6	3.6
6	3.8	4.0
9	3.9	4.1
12	3.9	3.7
15	4.0	4.4
18	3.9	3.7
21	3.9	3.7
24	4.0	4.4
27	3.9	3.9

APPARENT RADIUM-226 CONCENTRATION 22

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05979-RS
HOLE NUMBER: 22
LOCATION: 196210



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.2	3.2
6	3.4	3.8
9	3.4	3.0
12	3.6	4.0
15	3.6	3.6
18	3.6	3.4
21	3.7	4.2
24	3.5	3.1
27	3.5	3.5
30	3.5	3.5

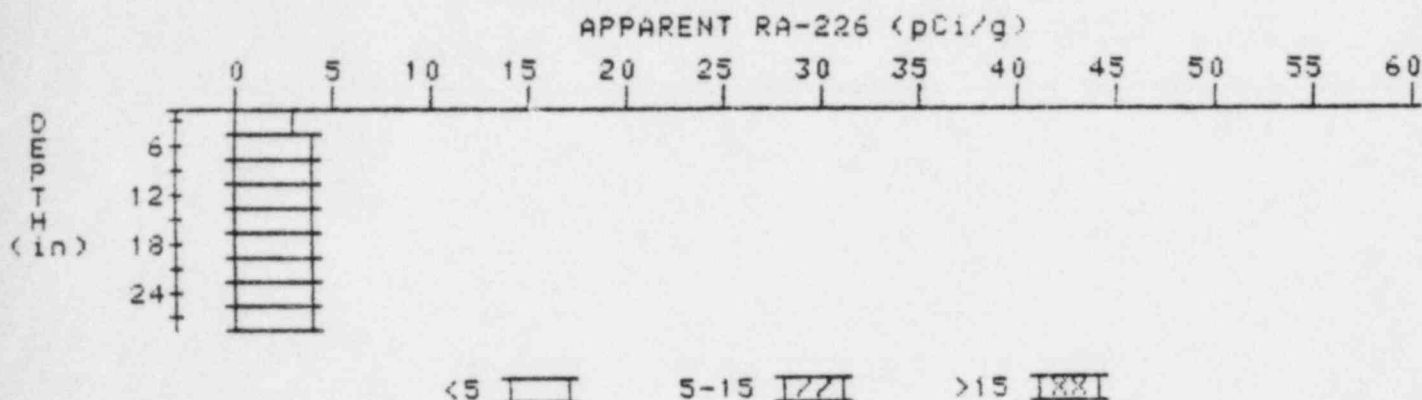
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

25

PROPERTY NUMBER: GJ-05979-RS

HOLE NUMBER: 25

LOCATION: 200240



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.4	3.4
6	3.6	3.8
9	3.7	3.7
12	3.8	4.2
15	3.7	3.5
18	3.7	3.7
21	3.7	3.7
24	3.7	3.7
27	3.7	3.7

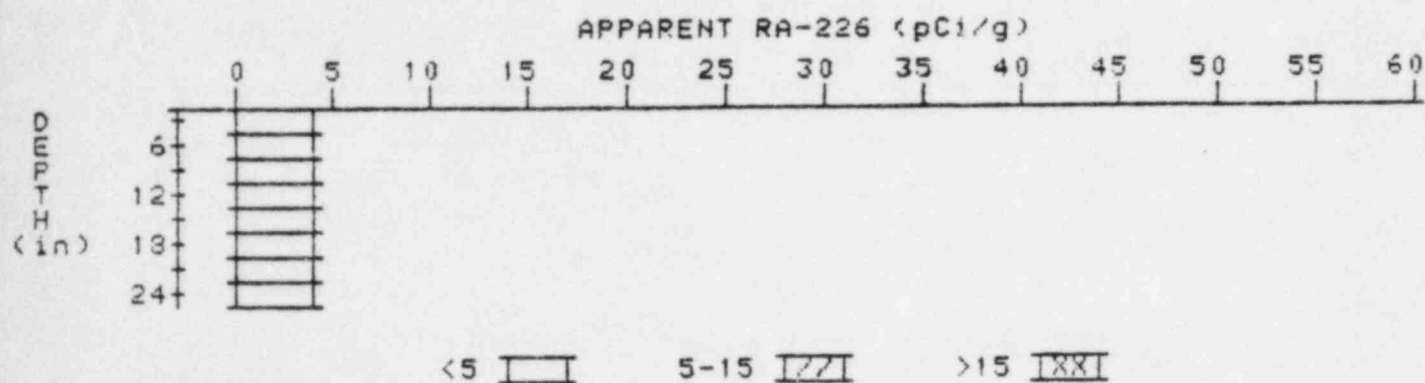
APPARENT RADIUM-226 CONCENTRATION 26

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05979-RS

HOLE NUMBER: 26

LOCATION: 200270



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.4	4.4
6	4.3	4.5
9	4.1	4.1
12	3.9	3.7
15	3.8	3.6
18	3.8	3.6
21	3.9	4.1
24	3.9	3.9

