

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-03999-RS
ADDRESS: 1930 Kennedy Avenue

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. Tucker
M. TUCKER
DOE PROJECT ENGINEER

DATE

July 12, 1985

REA03999:AB004

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PDR WASTE
WM-54 PDR

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-03999-RS, is a single-family residence located at 1930 Kennedy 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, 16 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$3,137. Remedial action on this property will take approximately 14 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 1930 Kennedy Avenue, Grand Junction, Colorado

Zoning: Residential (RSF-8)

Lot Size: Approximately 7,750 sf (0.18 acres)

Legal Description: Lot 28, Block 2, Arcadia Village Refile, City of Grand Junction, County of Mesa, State of Colorado.

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

Utilities: Utility locations are shown in Appendix Figure 2.2.

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

Bordering Properties:

| | |
|--------|-------------------------|
| North: | Alley |
| South: | Kennedy Avenue |
| East: | Single-family residence |
| West: | Single-family residence |

2.2 Existing Facilities and Structures

Primary Structure:

| | |
|--------------------|---|
| Type: | Single-story residence with attached carport |
| Size: | Approximately 850 sf |
| Construction Date: | 1954 |
| Construction: | Wood-frame |
| Foundation: | Concrete stemwall on spread footing |
| Footing Depth: | Approximately 37" to bottom of footing from grade |
| Basement: | None |
| Crawl Space: | Yes - Under entire living area |
| Condition: | Good |

Other Structures:

| | |
|---------------|------------------------|
| Type: | Shed No. 1 |
| Size: | Approximately 48 sf |
| Construction: | Prefabricated metal |
| Foundation: | Concrete slab-on-grade |
| Condition: | Good |

| | |
|---------------|---------------------|
| Type: | Shed No. 2 |
| Size: | Approximately 48 sf |
| Construction: | Prefabricated metal |
| Foundation: | None |
| 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-03999-RS on May 7, 1985. Data collection methods were performed in accordance with procedures fully described in the Radiologic Support Operations Procedures Manual (J-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 the covered patio north of the primary structure, in the rock garden north of the patio, and in the rock garden in the northeast corner of the property.

The Bendix radiologic survey was designed to investigate the entire property, with emphasis on previously identified areas of contamination. Conclusions based upon data analyses are discussed in Section 3.5, Extent of Contamination. Photocopies of the Official Survey Report, team leader notes, and deconvolution graphs are included in the Appendix (Section 6.0).

3.2 Gamma Exposure-Rate Surveys

3.2.1 Exterior Findings

Background Readings: 14 to 16 uR/h
Highest Outside Gamma Reading (HOG): 118 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: 14 to 17 uR/h
Highest Inside Gamma Reading (HIG): 17 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.

3.3 Boreholes, Soil Samples, and Other Measurements

Areas which displayed elevated gamma levels were further investigated; these areas are shown in Appendix Figures 3.3a and 3.4. 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 Sequix.

3.5 Extent of Contamination

Appendix Figures 3.5a and 3.5b 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) Under the shed (Shed 1) on the covered patio north of the primary structure, there is an 8-inch layer of contaminated soil under a 4-inch-thick concrete slab. The total depth of contamination is 12 inches. (NOTE: Shed 1 is portable and shall be considered as exterior involvement and part of Area B. For combined square footage, see under Area B.)
- (AREA B) The covered patio north of the primary structure is contaminated. There is an 8-inch layer of contaminated soil under the 4-inch-thick concrete slab. The total depth of contamination is 12 inches (approximately 390 sf).
- (AREA C) In the northeast corner of the property, there is a contamination in the rock garden. The depth of contamination is 6 inches (approximately 75 sf).
- (AREA D) In the rock garden, a strip of soil along the east fence line is contaminated to a depth 9 inches (approximately 30 sf).

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-03999-RS, includes removal of all areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figures 3.5a and 3.5b) 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 \$3,137.

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 Gamma Scan |
| Figure 3.3a | Interior Gamma Exposure Rates and Samples Locations - Crawl Space |
| Figure 3.3b | Interior Gamma Exposure Rates - Ground Floor |
| Figure 3.4 | Exterior Sample Locations |
| Figure 3.5a | Interior Estimated Extent of Contamination |
| Figure 3.5b | Exterior Estimated Extent of Contamination |
| Official Survey Report | |
| Team Leader Notes | |
| Deconvolution Graphs (Apparent Radium-226 Concentration) | |

Radium Concentrations at Exterior Locations

DOE ID #GJ-03999-RS

1930 Kennedy 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. | | |
| 4 | 160290 | 00 | DS | 1.2 | | * | Northwest corner of property |
| 5 | 166210 | 00 | DS | <1.0 | | * | West yard |
| 6 | 170184 | 00 | DS | 1.5 | | * | Gas line |
| | | 24 | DS | <1.0 | | * | |
| 7 | 180240 | 00 | DS | 1.7 | | * | North of patio |
| | 180240 | 06 | DS | <1.0 | | * | |
| 8 | 186170 | 00 | DS | 1.2 | | * | Next to water line |
| | | 00 | GS | | 1.1 | * | Water meter |
| | | 00-06 | SS | | | | |
| | | 03 | TC | 3.1 | | * | Background |
| | | 06 | TC | 3.4 | | * | |
| | | 09 | TC | 3.5 | | * | |
| | | 12 | TC | 3.5 | | * | DC = 0 inches |
| | | 15 | TC | 3.6 | | * | |
| | | 18 | TC | 3.6 | | * | |
| | | 21 | TC | 3.6 | | * | |
| | | 24 | TC | 3.6 | | * | |
| | | 27 | TC | 3.6 | | * | |
| | | 30 | TC | 3.6 | | * | |
| 9 | 186199 | 03 | TC | 3.5 | | * | Next to water line |
| | | 06 | TC | 3.6 | | * | South of primary structure |
| | | 09 | TC | 3.6 | | * | |
| | | 12 | TC | 3.5 | | * | |
| | | 15 | TC | 3.5 | | * | DC = 0 inches |
| | | 18 | TC | 3.5 | | * | |
| | | 21 | TC | 3.4 | | * | |
| | | 24 | TC | 3.6 | | * | |
| | | 27 | TC | 3.6 | | * | |
| | | 30 | TC | 3.6 | | * | |
| 10 | 190290 | 00 | DS | 1.9 | | * | Backyard |
| | | 06 | DS | 2.0 | | * | |
| | | 12 | DS | 1.8 | | * | |

Radium Concentrations at Exterior Locations

DOE ID #GJ-03999-RS

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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. | | |
| 11 | 191228 | 00-04 | SS | | | | |
| | | 04-10 | SS | | | | |
| | | 03 | TC | 13.7 | | * | On patio |
| | | 06 | TC | 10.8 | | * | Next to sewer line |
| | | 09 | TC | 7.7 | | * | |
| | | 12 | TC | 6.0 | | * | DC = 12 inches |
| | | 15 | TC | 4.9 | | * | Based on the |
| | | 18 | TC | 4.6 | | * | deconvolution graph |
| | | 21 | TC | 4.3 | | * | |
| | | 24 | TC | 4.3 | | * | |
| | | 27 | TC | 4.2 | | * | |
| | | 30 | TC | 4.2 | | * | |
| | | 33 | TC | 4.2 | | * | |
| | | 36 | TC | 4.1 | | * | |
| 12 | 191239 | 03 | TC | 3.5 | | * | North of patio by |
| | | 06 | TC | 3.7 | | * | sewer line |
| | | 09 | TC | 3.8 | | * | |
| | | 12 | TC | 3.8 | | * | |
| | | 15 | TC | 3.8 | | * | |
| | | 18 | TC | 3.8 | | * | |
| | | 21 | TC | 3.8 | | * | DC = 0 inches |
| | | 24 | TC | 3.8 | | * | |
| | | 27 | TC | 3.7 | | * | |
| | | 30 | TC | 3.7 | | * | |
| 13 | 200289 | 00 | DS | 1.8 | | * | In northeast rock |
| | | 06 | DS | 2.1 | | * | garden |
| | | 12 | DS | 1.0 | | * | |
| 14 | 202232 | 03 | TC | 4.7 | | * | East of patio |
| | | 06 | TC | 4.5 | | * | |
| | | 09 | TC | 4.1 | | * | |
| | | 12 | TC | 3.9 | | * | |
| | | 15 | TC | 3.8 | | * | |
| | | 18 | TC | 3.8 | | * | |
| | | 21 | TC | 3.8 | | * | DC = 0 inches |
| | | 24 | TC | 3.8 | | * | |
| | | 27 | TC | 3.8 | | * | |
| | | 30 | TC | 3.7 | | * | |
| | | 33 | TC | 3.8 | | * | |

