

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

Draft Radiological and Engineering Assessment

Vicinity Property No. DUR 030

Remedial Actions
Contractor
for the
Uranium Mill Tailings
Remedial Actions
Project



MORRISON
KNUDSEN

Vicinity Property No. DUR 030

8507090285 850404
PDR WASTE PDR
WM-48

DRAFT

THE RADIOLOGICAL AND ENGINEERING ASSESSMENT

AND FINAL DESIGN

FOR

DURANGO PROPERTY

DU-030

April 2, 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-030 is a private residence located at 62 Rio Vista Circle, Durango, CO.

1.2 Evaluation and Recommendation

1.2.1 Residual Radioactive Material Involvement

Over half of the property is contaminated, including the garage and the addition behind the garage. The front and both side yards are contaminated. There are two small areas in the back yard that are also contaminated. One of these areas is under the metal shed.

Note: For REA purposes, the vicinity property side of the street or sidewalk is assumed to be the property line and, therefore, the limit of remedial action covered by this REA. If contamination is found to extend under the sidewalk or street, it will be handled per a separate REA with the City of Durango.

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 \$59,800.00.

1.2.4 Schedule

The estimated duration of the remedial action effort is 30 to 40 days.

2.0 ENGINEERING FIELD SURVEY

2.1 Property Description

2.1.1 Property Use and Occupancy

Property DU-030 is a private residence located at 62 Rio Vista Circle, Durango, Colorado and owned by Ralph and Esther Koontz. 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 No. 360467 as follows:

Lot 14, Block 2, Riverview Park Second Resubdivision in the City of Durango, La Plata County, Colorado.

2.1.3 Bordering Properties

The lot is zoned R-1, Residential. It is located in a residential area 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 a residence; on the east by a residence; on the south by a residence; and on the west by Rio Vista Circle.

2.2 Existing Facilities and Structures

2.2.1 Structures

The residence is a single story brick veneered and wood frame structure on a concrete foundation. An attached single car wood frame garage with brick veneer is located on the south side of the house with a concrete driveway extending from the garage to the street. Concrete sidewalks extends along the street just outside the west property line and from the street to the house.

Two parallel concrete retaining walls extend north-south across the rear yard. One wall is 4.5 feet high with built in concrete steps in the center section. The other wall is located slightly east and is completely buried. A third retaining wall extends along the south property line into the rear yard. A detached, prefabricated metal shed on a concrete slab is located in the northeast corner of the lot. A series of wood bins and a wood shed line the 4.5 foot wall from the juncture of both retaining walls to beyond the steps. There is a covered concrete patio on the east side of the house.

Both front and rear yards are fully landscaped. Two large, mature deciduous trees and numerous shrubs are located in the front yard and a hedge extends along the north lot line from the street sidewalk to a point opposite the northwest house corner. The rear yard is fenced on the north side with chain link fencing, on the east lot line with wood picket fencing. Chain link gates are located on the north and south sides of the house and between the wood bins bordering the retaining wall steps.

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 historical investigations.

2.2.2 Utilities

Utilities are serviced to the property as follows:

Electric power - Overhead to east side of house.

Telephone - Overhead to east side of house.

Water - Underground from Rio Vista Circle.

Gas - Underground from rear (east) of lot.

Sewer - Underground from Rio Vista Circle.

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, 2.4 and 2.5.

Table 2.1

PROPERTY SURVEY DATA

GENERAL:

Site Location: Durango

Property Address: 62 Rio Vista Circle

Owner's Name: Ralph and Esther Koontz Address: Same

Lot No.: 14 Property Type: Residence

Occupancy Group: Adults: N/A Children: N/A

Survey Completed By: R. Livengood/C. Sanders-Meena Date: 5-15-84

Property Description - Exterior:

Dwelling: Sq. Ft.: 1075

Levels: Single story with crawl space

Construction Type: Brick veneered wood frame

Foundation: 38" high concrete perimeter wall with two concrete center support piers

Garage: Single car attached brick veneered wood frame on south side of house

Storage Bldg: Prefab: 10' X 6 1/2' metal on concrete slab

Other: Wood storage shed and boxes along retaining wall

Improvement Additions: Concrete block on back Porches: None of garage.

