

**RADIOLOGIC AND ENGINEERING ASSESSMENT**

FOR

DOE ID NO.: ED-0388A-RS  
ADDRESS: 600 3RD AVENUE

FEBRUARY 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 \_\_\_\_\_  
G. GRANDBOUCHE  
DOE PROJECT ENGINEER

DATE \_\_\_\_\_

REA0388A:REA-303

8507080379 850301  
PDR WASTE  
WM-40 PDR

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## **1.0 EXECUTIVE SUMMARY**

### **1.1 Introduction**

The location, DOE ID #ED-0388A-RS, is a single-family residence located at 600 3rd Avenue, Edgemont, South Dakota.

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, 3 tons; interior, 0 tons.

Approximately 8 days are required for completion of design work. Estimated cost to perform remedial action is \$980. Remedial action on this property will take approximately 3 days to complete.

## 2.0 PROPERTY DESCRIPTION

### 2.1 General Description

Address: 600 3rd Avenue, Edgemont, South Dakota

Zoning: Residential

Lot Size: Approximately 7,000 sq. ft. (0.16 acres)

Legal Description: Lot 1 of Block 10 of the Edgemont Original Township, Town of Edgemont, State of Colorado.

Point of Reference: This property is located approximately 1/2 mile west of the Edgemont Uranium Millsite. Appendix Figure 2.1 shows the property location relative to its surroundings.

Utilities: Utilities locations are shown in Appendix Figure 2.2.

Electrical:	Underground
Gas:	None
Propane:	Underground
Telephone:	Underground
Sewer:	Underground
Water:	Underground

Bordering Properties:

North:	E Street
South:	Vacant land (ED-0388B)
East:	3rd Avenue
West:	Alley

### 2.2 Existing Facilities and Structures

Primary Structure:

Type:	Mobile home
Size:	Approx. 924 sq. ft.
Construction:	Pre-fabricated metal panel
Foundation:	Assumed to be on metal jacks and concrete pads
Basement:	None
Crawl Space:	Yes
Condition:	Good

Other Structures:

Type:	Storage shed
Size:	Approximately 160 sq. ft.
Construction:	Wood
Foundation:	Wood foundation (mud sill)
Condition:	Good

Type: Shed  
Size: Approximately 55 sq. ft.  
Construction: Tin  
Foundation: Wood foundation (mad sill)  
Condition: Good

Improvements or Attachments to Structure:

Additions: None  
Porches: Type: Wooden steps Size: Approx. 9 sq. ft.  
Location: North side of trailer  
Type: Steel steps Size: Approx. 9 sq. ft.  
Location: South side of trailer  
Patios: None  
Driveways: None  
Sidewalks: Type: Concrete and loose bricks  
Location: South of trailer  
Fences: Type: Woven wire  
Location: Perimeter of yard  
General Remarks: Structures, utilities, landscaping and other special features of this property are included in Appendix Figure 2.2.

### 3.0 RADIOLOGIC SURVEY

#### 3.1 Introduction

Radiologic data were collected by Pacific Northwest Laboratory (PNL) at location #ED-0388A-RS on January 20, 1983. Additional field data were collected by Bendix on October 10, 1984. These data were evaluated to determine the areal and vertical extent of uranium mill tailings contamination at this 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.

#### 3.2 Gamma Exposure-Rate Surveys

##### 3.2.1 Exterior Findings

PNL Background Readings: 9 to 12 uR/h

PNL Highest Outside Gamma Reading (EOG): 200 uR/h

The Bendix exterior radium concentration measurements are presented in Appendix Table 3.1. Table 3.2 presents the PNL radium concentration measurements. PNL gamma exposure rate readings are shown in Appendix Figure 3.1. Appendix Figure 3.2 presents the ranges of elevated gamma readings observed in the Bendix survey. These measurements indicate areas of surface contamination.

##### 3.2.2 Interior Findings

PNL Background Readings: Not included in the PNL report

PNL Highest Inside Gamma Reading (HIG): Not in PNL report

#### 3.3 Boreholes, Soil Samples, and Other Measurements

Areas which displayed elevated gamma levels were further investigated. The location of measurements collected by PNL are included in Appendix Figures 3.1a and 3.1b. The Bendix sample locations are shown in Appendix Figure 3.3. Data from these investigations are included in Appendix Tables 3.1 and 3.2.

