RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-03494-RS
ADDRESS: 174 LITTLE PARK ROAD

JULY 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 M. K. Tucker COH
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DOE PROJECT ENGINEER

DATE July 11, 1985

REA03494:REA-509

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-03494-RS, is a single-family residence located at 174 Little Park 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, 10 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is $2,281. Remedial action on this property will take approximately 5 days to complete.

1.3 Areas to be Excluded

Area B, as discussed in Section 3.5 and shown on Appendix Figure 3.5, will not be included in this remedial action for the following reasons:

1. High readings in this area are the result of rock and mineral samples which have been collected by the property owners. These samples do not originate from the millsite, therefore do not fall under the scope of the UMTRA Program.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 174 Little Park Road, Grand Junction, Colorado

Zoning: Residential (R-2-A)

Lot Size: Approximately 132,000 sf (3.03 acres)

Legal Description: Lot 1 of the DeLong Subdivision; Section 33, T1S, R1W County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 2 miles southwest 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 Figures 2.2a and 2.2b.

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

Bordering Properties:

North:	Little Park Road
South:	Single-family residence
East:	Single-family residence
West:	Single-family residence

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-story residence
Size:	Approximately 1,680 sf
Construction Date:	1963
Construction:	Wood-frame
Foundation:	Concrete footing with rock and mortar stemwall
Footing Depth:	Approximately 48" to bottom of footing from grade
Basement:	None
Crawl Space:	None
Condition:	Good

Other Structures:

Type:	Shed
Size:	Approximately 80 sf
Construction:	Wood-frame
Foundation:	Wood
Condition:	Good

General Remarks:

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

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-03494-RS on March 22, 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 elevated gamma readings in parts of the driveway and flagstone sidewalk 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, 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: 8 to 15 uR/h
Hightest Outside Gamma Reading (HOG): 163 uR/h

Exterior radium-concentration measurements are presented in Appendix Table 3.1. Grid-point survey results are shown in Appendix Figure 3.1. Appendix Figure 3.2 presents the ranges of elevated gamma readings and indicates areas of possible contamination.

3.2.2 Interior Findings

Background Readings: 8 to 12 uR/h
Highest Inside Gamma Reading (HIG): 12 uR/h

Interior gamma exposure-rate measurements are summarized in Appendix Table 3.2. Appendix Figures 3.3a and 3.3b show interior exposure rates and locations of these measurements.

3.3 Boreholes, Soil Samples, and Other Measurements

Areas which displayed elevated gamma levels were further investigated; these areas are shown in Appendix Figure 3.4. Data from these investigations are included in Appendix Table 3.1.

3.4 Radon/Radon Daughter Concentration (RDC)

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

3.5 Extent of Contamination

Appendix Figure 3.5 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) The fill material below the 3-inch-thick flagstone sidewalk is contaminated. The total depth of contamination is 9 inches (approximately 210 sf).

(AREA B) The eastern one-third of the rock garden, adjacent to the driveway, is contaminated. The contamination is ore related, with several specimens lying on the surface (excluded).

(AREA C) A small area located south of the driveway is contaminated to a depth of 30 inches (approximately 35 sf).

(AREA D) A section of soil adjacent to the flagstone sidewalk is contaminated to a depth of 6 inches (approximately 68 sf).

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-03494-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 $2,281.

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

The owner preference is to keep the ore samples found in Area B.

These ore samples do not originate from the millsite, therefore do not fall under the scope of the UMTRA Program.

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 Pro ms, Division of Remedial Action Projects, UMTRA, 1984.

Bendix Field Engineering Corporation, Vicinity Properties General Construction Specification, for U.S. Department of Energy, Nuclear Energy Programs, Division of Remedial Action Projects, UMTRA, 1984.

Bendix Field Engineering Corporation, Environmental Assessment of Preliminary Cleanup Activities at Offsite Properties Contaminated by Tailings from the Grand Junction Inactive Uranium Millsite, (GJ-04), for U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations, Albuquerque, New Mexico, 1983.

U.S. Department of Energy, Programmatic Memorandum of Agreement (DOE No. DE-GM04-84AL28460) between the U.S. Department of Energy, the Advisory Council on Historic Preservation, and the Colorado State Historic Preservation Officer, for UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, 1984.

U.S. Department of Energy, Vicinity Properties Management and Implementation Manual, for UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, 1984.

U.S. Environmental Protection Agency, Standards for Remedial Action at Inactive Uranium Processing Sites (40 CFR Part 192), Washington, D.C., 1983.

6.0 APPENDIX

This Appendix contains the following:

Appendix Tables:

Table 3.1	Radium Concentrations at Exterior Locations
Table 3.2	Summary 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 2.2a	Site Plan
Figure 2.2b	Site Plan
Figure 3.1	Exterior Grid-Point Exposure Rates
Figure 3.2	Exterior Gamma Scan
Figure 3.3a	Interior Gamma Exposure Rates - Crawl Space
Figure 3.3b	Interior Gamma Exposure Rates - Ground Floor
Figure 3.4	Exterior Sample Locations
Figure 3.5	Estimated Extent of Contamination

Official Survey Report
Memo of Understanding
Team Leader Notes
Deconvolution Graphs (Apparent Radium-226 Concentration)

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	In Situ Ra-226 (pCi/g) Spectr.	Chem Ra-226 (pCi/g)	Comments
1	216453	00-06	SS			3.2	Sandy
2	262273	00-06	SS			4.0	Sandy
3	284453	03	TC	10.9		*	DC = 30 inches
		06	TC	12.2		*	Based on all
		09	TC	11.5		*	data available
		12	BH	9.8	7.9	*	
		15	TC	8.1		*	
		18	TC	7.5		*	
		21	TC	7.7		*	
		24	TC	7.6		*	
		27	TC	7.1		*	
		30	BH	6.0	2.3	*	
		33	TC	5.0		*	
4	370293	03	TC	2.5		*	DC = 0 inches
		06	TC	2.5		*	
		09	TC	2.3		*	
		12	TC	2.3		*	
		15	TC	2.3		*	
		18	TC	2.4		*	
		21	TC	2.6		*	
5	400370	00	DS	<1.0		*	Background
		00-06	SS			1.2	Sandy and rocky
		03	TC	1.5		*	DC = 0 inches
		06	TC	1.6		*	
		09	TC	1.6		*	
		12	BH	1.7	1.0	*	
		15	TC	1.8		*	
		18	TC	1.9		*	
		21	TC	2.2		*	
		24	BH	2.3	1.3	*	
6	410440	03	TC	3.8		*	Rock garden
		06	TC	2.7		*	Ore on surface
		09	TC	2.3		*	DC = 0 inches
		12	BH	2.1	<1.0	*	
		15	TC	2.2		*	
		18	BH	2.2	<1.0	*	
7	420444	03	TC	1.8		*	DC = 0 inches
		06	TC	1.9		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	In Situ Ra-226 (pCi/g) Spectr.	Chem Ra-226 (pCi/g)	Comments
7	420444	09	TC	2.0		*	
		12	BH	2.1	1.4	*	
		15	TC	2.4		*	
		18	BH	2.7	1.6	*	
		21	TC	2.9		*	
8	430408	03	TC	1.7		*	Water line
		06	TC	1.8		*	DC = 0 inches
		09	TC	2.1		*	
		12	TC	2.3		*	
		15	TC	2.6		*	
		18	TC	2.7		*	
		21	TC	2.8		*	
9	435415	00	DS	<1.0		*	Gas line
		10	DS	<1.0		*	
10	440392	03	TC	1.4		*	DC = 0 inches
		06	TC	1.4		*	
		09	TC	1.4		*	
		12	BH	1.5	<1.0	*	
		15	TC	1.5		*	
		18	TC	1.4		*	
		21	TC	1.3		*	
		24	BH	1.2	<1.0	*	
		27	TC	1.2		*	
11	442417	00	DS	<1.0		*	Front patio
12	447418	03	TC	10.6		*	
		06	TC	7.3		*	
		09	TC	4.7		*	DC = 9 inches
		12	TC	3.1		*	Based on the
		15	TC	2.4		*	deconvolution graph
		18	TC	2.0		*	
		21	TC	2.1		*	
		24	TC	2.2		*	
		27	TC	2.4		*	
		30	TC	2.5		*	
		33	TC	2.6		*	
13	449422	00	DS	10.1		*	Driveway
		06	DS	<1.0		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	In Situ Ra-226 (pCi/g) Spectr.	Chem Ra-226 (pCi/g)	Comments
14	453408	00	DS	<1.0		*	Patio Front of house
15	456417	00	DS	3.6		*	Driveway
		06	DS	<1.0		*	
16	462406	03	TC	15.7		*	
		06	TC	10.5		*	
		09	TC	6.4		*	DC = 9 inches
		12	TC	3.7		*	Based on the
		15	TC	2.7		*	deconvolution graph
		18	TC	2.5		*	
		21	TC	2.3		*	
		24	TC	2.5		*	
		27	TC	2.5		*	
		30	TC	2.6		*	
		33	TC	2.6		*	
17	475418	03	TC	1.5		*	Sewer line
		06	TC	1.4		*	DC = 0 inches
		09	TC	1.3		*	
		12	BH	1.4	<1.0	*	
		15	TC	1.6		*	
		18	TC	1.6		*	
		21	TC	1.5		*	
		24	TC	1.4		*	
		27	TC	1.4		*	
		30	BH	1.4	1.1	*	
18	483372	03	TC	1.7		*	Water line
		06	TC	1.7		*	DC = 0 inches
		09	TC	1.7		*	
		12	BH	1.7	<1.0	*	
		15	TC	1.7		*	
		18	TC	1.6		*	
		21	TC	1.7		*	
		24	TC	1.6		*	
		27	TC	1.6		*	
		30	BH	1.5	<1.0	*	
19	514385	03	TC	2.1		*	DC = 0 inches
		06	TC	2.0		*	
		09	TC	1.9		*	
		12	BH	1.7	0.7	*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	In Situ Ra-226 (pCi/g) Spectr.	Chem Ra-226 (pCi/g)	Comments
19	514385	15	TC	1.5		*	
		18	BH	1.5	1.2	*	
		21	TC	1.5		*	

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 = 03-22-85
Team Leader = PAT