to Dwellings: Deck: None Patio: Covered concrete on east side of house

Other: _____

Driveway: Concrete: From street to garage Paved: _____

Gravel: _____ Other: _____

Sidewalks: Concrete/Paved: As Noted on Drawing

Other: _____

Fences/Gates: Wood: Picket on east side of lot Other: _____

Chain Link: 4' high - north side back yard, 4' gate on south side

Radiological and Engineering Assessment: Property DU-030

Table 2.1 (cont'd)

PROPERTY SURVEY DATA

Site Location: Durango

Property Address: 62 Rio Vista Circle

Grounds: Lawn: Full front; back yard from house to retaining wall

Trees: As Noted on Drawing

Shrubs: As Noted on Drawing

Garden: Flower bed on north side of back yard next to storage building.

Grading: 25% from retaining wall to east lot line

Other: _____

Soil Type: Topsoil in lawned area; sloped area rocky

Existing Survey Plot: Yes

Property Description - Interior:

Room	Floor	Walls				Ceiling	Comments
		E	W	N	S		
Room Addtn.	Concrete	Panel	Brick	Panel	Panel		

Utilities:

Heating: Gas: X Electric: _____

Hot Water: _____ Other: _____

Air Cond: Gas: _____ Heat Pump: _____

Radiological and Engineering Assessment: Property DU-030

Table 2.1 (cont'd)

PROPERTY SURVEY DATA

Site Location: Durango

Property Address: 62 Rio Vista Circle

Electric Line Location: Overhead to east side of house

Gas Line Location: Underground from rear (east) of lot

Water Line Location: Underground from Rio Vista Circle (See Drawing)

Sewage Line Location: Underground from Rio Vista Circle (See Drawing)