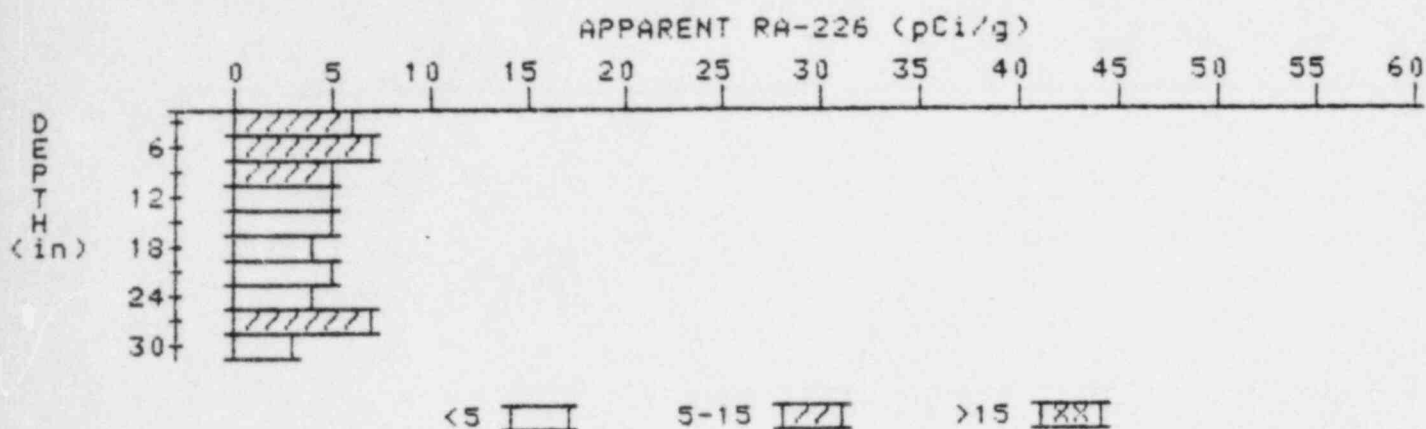
APPARENT RADIUM-226 CONCENTRATION 29

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05979-R3

HOLE NUMBER: 29

LOCATION: 228272



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.4	6.4
6	6.3	7.4
9	5.6	5.2
12	5.1	4.7
15	4.8	4.6
18	4.6	4.2
21	4.6	4.8
24	4.5	4.3
27	4.5	7.0
30	3.1	3.1

