

DEPARTMENT OF ENERGY
ALBUQUERQUE OPERATIONS OFFICE
CONTRACT NO. DE-AC04-83AL18796

Draft Radiological and Engineering Assessment

Vicinity Property No. DUR 048

**Remedial Actions
Contractor
for the
Uranium Mill Tailings
Remedial Actions
Project**



MORRISON
KNUDSEN

8507090293 850404
PDR WASTE
WM-48 PDR

Vicinity Property No. DUR 048

DRAFT

THE RADIOLOGICAL AND ENGINEERING ASSESSMENT

AND FINAL DESIGN

FOR

DURANGO PROPERTY

DU-048

April 1, 1985

PREPARED FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

UNITED STATES DEPARTMENT OF ENERGY

PREPARED BY

MORRISON-KNUDSEN COMPANY, INC.

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

Property DU-048 is a private residence located at 3095 7th Street, Durango, CO.

1.2 Evaluation and Recommendation

1.2.1 Residual Radioactive Material Involvement

There are three areas of contamination on this property in the areas of the crawl space, the front porch, and the gravel driveway.

1.2.2 Recommended Remedial Action Option

The recommended option is to remove the contaminated material.

1.2.3 Estimated Costs

The estimated cost for removal of the contaminated material and restoration of the property is \$19,700.00.

1.2.4 Schedule

The estimated duration of the remedial action effort is 25 to 30 days.

2.0 ENGINEERING FIELD SURVEY

2.1 Property Description

2.1.1 Property Use and Occupancy

Property DU-048 is a private residence located at 3095 7th Street, Durango, CO and owned by Marna T. Haley. The house is used as a rental unit. The map in Figure 2.1 illustrates the property's vicinity location.

2.1.2 Legal Description

The legal description as recorded with the La Plata County Recorder's Office on Microfilm #411600 follows:

Lots 19 and 20, Block 39 in that part of the City of Durango, formerly known and platted as the Town of Animas City, Colorado; formerly known as Lots 64 and 62 on East Street in the Town of Animas City, Colorado; now also described as Lots 19 and 20, Block 39, Animas City Annexation to the City of Durango, La Plata County, Colorado.

TOGETHER WITH the Westerly 20 feet of vacated Seventh Avenue adjacent thereto and the Southerly 11.1 feet of vacated Thirty-first (31) Street adjacent thereto as vacated by Ordinance No. 1210 recorded October 25, 1976 under Reception No. 404401 and Plat of same as filed under Reception No. 404402.

2.1.3 Bordering Properties

The lots are zoned R-1 Residential Dist. It is located less than 3-1/2 miles northeast of the old Vanadium Corporation of America mill tailings site. The property is bounded on the north by 31st Street; on the east by East 7th Avenue; on the south by a residence; and on the west by an alley.

2.2 Existing Facilities and Structures

2.2.1 Structures

The residence is a concrete block structure with aluminum siding on a concrete foundation. A wood frame room addition with lean-to roof has been built on the west side of the house on a concrete foundation with a slab floor. A concrete porch is located on the east side of the house covered by a fiberglass awning. A detached wood shed is located in the center of the rear yard.

Except for the vacated portions of 31st Street and East 7th Avenue on the north and east sides of the property, the yard area is grassed and fenced with wire mesh fencing. A two car graveled drive extends from East 7th Avenue to the fence line. A concrete sidewalk extends from this fence line to the front porch on the east side of the house. Most of the deciduous trees on the property are scattered along the fence on the alley or along 31st Street.

The residence is less than 50 years old and therefore meets the non-historic property requirements of Stipulation I.a. of the Programmatic Memorandum of Agreement between the DOE, the Colorado Historic Preservation Officer and the Advisory Council on Historic Preservation for which the DOE may proceed with remedial action without additional historic investigations.

2.2.2 Utilities

Utilities are serviced to the property as follows:

Electric power - Overhead from utility pole in alley to west side of house

Telephone - Overhead from utility pole in alley to west side of house

Water - Underground from 31st Street

Gas - Underground from alley to west side of house

Sewer - Sewer main in alley

2.2.3 Site Plan and Survey Data

See Figure 2.2 for a site plan of the property. Property survey data and photos are presented in Table 2.1 and Figures 2.3 and 2.4.

Table 2.1

PROPERTY SURVEY DATA

GENERAL:

Site Location: Durango

Property Address: 3095 7th Street

Owner's Name: Marna T. Haley Address: 12 Hyland Place

Lot No.: 19,20 Property Type: Residential - Rental Unit

Occupancy Group: Adults: 2 Children: _____

Survey Completed By: R. Livengood/C. Sanders-Meena Date: 5/21/84

Property Description - Exterior:

Dwelling: Sq. Ft.: 832

Levels: Single story with crawl space under original house

Construction Type: Concrete block with white aluminum siding

Foundation: 24" high conc. perimeter wall with concrete center support
pier; 24" conc. perimter wall on grade under addition

Garage: None

Storage Bldg: Prefab: _____

Other: 8'x7' wood shed in back yard

Improvement Additions: 16'x 9' wood frame Porches: Conc with fiberglass
to Dwellings: on W side of house awning

Deck: None Patio: None

Other: _____

Driveway: Concrete: _____ Paved: _____

Gravel: 2 car from 7th St to fence Other: _____

Sidewalks: Concrete/Paved: From fence to porch

Other: _____

Fences/Gates: Wood: _____ Other: 34" high wire mesh all
around residence

Chain Link: _____

Radiological and Engineering Assessment: Property DU-048

Table 2.1 (cont'd)

PROPERTY SURVEY DATA

Site Location: Durango

Property Address: 3095 7th Street

Grounds: Lawn: Full front and back within fence line

Trees: Several deciduous trees throughout the property

Shrubs: Several bushes along back property line

Garden: Unplanted plot on west side of shed

Grading: Relatively flat

Other: _____

Soil Type: Topsoil in lawned areas

Existing Survey Plot: Yes

Property Description - Interior: Interior Contamination

Room	Floor	Walls				Ceiling	Comments
		E	W	N	S		
Utility Rm	Concrete					Dry Wall	Hot water
							heater,
							Gas heater,
							Washer and
							Dryer lo-
							cated in
							this room

Utilities:

Heating: Gas: X Electric: _____

Hot Water: _____ Other: _____

Air Cond: Gas: _____ Heat Pump: _____

Radiological and Engineering Assessment: Property DU-048

Table 2.1 (cont'd)

PROPERTY SURVEY DATA

Site Location: Durango

Property Address: 3095 7th Street

Electric Line Location: Overhead from utility pole in alley to w side of house

Gas Line Location: Underground from alley to west side of residence

Water Line Location: Underground from 31st St. main

Sewage Line Location: Sewer main in alley

Telephone Line Location: Overhead from utility pole in alley to w side of residence

Building Codes and Zoning:

<u>Codes</u>	<u>Local</u>	<u>State</u>	<u>Federal</u>
<u>Building Work</u>	<u>UBC</u>		
<u>Plumbing</u>			
<u>HVAC</u>			
<u>Electrical</u>			
<u>Other</u>			

Zoning District: City of Durango

Present Dwelling Zoning: R-1 residence district

Setbacks: Front: _____

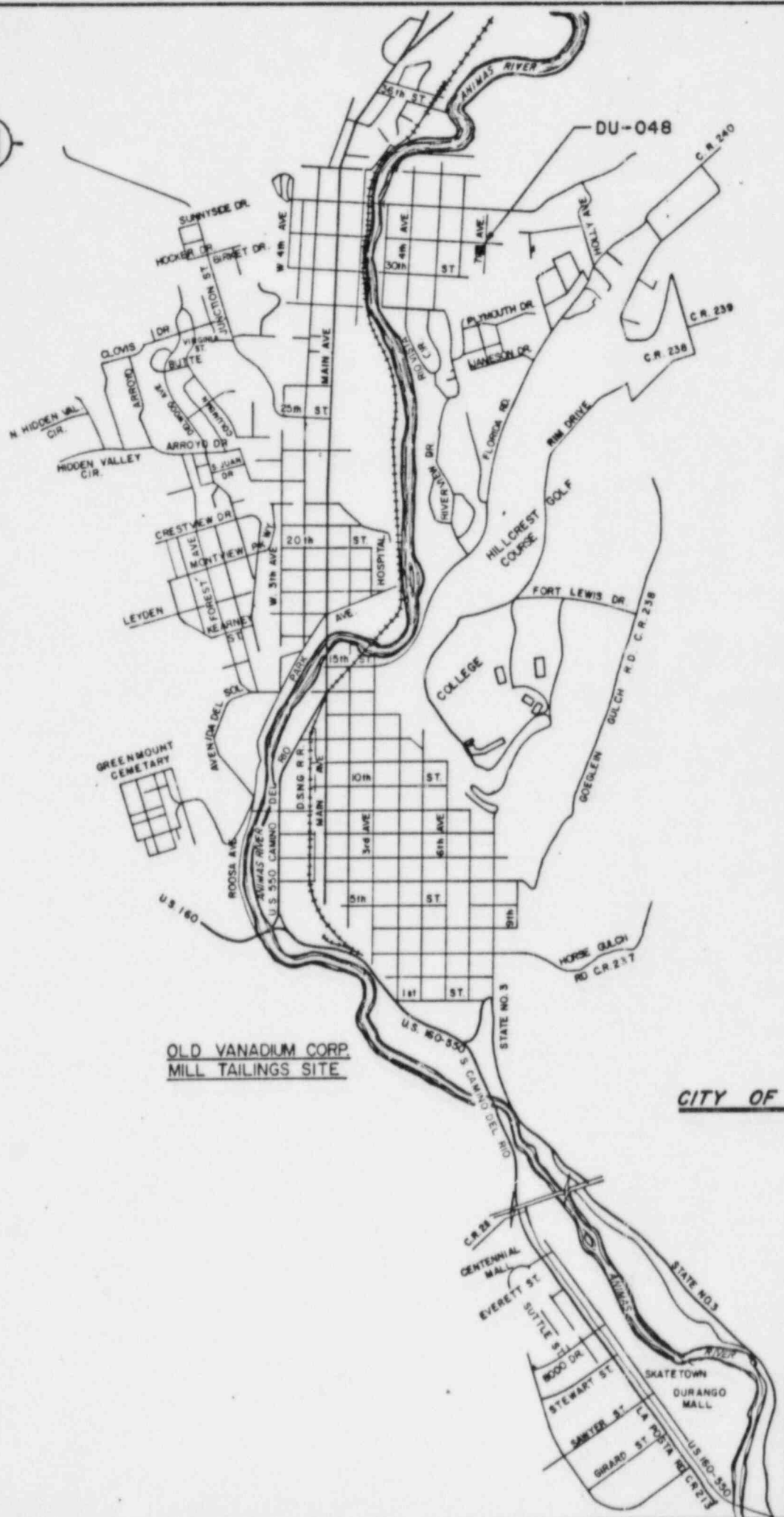
Rear: _____

Side: _____

Other: _____


Photographs:

<u>Roll Frame</u>	<u>Description</u>	<u>Direction</u>
<u>6-20</u>	<u>Front of House</u>	<u>Looking West</u>
<u>6-22</u>	<u>Rear of House</u>	<u>Looking Northeast</u>
<u>6-24</u>	<u>Rear of Yard</u>	<u>Looking Northwest</u>
<u>6-11</u>	<u>Utility Room</u>	<u>Looking Southeast</u>



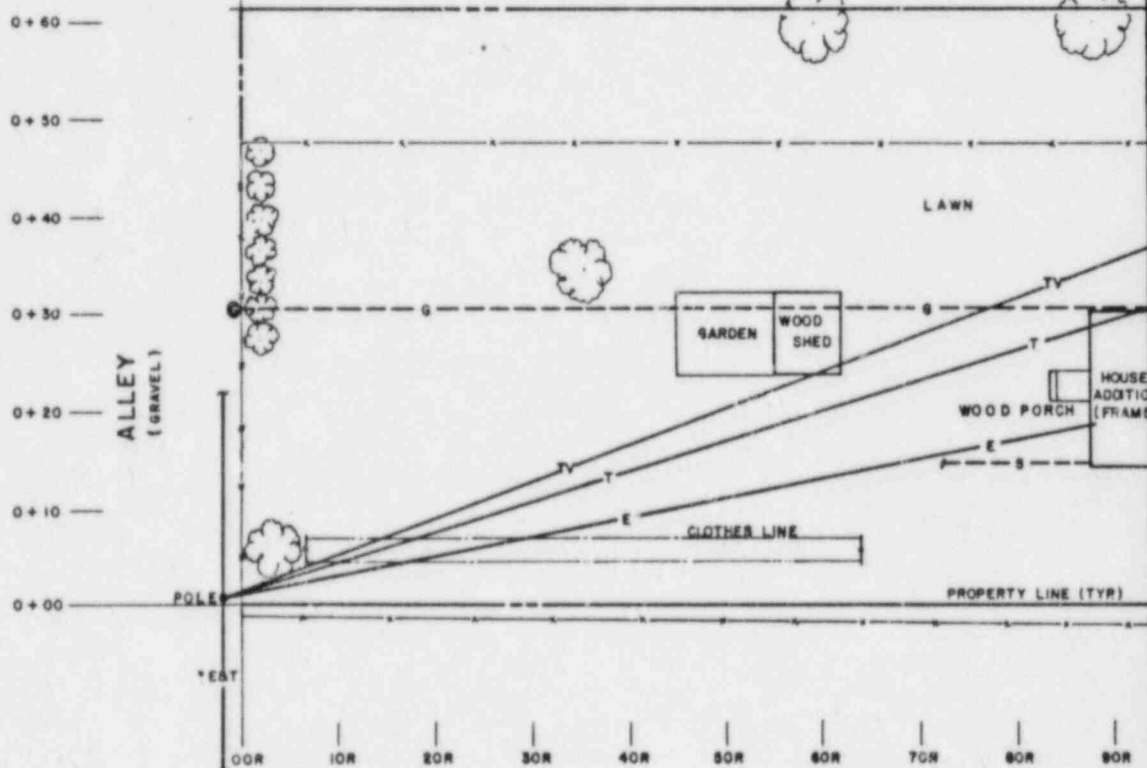
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31st STREET
(GRAVEL)

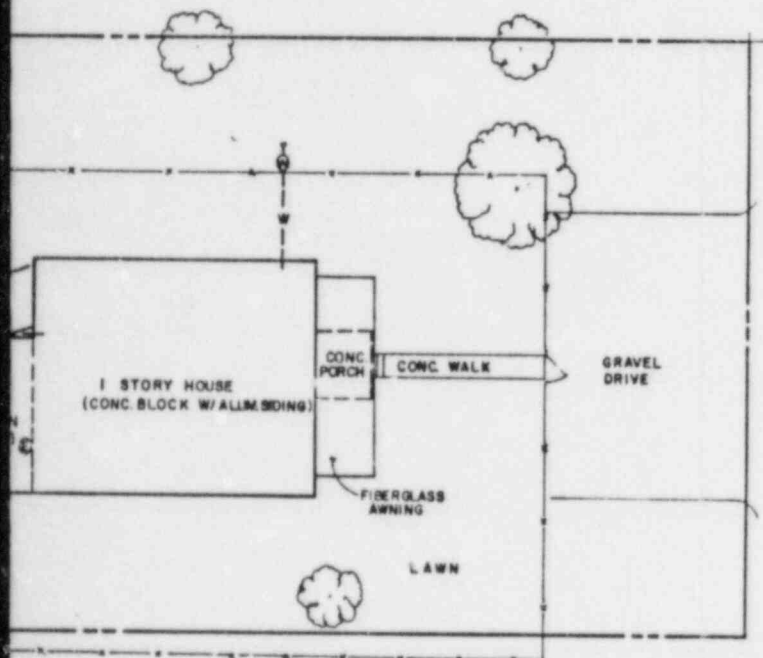


0 5 10
SCALE

LEGEND

— W —	WATER LINE
— G —	GAS LINE
— GM —	GAS MAIN
— S —	SEWER LINE
— SM —	SEWER MAIN
— STM —	STORM SEWER
— E —	ELECTRICAL LINE
— T —	TELEPHONE LINE
— TV —	CABLE TV
— — —	PROPERTY LINE
— x — x — x —	FENCE LINE
⊗ G, W or E	METER
⊗ G or W	VALVE
●	PROPERTY PIN
●	POWER POLE

NOTE: OVERHEAD SERVICE DENOTED BY SOLID LINE.
UNDERGROUND SERVICE DENOTED BY DASHED LINE.



E. 7th AVE.
(GRAVEL)

100R 110R 120R 130R 140R 150R 160R 170R

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U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

FIGURE 2.2
SITE PLAN DU-048

DURANGO, COLORADO
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

DESIGNED/DRAWN	GW
CHECKED	GW
REVIEWED	GW
APPROVED	GW

NR	DATE	DOE PROJECT MANAGER	DATE	DOE PROJECT ENGINEER	DATE
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MORRISON
KNUDSEN

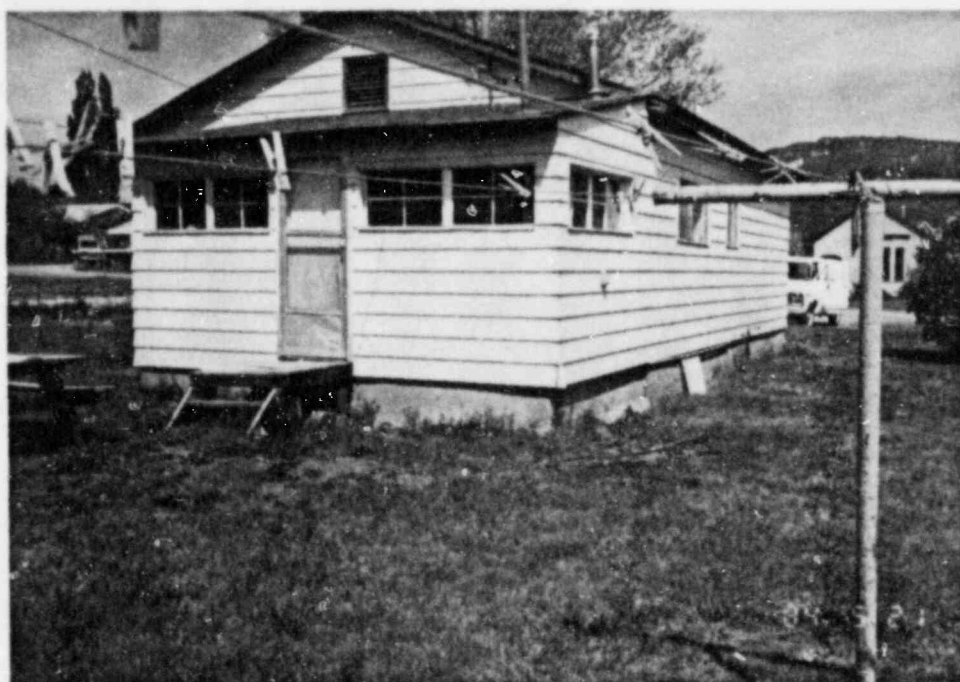
PROJECT NO.
DE-AC04-83AL18796
DRAWING NO.
DU-048-010

FINAL REA SUBMITTAL

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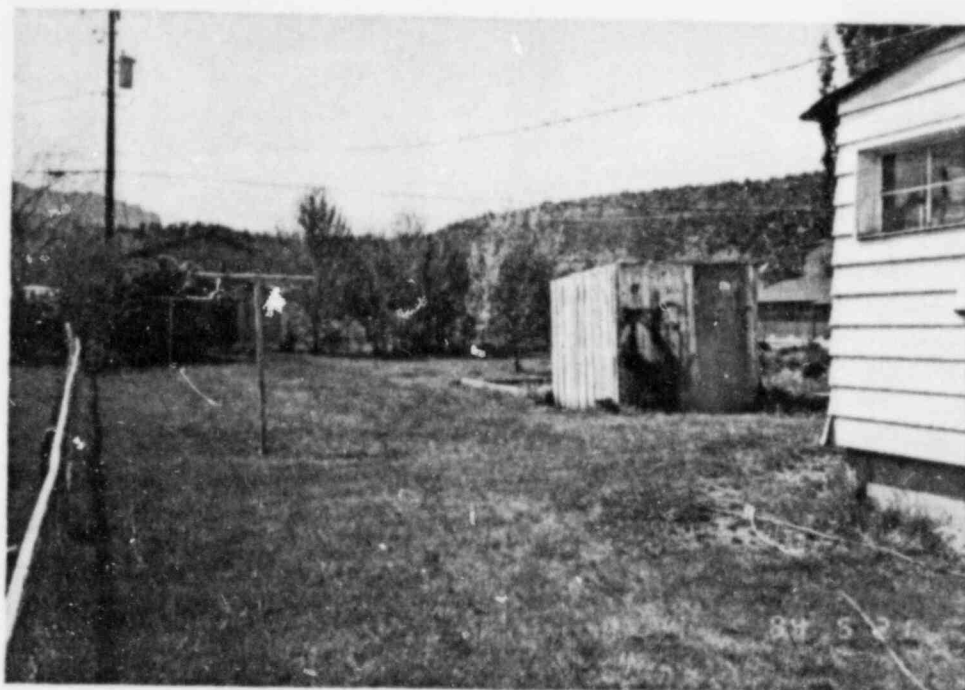


Front of House Looking West



Rear of House Looking Northeast

Figure 2.3 Property Photos



Rear of Yard Looking Northwest



Utility Room Looking Southeast

Figure 2.4 Property Photos

3.0 RADIOLOGICAL SURVEY AND ASSESSMENT

3.1 Gamma Exposure Rate Survey

3.1.1 Survey Method

The outdoor contaminated areas identified in the inclusion survey (Results of the Radiological Survey at Property DU-048, ORNL, February 1984) were surveyed in accordance with the RAC UMTRA Procedure 019. The survey was made on a 10' x 10' grid. A surface scan was made of the entire gridded property with a gamma scintillometer to identify the boundary of the contamination.