Radium Concentrations at Exterior Locations

DOE ID #GJ-03999-RS

1930 Kennedy 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. | | |
| 15 | 205195 | 00 | DS | 1.6 | | * | Southeast yard |
| | | 06 | DS | 1.1 | | * | |
| 16 | 208199 | 03 | TC | 4.0 | | * | Southeast yard DC = 0 inches |
| | | 06 | TC | 4.2 | | * | |
| | | 09 | TC | 4.0 | | * | |
| | | 12 | TC | 3.9 | | * | |
| | | 15 | TC | 3.9 | | * | |
| | | 18 | TC | 3.9 | | * | |
| | | 21 | TC | 3.9 | | * | |
| | | 24 | TC | 3.8 | | * | |
| | | 27 | TC | 3.9 | | * | |
| 17 | 210215 | 03 | TC | 3.4 | | * | East of primary structure DC = 0 inches |
| | | 06 | TC | 3.6 | | * | |
| | | 09 | TC | 3.6 | | * | |
| | | 12 | TC | 3.6 | | * | |
| | | 15 | TC | 3.6 | | * | |
| | | 18 | TC | 3.6 | | * | |
| | | 21 | TC | 3.6 | | * | |
| | | 24 | TC | 3.5 | | * | |
| | | 27 | TC | 3.5 | | * | |
| 18 | 210280 | 00 | DS | 3.6 | | * | Northeast rock garden DC = 6 inches |
| | | 06 | DS | 1.2 | | * | |
| 19 | 212202 | 00 | DS | <1.0 | | * | Southeast yard |
| | | 00 | GS | | 1.3 | * | |
| 20 | 212285 | 03 | TC | 16.6 | | * | Northeast rock garden DC = 9 inches Based on the deconvolution graph |
| | | 06 | TC | 12.6 | | * | |
| | | 09 | TC | 9.3 | | * | |
| | | 12 | TC | 6.7 | | * | |
| | | 15 | TC | 5.2 | | * | |
| | | 18 | TC | 4.7 | | * | |
| | | 21 | TC | 4.5 | | * | |
| | | 24 | TC | 4.4 | | * | |

Radium Concentrations at Exterior Locations

DOE ID #GJ-03999-RS

1930 Kennedy Avenue

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| Loc # | Grid Location | Depth (in.) | Meas. Type | In Situ Ra-226 | | Chem Ra-226 (pCi/g) | Comments |
|-------|---------------|-------------|------------|----------------|---------|---------------------|----------|
| | | | | (pCi/g) | | | |
| | | | | Tot. Ct | Spectr. | | |
| 20 | 212285 | 27 | TC | 4.5 | | * | |
| | | 30 | TC | 4.5 | | * | |
| | | 33 | TC | 4.3 | | * | |
| | | 36 | TC | 4.1 | | * | |
| | | 39 | TC | 4.1 | | * | |
| | | 42 | TC | 4.0 | | * | |
| | | 45 | TC | 4.1 | | * | |
| | | 48 | TC | 4.0 | | * | |
| | | 51 | TC | 4.0 | | * | |
| | | 54 | TC | 4.0 | | * | |

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 = 05-07-85
Team Leader = RS

Radium Concentrations at Interior Locations

DOE ID #GJ-03999-RS

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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 | 1.4 | | * | On dirt in crawl space along south wall |
| 2 | | 00 00-06 | DS SS | 2.2 | | * | On footing in crawl space along south wall |
| 3 | | 00 | DS | 1.4 | | * | Southeast corner in crawl space on footing |

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 = 05-07-85
Team Leader = RS

Table 3.3
Summary of Interior Gamma Exposure Rates

DOE ID No. GJ-03999-RS 1930 Kennedy Avenue Page 1 of 1

| 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 | * | * | * | 12 | 17-19 | 18 |
| GROUND FLOOR | * | * | * | * | 14-17 | * |
| SHED 1 | 03 | 17-24 | 20 | 03 | 21-31 | 25 |
| SHED 2 | * | * | * | * | 16-16 | * |

* The CDH and ORNL data indicate the absence of interior contamination at this property. This information was investigated by performing walking gamma scans. These areas and the ranges of gamma measurements are shown in the Appendix Figure 3.3b. Exposure rates in Shed 1 are shown in Appendix Figure 3.3b.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-03999-RS

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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> |
|-------------------|-------------------------|-----------|------------------|-----------|--------------------|
| <u>EXTERIOR</u> | | | | | |
| Concrete | | | | | |
| A,B | 30 x 13 = | 390 | | | |
| | minus planter = | (28) | | | |
| | | | | | |
| | | 362 | x 0.3 = | 109 | |
| | | | | | |
| | Volume of Concrete | | | = 109 | = 109/27 = 4 |
| Contaminated Fill | | | | | |
| A,B | 30 x 13 = | 390 | x 0.7 = | 273 | |
| C | 15 x 10/2 = | 75 | x 0.5 = | 38 | |
| D | 3 x 10 = | 30 | x 0.8 = | 24 | |
| | | | | | |
| | Volume of Fill | | | = 335 | = 335/27 = 12 |
| | | | | | |
| | TOTAL VOLUME - EXTERIOR | | | | = 16 |

Note: Shed 1 in Area A is portable and shall be considered as exterior involvement and part of Area B.

See Appendix Figures 3.5a and 3.5b For Areas

=====

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-03999-RS

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EXTERIOR

Remove/store/replace metal shed and contents
Lump Sum

\$ 200

Remove/replace concrete patio
362 sf @ \$3/sf

1,086

Support patio walls
22 lf @ \$3/lf

66

Remove identified residual radioactive material
5 cy @ \$44/cy (manual - open)
7 cy @ \$14.50/cy (machine - close)

220

102

Replace areas with roadbase
11 cy @ \$11.50/cy

127

Replace area with topsoil
1 cy @ \$9.50/cy

10

Replace area with sod
75 sf @ \$0.50/sf

38

TOTAL EXTERIOR \$ 1,849

TOTAL INTERIOR 0

ACCESS CONTROL 100

SUBTOTAL \$ 1,949

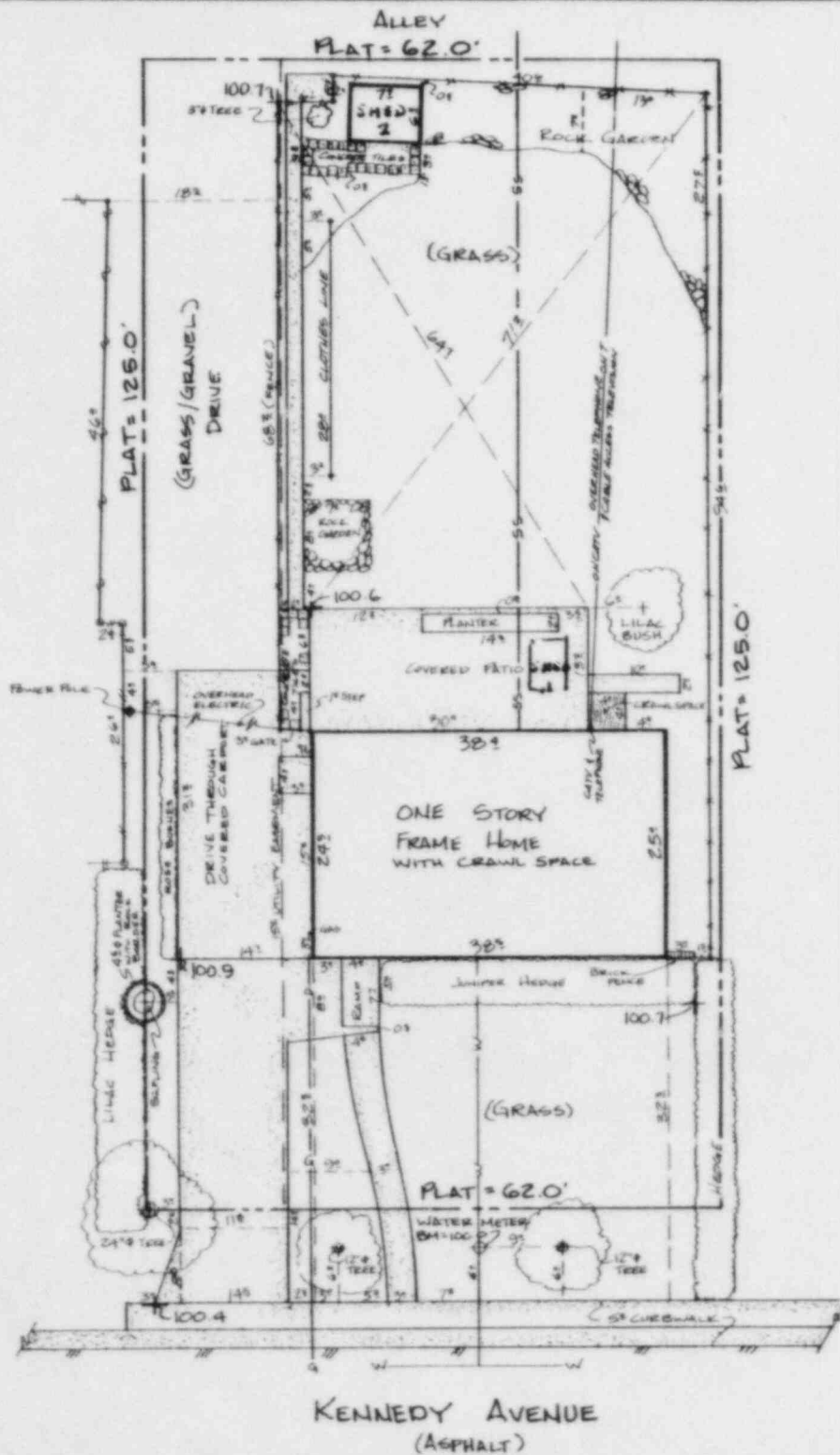
CONTINGENCY @ 15% 292

SUBTOTAL \$ 2,241

CONTRACTOR OVERHEAD & PROFIT @ 40% 896

GRAND TOTAL \$ 3,137

SC071185
REA03999.AB004/LAJ



LOT 28 BLOCK 2 ARCADIA VILLAGE REFILE,
CITY OF GRAND JUNCTION, COLORADO.