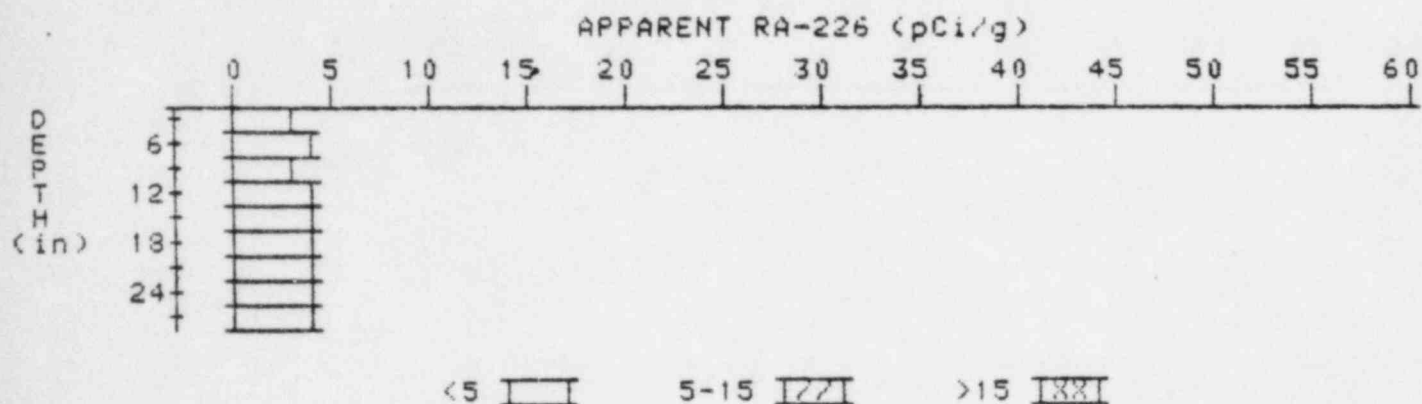
APPARENT RADIUM-226 CONCENTRATION 30

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05979-RS

HOLE NUMBER: 30

LOCATION: 240230



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

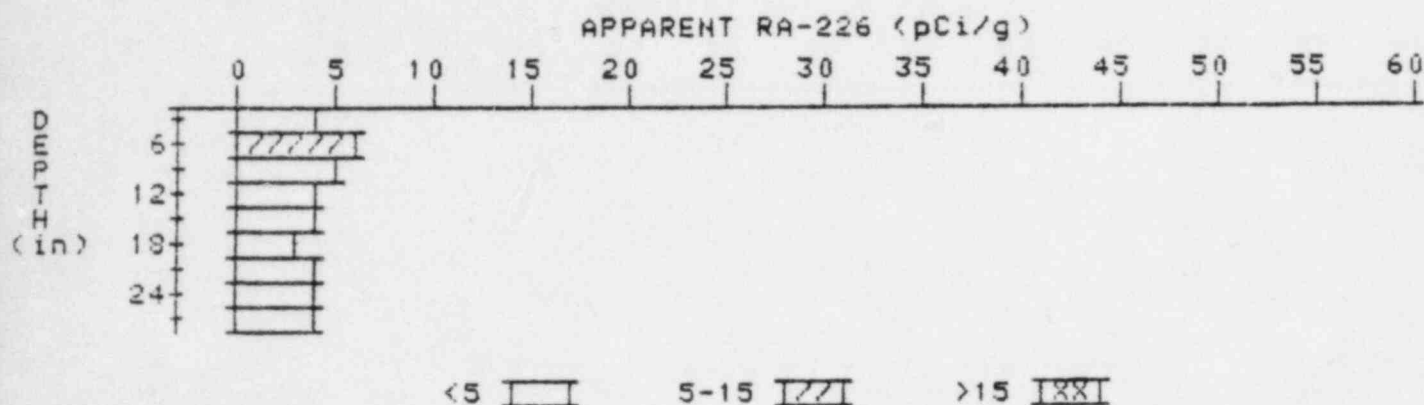
APPARENT RADIUM-226 CONCENTRATION 35

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05979-RS

HOLE NUMBER: 35

LOCATION: 266272

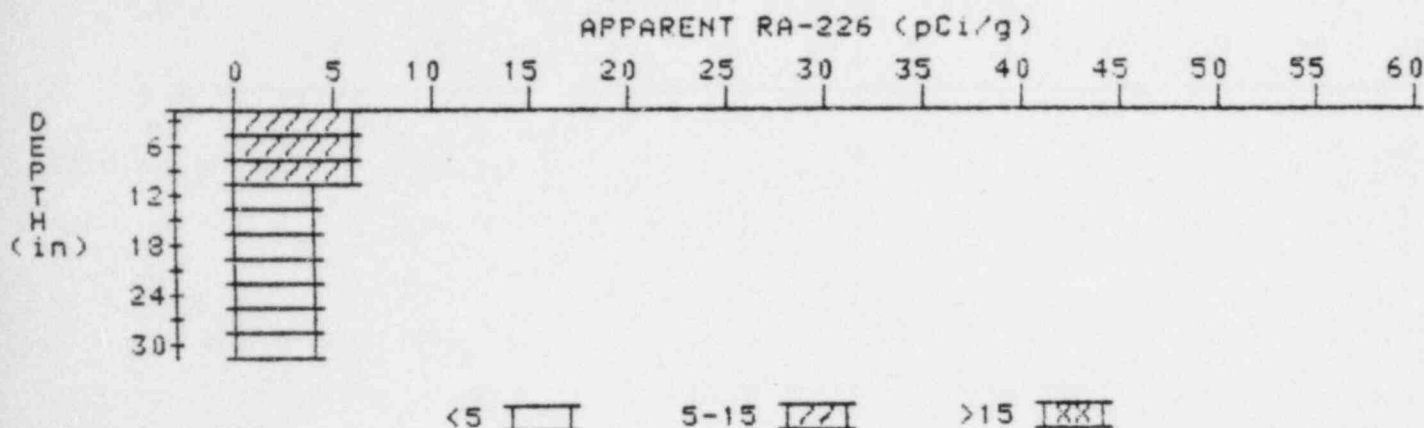


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.3	4.3
6	4.7	5.8
9	4.5	4.7
12	4.2	4.0
15	4.0	4.0
18	3.8	3.4
21	3.8	3.6
24	3.9	4.3
27	3.8	3.8

APPARENT RADIUM-226 CONCENTRATION 36

DECONVOLUTION GRAPH

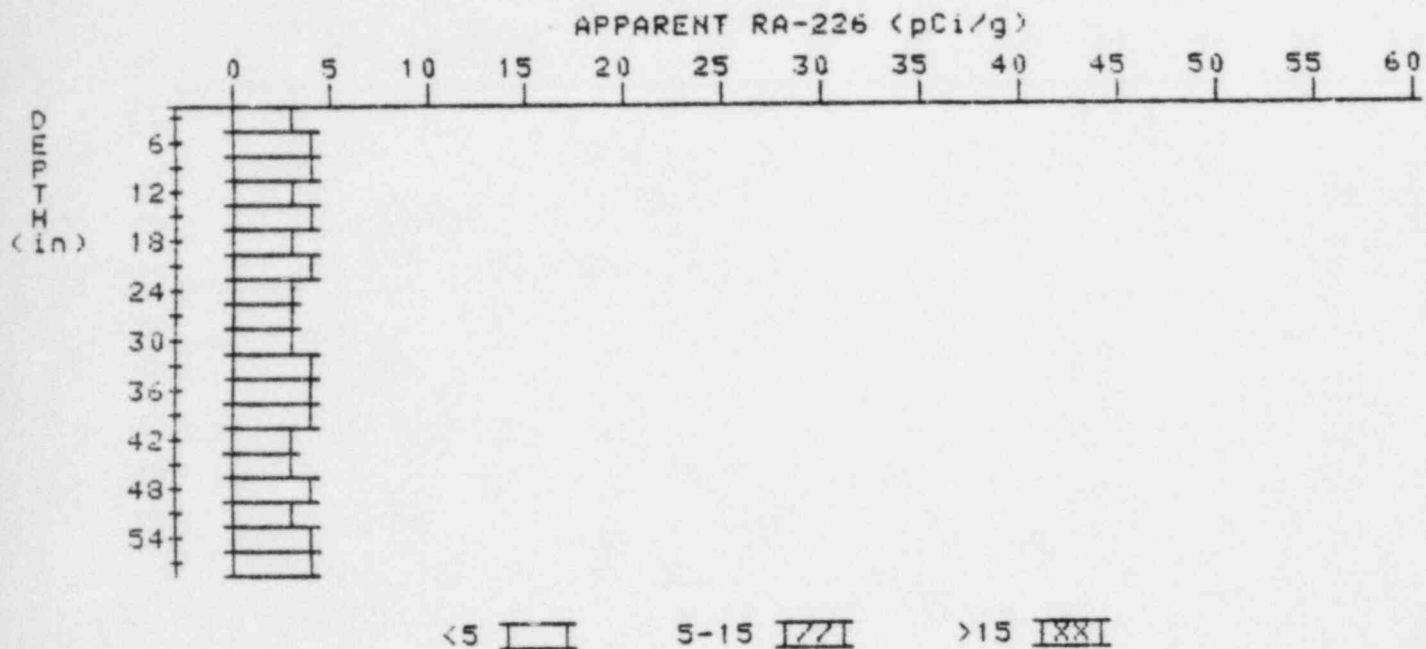
PROPERTY NUMBER: GJ-05979-R3
HOLE NUMBER: 36
LOCATION: 267238