An indoor gamma survey was conducted inside and under the building in areas identified in the inclusion survey. This indoor survey was not conducted on a grid.

3.1.2 Survey Results

Outdoor surface gamma readings on the property range from 13 to 62 micro R/hr (Table 3.1). This may be compared with the background for the Durango site of 14 micro R/hr. Table 3.1 lists surface gamma readings greater than 15 micro R/hr. Readings were made within one foot of the building on all four sides.

Indoor surface gamma readings range from 12 to 205 micro R/hr (Table 3.2).

3.2 Borehole Survey

3.2.1 Survey Method

A gasoline-powered hand auger was used to drill 4-inch diameter holes in and around the regions identified as contaminated during the gamma survey. The holes were surveyed in compliance with the RAC UMTRA Procedure 018. Three angle holes were augered under the footings of the house at the crawl space to learn if contamination was under the foundation.

3.2.2 Survey Results

Contamination was found in 3 of the 19 outdoor holes augered. Low-level contamination was found in an additional two holes. The location and depth of the contamination is described in Table 3.3 and is shown in Figure 3.1.

The only contaminated angle hole was by the west wall. This is near the area of contamination described in Section 4.0 as Area A.

3.3 Radon/Radon Daughter Survey

No radon/radon daughter surveys were performed inside the buildings at the property, but the inclusion survey reported that radon daughter concentrations ranged as high as 0.098 WL. This can be attributed to the contamination located in the crawl space below the house.

3.4 Estimated Extent of Contamination

Three areas of contamination were identified in the survey.

Area A consists of the area directly in back of the house, under the rear addition to the house, and in the crawl space under the house. The frame house addition will have to be removed in order to gain access to the materials, but the tailings which are in the crawl space under the house itself can be removed without further damage to the structure. Because of the looseness of the tailings, it was not possible to maintain a borehole for logging; the estimated depth is 42 inches under the porch, and 6-24 inches in the crawl space.

Area B consists of the concrete front porch to the house and the material below it. The borehole in the porch reached a depth of 8 inches and was stopped by a large rock, but it is estimated that the overall depth of contamination is 36-42 inches.

Area C has an estimated depth of contamination of 12 inches.

The inclusion survey's report of contamination in the front yard could not be confirmed during the present survey except for Area C, which is in the driveway. Both gamma measurements and boreholes in the area showed only background radiation levels.

Table 3.1
OUTDOOR GAMMA SURVEY
Property DU-048

POINT	MICRO R/hr
0+00,60R	16
0+20,60R	16
0+10,70R	16
0+20,70R	16
0+30,70R	16
0+40,70R	16
0+00,80R	17
0+10,80R	17
0+20,80R	20
0+30,80R	19
0+40,80R	17
0+50,80R	16
0+00,90R	18
0+10,90R	20
0+14,90R	62
0+30,90R	48
0+40,90R	16
0+50,90R	16

Table 3.1 - Cont'd.
OUTDOOR GAMMA SURVEY
Property DU-048

POINT	MICRO R/hr
0+00,110R	16
0+10,110R	17
0+14,110R	17
0+40,110R	16
0+50,110R	16
0+00,120R	16
0+10,120R	16
0+14,120R	17
0+40,120R	16
0+50,120R	16
0+00,130R	16
0+10,130R	16
0+20,130R	17
0+50,130R	16
0+00,70R	16
0+20,150R	16
0+40,150R	16
0+50,150R	16
0+00,160R	16
0+10,160R	16

Table 3.1 - Cont'd.
OUTDOOR GAMMA SURVEY
Property DU-048

POINT	MICRO R/hr
0+20,160R	16
0+30,160R	16
0+40,160R	16
0+50,160R	16
0+00,100R	18
0+10,100R	18
0+14,100R	20
0+40,100R	16
0+50,100R	16
0+30,100R	21
0+40,100R	16
0+50,100R	16
0+60,130R	15
0+00,140R	15
0+10,140R	15
0+20,140R	15
0+30,140R	16
0+40,140R	15
0+00,170R	16
0+10,170R	18
0+20,170R	17

Table 3.1 - Cont'd.
OUTDOOR GAMMA SURVEY
Property DU-048

POINT	MICRO R/hr
0+30,170R	16
0+40,170R	15
0+50,170R	16
0+60,170R	14
0+40,135R	12
0+32,135R	12

Table 3.2
INDOOR GAMMA SURVEY
Property DU-048

LOCATION	MICRO R/hr
Back Porch	
SW	88
Door	89
NW	42
NE	95
Door to Kitchen	95
SE	138
Kitchen	
SE	23
SW	40
NE	17
Crawl space at back of house adjacent to back porch	
Left corner	12
Right corner	12
Crawl Space Under House (see Figure 1 for locations)	
1	205
2	50
3	50
4	41

Table 3.2 - Cont'd.
INDOOR GAMMA SURVEY
Property DU-048

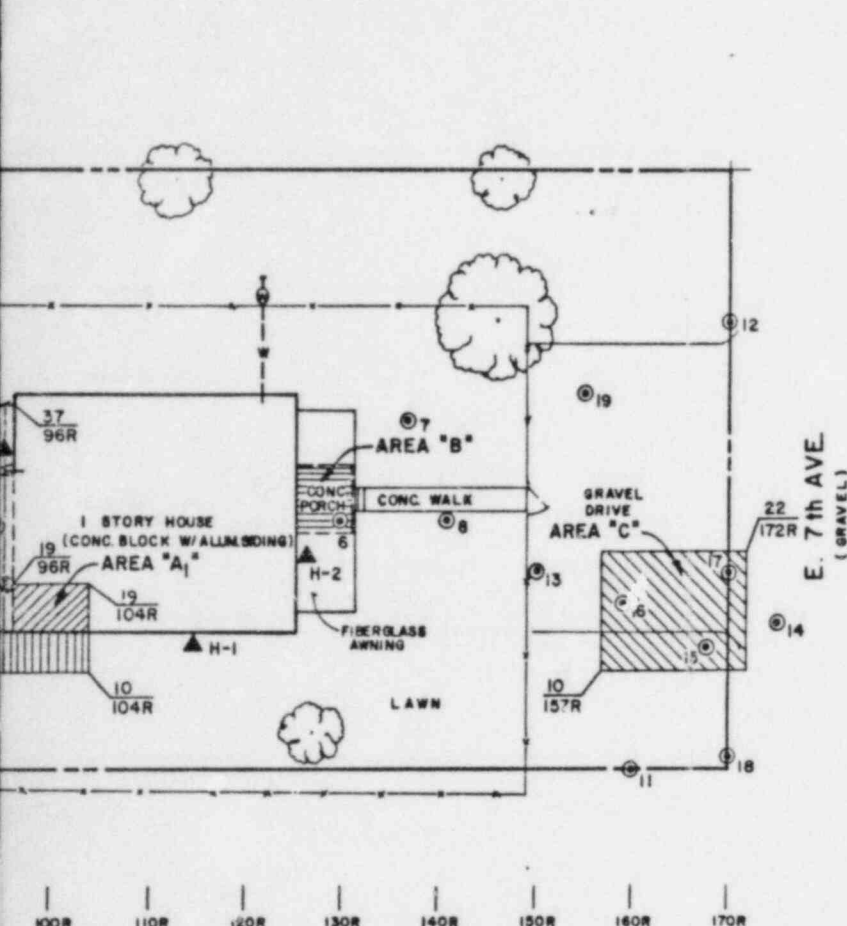
LOCATION	MICRO R/hr
5	18
6	25
7	22
8	21
9	17

Table 3.3
BOREHOLE SURVEY
Property DU-048

HOLE	COORDINATES	CONTAMINATION DEPTH
1	0+30,80R	None
2	0+01,78R	None
3	0+10,80R	None
4	0+15,71R	None
5	0+07,91R	None
6	0+25,130R	0-8"+
7	0+35,137R	None
8	0+25,141R	None
9	0+39,91R	None
10	0+23,92R	0-24"+
11	0+00,160R	None
12	0+45,170R	None
13	0+20,150R	None
14	0+15,175R	None
15	0+12,168R	0-6"*
16	0+17,159R	0-6"*
17	0+20,170R	0-8"+
18	0+01,170R	None
19	0+38,155R	None

*Low-level contamination present.

+Vertical extent of contamination not reached.

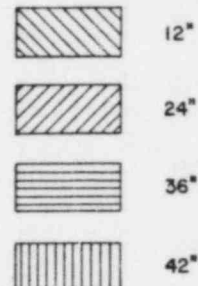


LEGEND

⊙₃ AUGER HOLE DESIGNATION

▲_{H-3} ANGLE HOLE DESIGNATION

ESTIMATED DEPTH OF CONTAMINATION



Also Available On
Aperture Card

TI
APERTURE
CARD

8507090293-03

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED/DRAWN
CHECKED
REVIEWED
RECOMMENDED

NR

DATE

DOE PROJECT MANAGER

NR

DATE

DOE PROJECT ENGINEER

NR

DATE

FIGURE 3.1

RADIOLOGICAL SURVEY DATA DU-048

DURANGO, COLORADO

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

PROJECT NO.

DE-ACO4-83AL18796

DRAWING NO.

DU-048-015

REV.

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MORRISON
KNUDSEN

FINAL REA SUBMITTAL

REVISIONS

DRAWN BY CHECKED BY APPROVAL DATE ENG DOE

4.0 ENGINEERING ASSESSMENT

Engineering options were formulated and evaluated based on the radiological and engineering assessment for this property. Factors forming the basis of the evaluation were: the extent and location of the contamination, construction costs, and required demolition and constructibility for the various options. Results of the evaluation are detailed below.

4.1 Evaluation of Options

4.1.1 Options

Two options were evaluated for property DU-048:

1. No action should be taken.
2. Complete decontamination of the property including retrieval of the contaminated material and restoration of the property.