#### 3.4 Radon/Radon Daughter Concentration

Radon daughter concentration (RDC):

The working level (WL) was not assessed by PNL.

No RDC measurements were taken by Bendix.

### 3.5 Extent of Contamination

Appendix Figure 3.4 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 material are:

- (AREA A) Near the southwest corner of the mobile home there is contamination to a depth of 6 inches.
- (AREA B) There is contamination to a depth of 9 inches next to the north side of the mobile home. Pieces of ore were noted at this location.
- (AREA C) The largest deposit of contamination is in the east yard. There are small pieces of ore throughout this area. The depth of contamination is 9 inches.
- (AREA D) Pieces of ore were observed in 3 small deposits north of the mobile home. The depth of contamination is 6 inches.
- (AREA E) Another small deposit of ore was found near the southeast corner of Lot 1. The depth of contamination is 6 inches.

#### 4.0 RECOMMENDED REMEDIAL ACTION

##### 4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID #ED-0388A-RS, includes removal of all areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figure 3.4) 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 Specifications (Bendix Field Engineering Corporation, 1984), and Statement of Work for Construction Subcontractor.

##### 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 \$980.

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

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, Operating Manual-Edgemont Vicinity Properties, (GJ-19), for U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, 1984.

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, Vicinity Properties General Construction Specification, for U.S. Department of Energy, Nuclear Energy Programs, Division of Remedial Action Projects, UMTRA, 1983.

Bendix Field Engineering Corporation, Environmental Assessment of Cleanup Activities at Vicinity Properties in Edgemont, South Dakota, (GJ-06), for U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations, Albuquerque, New Mexico, 1983.

Pacific Northwest Laboratory, Draft Proceedings of the Workshop on Radiological Surveys in Support of the Edgemont Clean-Up Action Program, R.W. Perkins, Workshop Chairman, 1981.

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 Concentration at Exterior Locations - Bendix
Table 3.2	Radium Concentration at Exterior Locations - PNL
Table 4.1	Area Volume Calculations
Table 4.2	Estimated Cost of Decontamination & Restoration

Appendix Figures:

Figure 2.1	Vicinity Map
Figure 2.2	Site Plan
Figure 3.1	PNL Exterior Grid Point Exposure Rates and Sample Locations
Figure 3.2	Bendix Exterior Gamma Scan
Figure 3.3	Bendix Sample Locations
Figure 3.4	Estimated Extent of Contamination

Team Leader Notes

Official Survey Report

Table 3.1  
Exterior Radium Concentrations  
Bendix

DOE ID No. ED-0388A-RS

600 3rd Avenue

Page 1 of 1

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
1	184255	00-06 06	SS DS			25.3 *	Over sewer line
2	192294	00-06 00	SS DS			1.6 *	Background location
3	216279	00	DS	27.6		*	DC based on scintil- lometer readings at 6 inches
4	221272	00	DS	15.9		*	DC based on scintil- lometer readings at 9 inches
5	237276	00	DS	108.7		*	
6	248213	00-06 06	SS DS			1.4 *	DC = 0 inches
7	251279	00	DS	25.4		*	DC based on scintil- lometer readings at 6 inches
8	255242	00	DS	157.5		*	DC based on scintil- lometer readings at 6 inches
9	255267	00	DS	226.2		*	DC based on scintil- lometer readings at 9 inches

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 = 10-10-84  
Team Leader = SH

Table 3.2  
Exterior Radium Locations  
Pacific Northwest Laboratory  
600 3rd Avenue

DOE ID No. ED-0388A-RS

Page 1 of 1

Location Code	Depth (cm)	Meas. Type	Ra-226 Concentration (pCi/g)	Deposit Depth (As per PNL)
#1	5	BH	336.0	DC = 60 cm (24 inches)
	10	BH	420.0	
	15	BH	457.0	
	20	BH	435.0	
	25	BH	329.0	
	30	BH	204.0	
	45	BH	40.9	
	60	BH	10.0	
	75	BH	3.6	
	105	BH	2.8	
	135	BH	2.7	
	165	BH	3.0	
#2	5	BH	3.4	DC = 0 cm
	15	BH	3.4	
	30	BH	2.2	
	45	BH	2.4	
	75	BH	2.3	
#3	5	BH	12.0	DC = 20 cm (8 inches)
	10	BH	26.8	
	15	BH	27.2	
	20	BH	10.6	
	25	BH	6.8	
	30	BH	3.4	
	45	BH	2.3	
	60	BH	2.3	
	75	BH	2.3	
	90	BH	2.3	
A	00-45	SS	1029.0	
B	00-05	SS	3.3	
C	00-05	SS	2.7	