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.7	5.7
6	5.7	6.4
9	5.3	5.7
12	4.7	4.3
15	4.3	3.8
18	4.2	4.2
21	4.1	3.9
24	4.1	4.1
27	4.1	4.3
30	4.0	4.0

APPARENT RADIUM-226 CONCENTRATION 37 DECONVOLUTION GRAPH

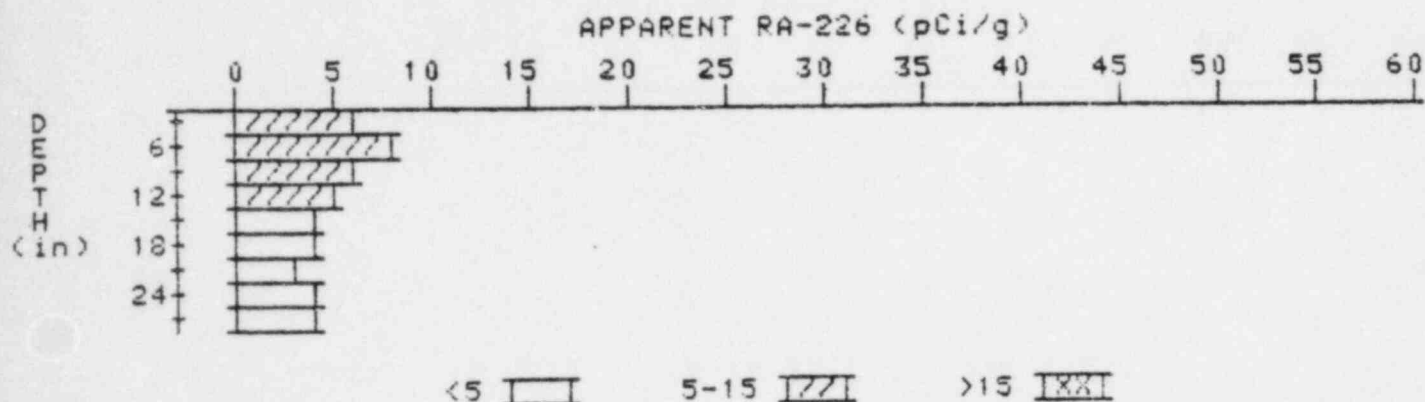
PROPERTY NUMBER: GJ-05979-RS
HOLE NUMBER: 37
LOCATION: 275199



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.3	3.7
9	3.4	3.6
12	3.4	3.4
15	3.4	3.6
18	3.3	2.9
21	3.4	3.6
24	3.4	3.4
27	3.4	3.4
30	3.4	3.2
33	3.5	3.7
36	3.5	3.5
39	3.5	3.7
42	3.4	3.2
45	3.4	3.2
48	3.5	3.9
51	3.4	3.0
54	3.5	3.7

APPARENT RADIUM-226 CONCENTRATION 38 DECONVOLUTION GRAPH

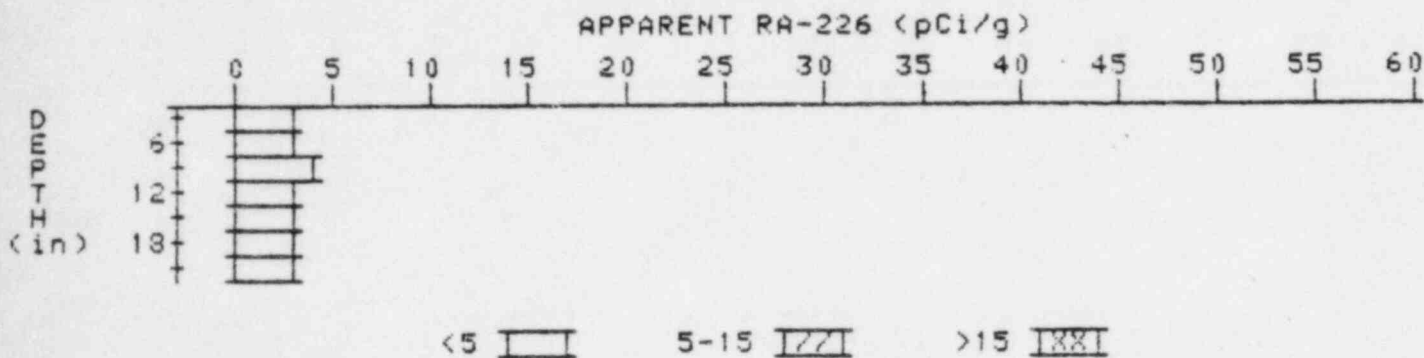
PROPERTY NUMBER: GJ-05979-RS
HOLE NUMBER: 38
LOCATION: 280260