Telephone Line Location: Overhead to east side of house

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: _____

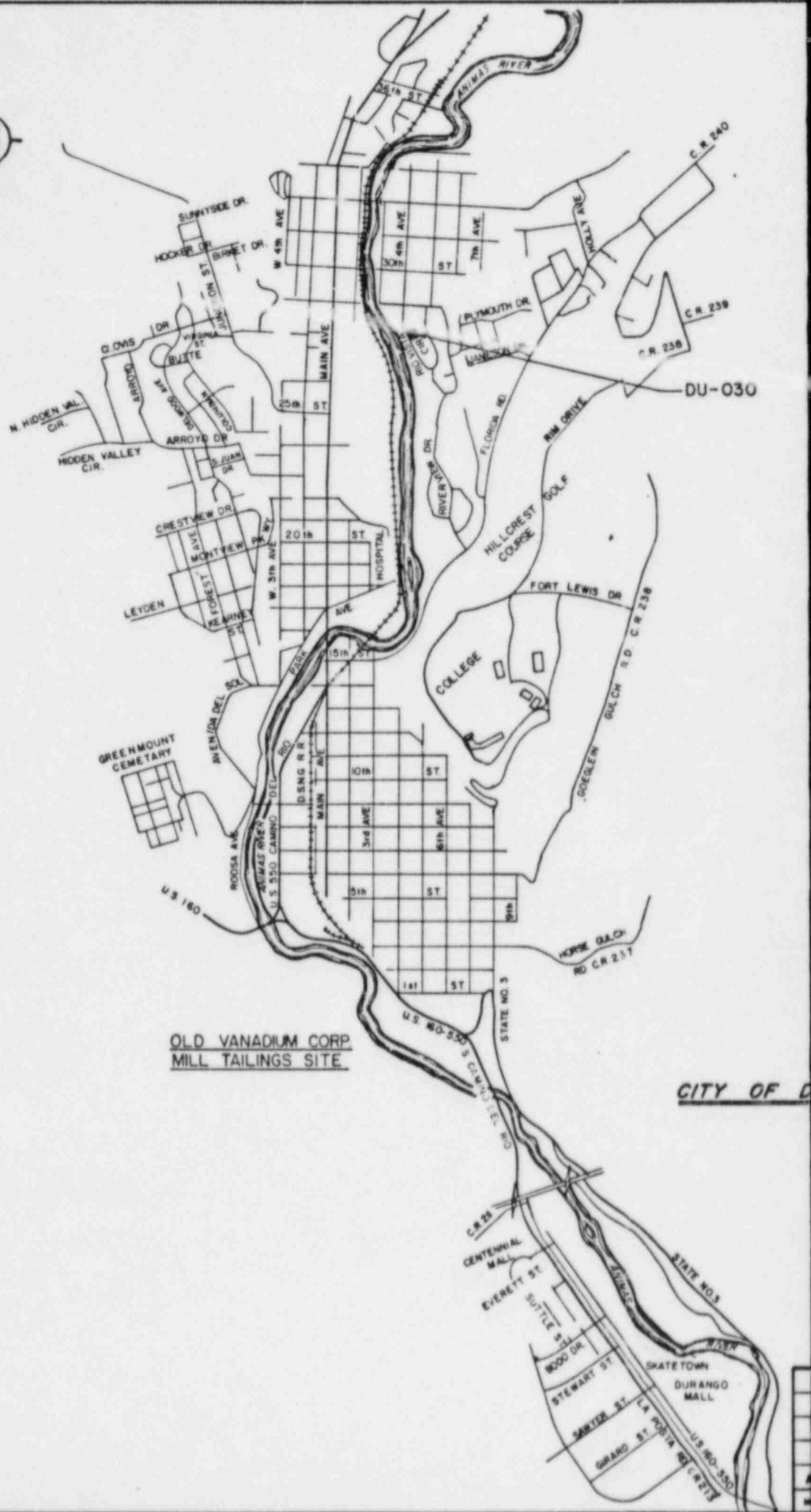
Rear: _____

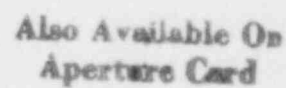
Side: _____

Other: _____

Photographs:

<u>Roll Frame</u>	<u>Description</u>	<u>Direction</u>
<u>1-9</u>	<u>Front of House</u>	<u>Looking East</u>
<u>1-6</u>	<u>Rear of House</u>	<u>Looking West</u>
<u>1-4</u>	<u>Rear of Yard</u>	<u>Looking North</u>
<u>1-5</u>	<u>Rear of Yard</u>	<u>Looking South</u>
<u>7-1</u>	<u>House Addition</u>	<u>Looking East</u>
<u>7-2</u>	<u>House Addition</u>	<u>Looking West</u>