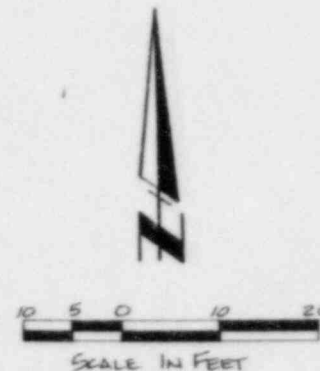
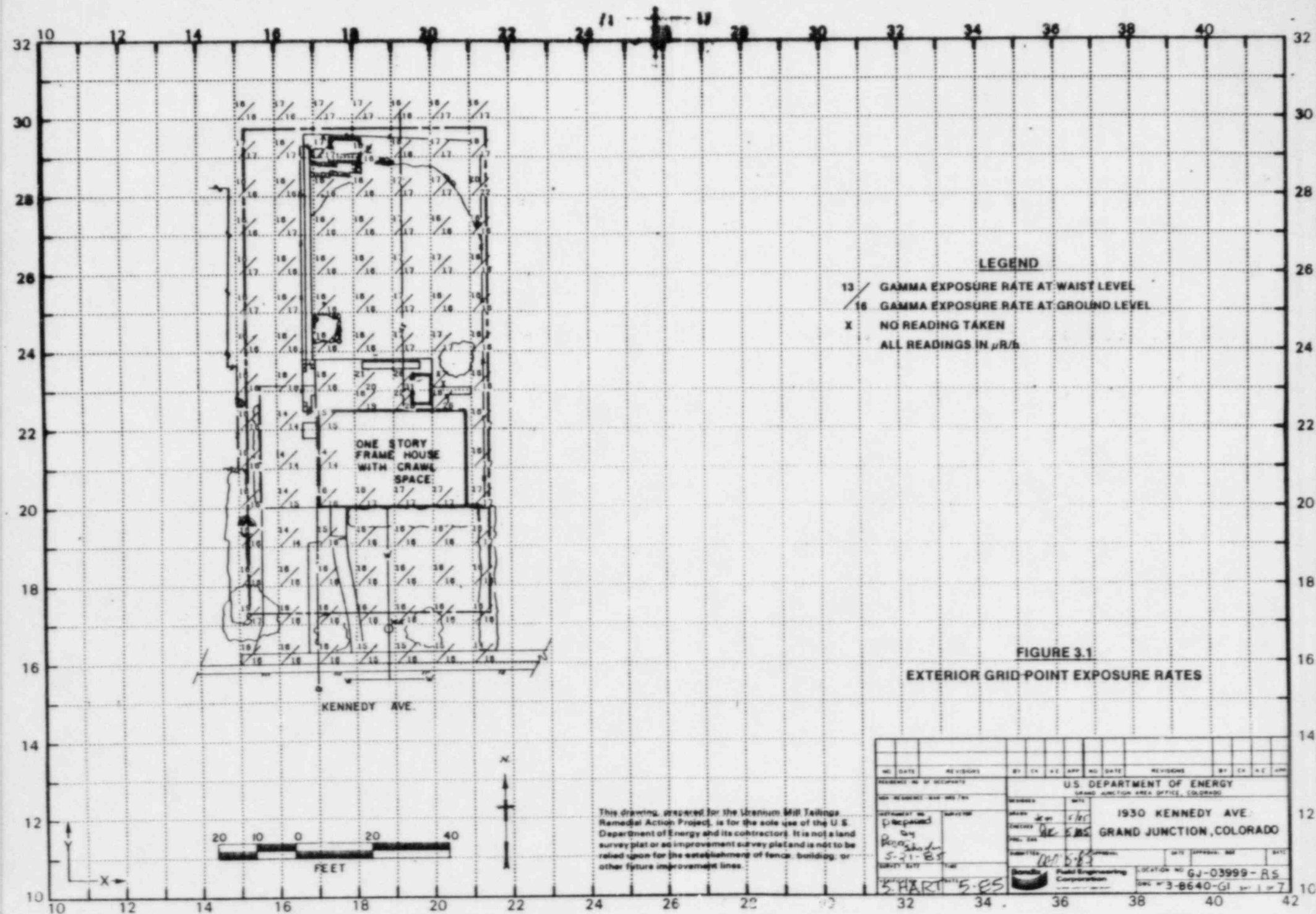


FIGURE 2.2 SITE PLAN

| | | |
|--|-------------------|--|
| U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECT OFFICE, COLORADO | | DOE ID NO. GJ03999RS |
| ADDRESS 1930 KENNEDY AVENUE GRAND JUNCTION, COLORADO | | ALLIED ENGINEERING CORPORATION Grand Junction Operations |
| SURV 266 4 29 85 | DRAFT REK 4 30 85 | CR 11 5 85 |
| DRAWING NO. 3CG40.F1 | SHEET 1 OF 1 | |

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 plot or an improvement survey plot and is not to be relied upon for the establishment of fence, building, or other future improvement lines.