Table 3.2
Summary of Interior Gamma Exposure Rates

DOE ID #GJ-03494-RS 174 Little Park Road

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)
CRAWL SPACE	*	*	*	18	09-12	10
GROUND FLOOR	*	*	*	*	08-10	*
BREEZEWAY	08	11-14	10	08	10-12	11
GARAGE	07	09-12	10	07	10-12	11

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

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-03494-RS

AREA	CALCULATIONS(ft)		SF		DEPTH(ft)		CF				CUBIC YARDS
EXTERIOR											
	Contaminated Fill										
A	30 x 7	=	210	x	0.5	=	105				
C	7 x 5	=	35	x	2.5	=	88				
D	17 x 4	=	68	x	0.5	=	34				
	Volume of Fill					=	227	=	227/27	=	8
	Flagstone Walk										
A	30 x 7	=	210	x	0.3	=	63				
	Volume of Flagstone					=	63	=	63/27	=	2
	TOTAL VOLUME - EXTERIOR									=	10

See Appendix Figure 3.5 For Areas

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-03494-RS

EXTERIOR		
Remove/replace flagstone walk 210 sf @ $4.50/sf		$ 945
Remove identified residual radioactive material 8 cy @ $44/cy (manual-open)		352
Replace topsoil 4 cy @ $9.50/cy		38
Replace roadbase 4 cy @ $11.50/cy		46
	TOTAL EXTERIOR	$ 1,381
	TOTAL INTERIOR	0
	ACCESS CONTROL	100
	SUBTOTAL	$ 1,481
	CONTINGENCY @ 10%	148
	SUBTOTAL	$ 1,629
	CONTRACTOR OVERHEAD & PROFIT @ 40%	652
	GRAND TOTAL	$ 2,281

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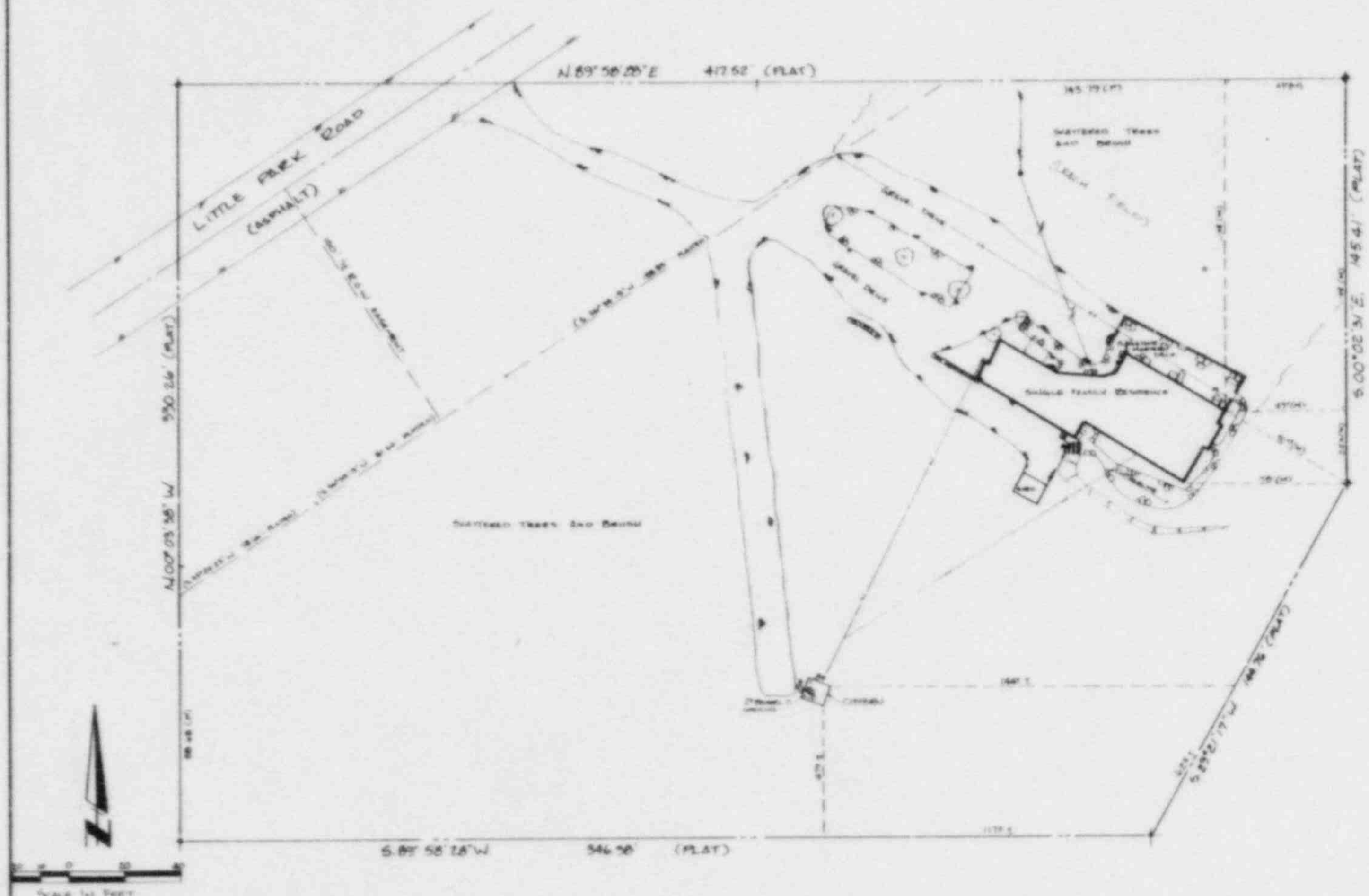
REA03494/REA-509/LAJ

FIGURE 2.1
VICINITY MAP



U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO	LOCATION NO. GJ03494 RS
ADDRESS: 174 LITTLE PARK ROAD GRAND JUNCTION, COLORADO	
DRAWING NO. 3-D529-F2	SHEET 2 OF 2