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.6	5.6
6	6.3	8.3
9	5.9	6.4
12	5.2	5.2
15	4.5	3.6
18	4.3	4.5
21	4.0	3.5
24	4.0	3.8
27	4.1	4.1

APPARENT RADIUM-226 CONCENTRATION 41 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05979-RS
HOLE NUMBER: 41
LOCATION: 291217



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	3.7
12	3.2	2.8
15	3.3	3.5
18	3.3	3.3
21	3.3	3.3

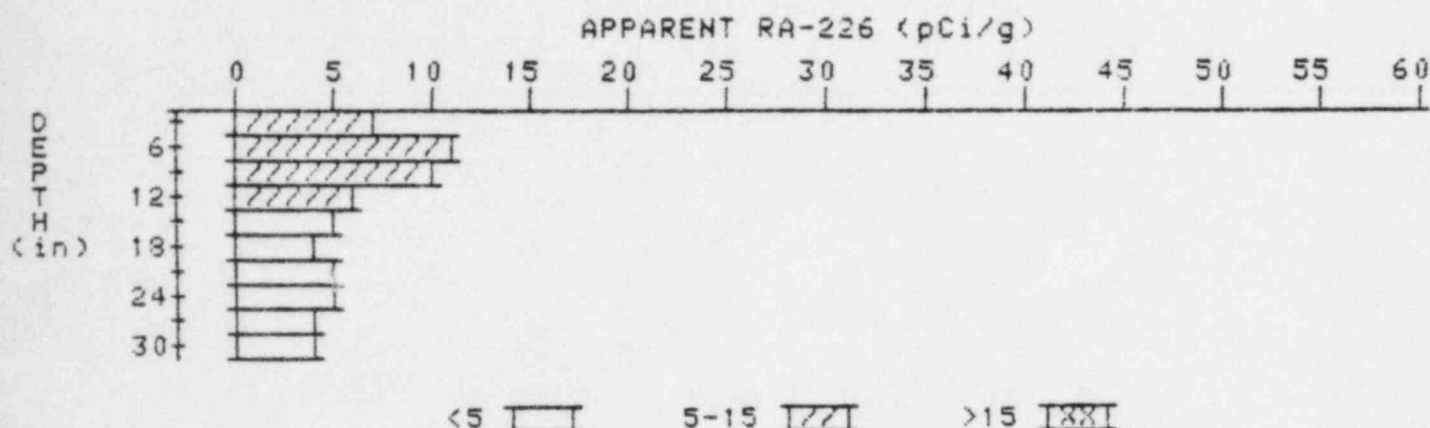
APPARENT RADIUM-226 CONCENTRATION 44

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05979-RS

HOLE NUMBER: 44

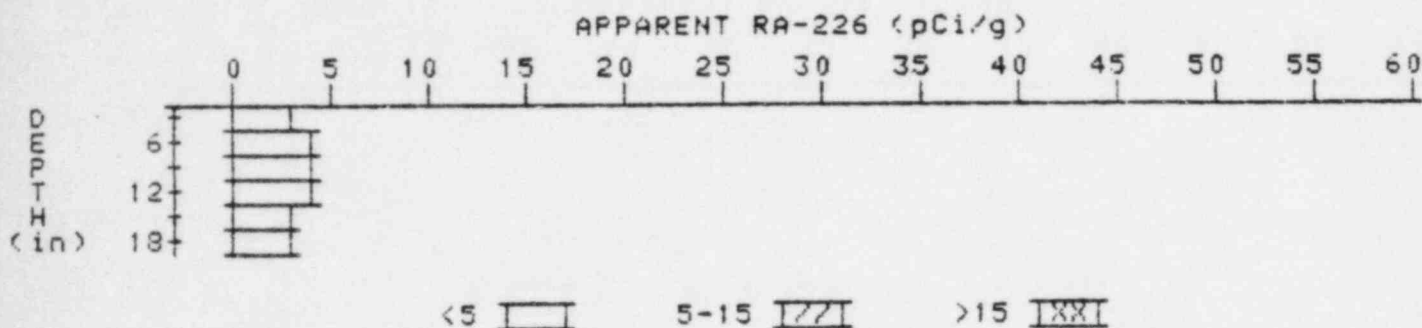
LOCATION: 300270



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.8	6.8
6	8.1	10.6
9	8.0	10.3
12	6.6	6.1
15	5.5	4.6
18	4.9	4.2
21	4.7	4.7
24	4.5	4.5
27	4.3	4.1
30	4.2	4.2

APPARENT RADIUM-226 CONCENTRATION 49 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05979-RS
HOLE NUMBER: 49
LOCATION: 168234