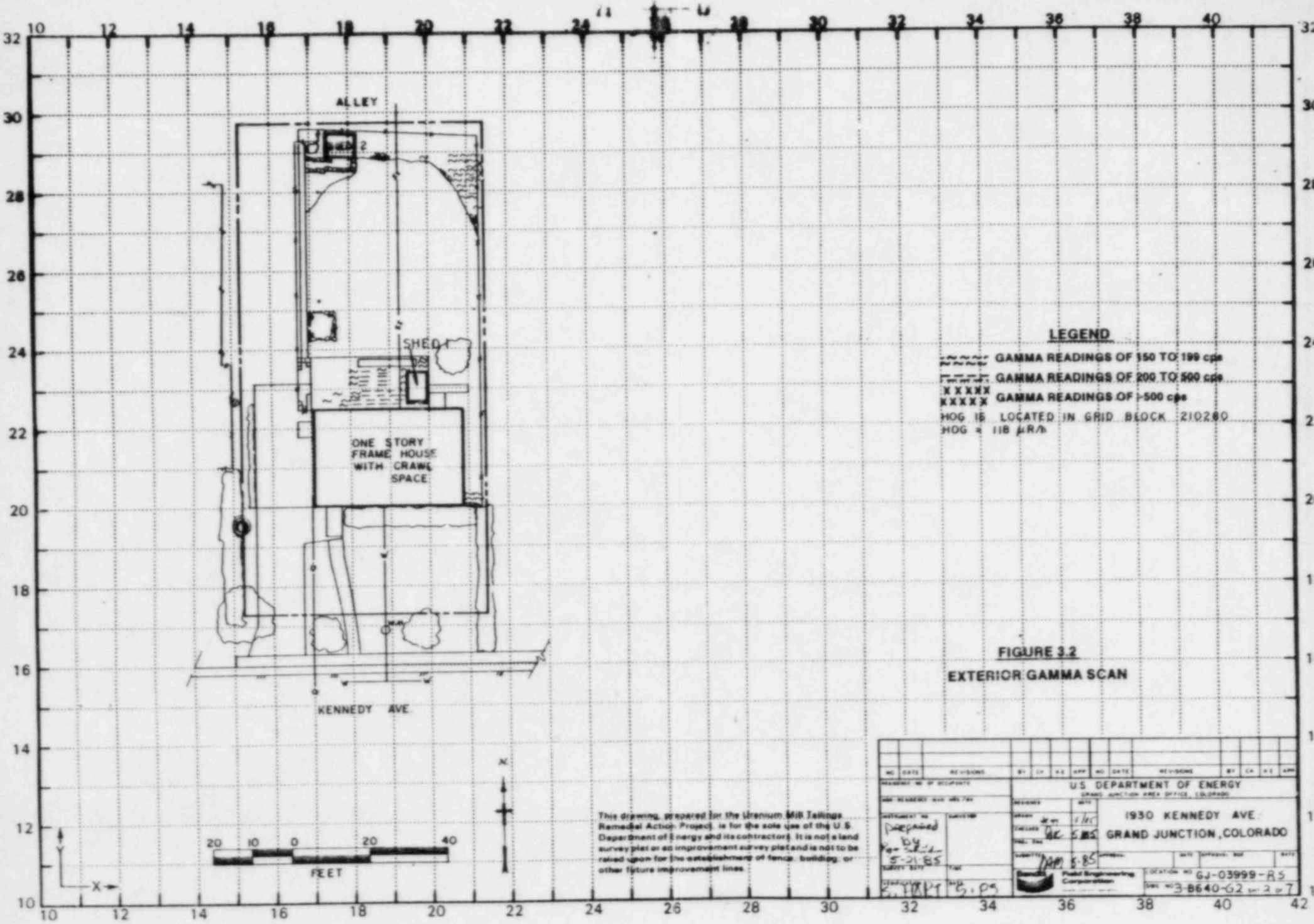
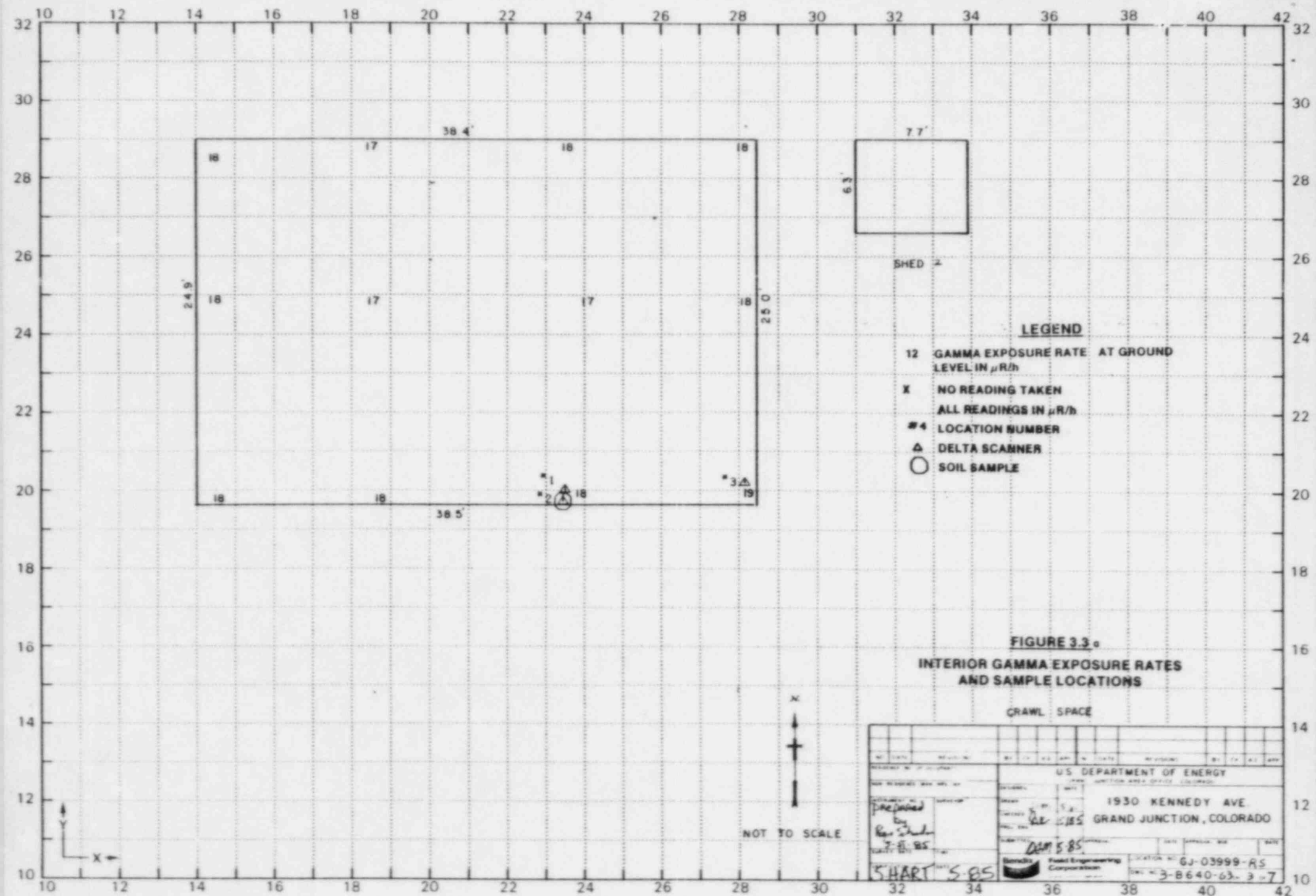
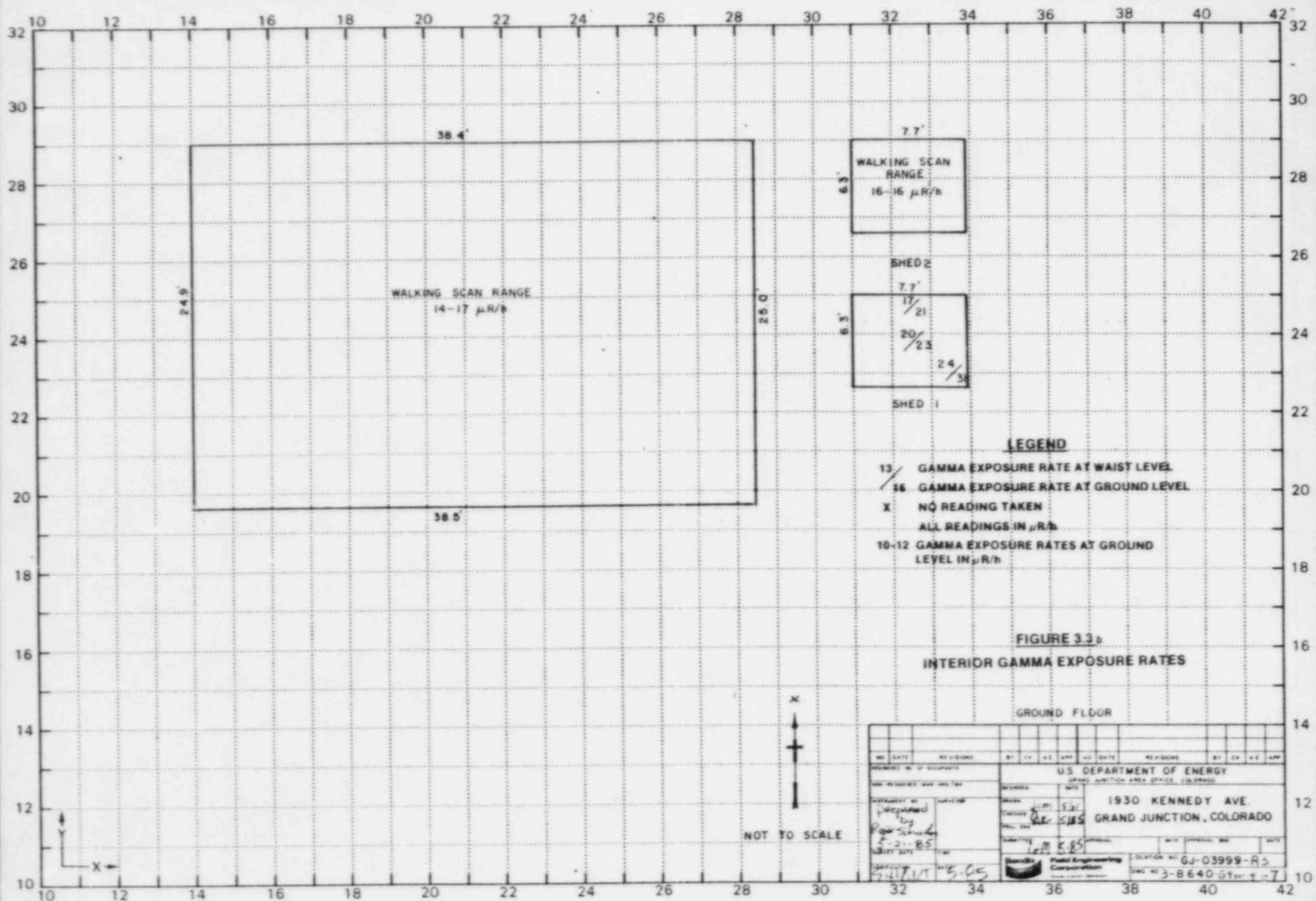
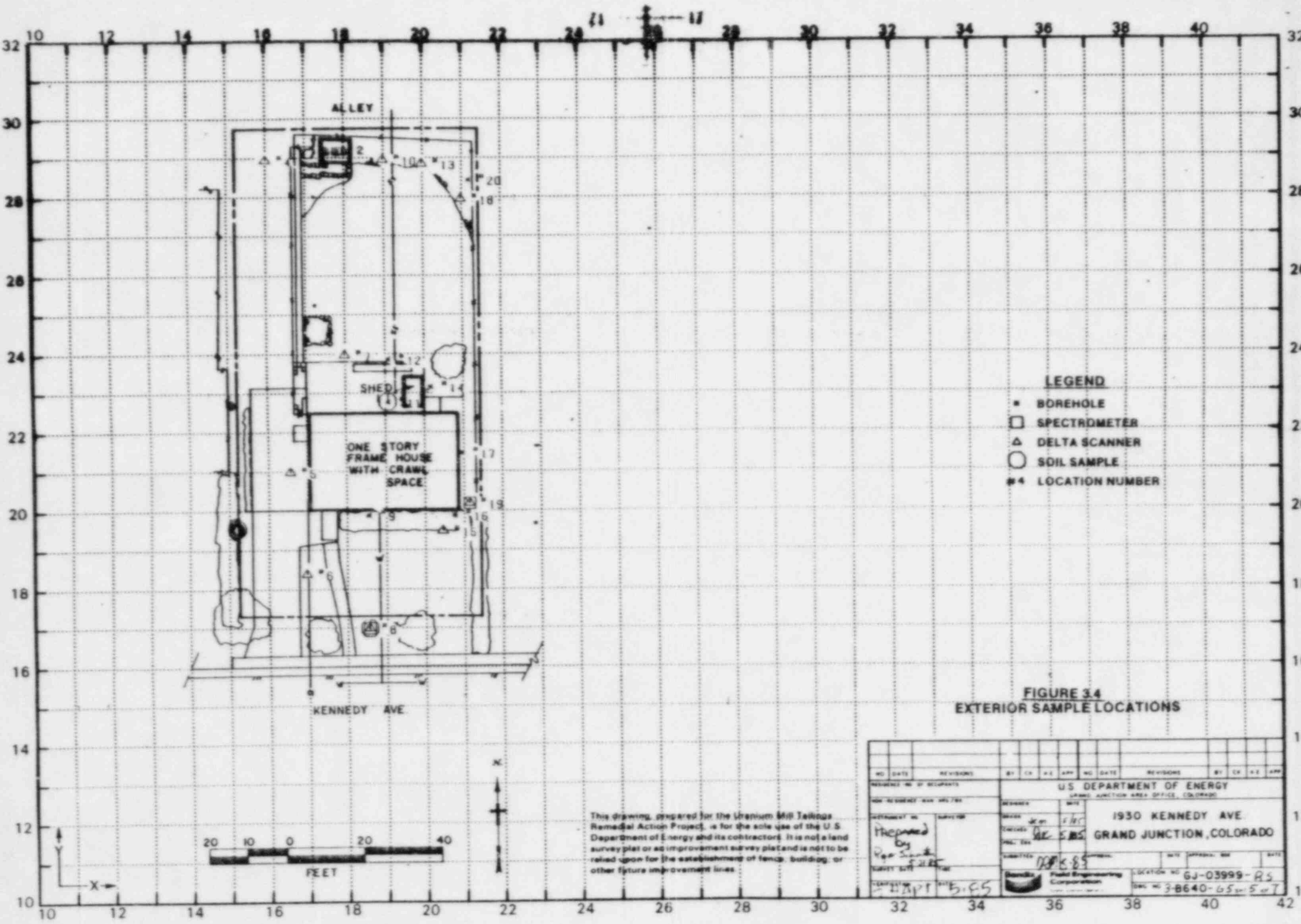