FIGURE 2.2 a SITE PLAN

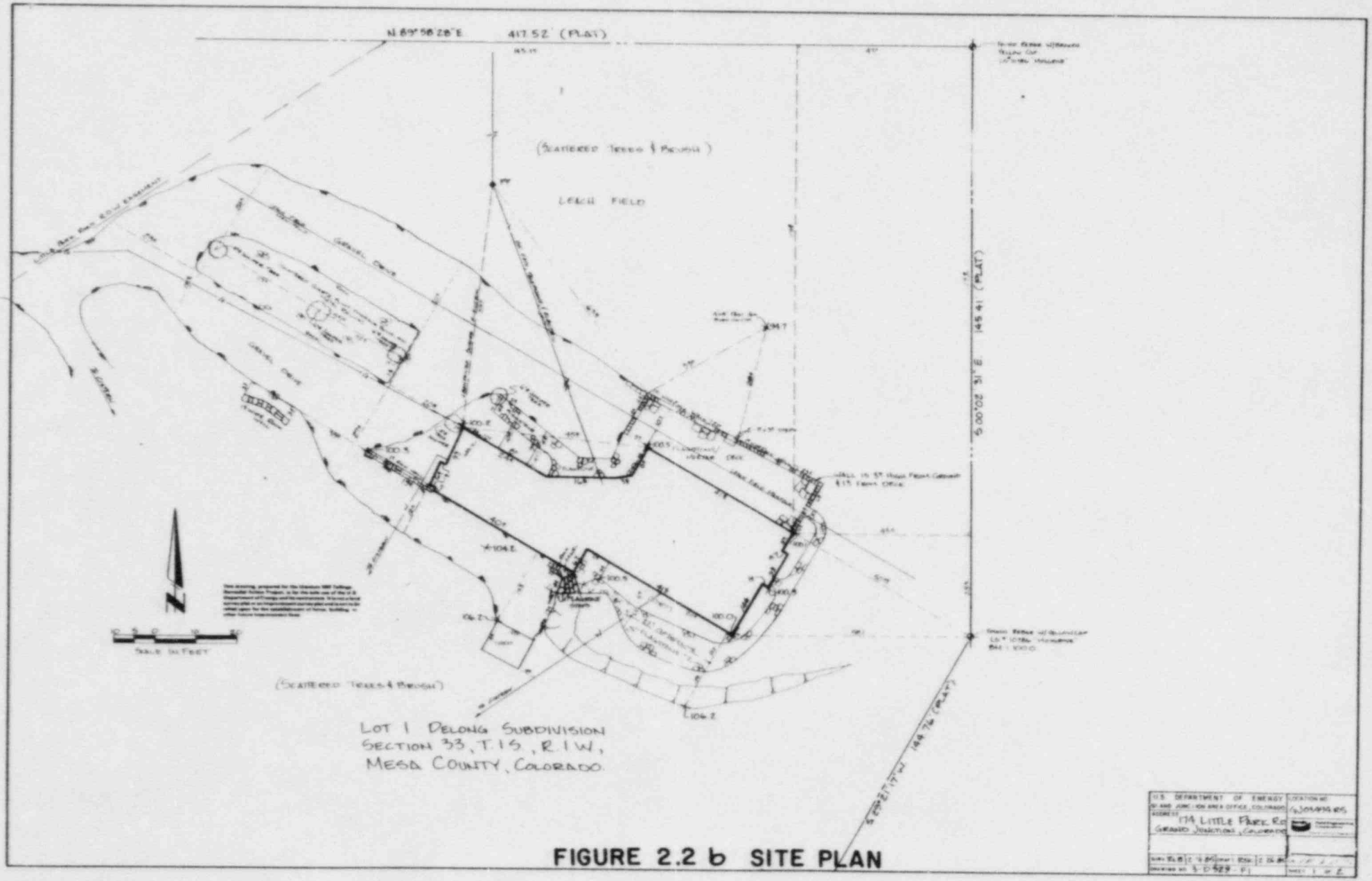
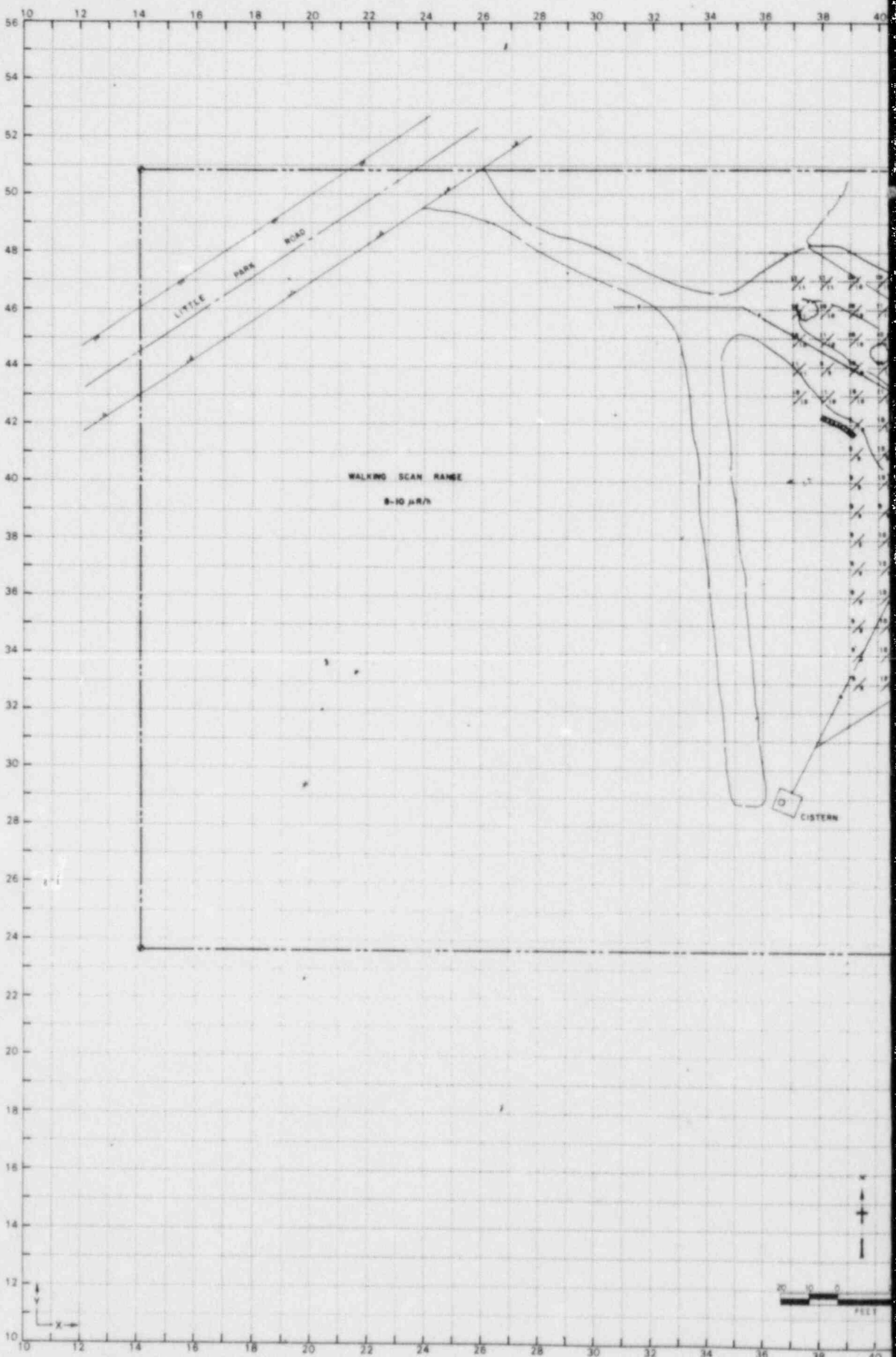
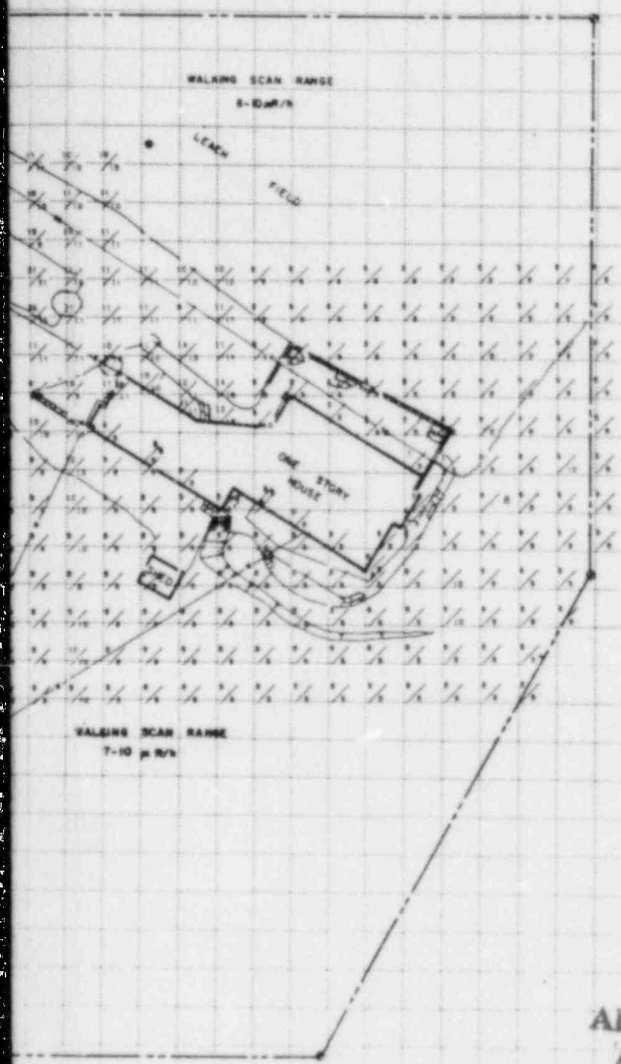


FIGURE 2.2 b SITE PLAN


LITTLE PARK ROAD
WALKING SCAN RANGE
8-10 μR/h
CISTERN
N
FEET



LEGEND

13/ GAMMA EXPOSURE RATE AT WAIST LEVEL
/18 GAMMA EXPOSURE RATE AT GROUND LEVEL
X NO READING TAKEN
ALL READINGS IN μR/h
10-12 GAMMA EXPOSURE RATES AT GROUND LEVEL IN μR/h

FIGURE 3.1
EXTERIOR GRID-POINT EXPOSURE RATES

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

174 LITTLE PARK ROAD
GRAND JUNCTION, COLORADO

Prepared by D. Cossey 4-19-95

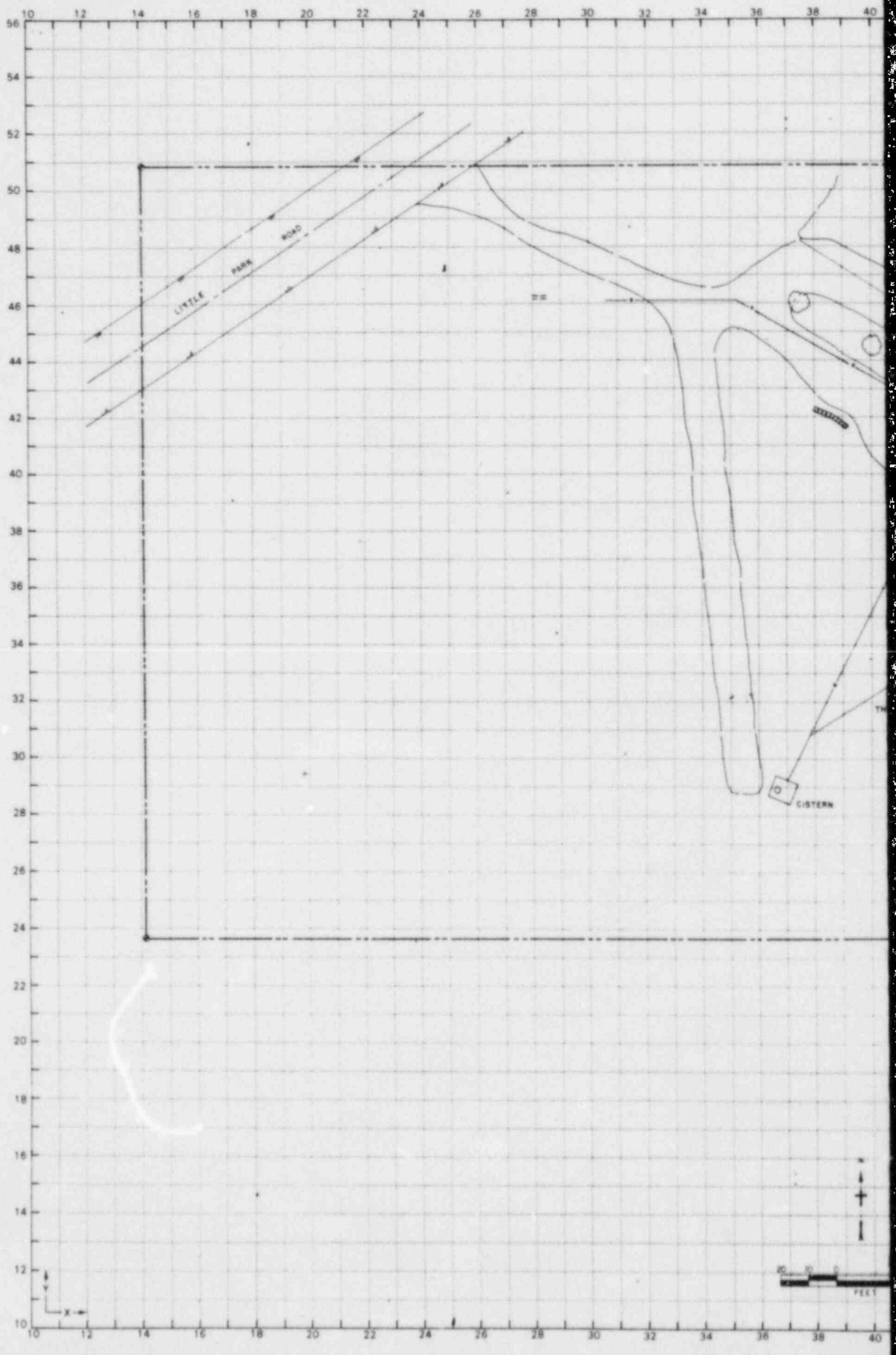
S. HART 5-95

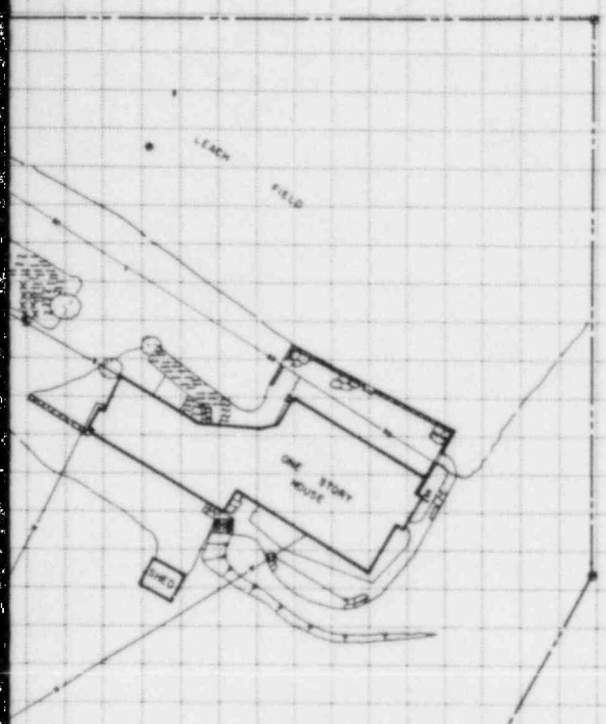
Field Engineering Corporation

LOCATION NO. GJ-03494-85

DWG NO. S-0529-G1 SHT 1 OF 4

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.