SS = Soil Sample

BH = Borehole Measurement

\*\*See Figures 3.1a and 3.1b For PNL Sample Locations\*\*

Table 4.1  
Area Volume Calculations  
DOE ID No. ED-0388A-RS

AREA	CALCULATION		CUBIC YARDS	TONS
A	$13' \times 2' \times 0.5'$	=	13	
B	$5' \times 3' \times 0.75'$	=	11.25	
C	$5' \times 9' \times 0.75'$	=	33.75	
D	$6' \times 1' \times 0.5'$	=	3	
E	$2' \times 2' \times 0.5'$	=	2	
			<hr/>	
			63/27 =	2.33 =
				<hr/>
			TOTAL VOLUME - EXTERIOR =	3

See Appendix Figure 3.4 For Areas

Table 4.2  
Estimated Cost of Decontamination and Restoration  
DOE ID No. ED-0388A-RS

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EXTERIOR

Remove identified residual radioactive material (manual)		
3 tons @ \$83.33/ton	\$	250
Remove/replace wood chips		25
Remove/replace loose bricks		25
Replace topsoil		
3 tons @ \$7.92/ton		24
Replace sod		
66 sf @ \$0.30/sf		20
		<hr/>
TOTAL EXTERIOR	\$	344
ACCESS CONTROL		250
		<hr/>
SUBTOTAL	\$	594
CONTINGENCY @ 10%		59
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SUBTOTAL	\$	653
CONTRACTOR OVERHEAD & PROFIT @ 50%		327
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GRAND TOTAL	\$	980

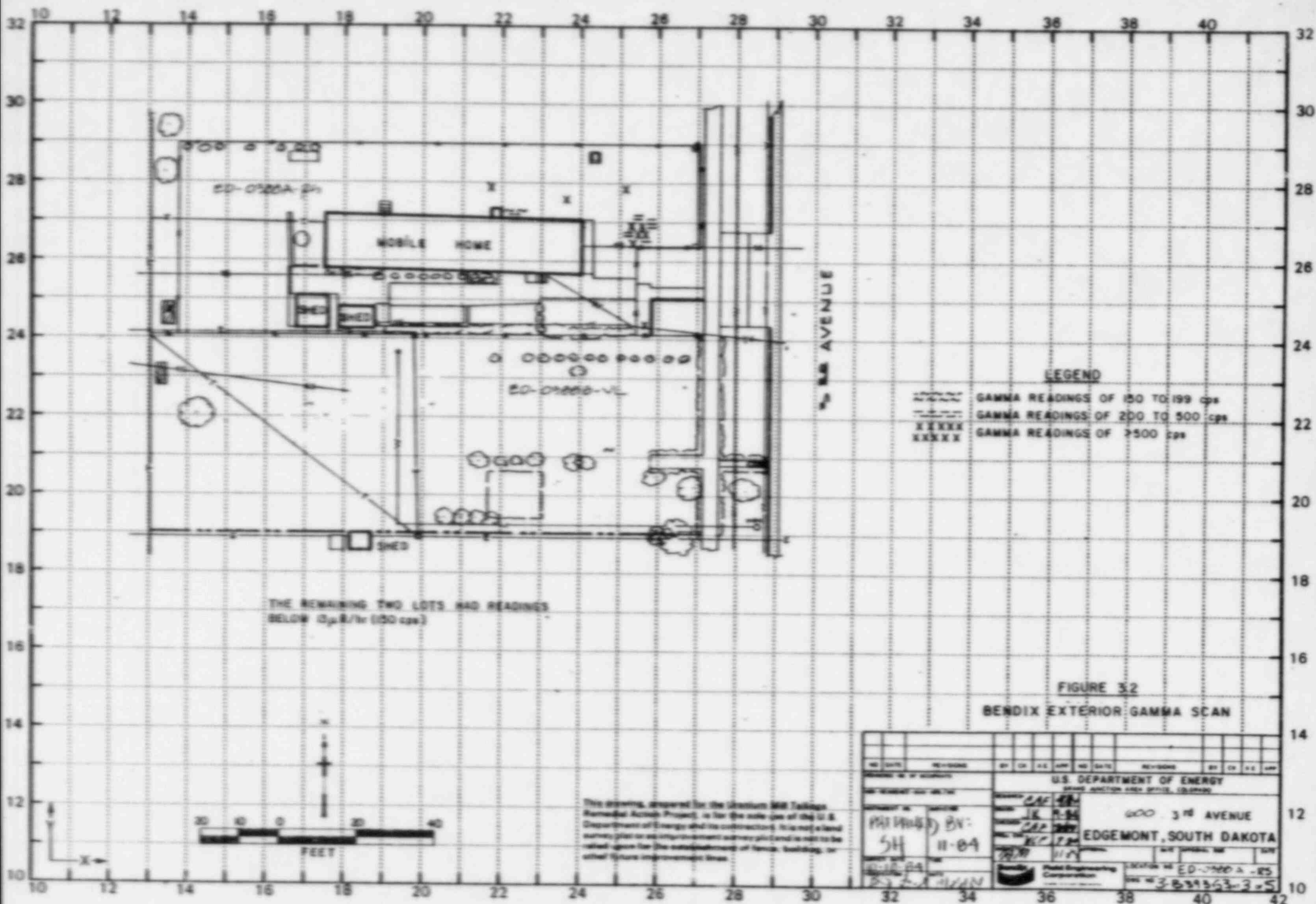
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OWNER: HARROD  
662-7027