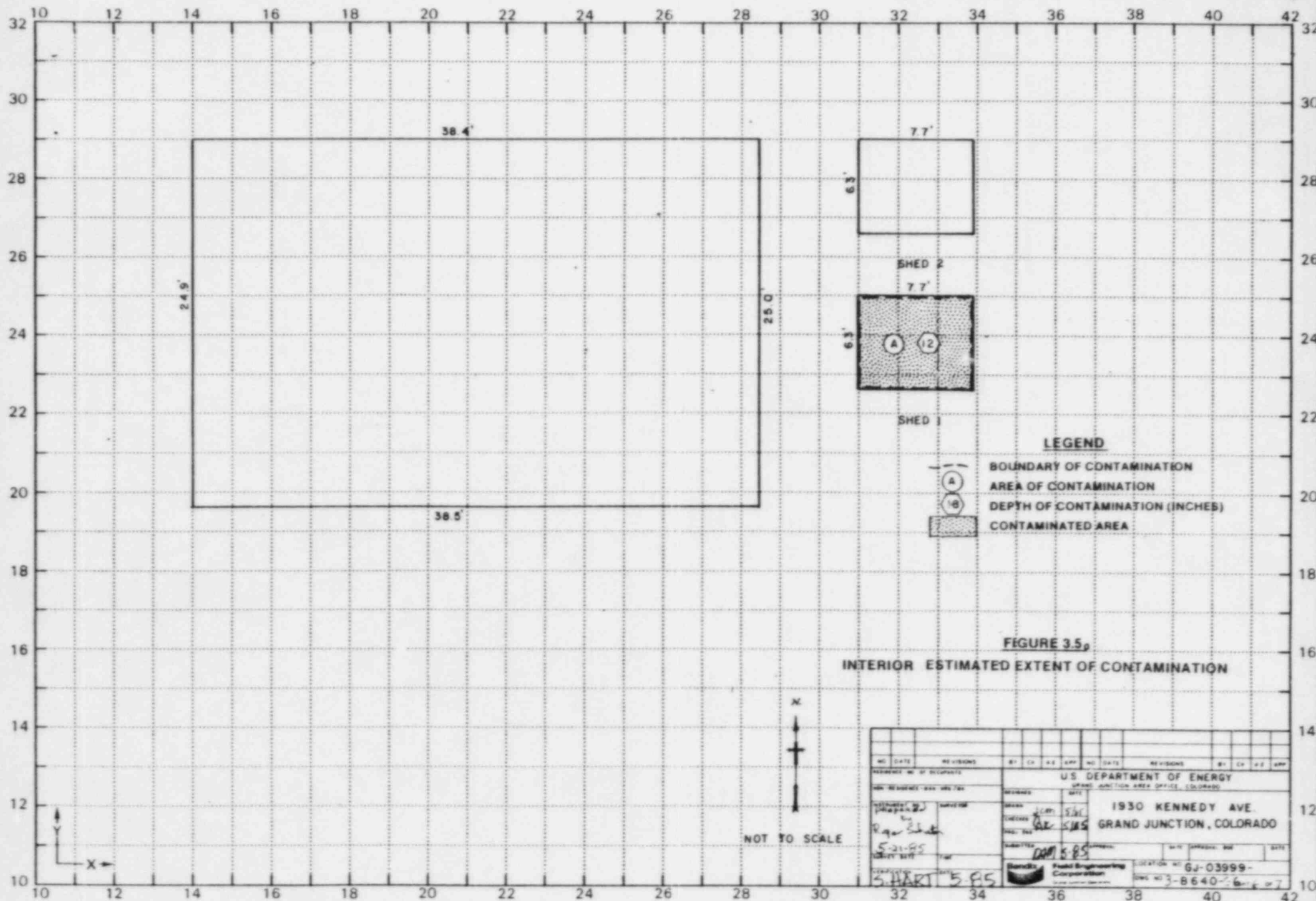
FIGURE 3.2
EXTERIOR GAMMA SCAN

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| NO. DATE REVISIONS BY CH A.E. APP. NO. DATE REVISIONS BY CH A.E. APP. | | | | | | | | | |
| PREPARED BY: <i>BY</i> DATE: <i>5-21-85</i> DRAWN BY: <i>G. P. S.</i> CHECKED BY: <i>G. P. S.</i> | | | | | | | | | |
| U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO 1930 KENNEDY AVE. GRAND JUNCTION, COLORADO | | | | | | | | | |
| LOCATION NO. GJ-03999-R5 DATE NO. 3-8640-62 rev. 2 of 7 | | | | | | | | | |