LITTLE PARK ROAD
CISTERN
FEET



HOG IS LOCATED IN GRID BLOCK 400430
HOG= 163 μR/h

LEGEND

GAMMA READINGS OF 150 TO 199 cpm
GAMMA READINGS OF 200 TO 500 cpm
GAMMA READINGS OF >500 cpm

FIGURE 3.2
EXTERIOR GAMMA SCAN

Also Available On
Aperture Card

TI
APERTURE
CARD

NO	DATE	REVISIONS	BY	CK	AE	APP

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

174 LITTLE PARK ROAD
GRAND JUNCTION, COLORADO

Bendix Field Engineering Corporation

LOCATION NO. GJ-03494-RS

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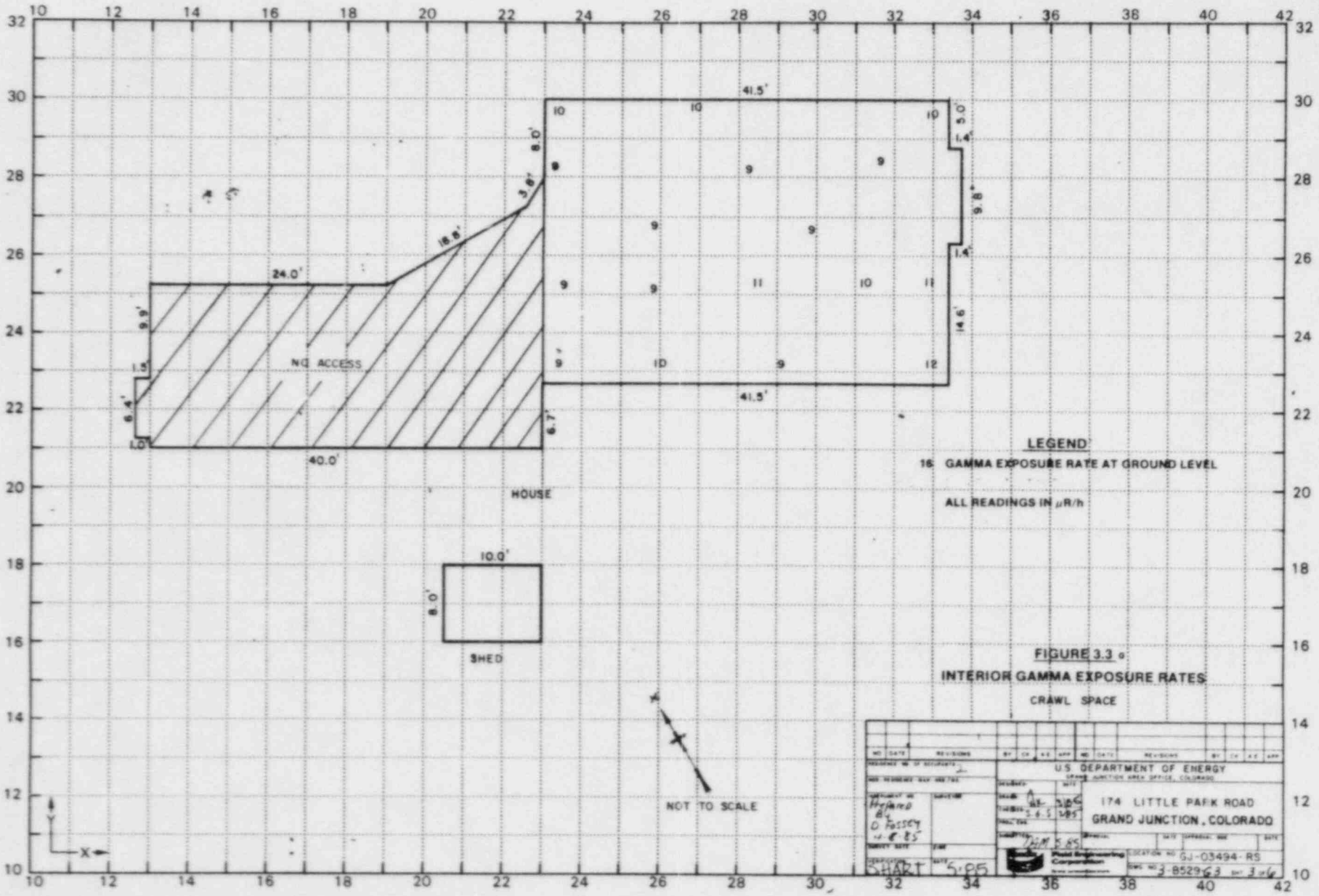


FIGURE 3.3 c

INTERIOR GAMMA EXPOSURE RATES

CRAWL SPACE

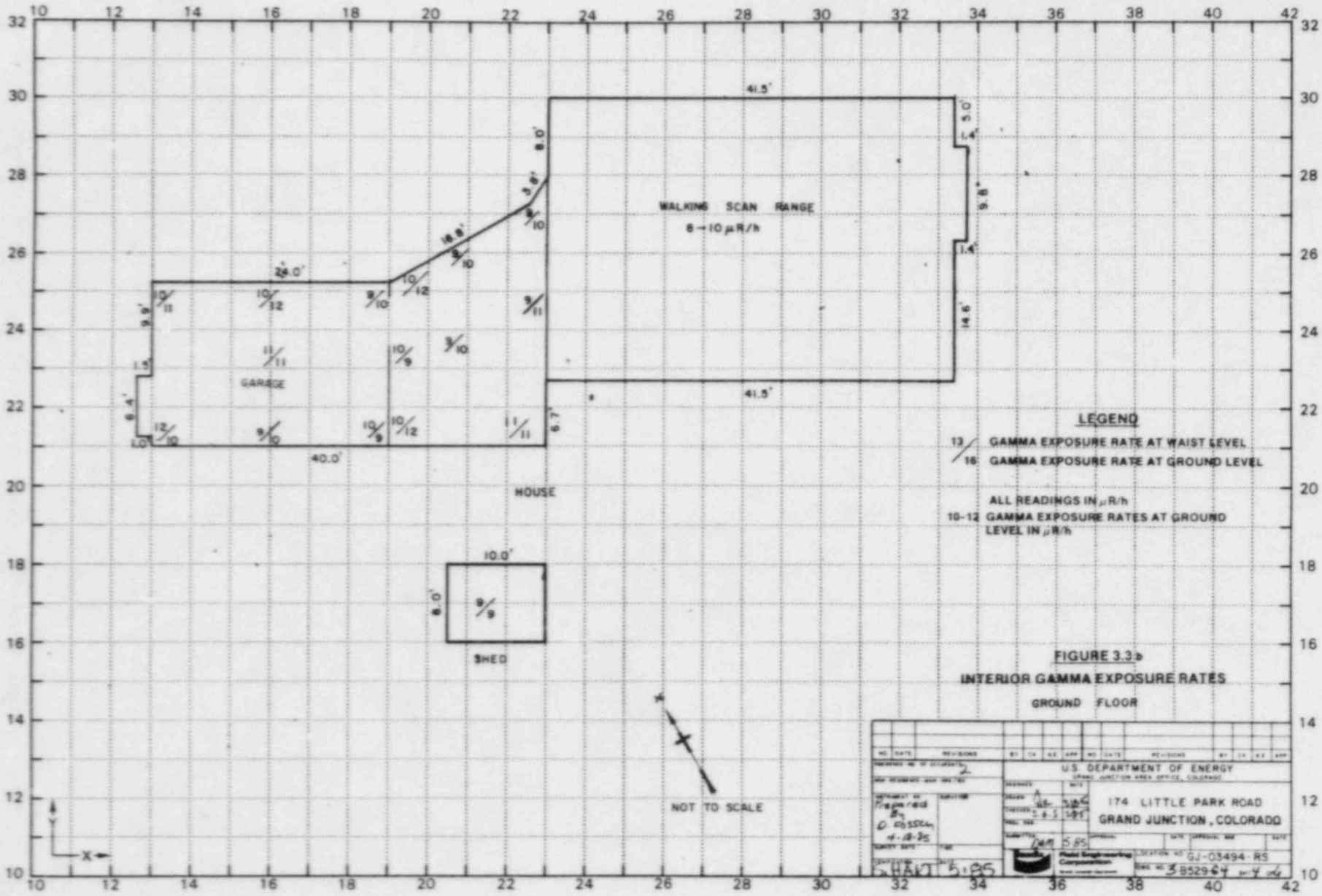
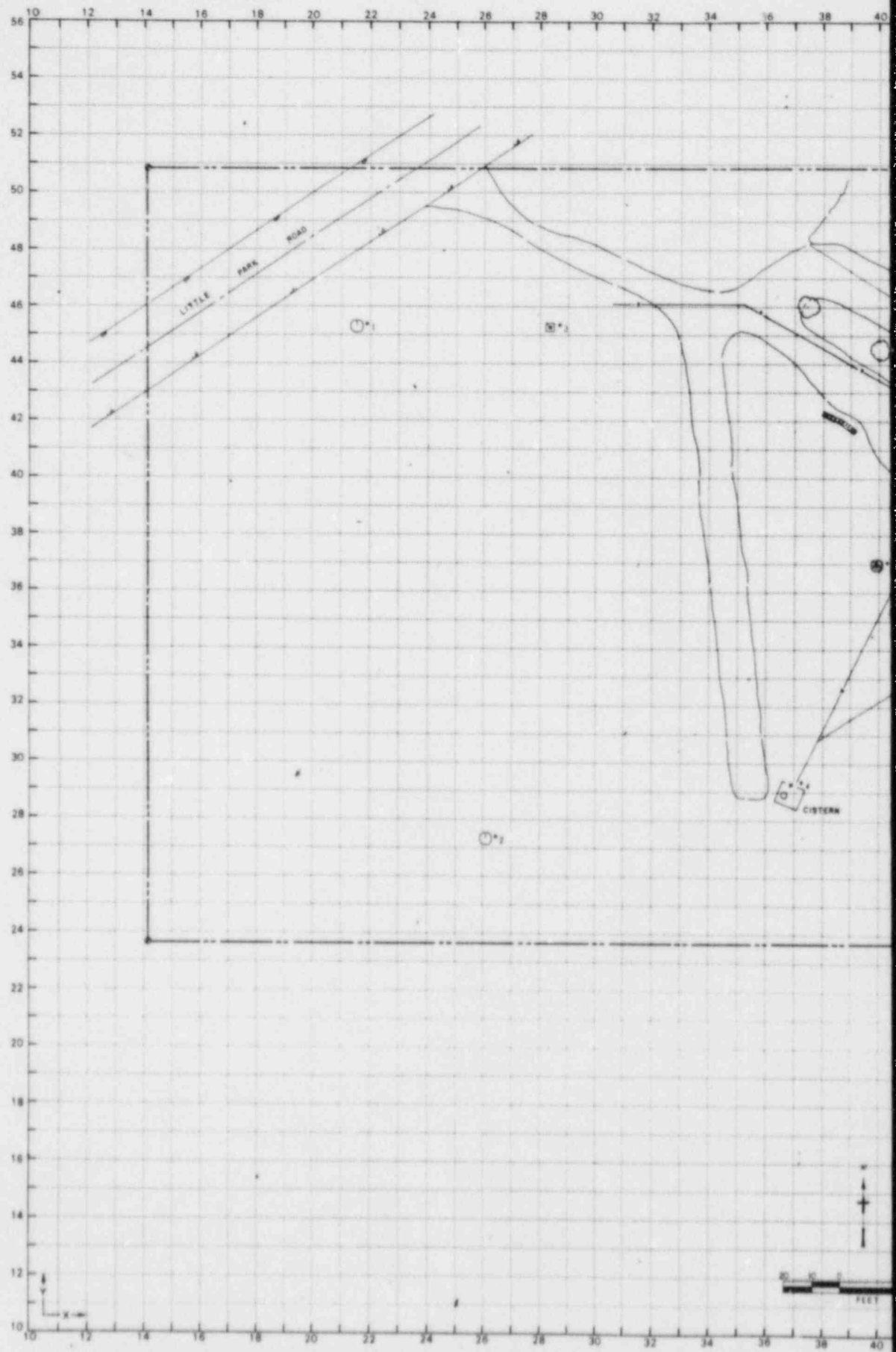
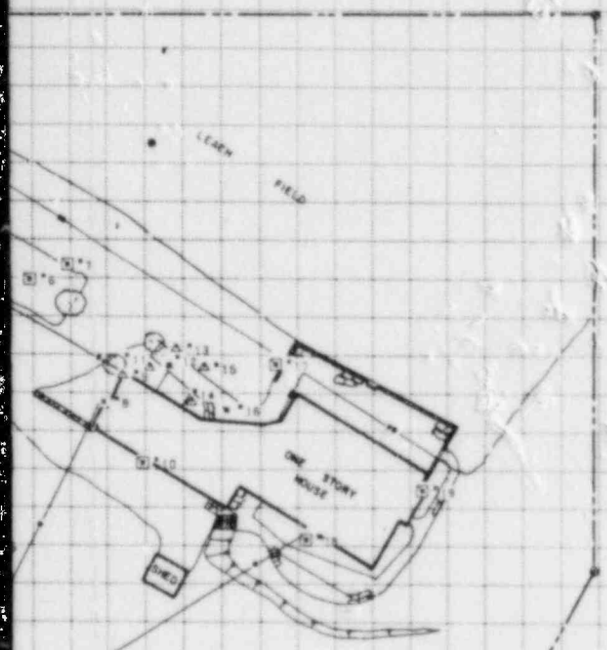