Option 2 would include the following:

- o Remove and store washing appliances and miscellaneous items. Temporarily relocate gas water heater so as to maintain service to the residence during construction. Replace washing appliances, miscellaneous items and water heater when construction has been completed.
- o Demolish and remove room addition and concrete front porch.
- o Excavate areas of contamination to the limits and depths illustrated in Figure 4.1.
- o Backfill excavated areas with common fill and to with:
 - (1) Topsoil and sod in lawn areas.
 - (2) Structural fill in concrete areas.
 - (3) Gravel in graveled areas.
- o Reconstruct room addition and concrete front porch as shown in Figure 4.2.

4.1.2 Costs

Estimated costs for the activities associated with Option 2 are detailed in Table 4.1. Costs include labor, insurance, material, equipment, supplies, overhead, profit, and contingency. All costs are listed in 1985 dollars. It is anticipated that the time required for the subcontractor to complete the work will be 25 to 30 days.

4.2 Recommendation

The limited cost and amount of remedial action work precluded evaluating any more than these two options. The results of the radiological assessment concluded that contamination levels on the property exceeded EPA guidelines. Therefore, based on these guidelines, it is recommended that Option 2, decontamination of the property, be pursued. The total estimated cost for Option 2 is \$19,700.00.

Table 4.1
OPTION 2 COSTS

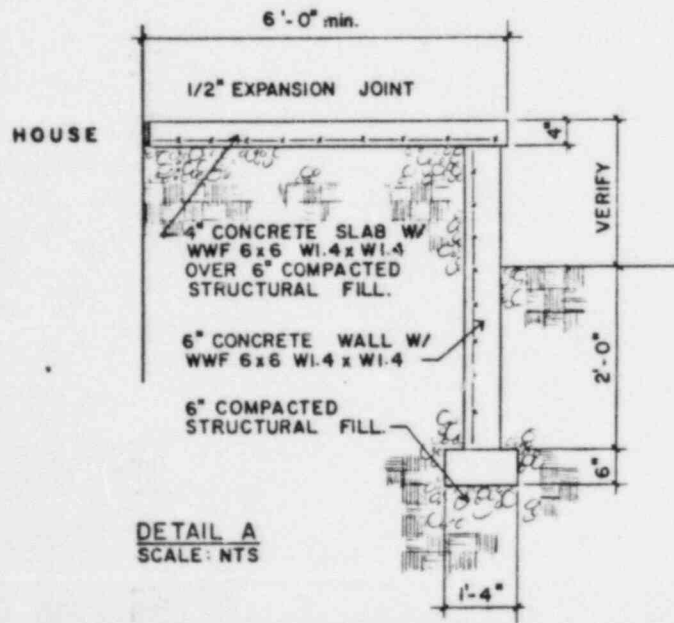
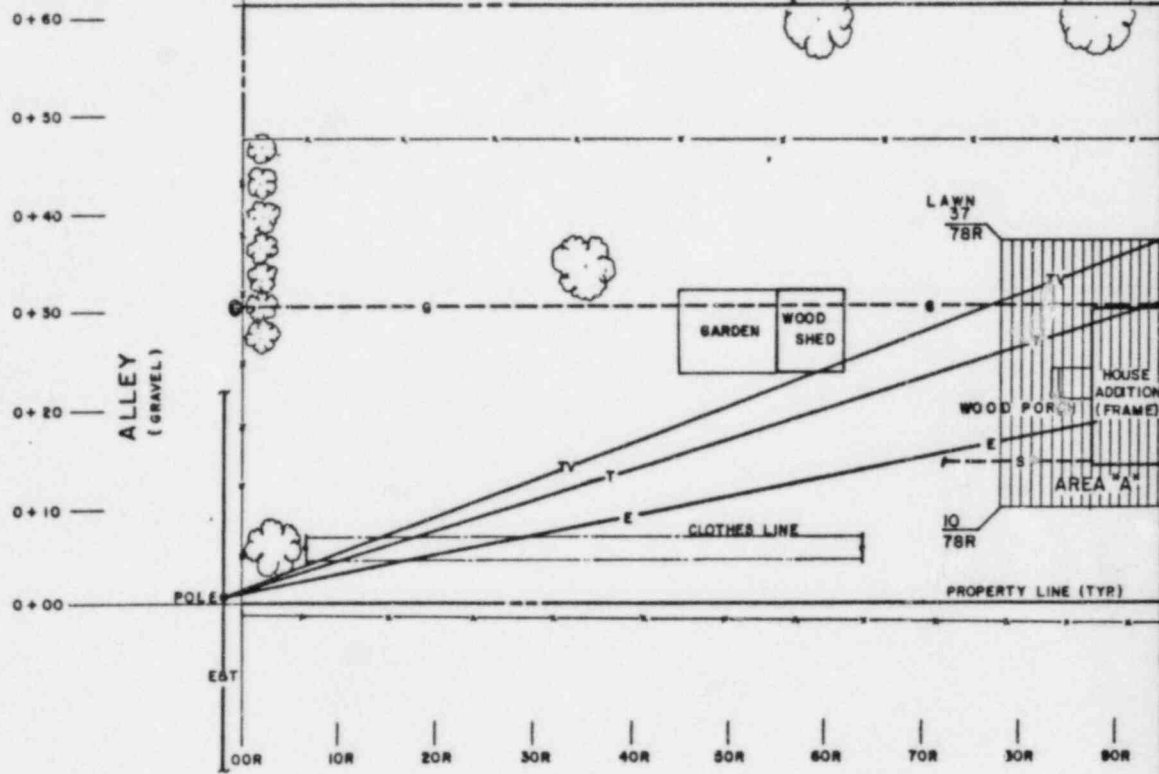
<u>Activity</u>	<u>Unit Price</u>	<u>Quantity</u>	<u>Estimated Cost</u>
Structure Demolition and Removal	12.00	144 sf	1,728.00
Conc. Porch Demolition and Removal	4.20	42 sf	176.40
Appliance Storage	360.00	1 LS	360.00
Water Heater Provisions	355.00	1 LS	355.00
Excavation (internal - hand)	390.00	3 cy	1,170.00
Excavation (machine)	8.30	80 cy	664.00
Relocate Power Meter	600.00	1 LS	600.00
Common Backfill (internal hand)	170.00	3 cy	510.00
Common Backfill (machine)	7.20	66 cy	475.20
Structural Fill (machine)	26.40	3 cy	79.20
Topsoil	26.40	8 cy	211.20
Sod	3.00	381 sf	1,143.00
Gravel	26.40	3 cy	79.20
Structure Restoration	36.00	144 sf	5,184.00
Conc. Porch Restoration	16.30	42 sf	684.60
Replace Appliances	200.00	1 LS	200.00

Table 4.1 - Cont'd.
OPTION 2 COSTS

Subtotal	13,619.80
5% Subcontractor's Contingency	681.00
20% Overhead & Profit	<u>2,860.16</u>
Subtotal	17,160.96
15% Contingency	<u>2,574.14</u>
Rounded Total	19,700.00



31st STREET
(GRAVEL)



DETAIL A
SCALE: NTS

Also Available On
Aperture Card

TI APERTURE CARD

LEGEND

— W —	WATER LINE
— G —	GAS LINE
— GM —	GAS MAIN
— S —	SEWER LINE
— SM —	SEWER MAIN
— STM —	STORM SEWER
— E —	ELECTRICAL LINE
— T —	TELEPHONE LINE
— TV —	CABLE TV
— — —	PROPERTY LINE
— X — X — X —	FENCE LINE
⊗ G, W or E	METER
⊗ G or W	VALVE
⊙	PROPERTY PIN
●	POWER POLE

NOTE: OVERHEAD SERVICE DENOTED BY SOLID LINE.
UNDERGROUND SERVICE DENOTED BY DASHED LINE.

SCOPE OF WORK

AREA "A" AND "A₁"

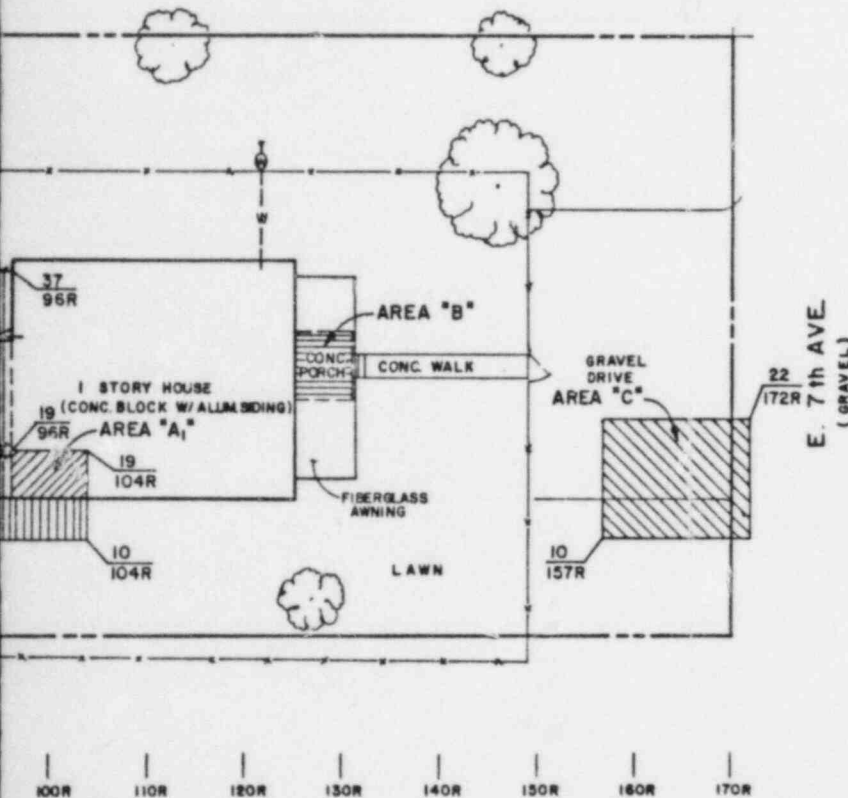
- RETAIN AND STORE APPLIANCES AND MISCELLANEOUS ITEMS. PROVISIONS TO BE MADE FOR WATER HEATER SERVICE TO REMAIN DURING CONSTRUCTION.
- DEMOLISH AND REMOVE HOUSE ADDITION AS PER DRAWING DU-048-021.
- EXCAVATE AREA "A" TO A DEPTH OF 42 INCHES.
- HAND EXCAVATE AREA "A₁" TO A DEPTH OF 24 INCHES. TEMPORARY STRUCTURE SUPPORT WILL BE NEEDED DURING EXCAVATION PHASE.
- BACKFILL AREA "A₁" WITH COMMON BACKFILL AND TOP WITH 6 INCHES OF STRUCTURAL FILL.
- CONSTRUCT NEW HOUSE ADDITION AS PER DEMOLITION AND RESTORATION DRAWING DU-048-021.
- REPLACE APPLIANCES TO PREVIOUS LOCATIONS.
- BACKFILL REMAINING AREA "A" WITH COMMON BACKFILL AND TOP WITH 6 INCHES OF TOPSOIL IN LAWN AREA AND SOD.