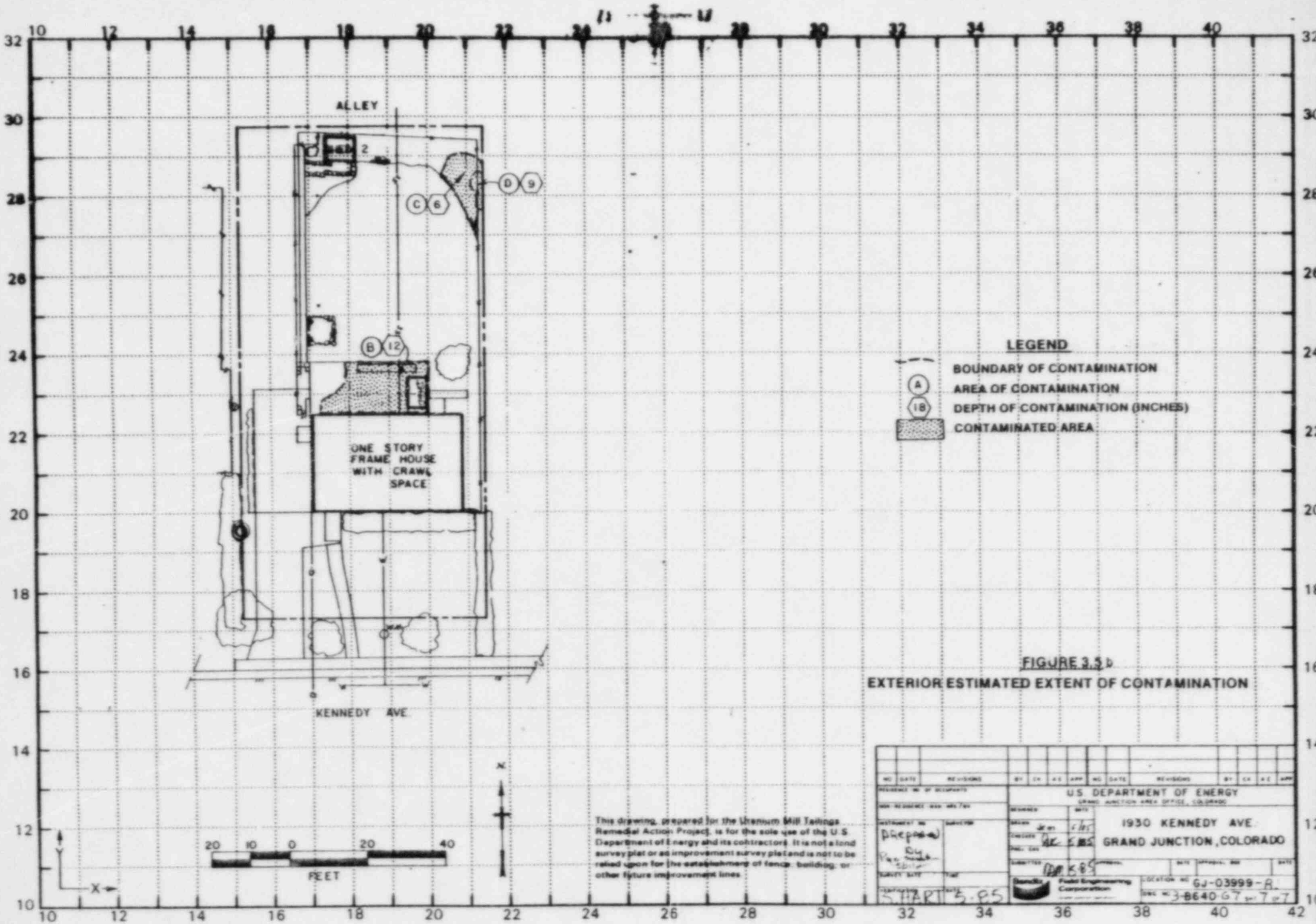








| REVISIONS | | | | | | | | | | REVISIONS | | | | | | | | | |
|--|------|-----------|----|----|------|------|-----|------|-----------|-----------|----|------|------|--|--|--|--|--|--|
| NO. | DATE | REVISIONS | BY | CH | A.E. | APP. | NO. | DATE | REVISIONS | BY | CH | A.E. | APP. | | | | | | |
| <p>U.S. DEPARTMENT OF ENERGY OFFICE OF ENVIRONMENTAL AFFAIRS (OEA)</p> <p>1930 KENNEDY AVE. GRAND JUNCTION, COLORADO</p> <p>PROJECT: <i>5-21-85</i> SUBJECT: <i>SHED 1 & 2</i></p> <p>DATE: <i>5-21-85</i> BY: <i>5-21-85</i></p> <p>LOCATION NO: <i>6J-03999-</i> DRAWING NO: <i>3-B640-6-1-7</i></p> | | | | | | | | | | | | | | | | | | | |



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

Official Survey Report

Property Address 1930 Kennedy

Property Owner Richard L. Bamford

Address of Owner (if different from above) 2507 Mt. Sopris Drive Grand Junction

Report Prepared By Roger Schouten

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

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

1 XXX1 Residual radioactive materials found at the following locations:

1 XXX1 In open areas.

1 XXX1 Under or around exterior improvements.

1 XXX1 Under or around a typically nonoccupied structure.

1 XXX1 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 XXX1 Levels of radiation from residual radioactive materials exceed EPA Standards such that Remedial Action is recommended and will be accomplished, with your consent, as soon as budget and schedule permit.

cc:

G. A. Franz, III, GJ/CDH

J. Themelis, Mgr. UMTRA Proj. Off.

HIG = 17 uR/h
HOG = 112 uR/h

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado 81501

DATE: May 7, 1985
TO: Files
FROM: Roger Schouten
SUBJECT: Team Leader Notes - GJ-03999-RS

Address: 1930 Kennedy

Owner: R.L. Bamford

Team Members

| | |
|---------------------------|----------|
| R. Schouten (Team Leader) | L. Kula |
| S. Larsen | D. Dow |
| C. Holmes | P. Hardy |

Instruments

C-3510, C-1247, C-1206, C-1036, C-1149, C-4005, C-3940, C-????,
C-1239, C-3361, C-1372

Contamination was found in the rock gardens and on the patio during our exterior gamma scan. In the rock garden north of the patio (grid block 190240), the source of our elevated reading was obvious. This source was identified as ore by D. Mackler. After removal of the ore, the cps readings dropped dramatically to a level close to background.

Permission was received to take the sample with us and it was disposed of properly.

The same strategy was used in the rock garden located in the northeast corner of the property; however, there were too many sources and this area was further investigated with deltas and a borehole.

Team Leader Notes
Roger Schouten
GJ-03999-RS
May 7, 1985
Page 2

Permission was received from a representative of Target Realty to investigate the adjacent property to the east. No spillover contamination was found.

Located on the contaminated patio, was a shed not shown on our property map. This structure was drawn on our maps and labeled as Shed 1.

Tim Woods, Health and Safety, visited the property and suggested we air out the crawl space before entering, we did.

All shown underground utilities were checked.

No other problems were encountered.

All members were frisked.

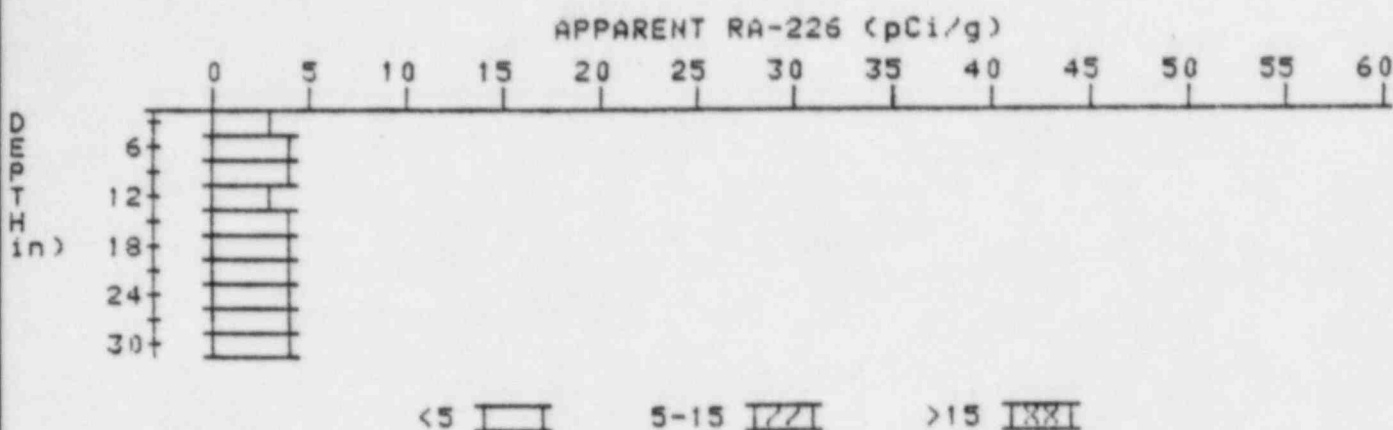
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

8

PROPERTY NUMBER: GJ-03999-RS

HOLE NUMBER: 8

LOCATION: 186170



| 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 | 3.8 |
| 18 | 3.6 | 3.6 |
| 21 | 3.6 | 3.6 |
| 24 | 3.6 | 3.6 |
| 27 | 3.6 | 3.6 |
| 30 | 3.6 | 3.6 |

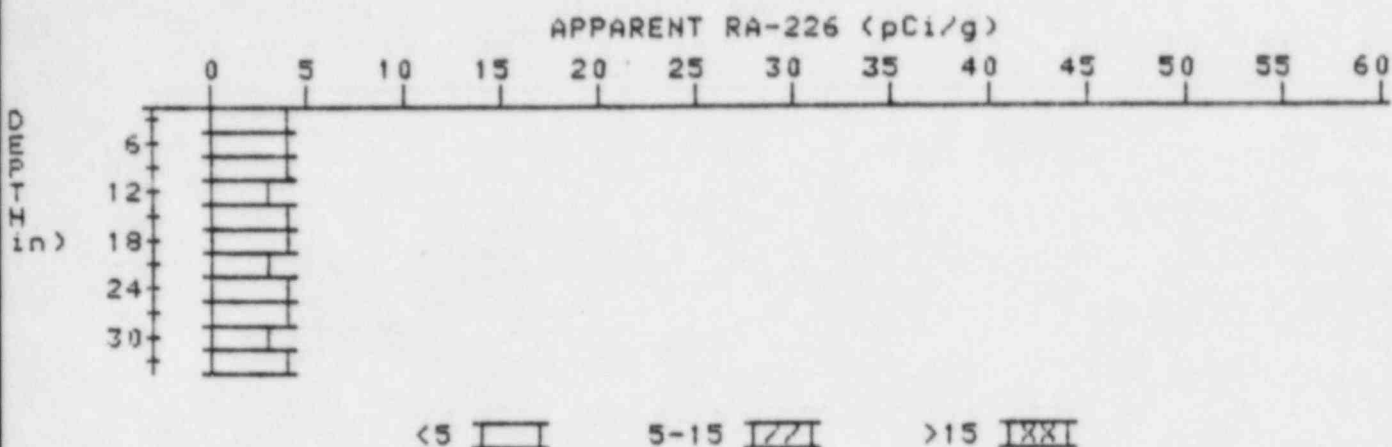
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