FIGURE 3.3-b

INTERIOR GAMMA EXPOSURE RATES

GROUND FLOOR


LITTLE PARK ROAD
CISTERN
FEET



LEGEND

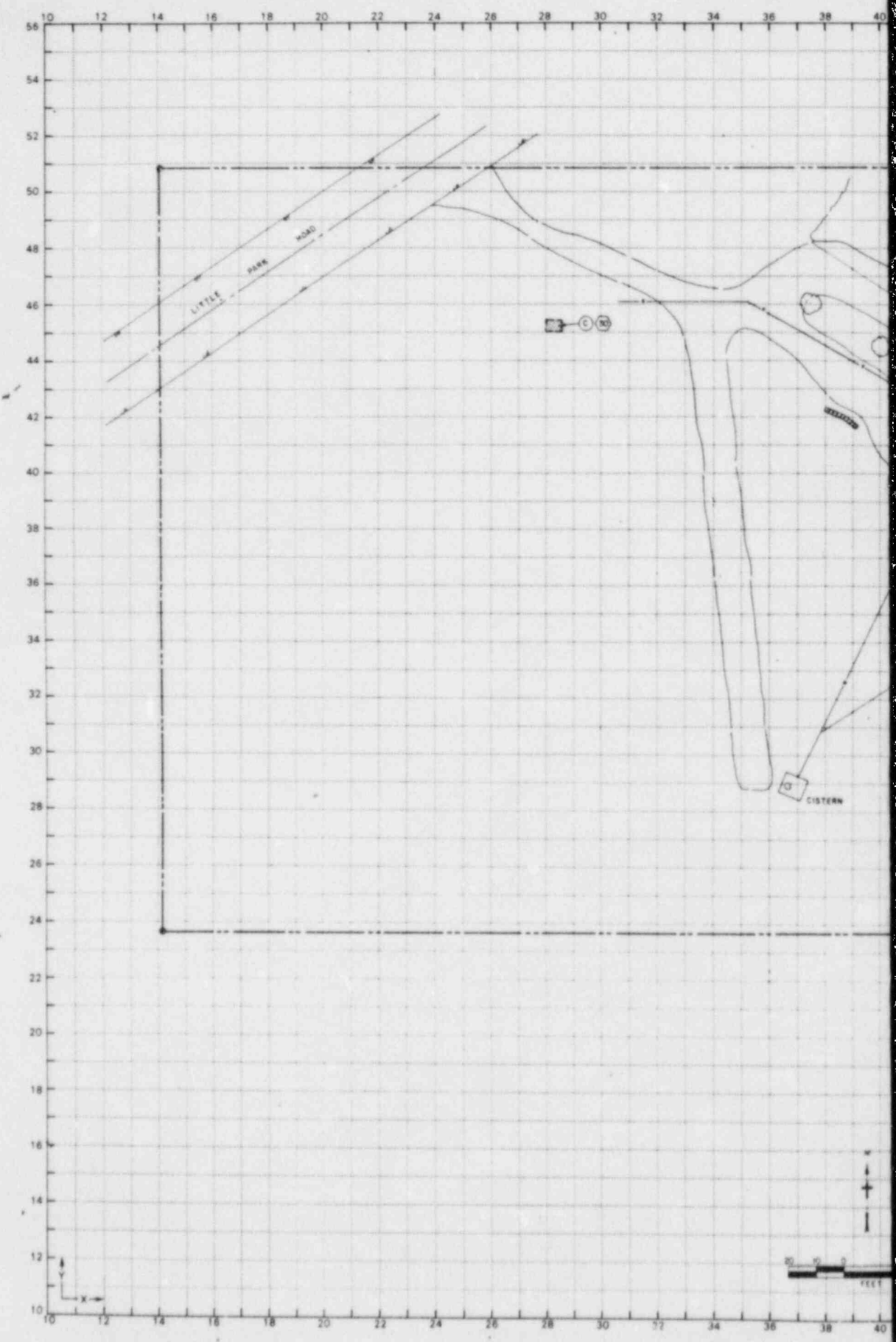
- BOREHOLE
- SPECTROMETER
- DELTA SCANNER
- SOIL SAMPLE
- LOCATION NUMBER

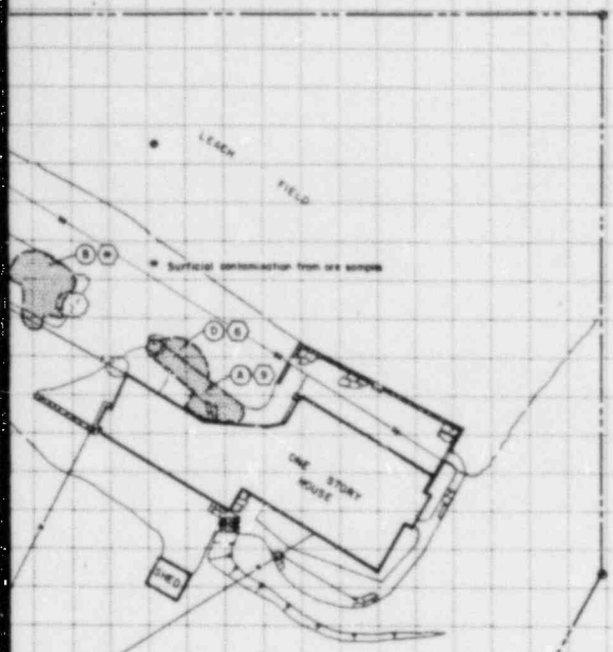
FIGURE 3.4
EXTERIOR SAMPLE LOCATIONS

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

174 LITTLE PARK RD
GRAND JUNCTION, COLORADO

Bendix Field Engineering Corporation


LITTLE PARK ROAD
CISTERN
FEET



LEGEND

- BOUNDARY OF CONTAMINATION
- (A) AREA OF CONTAMINATION
- (B) DEPTH OF CONTAMINATION (INCHES)
- CONTAMINATED AREA

FIGURE 33
ESTIMATED EXTENT OF CONTAMINATION

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

174 LITTLE PARK ROAD
GRAND JUNCTION, COLORADO

Bendix Field Engineering Corporation

LOCATION NO. GJ-03494-R5
DWG. NO. 3-0529-66 SH. 6 OF 6

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 as it is not to be relied upon for the establishment of fence, building, or other future improvement lines.