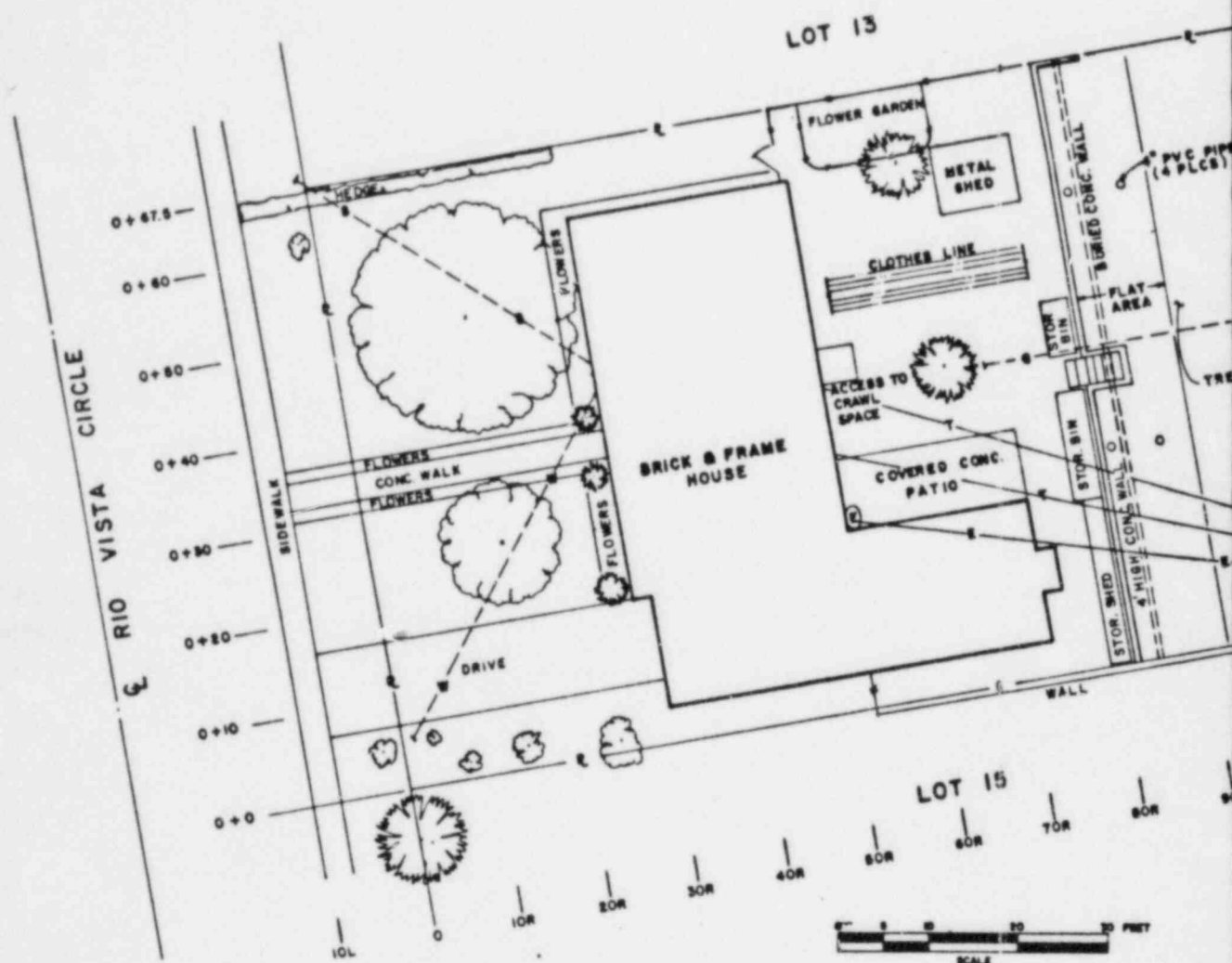





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URANGO, COLORADO

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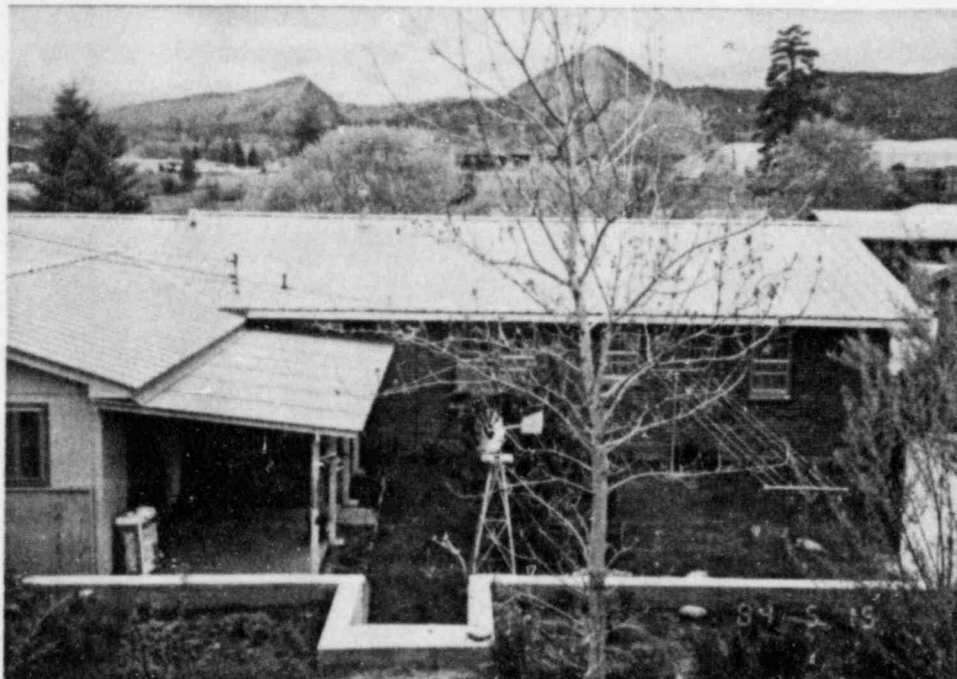
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	DATE	DOE PROJECT MANAGER	DATE	DOE PROJECT ENGINEER
	NR	NR	NR	NR
	<p>PROJECT NO. DE-AC04-83AL18796</p> <p>DRAWING NO. DU-030-005</p>			