9

PROPERTY NUMBER: GJ-03999-RS

HOLE NUMBER: 9

✓LOCATION: 186199



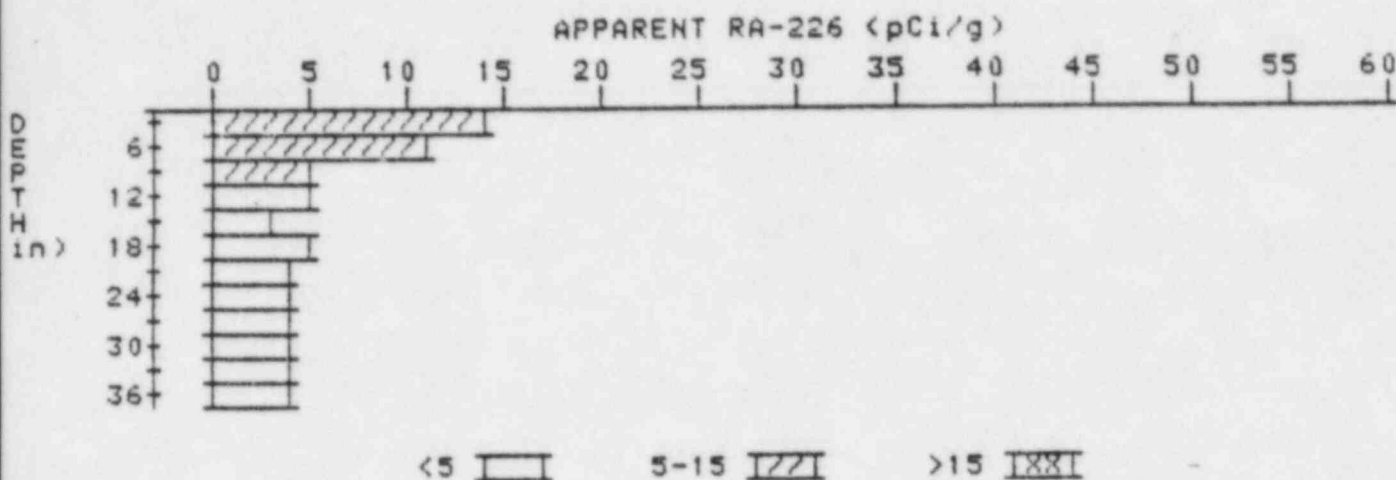
| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|--|--|
| 3 | 3.5 | 3.5 |
| 6 | 3.6 | 3.8 |
| 9 | 3.6 | 3.8 |
| 12 | 3.5 | 3.3 |
| 15 | 3.5 | 3.5 |
| 18 | 3.5 | 3.7 |
| 21 | 3.4 | 2.9 |
| 24 | 3.6 | 4.0 |
| 27 | 3.6 | 3.6 |
| 30 | 3.6 | 3.4 |
| 33 | 3.7 | 3.7 |

APPARENT RADIUM-226 CONCENTRATION 11 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03999-RS

HOLE NUMBER: 11

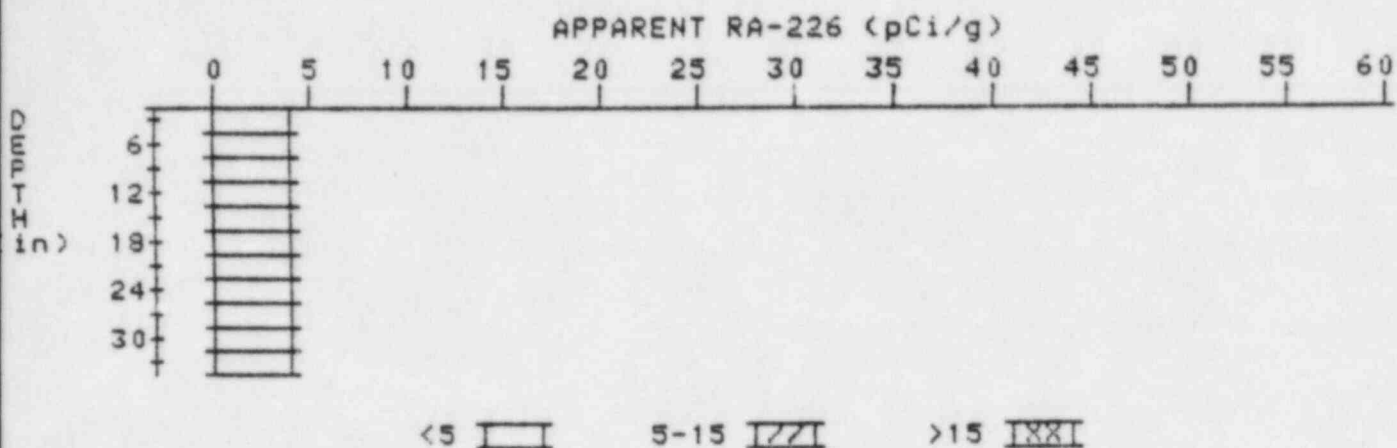
LOCATION: 191228



| Depth (in) | Apparent Radium-226 (pCi/g) | Apparent Radium-226 (pCi/g) |
|---------------|-----------------------------------|-----------------------------------|
| | Undeconvolved | Deconvolved |
| 3 | 13.7 | 13.7 |
| 6 | 10.8 | 11.2 |
| 9 | 7.7 | 5.2 |
| 12 | 6.0 | 4.9 |
| 15 | 4.9 | 3.5 |
| 18 | 4.6 | 4.6 |
| 21 | 4.3 | 3.8 |
| 24 | 4.3 | 4.5 |
| 27 | 4.2 | 4.0 |
| 30 | 4.2 | 4.2 |
| 33 | 4.2 | 4.4 |
| 36 | 4.1 | 4.1 |

APPARENT RADIUM-226 CONCENTRATION 12 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03999-RS
HOLE NUMBER: 12
✓ LOCATION: 191239



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

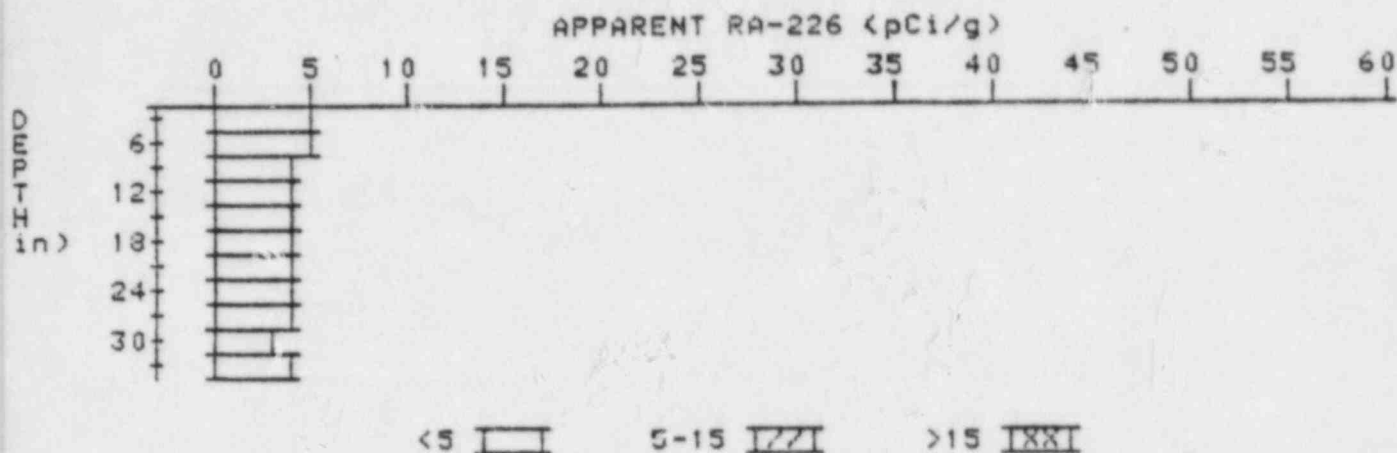
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