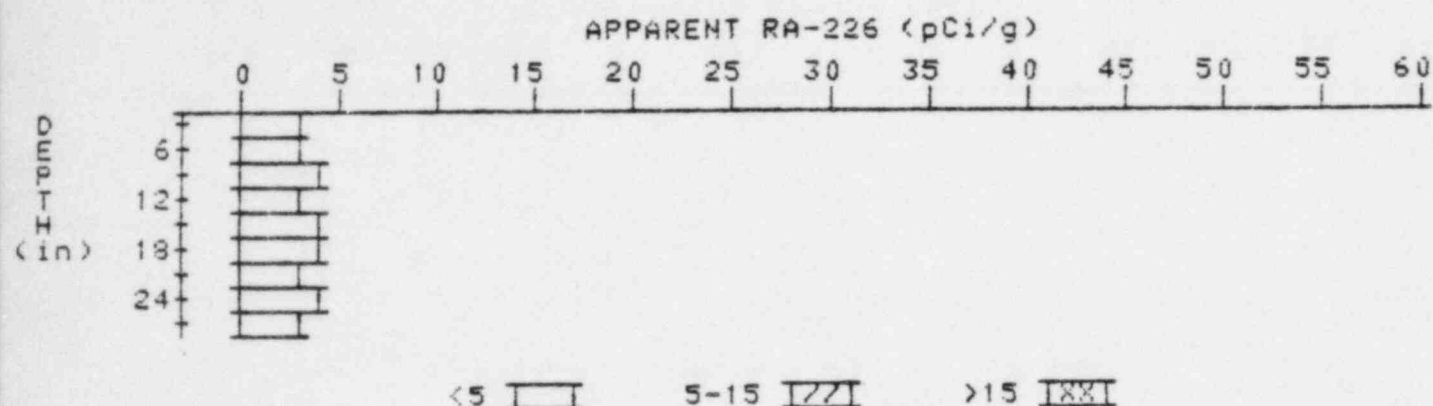


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.9	2.9
6	3.3	3.8
9	3.4	3.6
12	3.4	3.6
15	3.3	3.1
18	3.3	3.3

APPARENT RADIUM-226 CONCENTRATION 52

DECONVOLUTION GRAPH

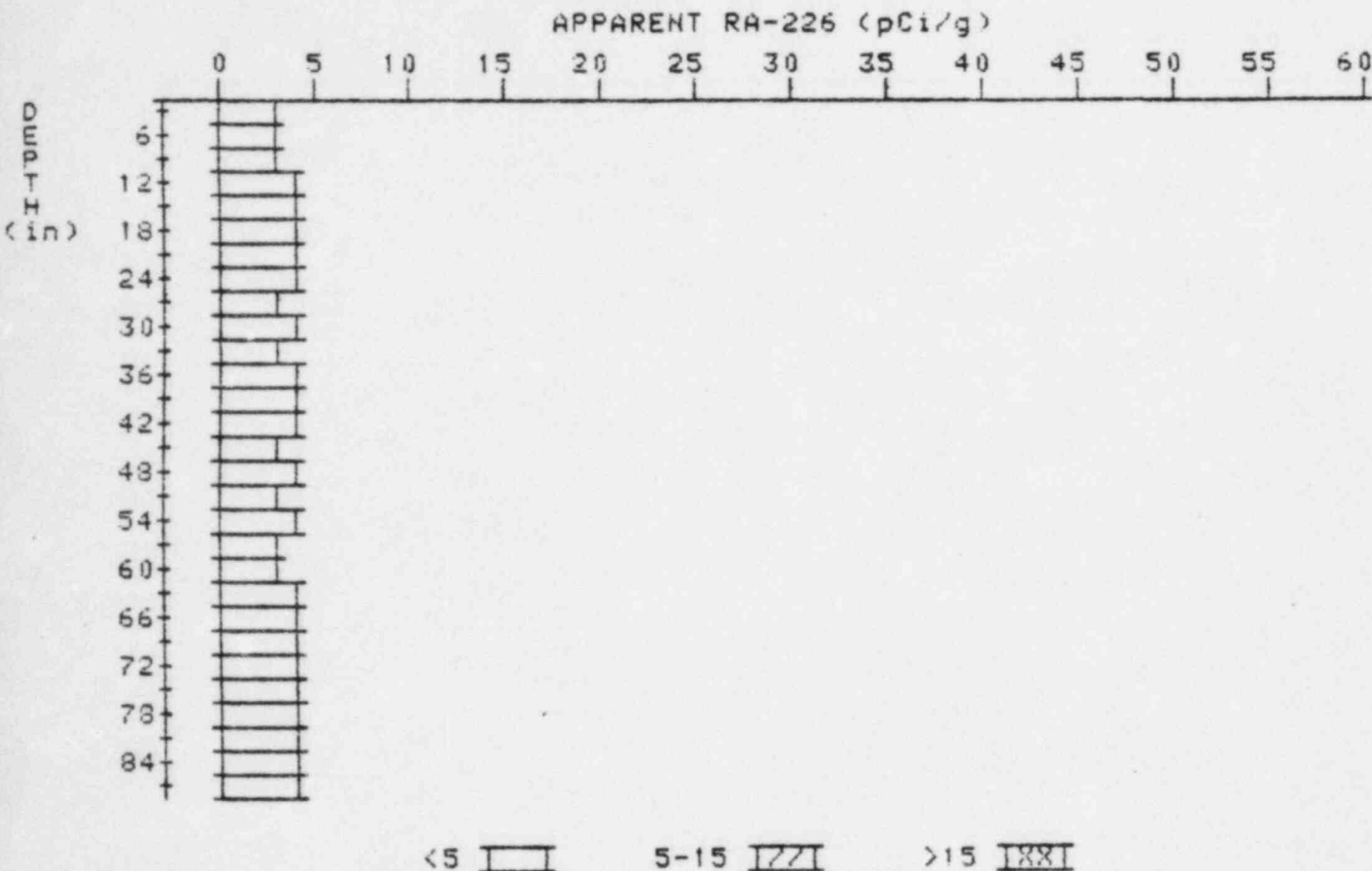
PROPERTY NUMBER: GJ-05979-RS
 HOLE NUMBER: 52
 LOCATION: 249306