DRAWN BY: Prepared By D. Losey 4-18-85
CHECKED BY: Z. HART 5.85

8508010521-04

3/85

DOE ID NO. GJ-03494-RS Date 04/18/85

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

Official Survey Report

Property Address 174 Little Park Road

Property Owner Alfred and Kathy Delong

Address of Owner (if different from above) _____

Report Prepared By Daniel Fossey

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

1___1 No evidence of residual radioactive material on surveyed property.

1_X_1 Residual ractioactive materials found at the following locations:

1_X_1 In open areas.

1_X_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_X_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 = 12 uR/h
HOG = 163 uR/h

ALLIED Bendix Aerospace

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

April 22, 1985

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

ATTN: Jon Luellen

Dear Jon:

The following is in response to your questions and comments during the Technical Review concerning Department of Energy (DOE) Identification (ID) number GJ-03494-RS.

1. The depth of contamination has been changed to 30-inches in Area 'C'. There were elevated gamma readings in this area.

2. As per our conversation, the owner will not allow the removal of the ore specimens in Area 'B'. This will be noted in the Radiologic and Engineering Assessment (REA).

3. The sewer line enters the house at the northeast corner of the structure.

4. Area 'D' has been added to the estimated extent of contamination map to include the area in question.

Thank you for your time and cooperation. If you should have additional questions or comments you may contact me at 242-8621, extension 467.

Very truly yours,

Dan Fossey
RSD Survey Team

DF:pr

INTERNAL
MEMORANDUM

Bendix Field Engineering Corporation
Grand Junction Projects Office

Date: March 22, 1985

To: Files

From: Peter A. Trujillo IV

Subject: Team Leader Notes - GJ-03494-RS

Owner: Alfred and Kathy DeLong

Occupancy: 3

Address: 174 Little Park Road

Team Members

D. Herrera	D. Fossey
C. Adams	S. Larsen
P. Tuhey	M. Dexter
P. Hardy	B. Wilkins
S. Southern	H. Mattison
K. Cary	I. Caley
K. Bevan	
N. Wallace	

Colorado Department of Health (CDH) and Oak Ridge National Laboratory (ORNL) data indicate contamination in the driveway and adjacent flagstone walk.

Bendix team members arrived on the site at 9:18 A.M. and began gridding. The grid set-up was difficult due to the location of the major landmarks in relation to the grid lines (i.e. major landmarks were diagonal from grid lines) in addition to the slope of the land.

In addition to the area of contamination identified by CDH and ORNL, two other areas were discovered. Area 1: abutting the south fireplace and Area 2: abutting the dirt drive in a pile of ashes.

Approaching lunch time, so all team members were frisked and found to be free of contamination.

K. Bevan returned to the compound and N. Wallace arrived on the site to assist.

All drilling of boreholes was difficult due to the fact all boreholes hit obstructions.

Due to the sloping of the ground, the garage foundation on the west side was of greater depth.

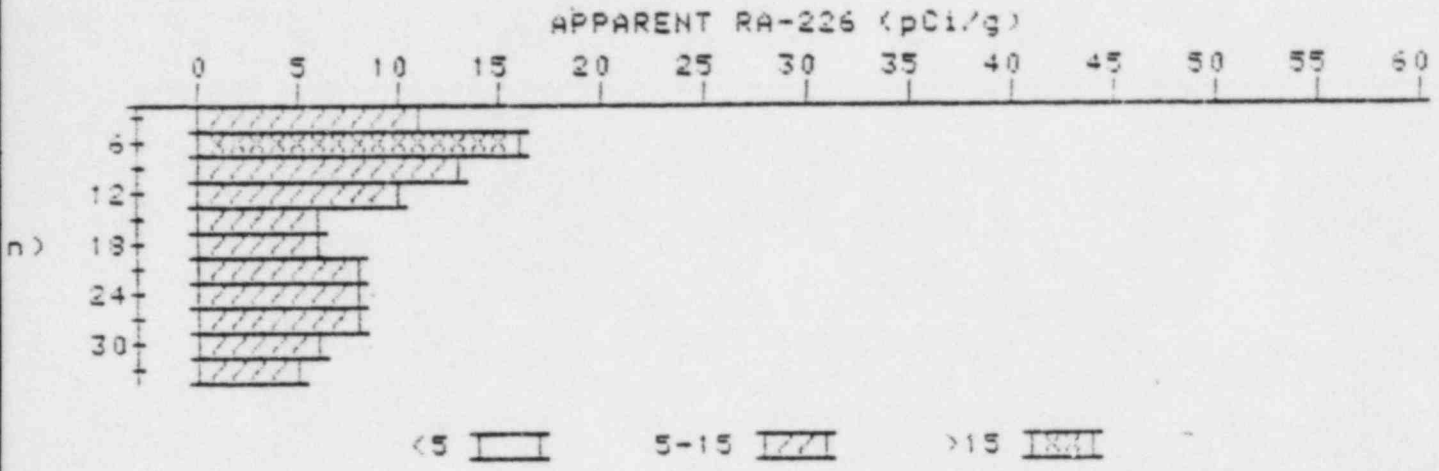
A walking scan was performed over 2.8 of the 3.2 acres of the property.

Contamination of Area 2 was discovered during the walking scan.

ECON V85.1<850117.1233>

PPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

OPERTY NUMBER: GJ-03494-RS
HOLE NUMBER: 3
LOCATION: 284453

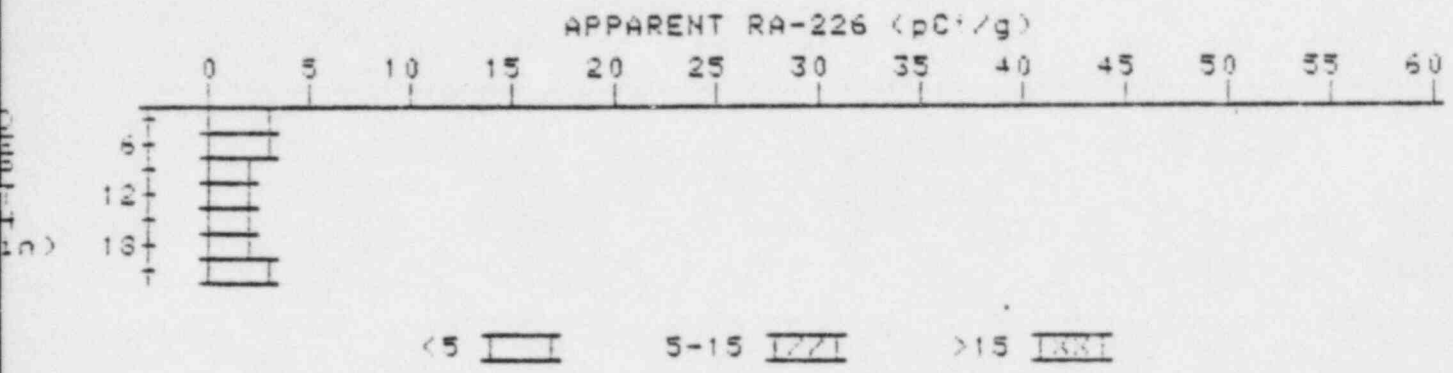


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	10.9	10.9
6	12.2	15.8
9	11.5	10.3
12	9.8	9.8
15	8.1	6.1
18	7.5	6.1
21	7.7	8.2
24	7.6	8.3
27	7.1	8.2
30	6.0	5.8
33	5.0	5.0

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03494-RS
HOLE NUMBER: 4
LOCATION: 370293



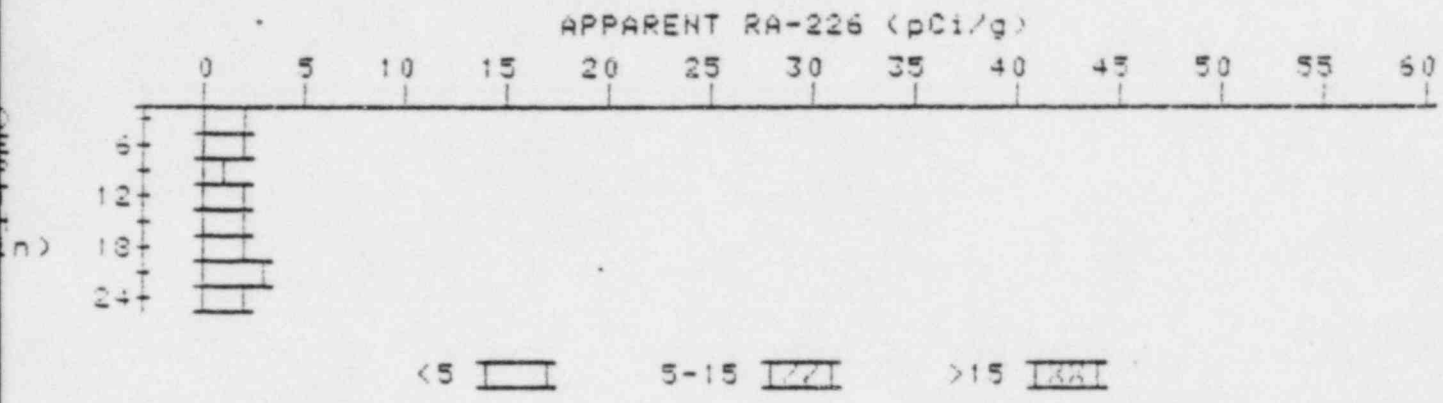
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.5	2.5
6	2.5	2.9
9	2.3	1.9
12	2.3	2.3
15	2.3	2.1
18	2.4	2.2
21	2.6	2.6