AREA "B"

- REMOVE AND SALVAGE FIBERGLASS PORCH ROOF.
- DEMOLISH AND REMOVE CONCRETE PORCH.
- EXCAVATE AREA "B" TO A DEPTH OF 36 INCHES.
- BACKFILL EXCAVATED AREA WITH COMMON BACKFILL AND TOP WITH 6 INCHES OF STRUCTURAL FILL.
- CONSTRUCT NEW CONCRETE PORCH AS PER DRAWING DU-048-020, DETAIL A.
- REPLACE FIBERGLASS PORCH ROOF.

AREA "C"

- EXCAVATE AREA "C" TO A DEPTH OF 12 INCHES.
- BACKFILL EXCAVATED AREA WITH COMMON BACKFILL AND TOP WITH 6 INCHES OF GRAVEL.



NOTES:

1. THE LATEST REVISION OF THE FOLLOWING TECHNICAL SPECIFICATIONS APPLY TO THE REMEDIAL ACTION WORK REQUIRED FOR PROPERTY NO. DU-048.
 - SECTION 02050 DEMOLITION
 - SECTION 02110 CLEARING AND GRUBBING
 - SECTION 02130 CONTAMINATED MATERIAL REMOVAL
 - SECTION 02150 UNDERPINNING
 - SECTION 02200 EXCAVATION AND BACKFILL
 - SECTION 02480 LANDSCAPING
 - SECTION 03300 CAST-IN-PLACE CONCRETE
2. UTILITY LOCATIONS ARE FOR REFERENCE ONLY. ACTUAL LOCATIONS SHALL BE DETERMINED BY THE SUBCONTRACTOR PRIOR TO START OF CONSTRUCTION.
3. THE EXCAVATION LIMITS AND DEPTHS ARE BASED ON A LIMITED NUMBER OF BORINGS TAKEN DURING THE RADIOLOGICAL SURVEYS OF THIS PROPERTY. ADDITIONAL RADIOLOGICAL SURVEYS PERFORMED DURING REMEDIAL ACTION MAY REQUIRE MORE OR LESS EXCAVATION TO BE TAKEN FROM THE DESIGNATED AREAS. ALL CHANGES TO THE LIMITS AND DEPTHS OF EXCAVATION AS SHOWN ON THE DESIGN DRAWINGS SHALL BE AS DIRECTED BY THE CONTRACTOR'S REPRESENTATIVE.

8507 090293-04

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

FIGURE 4.1

EXCAVATION & RESTORATION PLAN DU-048

DURANGO, COLORADO

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

DESIGNED BY
CHECKED BY
REVIEWED BY
RECOMMENDED BY

APPROVED DATE DOE PROJECT MANAGER DATE DOE PROJECT ENGINEER DATE

NR

NR

NR

PROJECT NO.

DE-AC04-83AL18796

DRAWING NO. DU-048-020

REV. A

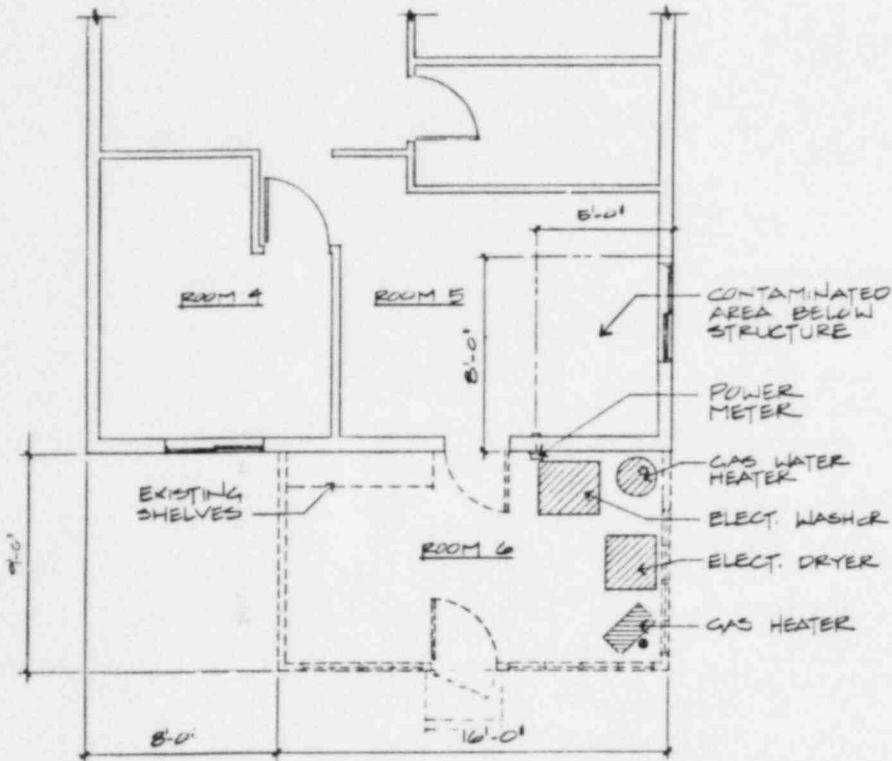


MORRISON
KNUDSEN

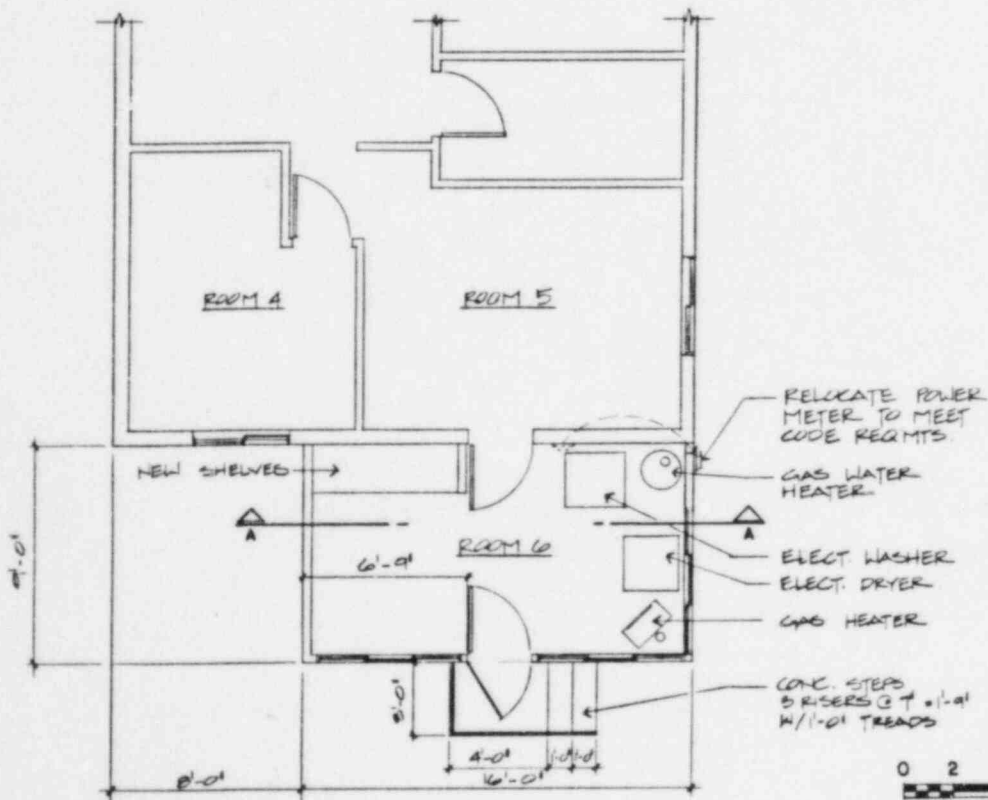
FINAL REA SUBMITTAL

REVISIONS

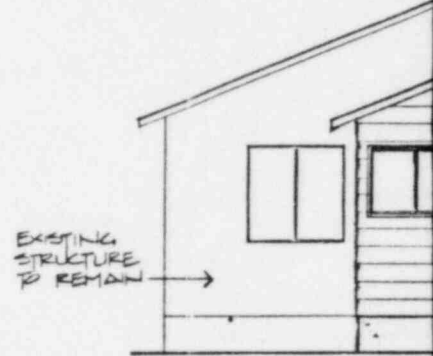
DRAWN BY CHECKED BY APPROVED BY DATE



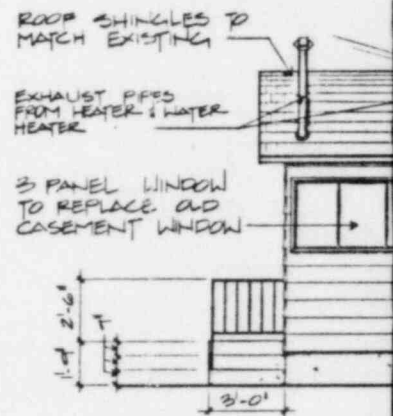
DEMOLITION PLAN



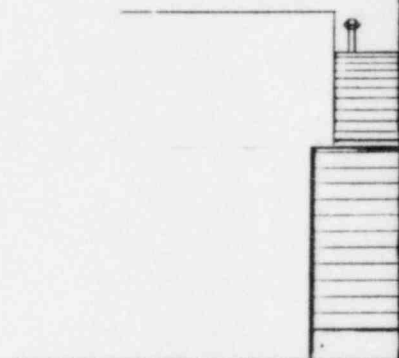
RESTORATION PLAN



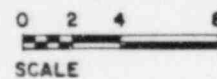
WEST ELEVATION



SOUTH ELEVATION



NORTH ELEVATION



NOTES

----- INDICATES PORTION OF STRUCTURE TO BE TORN DOWN & REMOVED FROM SITE.