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
=====	=====	=====
3	3.3	3.3
6	3.3	2.9
9	3.5	3.9
12	3.5	3.3
15	3.6	4.0
18	3.5	3.5
21	3.4	3.0
24	3.5	3.9
27	3.4	3.4

APPARENT RADIUM-226 CONCENTRATION 53 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05979-RS
HOLE NUMBER: 53
LOCATION: 274284



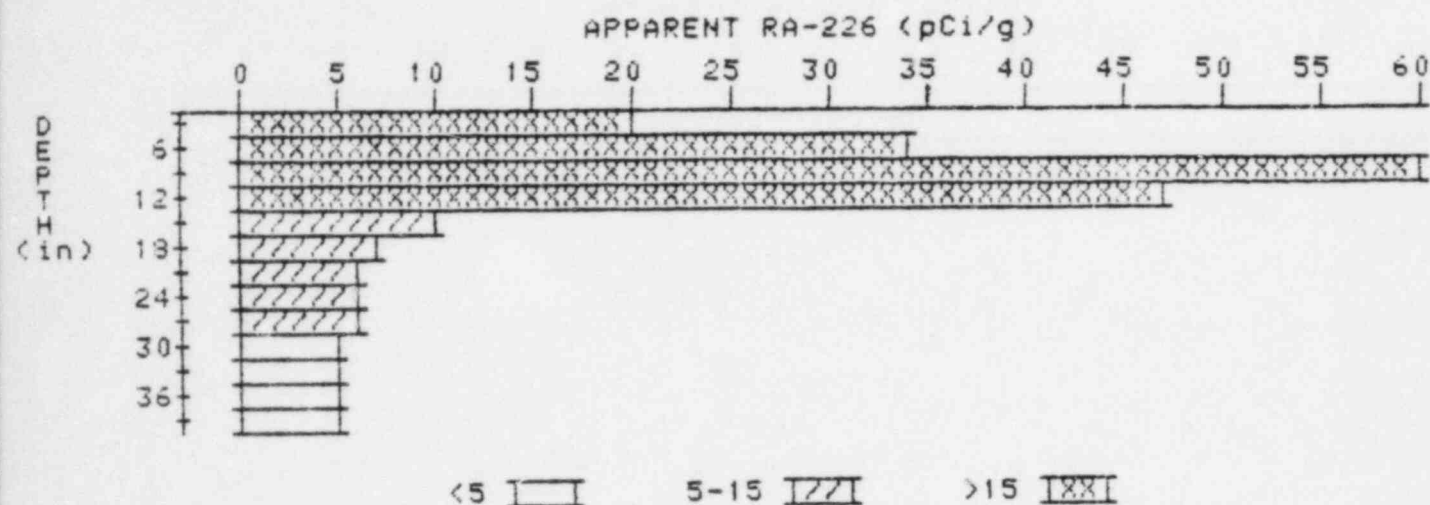
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.1	3.1
6	3.3	3.5
9	3.4	3.4
12	3.5	3.5
15	3.6	3.3
18	3.6	3.6
21	3.6	3.6
24	3.6	3.6
27	3.6	3.4
30	3.7	4.1
33	3.6	3.4

36	3.6	3.
39	3.6	3.6
42	3.6	3.6
45	3.6	3.4
48	3.7	4.1
51	3.6	3.2
54	3.7	4.1
57	3.6	3.4
60	3.6	3.4
63	3.7	3.7
66	3.8	4.0
69	3.8	3.8
72	3.8	3.8
75	3.8	3.8
78	3.8	3.6
81	3.9	3.9
84	4.0	4.0
87	4.1	4.1

APPARENT RADIUM-226 CONCENTRATION 55

DECONVOLUTION GRAPH

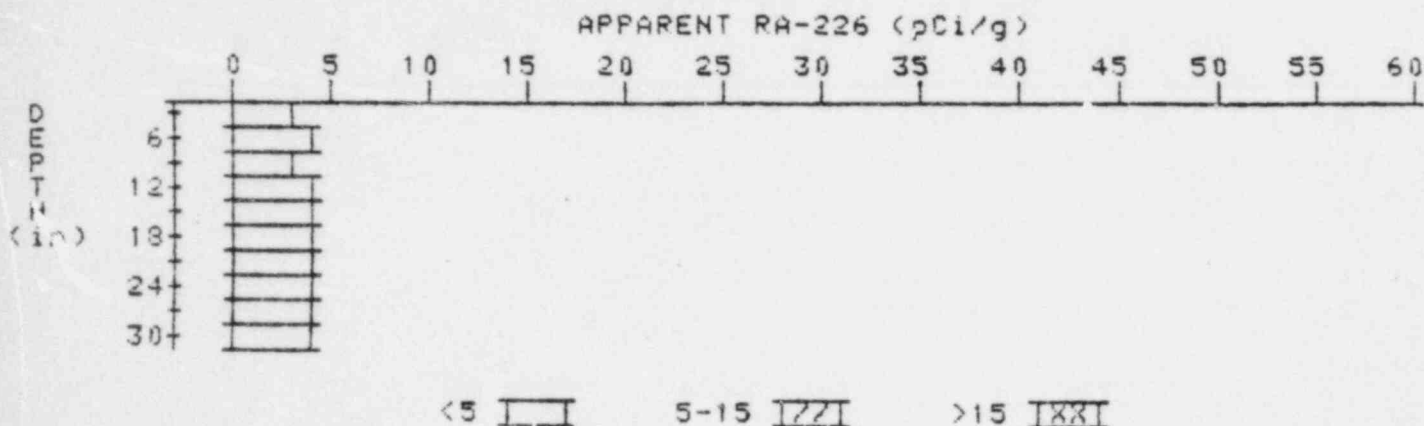
PROPERTY NUMBER: GJ-05979-RS
HOLE NUMBER: 55
LOCATION: 288298