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

5

PROPERTY NUMBER: GJ-03494-R3
HOLE NUMBER: 5
LOCATION: 400370

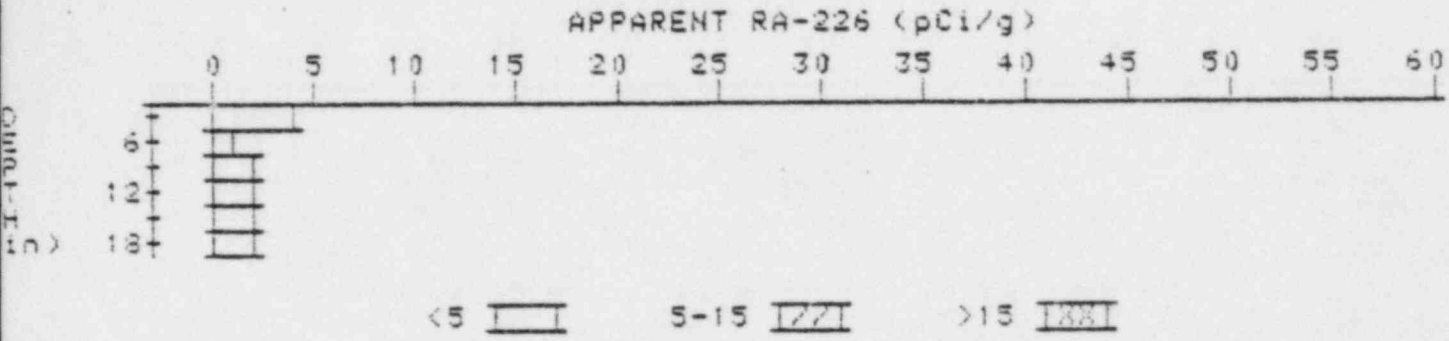


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	1.5	1.5
6	1.6	1.8
9	1.6	1.4
12	1.7	1.7
15	1.8	1.8
18	1.9	1.5
21	2.2	2.6
24	2.3	2.3

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

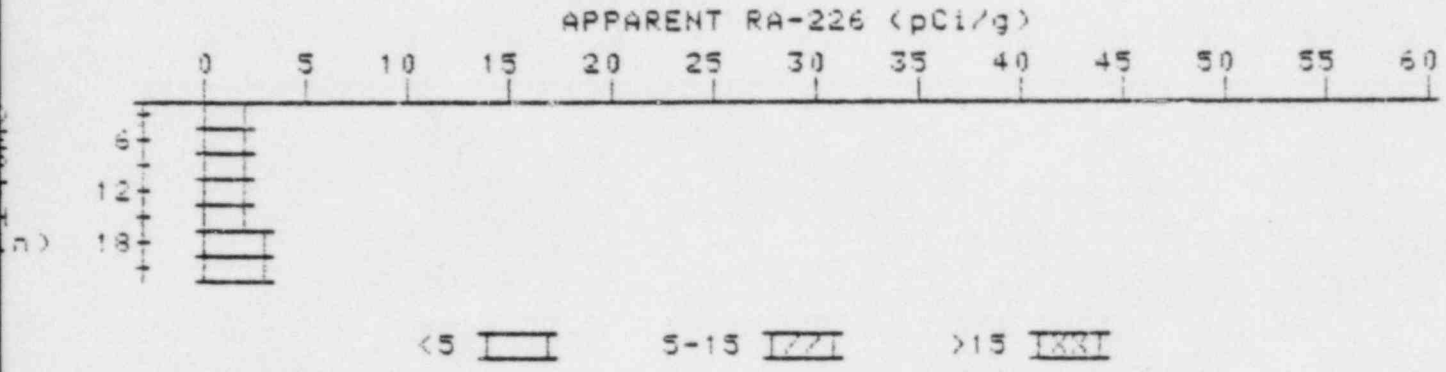
PROPERTY NUMBER: GJ-03494-RS
HOLE NUMBER: 6
LOCATION: 410440



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.8	3.8
6	2.7	1.5
9	2.3	1.9
12	2.1	1.6
15	2.2	2.4
18	2.2	2.2

PPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

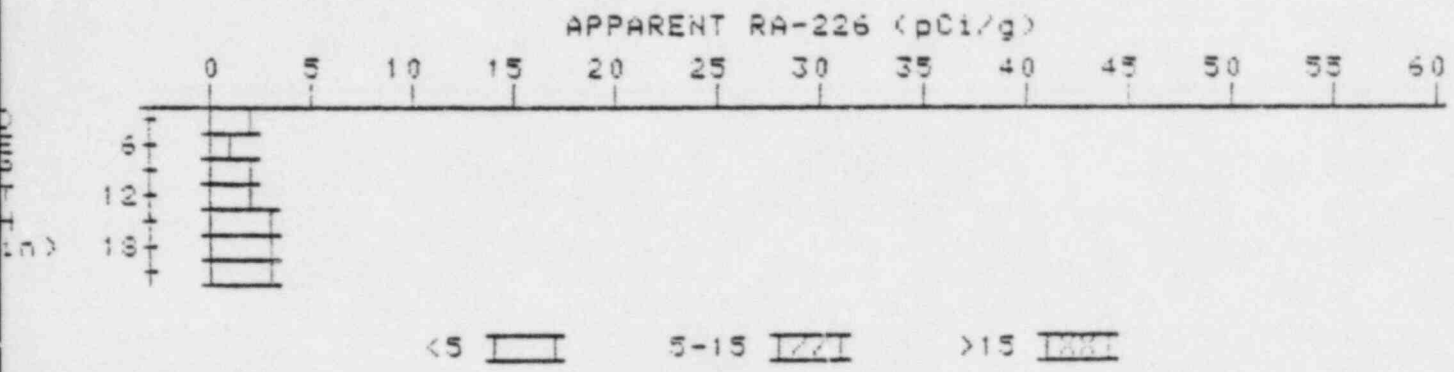
OPERTY NUMBER: GJ-03494-RS
HOLE NUMBER: 7
LOCATION: 420444,



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	1.8	1.8
6	1.9	1.9
9	2.0	2.0
12	2.1	1.7
15	2.4	2.4
18	2.7	2.9
21	2.9	2.9

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03494-RS
HOLE NUMBER: 8
LOCATION: 430408

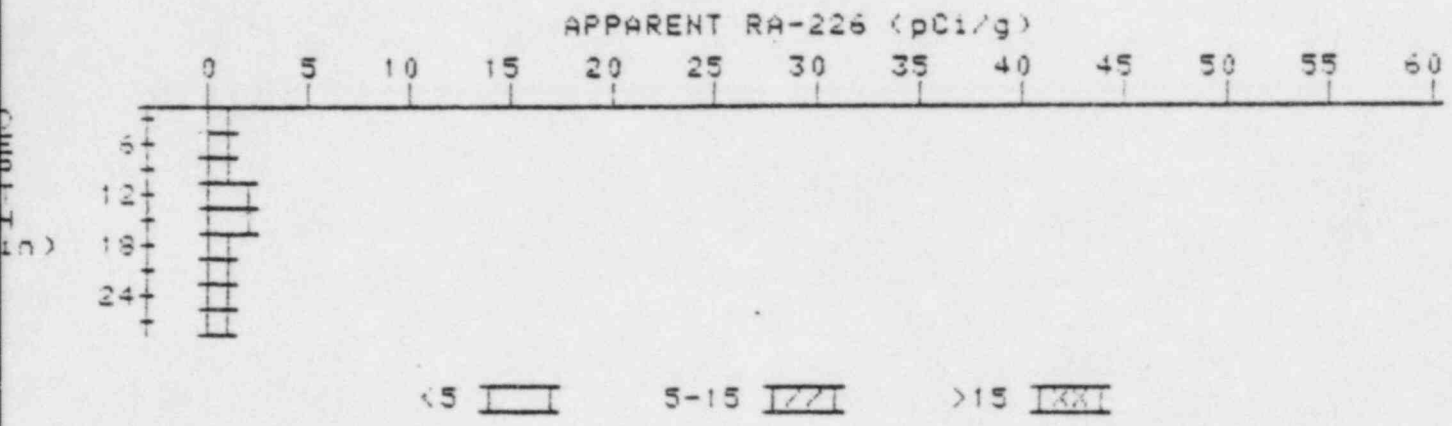


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	1.7	1.7
6	1.8	1.4
9	2.1	2.3
12	2.3	2.1
15	2.6	3.0
18	2.7	2.7
21	2.8	2.8

DECON V8S.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 10

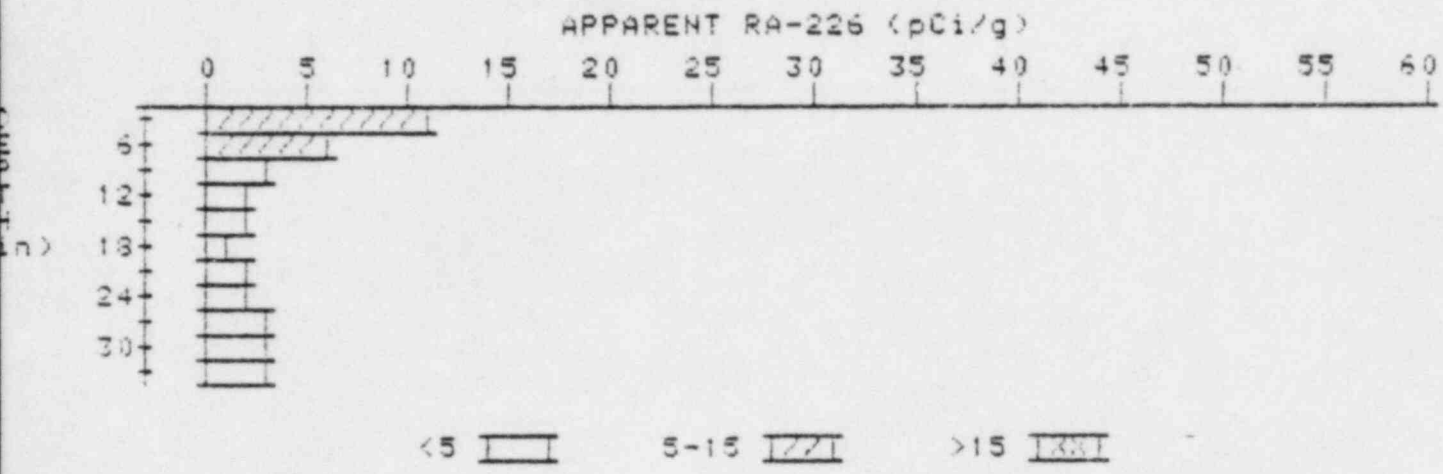
PROPERTY NUMBER: GJ-03494-RS
HOLE NUMBER: 10
LOCATION: 440392



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	1.4	1.4
6	1.4	1.4
9	1.4	1.2
12	1.5	1.7
15	1.5	1.7
18	1.4	1.4
21	1.3	1.3
24	1.2	1.0
27	1.2	1.2