14

PROPERTY NUMBER: GJ-03959-RS

HOLE NUMBER: 14

LOCATION: 202232



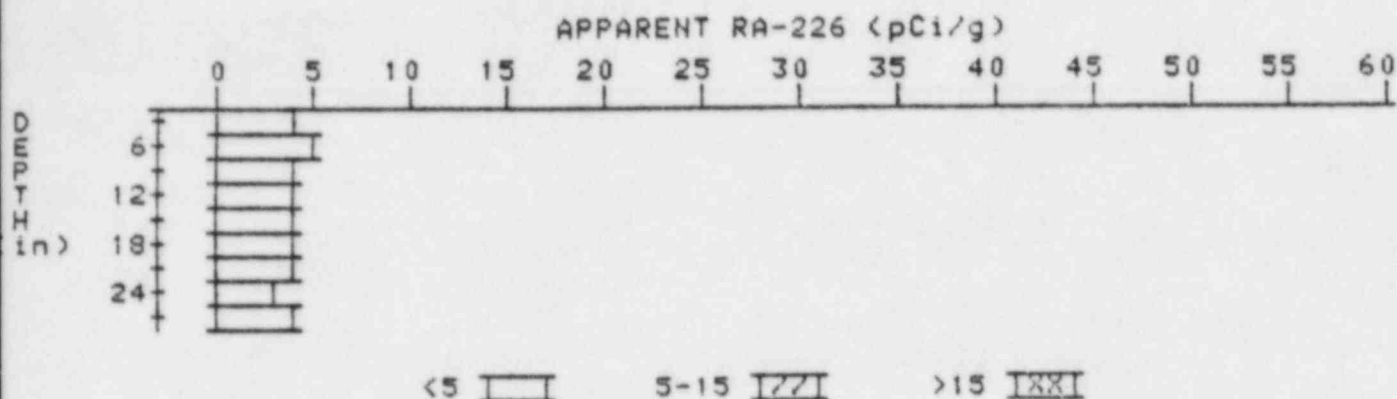
| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|--|--|
| 3 | 4.7 | 4.7 |
| 6 | 4.5 | 4.9 |
| 9 | 4.1 | 3.7 |
| 12 | 3.9 | 3.7 |
| 15 | 3.8 | 3.6 |
| 18 | 3.8 | 3.8 |
| 21 | 3.8 | 3.8 |
| 24 | 3.8 | 3.8 |
| 27 | 3.8 | 4.0 |
| 30 | 3.7 | 3.3 |
| 33 | 3.8 | 3.8 |

APPARENT RADIUM-226 CONCENTRATION 16 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03999-RS

HOLE NUMBER: 16

LOCATION: 208199



| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|--|--|
| ===== | ===== | ===== |
| 3 | 4.0 | 4.0 |
| 6 | 4.2 | 4.9 |
| 9 | 4.0 | 3.8 |
| 12 | 3.9 | 3.7 |
| 15 | 3.9 | 3.9 |
| 18 | 3.9 | 3.9 |
| 21 | 3.9 | 4.1 |
| 24 | 3.8 | 3.4 |
| 27 | 3.9 | 3.9 |

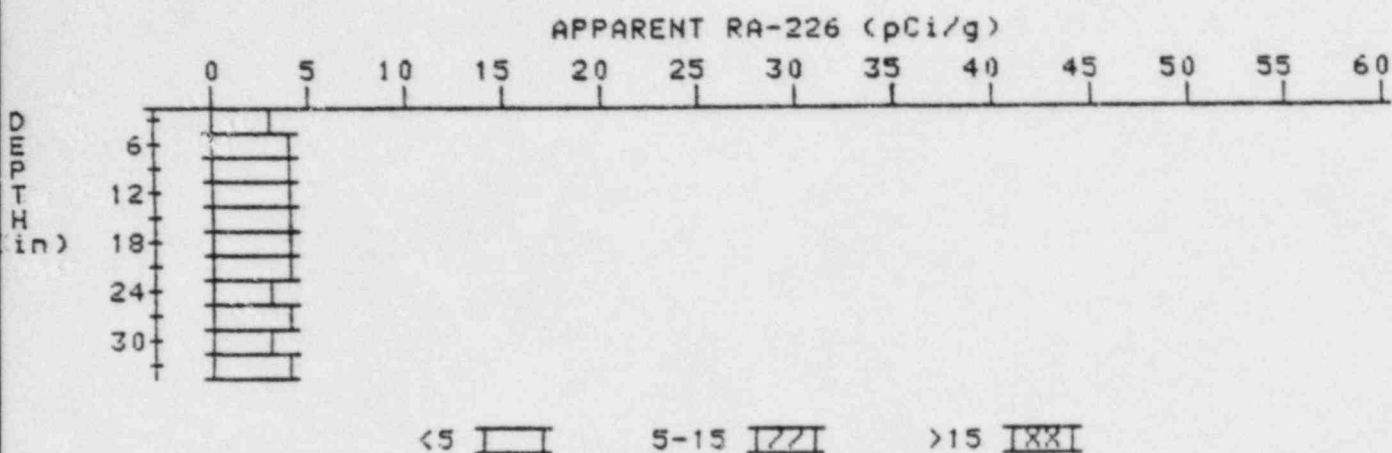
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

17

PROPERTY NUMBER: GJ-03999-RS

HOLE NUMBER: 17

LOCATION: 210215



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

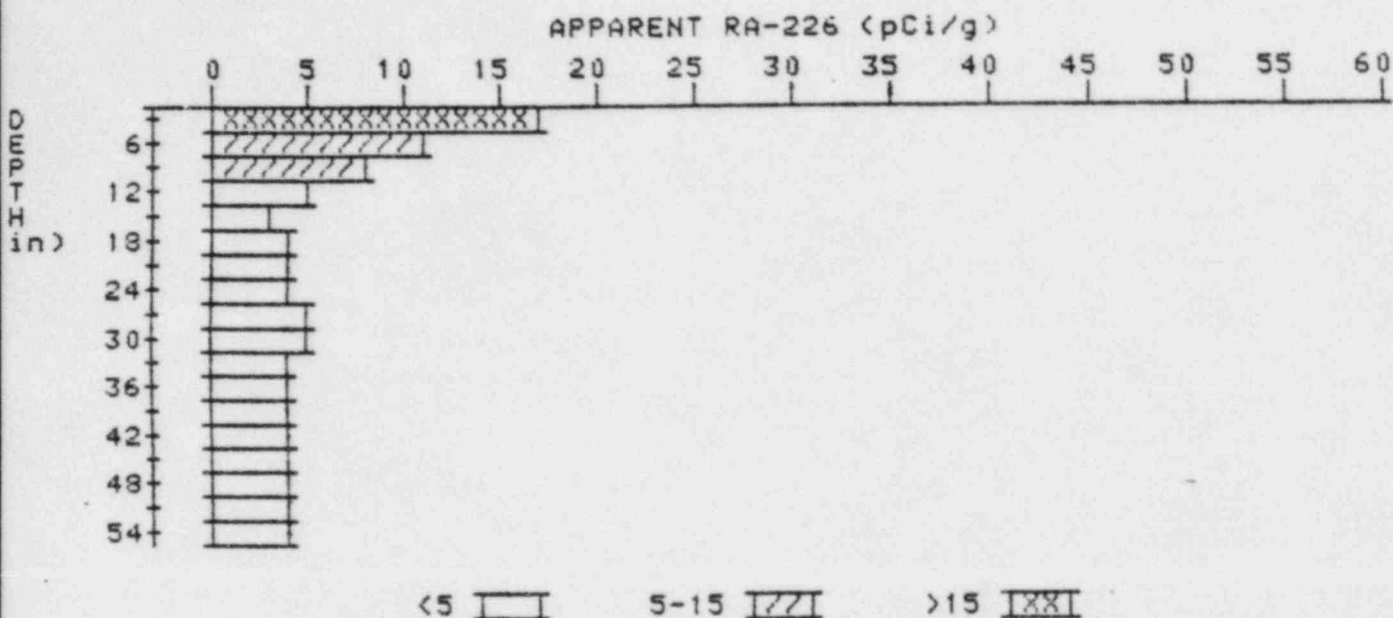
APPARENT RADIUM-226 CONCENTRATION 20

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03999-RS

HOLE NUMBER: 20

LOCATION: 212285



| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|--|--|
| 3 | 16.6 | 16.6 |
| 6 | 12.6 | 11.4 |
| 9 | 9.3 | 8.1 |
| 12 | 6.7 | 4.7 |
| 15 | 5.2 | 3.4 |
| 18 | 4.7 | 4.2 |
| 21 | 4.5 | 4.3 |
| 24 | 4.4 | 4.0 |
| 27 | 4.5 | 4.7 |
| 30 | 4.5 | 4.9 |
| 33 | 4.3 | 4.3 |
| 36 | 4.1 | 3.7 |
| 39 | 4.1 | 4.3 |
| 42 | 4.0 | 3.6 |
| 45 | 4.1 | 4.5 |
| 48 | 4.0 | 3.8 |
| 51 | 4.0 | 4.0 |
| 54 | 4.0 | 4.0 |