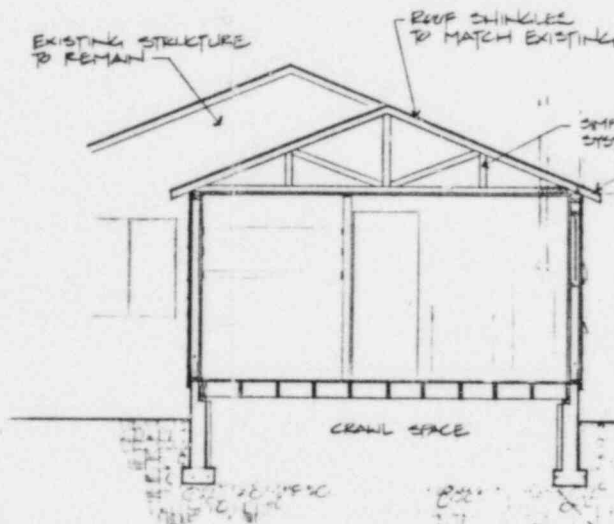
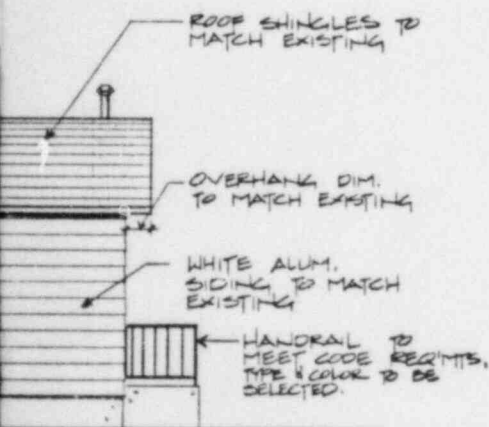
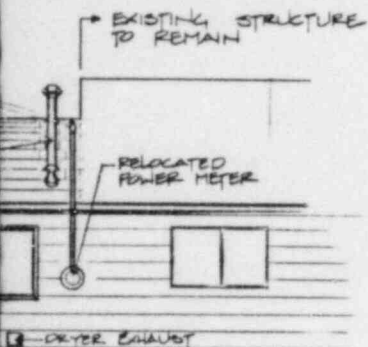
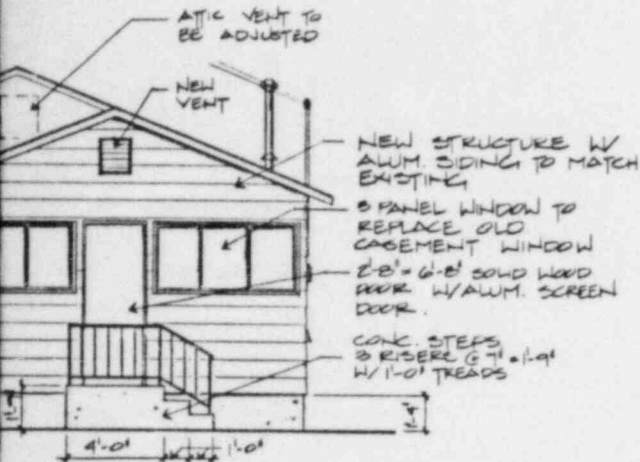
----- INDICATES AREA CONTAMINATED - TO BE EXCAVATED AND REFILLED

▨ INDICATES ITEMS TO BE SAVED AND RESTORED INTO NEW STRUCTURE.

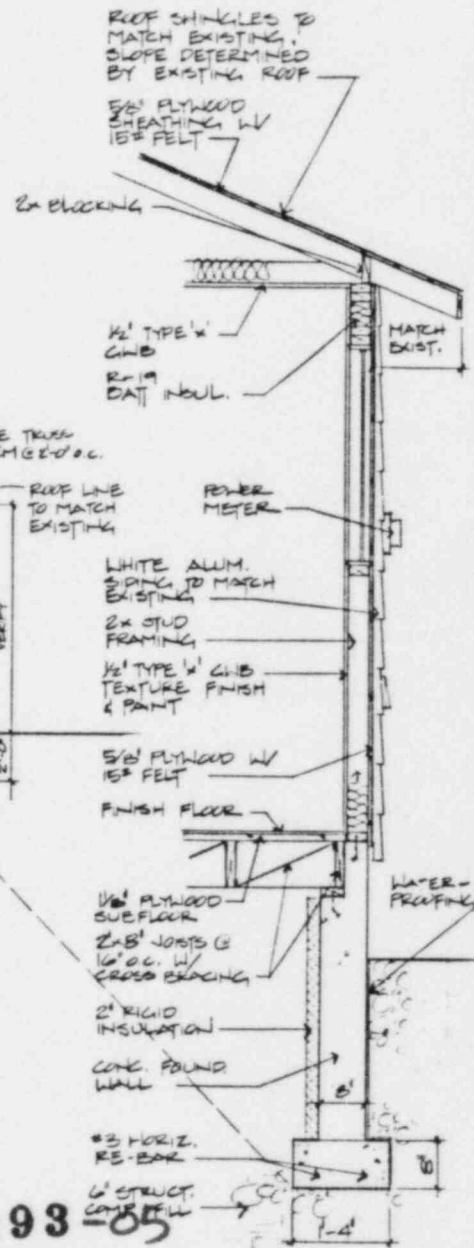
NEW CONSTRUCTION TO COMPLY W/CITY & STATE CODES.

Also Available On
Aperture Card

TI APERTURE CARD



BUILDING SECTION A A



8507 090293-85

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

FIGURE 4.2

DEMOLITION & RESTORATION

PLANS, ELEVATIONS, SECTION & DETAIL

DURANGO, COLORADO

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

DESIGNED BY
DRAWN BY CAM
CHECKED BY
REVIEWED BY
RECOMMENDED BY
APPROVED BY

NR

DATE

DOE PROJECT MANAGER

NR

DATE

DOE PROJECT ENGINEER

NR

DATE

PROJECT NO.

DE - AC04 - 83AL18796

DRAWING NO.

DU-048-021

REV.
A



MORRISON
KNUDSEN

FINAL REA SUBMITTAL

REVISIONS

DRAWN BY CHECKED BY APPROVAL LINE DATE APPROVAL DATE

5.0 TECHNICAL SPECIFICATIONS

Technical specifications applicable to this property are indexed in Table 5.1 . Specifications previously approved by the Department of Energy (DOE) are noted in the table. Also listed are specifications not previously submitted to the DOE which require approval. The text for these additional specifications follow the table.

Table 5.1
INDEX OF TECHNICAL SPECIFICATIONS

Description		Specifications Previously Approved	Specifications Requiring DOE Approval
SECTION 02050	DEMOLITION	X	
SECTION 02110	CLEARING AND GRUBBING	X	
SECTION 02130	CONTAMINATED MATERIAL REMOVAL	X	
SECTION 02150	UNDERPINNING	X	
SECTION 02200	EXCAVATION AND BACKFILL	X	
SECTION 02480	LANDSCAPING	X	
SECTION 03300	CAST-IN-PLACE CONCRETE	X	

6.0 CONSTRUCTION DRAWINGS

Listed below is an index of the construction drawings required for remedial action on this property.

<u>Drawing Number</u>	<u>Drawing Title</u>
DU-048-020	Excavation & Restoration Plan DU-048
DU-048-021	Demolition & Restoration Plans, Elevations, Section & Detail DU-048

APPENDIX A
SURVEY DATA LOGS

OUTDOOR GAMMA SCREENING SURVEY DATA SHEET

LOGGING CREW: ERNEST COUCH
EDWARD SCHULTZ
LEON BENALLY

SHEET 1 OF 7 PAGE 1
 DATE: 6-26-84
 PROPERTY ID: DU-048

INSTRUMENT ID NO.: LUD 2220 # 31972 W/4410 # 16527

BACKGROUND CALCULATION:

#1 _____ + #2 _____ + #3 _____ = _____ + 3 = 11,540 COUNTS/1MIN

AREA: _____		AREA: _____		AREA: _____		AREA: _____	
POINT ID	READING COUNTS/1MIN	POINT ID	READING COUNTS/1MIN	POINT ID	READING COUNTS/1MIN	POINT ID	READING COUNTS/1MIN
0+00	15000	0+30	12480	0+60	13430	0+90	18110
+00R	12120	+30R	13760	+60R	13460	+90R	15740
0+10	13530	0+40	13170	0+70	17910	0+100	15550
+00R	12260	+40R	13110	+70R	16800	+100R	15880
0+20	14670	0+50	14320	0+80	16780	0+110	13750
+00R	13260	+50R	14080	+80R	17170	+110R	13060
0+30	14580	0+60	13120	0+90	17490	0+120	17160
+00R	12930	+60R	13350	+90R	18970	+120R	17370
0+40	12970	0+70	13110	0+100	17470	0+130	19350
+00R	13220	+70R	13660	+100R	17910	+130R	19360
0+50	13070	0+80	12870	0+110	15440	0+140	19130
+00R	13300	+80R	13010	+110R	16150	+140R	19110
0+60	13110	0+90	12920	0+120	14860	0+150	16690
+00R	12700	+90R	12490	+120R	14990	+150R	15870
0+70	12310	0+100	13480	0+130	14320	0+160	15730
+00R	13110	+100R	13480	+130R	14150	+160R	14900
0+80	12680	0+110	13580	0+140	22010	0+170	13690
+00R	13220	+110R	14060	+140R	18960	+170R	13210
0+90	13150	0+120	13890	0+150	21420	0+180	16850
+00R	13860	+120R	13290	+150R	21180	+180R	16370
0+100	13550	0+130	14290	0+160	30730	0+190	16790
+00R	14000	+130R	12920	+160R	32500	+190R	16550
0+110	13730	0+140	15050	0+170	28850	0+200	19740
+00R	13780	+140R	13740	+170R	28440	+200R	17750
0+120	14230	0+150	12200	0+180	19440	0+210	18770
+00R	13560	+150R	13170	+180R	18450	+210R	18000
0+130	13970	0+160	14040	0+190	17260	0+220	15850
+00R	13270	+160R	13670	+190R	17320	+220R	14420
0+140	13210	0+170	13450	0+200	14100	0+230	13590
+00R	12960	+170R	14130	+200R	13860	+230R	13970
0+150	13560	0+180	13640	0+210	22950	0+240	16230
+00R	13150	+180R	14850	+210R	26660	+240R	16040
0+160	12820	0+190	14590	0+220	29470	0+250	16060
+00R	12740	+190R	14090	+220R	31410	+250R	15760
0+170	13720	0+200	14210	0+230	146590	0+260	19520
+00R	12810	+200R	14190	+230R	6550	+260R	17410
0+180	14130	0+210	16210	0+240	18090	0+270	32950
+00R	13790	+210R	15410	+240R	17820	+270R	21170
0+190	13440	0+220	14640	0+250	16650	0+280	17520
+00R	13590	+220R	14670	+250R	16090	+280R	16850
0+200	14180	0+230	16240	0+260	13750	0+290	15990
+00R	13610	+230R	14480	+260R	12700	+290R	13870
0+210	14000	0+240	12130	0+270	24640	0+300	14990
+00R	13480	+240R	15510	+270R	22780	+300R	13770
0+220	13050	0+250	14640	0+280	24910	0+310	14980
+00R	13240	+250R	15260	+280R	26110	+310R	13540
0+230	12860	0+260	16480	0+290	31120	0+320	14740
+00R	13040	+260R	14950	+290R	34100	+320R	14810
0+240		0+270		0+300	109180		
				+300R	56300		

REMARKS: All Readings in cpm
Top - CONTACT READINGS
Bottom - 1 METER READINGS

OUTDOOR GAMMA SCREENING SURVEY DATA SHEET

LOGGING CREW: ERNEST COUCH
EDWARD SCHULTZ
LEVON BERNARDY

SHEET 2 OF 7 PAGE 2
 DATE: 6-26-84
 PROPERTY ID: DU-08/8

INSTRUMENT ID NO.: LUD 220 #31972 W/4410 #16527

BACKGROUND CALCULATION:

#1 _____ + #2 _____ + #3 _____ = _____ + 3 = 11500 COUNTS/1MIN

AREA: _____		AREA: _____		AREA: _____		AREA: _____	
POINT ID	READING COUNTS/1MIN	POINT ID	READING COUNTS/1MIN	POINT ID	READING COUNTS/1MIN	POINT ID	READING COUNTS/1MIN
0+20 +140R	15210 15550	0+50 +170R	17200 16030	0+35 +190R	2760 14470	FRONT	
0+30 +140R	16610 17760	0+60 +170R	13960 13890	0+38 +190R	2210 14580	SN	21990 18460
0+40 +140R	15400 14240	FRONT OF		0+29 +183R	2560 16950	NW	19370 18800
0+50 +140R	13610 13720	HOUSE		0+20 +183R	3320 14840	NE	19450 22010
0+60 +140R	14300 13630	0+40 +135R	2140 8580	0+18 +183R	2710 18800		
0+70 +130R	15270 14620	0+36 +135R	2910 8710	0+14 +183R	2430 14600		
0+10 +150R	15010 15330	0+32 +135R	3580 12210	0+10 +184R	1870 10080		
0+20 +150R	15830 15250	0+28 +135R	1850 11510	0+5 +183R	1940 10410		
0+30 +150R	15250 15930	0+24 +135R	1770 8840	0+5 +175R	2370 10370		
0+40 +150R	17140 17520	0+20 +135R	1690 8420	0+10 +175R	1870 9460		
0+50 +150R	15440 13900	0+16 +135R	1850 8650	0+14 +175R	2100 10100		
0+60 +150R	13300 13800	0+16 +145R	1750 9110	0+18 +175R	2170 13250		
0+70 +160R	16860 16310	0+20 +145R	1830 8420	0+21 +175R	2500 13130		
0+10 +160R	16640 17210	0+24 +145R	1770 8930	0+25 +175R	2430 13630		
0+20 +160R	15940 16700	0+26 +145R	1960 10710	0+32 +175R	2310 8860		
0+30 +160R	17130 16090	0+30 +145R	1960 13040	0+40 +175R	1990 9180		
0+40 +160R	15650 13280	0+28 +145R	2030 11310	0+40 +165R	1760 8440		
0+50 +160R	16030 14830	0+32 +145R	1750 8910	0+31 +165R	1960 9340		
0+60 +160R	14530 14340	REAR OF HOUSE		0+28 +165R	1860 9580		
0+70 +170R	17190 16440	CONE READINGS		0+18 +165R	1760 10140		
0+10 +170R	24390 19460	0+44 +194R	1900 10890	0+14 +165R	1760 9130		
0+20 +170R	19600 18790	0+44 +192R	2000 10340	0+8 +165R	1820 8460		
0+30 +170R	17260 16710	0+44 +184R	1950 9740	0+4 +165R	1570 8800		
0+40 +170R	14660 14000	0+38 +185R	2490 13780				

REMARKS: Shielded unshielded for cone shield Contact 1 inch for
normal grid points
AA readings in cpm



BOREHOLE LOG

LOGGING CREW:

ERNEST COUCH
EDWARD SCHULTZ
LEON BENALLY

SHEET

3 OF 7 PAGE 3

DATE:

6-26-84

PROPERTY ID:

DU-048

INSTRUMENT ID NO.

LUD 2220 * 31962 w/440 #16585

AREA:

Durango Colo.

NOTES: 1. ALL HOLES ARE 4" DIA. UNLESS OTHERWISE NOTED.

2. RECORD UNUSUAL CONDITIONS, SUCH AS THE PRESENCE OF WATER IN BOREHOLES AND DEPTH, CASING TYPE AND THICKNESS IF USED, CONCRETE CORES AND THICKNESS, OBSTRUCTIONS, UTILITIES, ETC., IN THE REMARKS SECTION.

HOLE ID: 0+30+80R		HOLE ID: 0+01+78R		HOLE ID: 0+10+80R		HOLE ID: 0+15+71R	
TIME DRILLED: _____		TIME DRILLED: _____		TIME DRILLED: _____		TIME DRILLED: _____	
TIME LOGGED: _____		TIME LOGGED: _____		TIME LOGGED: _____		TIME LOGGED: _____	
SOIL TYPE: _____		SOIL TYPE: _____		SOIL TYPE: _____		SOIL TYPE: _____	
DEPTH	COUNTS/1MIN	DEPTH	COUNTS/1MIN	DEPTH	COUNTS/1MIN	DEPTH	COUNTS/1MIN
SURFACE		SURFACE		SURFACE		SURFACE	
0"	27960	0"	20010	0"	21460	0"	16270
6"	31740	6"	21110	6"	20720	6"	32050
12"	30870	12"	21970	12"	23590	12"	20200
18"	26000	18"	21560	18"	22280	18"	21180
24"	22890	24"	21300	24"	22380	24" 21	20430
30"		30"		30"	21170	30"	
36"		36"		36"		36"	
42"		42"		42"		42"	
48"		48"		48"		48"	
54"		54"		54"		54"	
60"		60"		60"		60"	
66"		66"		66"		66"	
72"		72"		72"		72"	
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"		90"	
96"		96"		96"		96"	

REMARKS:

Bore hole bkgd ave 23,000 cpm

All readings are in cpm

Holes drilled to rock

BOREHOLE LOG

LOGGING CREW: Ernest Cayich
Edward Lech
Leon Binally
 SHEET 4 OF 7 PAGE 4
 DATE: 6-26-84
 PROPERTY ID: DU-048
 INSTRUMENT ID NO. LUP 2220 34982 4440 #16528 AREA: Durango Colo.

- NOTES: 1. ALL HOLES ARE 4"DIA. UNLESS OTHERWISE NOTED.
 2. RECORD UNUSUAL CONDITIONS, SUCH AS THE PRESENCE OF WATER IN BOREHOLES AND DEPTH, CASING TYPE AND THICKNESS IF USED, CONCRETE CORES AND THICKNESS, OBSTRUCTIONS, UTILITIES, ETC. IN THE REMARKS SECTION.

HOLE ID: 0F07+91R		HOLE ID: 0F25+130R		HOLE ID: 0F35+137R		HOLE ID: 0F25+141R	
TIME DRILLED: _____		TIME DRILLED: _____		TIME DRILLED: _____		TIME DRILLED: _____	
TIME LOGGED: _____		TIME LOGGED: _____		TIME LOGGED: _____		TIME LOGGED: _____	
SOIL TYPE: _____		SOIL TYPE: _____		SOIL TYPE: _____		SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE		SURFACE		SURFACE		SURFACE	
0"	24490	0"	391130	0"	17640	0"	15630
6"	23840	6"	88850	6"	20360	6"	19480
12"	22000	12" 8	84240	12"	21590	12"	19800
18"	22730	18"		18" 14	20880	18"	20250
24"	21920	24"		24"		24"	
30"		30"		30"		30"	
36"		36"		36"		36"	
42"		42"		42"		42"	
48"		48"		48"		48"	
54"		54"		54"		54"	
60"		60"		60"		60"	
66"		66"		66"		66"	
72"		72"		72"		72"	
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"		90"	
96"		96"		96"		96"	

DRILLED
INTO ROCK
TAKEN
TO BE
3 1/2' UNDER
SLAB!

DRILLED
 INTO ROCK
 TAILWAS
 TO BE
 UNDER
 3 1/2' UNDER
 SLAB!

REMARKS: All readings in cpm
Bore hole bkgd. ave 23000 cpm
All holes drilled to rock

BOREHOLE LOG

LOGGING CREW: Ernest Couch

SHEET 5 OF 7 PAGE 5

Edward DeWitt

DATE: 6-26-84

Levon Penally

PROPERTY ID: 00-048

INSTRUMENT ID NO. LVD 2220 #31982 #4410 #6528 AREA: Durango, Colo.

- NOTES: 1. ALL HOLES ARE 4" DIA. UNLESS OTHERWISE NOTED.
2. RECORD UNUSUAL CONDITIONS, SUCH AS THE PRESENCE OF WATER IN BOREHOLES AND DEPTH, CASING TYPE AND THICKNESS IF USED, CONCRETE CORES AND THICKNESS, OBSTRUCTIONS, UTILITIES, ETC., IN THE REMARKS SECTION.

HOLE ID: <u>0539+91R</u>		HOLE ID: <u>Back</u>		HOLE ID: _____		HOLE ID: _____	
TIME DRILLED: _____		TIME DRILLED: <u>poth</u>		TIME DRILLED: _____		TIME DRILLED: _____	
TIME LOGGED: _____		TIME LOGGED: _____		TIME LOGGED: _____		TIME LOGGED: _____	
SOIL TYPE: _____		SOIL TYPE: <u>K</u>		SOIL TYPE: _____		SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE		SURFACE		SURFACE		SURFACE	
0"	<u>29200</u>	0"	<u>261920</u>	0"		0"	
6"	<u>30260</u>	6"	<u>581530</u>	6"		6"	
12"	<u>27140</u>	12"	<u>820180</u>	12"		12"	
18"	<u>24650</u>	18"	<u>671220</u>	18"		18"	
24"	<u>22710</u>	24"	<u>317290</u>	24"		24"	
30"		30"		30"		30"	
36"		36"		36"		36"	
42"		42"		42"		42"	
48"		48"		48"		48"	
54"		54"		54"		54"	
60"		60"		60"		60"	
66"		66"		66"		66"	
72"		72"		72"		72"	
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"		90"	
96"		96"		96"		96"	

REMARKS: All readings in cpm
Bore hole bkgd. ave. 23000 cpm
Holes drilled to rock

***** DRILLED INTO LOOSE SAND, HOLE WOULD SLUF
IN AS SOON AS AUGER WAS PULLED OUT
ESTIMATE TAILINGS TO BE ~ 3' - 3 1/2' (EET) DEEP
UNDER SLAB WITHIN FOUNDATION.

INTERIOR SURVEY DATA LOG/HOT SPOT

SURVEY CREW E. SCHULTZ
L. BENALLY, JR

SHEET 7 OF 7 PAGE 7
 DATE July 6, 1984
 PROPERTY ID # DU-048
 PROJECT Durango, Colorado

GAMMA SCINTLLATOR HOT SPOT DATA

2220 INSTRUMENT ID # 31982 ^{± 16528} uR/h CONVERSION CURVE # _____ (ATTACHED)

NOTES: 1) RECORD SPOT ID LOCATIONS ON INTERIOR SURVEY SKETCH AND ATTACH COPY.
 2) INCLUDE DISCUSSION OF ANOMALIES, SUGGESTIONS, OBSERVATIONS, MATERIAL SAMPLES INFORMATION, SOURCES OF NATURAL RADIOACTIVITY, ETC., IN COMMENTS.