APPARENT RADIUM-226 CONCENTRATION 12
DECONVOLUTION GRAPH

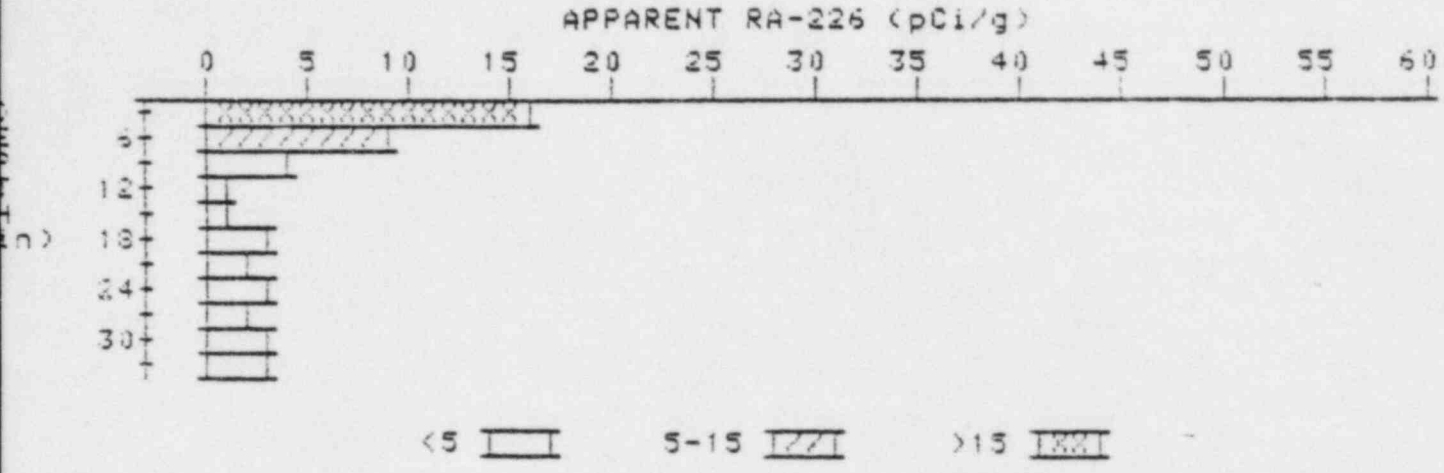
PROPERTY NUMBER: GJ-03494-RS
HOLE NUMBER: 12
LOCATION: 447418



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	10.6	10.6
6	7.3	6.1
9	4.7	2.9
12	3.1	1.5
15	2.4	1.9
18	2.0	1.1
21	2.1	2.1
24	2.2	2.0
27	2.4	2.6
30	2.5	2.5
33	2.6	2.6

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 16

ROPERTY NUMBER: GJ-03494-RS
HOLE NUMBER: 16
LOCATION: 462406

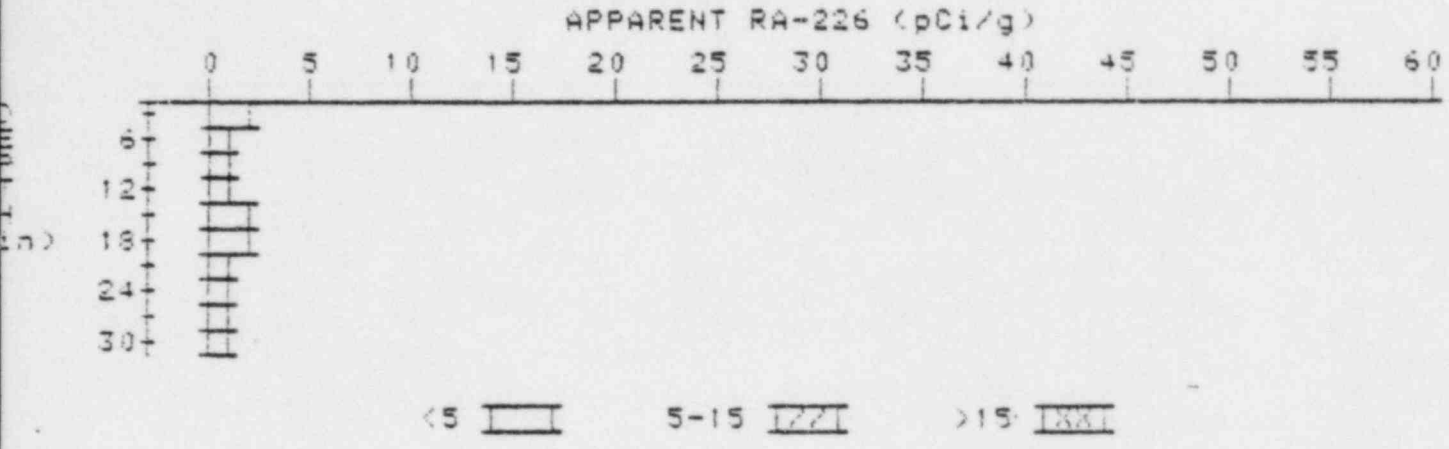


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	15.7	15.7
6	10.5	8.5
9	6.4	3.9
12	3.7	.7
15	2.7	1.3
18	2.5	2.5
21	2.3	1.6
24	2.5	2.9
27	2.5	2.3
30	2.6	2.8
33	2.6	2.6

DECQN V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION 17
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03494-RS
HOLE NUMBER: 17
LOCATION: 475418

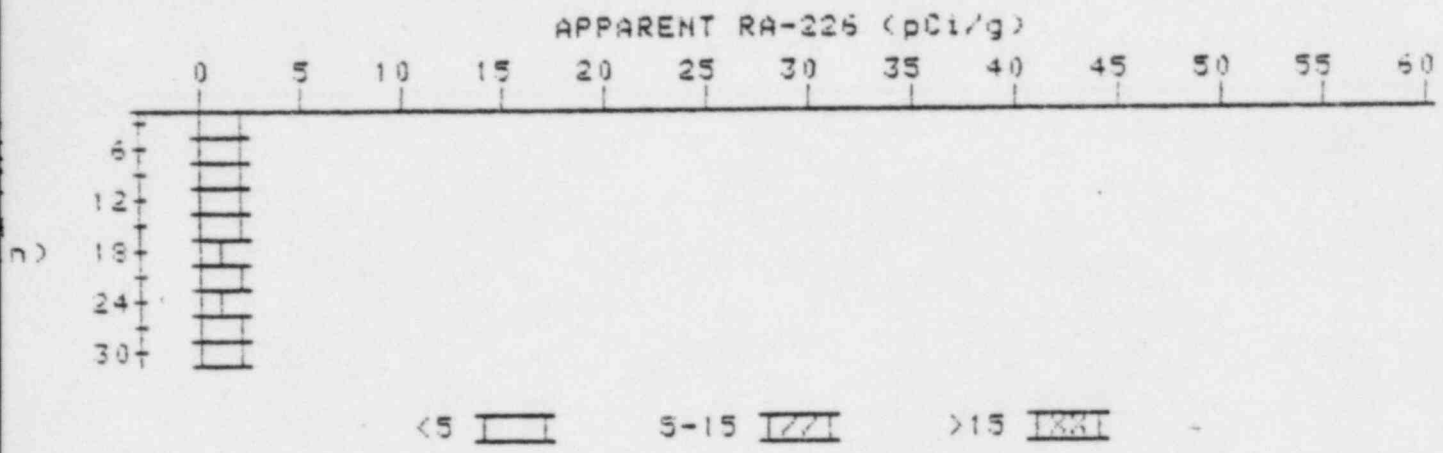


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	1.5	1.5
6	1.4	1.4
9	1.3	.9
12	1.4	1.2
15	1.6	2.0
18	1.6	1.8
21	1.5	1.5
24	1.4	1.2
27	1.4	1.4
30	1.4	1.4

ECON V85.1<850117.1233>

PPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 18

OPERTY NUMBER: GJ-03494-RS
HOLE NUMBER: 18
LOCATION: 483372



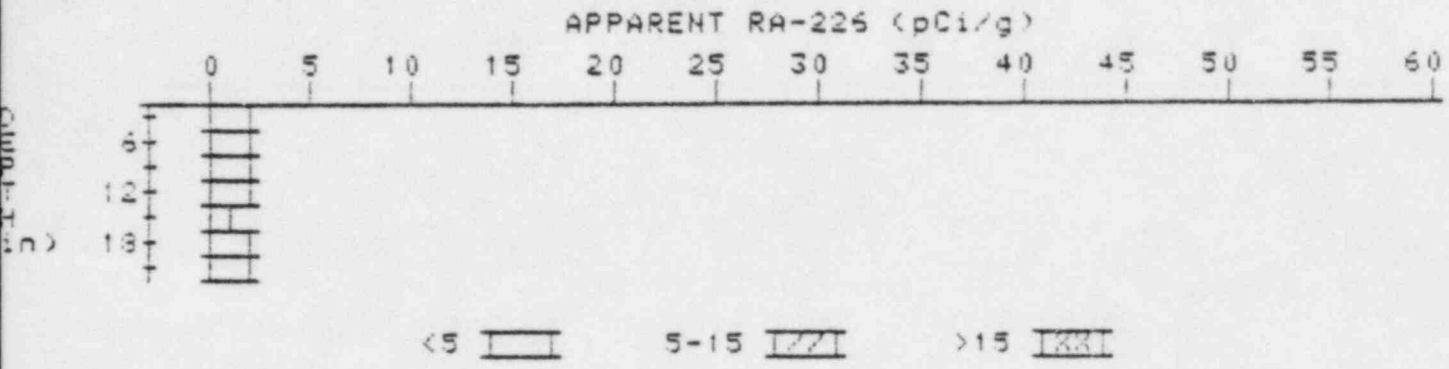
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	1.7	1.7
6	1.7	1.7
9	1.7	1.7
12	1.7	1.7
15	1.7	1.9
18	1.6	1.2
21	1.7	2.1
24	1.6	1.4
27	1.6	1.8
30	1.5	1.5

DECON V85.1<850117.1233>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

19

PROPERTY NUMBER: GJ-03494-RS
HOLE NUMBER: 19
LOCATION: 514385



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.1	2.1
6	2.0	2.0
9	1.9	2.1
12	1.7	1.7
15	1.5	1.1
18	1.5	1.5
21	1.5	1.5