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	19.8	19.8
6	31.7	34.0
9	42.3	73.8
12	35.2	47.5
15	21.2	10.2
18	13.4	6.6
21	9.4	5.8
24	7.4	5.8
27	6.3	5.8
30	5.5	5.0
33	5.0	4.6
36	4.7	4.5
39	4.5	4.5

APPARENT RADIUM-226 CONCENTRATION 56 DECONVOLUTION GRAPH

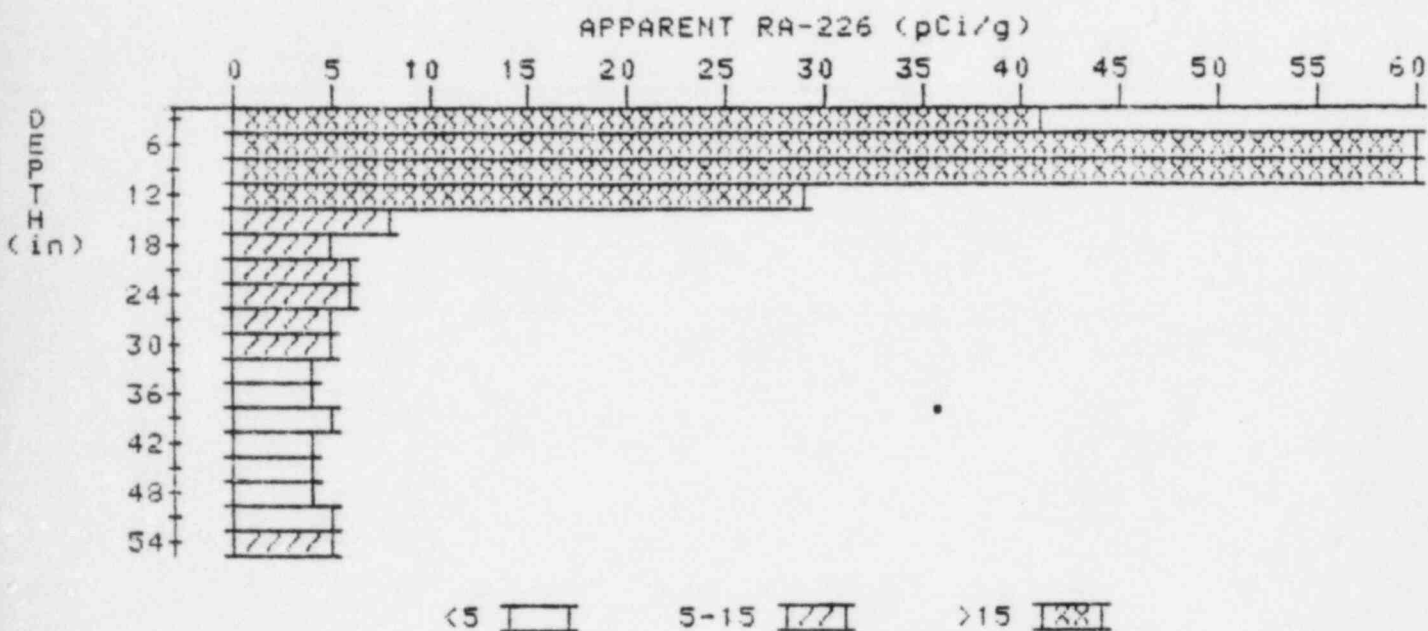
PROPERTY NUMBER: GJ-05979-RS
HOLE NUMBER: 56
LOCATION: 290240



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.1	3.1
6	3.5	4.2
9	3.5	3.3
12	3.6	3.6
15	3.7	3.9
18	3.7	3.5
21	3.8	4.2
24	3.7	3.5
27	3.7	3.7
30	3.7	3.7

APPARENT RADIUM-226 CONCENTRATION 59 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05979-RS
HOLE NUMBER: 59
LOCATION: 307296



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	41.4	41.4
6	56.9	91.0
9	53.2	79.0
12	35.0	29.0
15	20.2	7.6
18	12.5	5.2
21	8.9	5.9
24	7.0	5.6
27	5.9	5.0
30	5.3	5.1
33	4.8	4.3
36	4.6	4.4
39	4.5	4.5
42	4.4	4.2
45	4.4	4.2
48	4.5	4.3
51	4.7	4.5
54	5.0	5.0