10-10-84 p.m.  
#E00388  
602 608 3RD AVE

A waiting scan was performed on lots #1, #2, #4 and #5. The only areas of elevated gamma were a small spot in the east side of lot #2, and scattered deposits of predominantly ore (point sources) in lot #1. The point source readings were as high as 3500 cps. Five ore or tailings deposits were documented on lot #1 that PNL did not indicate in their survey data. The contamination in lot #2 was not identified by PNL either. Six inch & 9 inch exploration holes were investigated over some ore deposits to indicate the depth of contamination. Soil samples and surface deltas were also taken.

All surveys were decontaminated and frisked. No contamination was found.

HART 1116 DELTA

MACLER  
DUFFE  
RYAN

1137 SCINTILLIMETERS  
1142 } S. Hart

Lot #1 has a new owner.

Mrs. Harrod sold this property to Shirley A. Barrett.

An access permit was filled out and signed by the new owner.

5/7

Location No. ED--00388--RMS 98

Date November 17, 1984

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

Official Survey Report

Property Address 600 3rd Avenue

Property Owner Shirley A. Barrett

Address of Owner (if different from above) \_\_\_\_\_

Report Prepared By S. Hart

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

☐ No evidence of residual radioactive material on surveyed property.

☒ Residual radioactive materials found at the following locations:

☒ In open areas.

☐ Under or around exterior improvements.

☐ Under or around a typically nonoccupied structure.

☒ Under or around a typically occupied structure.

II. RESULTS OF RADIOLOGIC ASSESSMENT

☐ 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.

☒ 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:

J. A. Morley, UMTRA, AL

HIG = N/A uR/hr

HOG = 200 uR/hr

**Bendix**

**Field Engineering  
Corporation**

Mr. George Grandbouche  
U.S. Department of Energy  
Grand Junction Area Office  
P.O. Box 2567  
Grand Junction, CO 81502

February 27, 1985

Subject: Approval of REA for DOE ID No. ED-0388B, C, and D  
Located at 602, 606 and 608 3rd Avenue, Edgemont, South Dakota

Dear George:

Attached are copies of the REA for the subject vicinity property.

Please forward two copies of the REA and the appropriate approval form to the South Dakota Department of Water and Natural Resources and the Nuclear Regulatory Commission. One additional review copy is enclosed for transmittal to the UMTRA Project Office.

Please return completed REA approval forms to me by March 6, 1985.

If you have any questions, please do not hesitate to contact me at (303) 242-8621 extension 393.

Sincerely,



Michael E. Madson  
EDGVP Project Manager

cc: L. Edwards w/attachment  
J. Friestad w/attachment

EDREA-2:8MEM301