* UNDER HOUSE NOTE DRWG F/DETAIL

HOT SPOT ID #	COUNTS /0.1MIN	RATE uR/h
LOCATION:		
1	323630	205
2	117140	50
3	117140	50
4	93840	41
5	23880	18
LOCATION:		
LOCATION:		

HOT SPOT ID #	COUNTS /0.1MIN	RATE uR/h
LOCATION:		
6	46670	25
7	35850	22
8	32830	21
9	22100	17
LOCATION:		
LOCATION:		

HOT SPOT ID #	COUNTS /0.1MIN	RATE uR/h
LOCATION:		
LOCATION:		

COMMENTS: ALL MEASUREMENTS ARE CONTACT READINGS. ALL READINGS WERE TAKEN UNDER THE FLOOR (CRAWLSPACE)
ALL READINGS ARE IN COUNTS PER MINUTE (CPM). BACK GROUND MEASUREMENT @ 11,500 CPM.

BOREHOLE LOG

Supplemental Data

LOGGING CREW:

*Ernest Couch
Edward Schultz
Julius Bitilly*

SHEET

OF

PAGE

1

DATE:

October 18, 1984

PROPERTY ID:

DU-048

INSTRUMENT ID NO:

140220 # 24982 / 4410 # 16528

AREA:

Durango, Colorado

- NOTES: 1. ALL HOLES ARE 4" DIA. UNLESS OTHERWISE NOTED.
2. RECORD UNUSUAL CONDITIONS, SUCH AS THE PRESENCE OF WATER IN BOREHOLES AND DEPTH, CASING TYPE AND THICKNESS IF USED, CONCRETE CORES AND THICKNESS, OBSTRUCTIONS, UTILITIES, ETC., IN THE REMARKS SECTION.

HOLE ID: <u>S. WALL</u>		HOLE ID: <u>E. WALL</u>		HOLE ID: <u>W. WALL</u>		HOLE ID: _____	
TIME DRILLED: _____		TIME DRILLED: _____		TIME DRILLED: _____		TIME DRILLED: _____	
TIME LOGGED: _____		TIME LOGGED: _____		TIME LOGGED: _____		TIME LOGGED: _____	
SOIL TYPE: _____		SOIL TYPE: _____		SOIL TYPE: _____		SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	<u>19220</u>	SURFACE	<u>18480</u>	SURFACE	<u>31950</u>	SURFACE	
0"	<u>19480</u>	0"	<u>17830</u>	0"	<u>33470</u>	0"	
<u>8.5</u>	<u>20610</u>	6"	<u>19190</u>	6"	<u>26770</u>	6"	
<u>412 2"</u>	<u>20180</u>	<u>FOOTING</u>	<u>18290</u>	12"		12"	
18"		18"		18"		18"	
24"		24"		24"		24"	
30"		30"		30"		30"	
36"		36"		36"		36"	
42"		42"		42"		42"	
48"		48"		48"		48"	
54"		54"		54"		54"	
60"		60"		60"		60"	
66"		66"		66"		66"	
72"		72"		72"		72"	
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"		90"	
96"		96"		96"		96"	

REMARKS:

*Crawl space, H = horizontal, H & vertical
equals the hole was angled and # of inches
under spread footing, background is 23000 cpm
all counts in CPM & 20" High
Note: Tailing pile is 4' in diameter located in SW
corner of crawl space - Contact on surface 415020 cpm*

BOREHOLE LOG
Supplemental Data

 LOGGING CREW: Ernest Couch
Edward Schulz
Julius Bittner

 SHEET 2 OF 4 PAGE 2

 DATE: October 29, 1984

 PROPERTY ID: DU-048

 INSTRUMENT ID NO. LUD 2220 #3982 w/4416 #6528 AREA: Durango, Colorado

- NOTES: 1. ALL HOLES ARE 4" DIA. UNLESS OTHERWISE NOTED.
 2. RECORD UNUSUAL CONDITIONS, SUCH AS THE PRESENCE OF WATER IN BOREHOLES AND DEPTH, CASING TYPE AND THICKNESS IF USED, CONCRETE CORES AND THICKNESS, OBSTRUCTIONS, UTILITIES, ETC., IN THE REMARKS SECTION.

HOLE ID: <u>0+00+160R</u>	HOLE ID: <u>0+45+170R</u>	HOLE ID: <u>0+20+150R</u>	HOLE ID: <u>0+15+175R</u>
TIME DRILLED: _____	TIME DRILLED: _____	TIME DRILLED: _____	TIME DRILLED: _____
TIME LOGGED: _____	TIME LOGGED: _____	TIME LOGGED: _____	TIME LOGGED: _____
SOIL TYPE: _____	SOIL TYPE: _____	SOIL TYPE: _____	SOIL TYPE: _____

DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	<u>16020</u>	SURFACE	<u>13960</u>	SURFACE		SURFACE	<u>16150</u>
0"	<u>16050</u>	0"	<u>18350</u>	0"	<u>15030</u>	0"	<u>17860</u>
6"	<u>19960</u>	6"	<u>24880</u>	6"	<u>23250</u>	6"	<u>22350</u>
12"	<u>21560</u>	12"	<u>22570</u>	12"	<u>25950</u>	12"	<u>23400</u>
<u>18" 15</u>	<u>22030</u>	18"	<u>ROCKS</u>	18"	<u>22730</u>	18"	<u>23630</u>
24"		24"		<u>24" 19</u>	<u>21280</u>	24"	
30"		30"		30"		30"	
36"		36"		36"		36"	
42"		42"		42"		42"	
48"		48"		48"		48"	
54"		54"		54"		54"	
60"		60"		60"		60"	
66"		66"		66"		66"	
72"		72"		72"		72"	
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"		90"	
96"		96"		96"		96"	

 REMARKS: Shallow core holes are due to rocky
ground, background is 23000 cpm, all
counts in CPM.

BOREHOLE LOG
Supplemental Data

LOGGING CREW:

*Ernest Couch
Edward Schulty
Julian Bittelly*

SHEET

3 OF *4*

 PAGE *3*

DATE:

October 29, 1984

PROPERTY ID:

DU-048

INSTRUMENT ID NO

1402220 #3482 #440 #16528

AREA:

Durango, Colorado

NOTES: 1. ALL HOLES ARE 4" DIA. UNLESS OTHERWISE NOTED.

2. RECORD UNUSUAL CONDITIONS, SUCH AS THE PRESENCE OF WATER IN BOREHOLES AND DEPTH, CASING TYPE AND THICKNESS IF USED, CONCRETE CORES AND THICKNESS, OBSTRUCTIONS, UTILITIES, ETC., IN THE REMARKS SECTION.

HOLE ID: <i>C+12+168R</i>	HOLE ID: <i>C+17+159R</i>	HOLE ID: <i>C+20+176R</i>	HOLE ID: <i>C+1+170R</i>
TIME DRILLED: _____	TIME DRILLED: _____	TIME DRILLED: _____	TIME DRILLED: _____
TIME LOGGED: _____	TIME LOGGED: _____	TIME LOGGED: _____	TIME LOGGED: _____
SOIL TYPE: _____	SOIL TYPE: _____	SOIL TYPE: _____	SOIL TYPE: _____

DEPTH	COUNTS/1MIN	DEPTH	COUNTS/1MIN	DEPTH	COUNTS/1MIN	DEPTH	COUNTS/1MIN
SURFACE	<i>30000</i>	SURFACE	<i>16180</i>	SURFACE	<i>18680</i>	SURFACE	<i>17120</i>
0"	<i>24390</i>	0"	<i>20040</i>	0"	<i>22230</i>	0"	<i>16150</i>
6"	<i>34340</i>	6"	<i>32530</i>	6"	<i>42520</i>	6"	<i>19820</i>
12"	<i>28110</i>	12"	<i>29560</i>	18"	<i>43290</i>	12"	<i>21560</i>
18"	<i>25630</i>	18"		18"		18"	<i>21300</i>
24"		24"		24"		24"	
30"		30"		30"		30"	
36"		36"		36"		36"	
42"		42"		42"		42"	
48"		48"		48"		48"	
54"		54"		54"		54"	
60"		60"		60"		60"	
66"		66"		66"		66"	
72"		72"		72"		72"	
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"		90"	
96"		96"		96"		96"	

REMARKS:

Shallow bore holes are due to rocky ground, background is 23000 cpm, all counts in CPM.

BOREHOLE LOG
Supplemental Data

 LOGGING CREW: *Ernest Couch*
Edward Schulty
Julius Bitzilly
 INSTRUMENT ID NO: *LUD 220 #71982 w/4110 #16528*

 SHEET *4* OF *4* PAGE *4*
 DATE: *October 29, 1984*
 PROPERTY ID: *DO-0018*
 AREA: *Durango, Colorado*

- NOTES: 1. ALL HOLES ARE 4" DIA. UNLESS OTHERWISE NOTED.
 2. RECORD UNUSUAL CONDITIONS, SUCH AS THE PRESENCE OF WATER IN BOREHOLES AND DEPTH, CASING TYPE AND THICKNESS IF USED, CONCRETE CORES AND THICKNESS, OBSTRUCTIONS, UTILITIES, ETC., IN THE REMARKS SECTION.

HOLE ID: <i>Q+38+155R</i>	HOLE ID: _____	HOLE ID: _____	HOLE ID: _____
TIME DRILLED: _____	TIME DRILLED: _____	TIME DRILLED: _____	TIME DRILLED: _____
TIME LOGGED: _____	TIME LOGGED: _____	TIME LOGGED: _____	TIME LOGGED: _____
SOIL TYPE: _____	SOIL TYPE: _____	SOIL TYPE: _____	SOIL TYPE: _____

DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	<i>13870</i>	SURFACE		SURFACE		SURFACE	
0"	<i>15820</i>	0"		0"		0"	
6"	<i>21530</i>	6"		6"		6"	
<i>1270</i>	<i>22430</i>	12"		12"		12"	
18"		18"		18"		18"	
24"		24"		24"		24"	
30"		30"		30"		30"	
36"		36"		36"		36"	
42"		42"		42"		42"	
48"		48"		48"		48"	
54"		54"		54"		54"	
60"		60"		60"		60"	
66"		66"		66"		66"	
72"		72"		72"		72"	
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"		90"	
96"		96"		96"		96"	

 REMARKS: *Shallow bore holes are due to rocky ground, background is 23000 cpm, all counts in CPM.*



MORRISON-KNUDSEN COMPANY, INC.

UMTRA PROJECT OFFICE
P.O. BOX 9136
ALBUQUERQUE, NEW MEXICO 87119