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Front of House Looking East

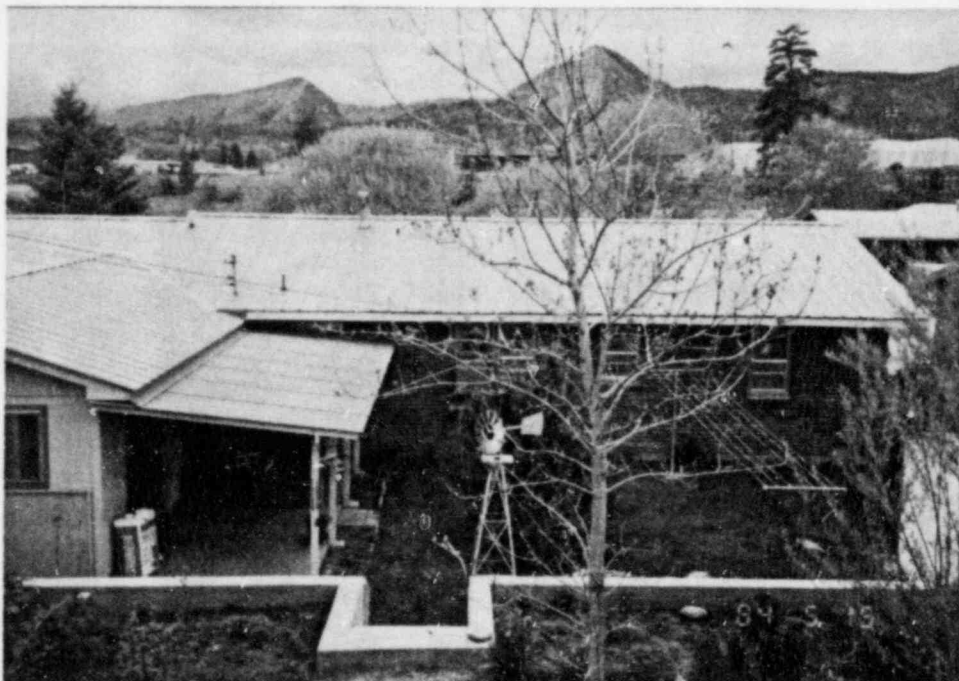


Rear of House Looking West

Figure 2.3 Property Photos

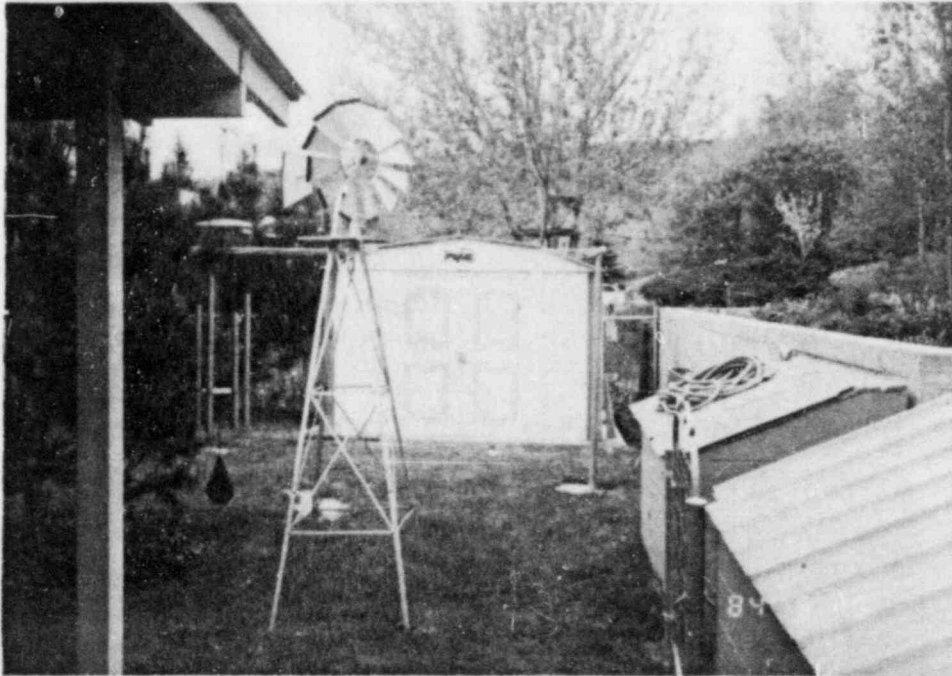


Front of House Looking East

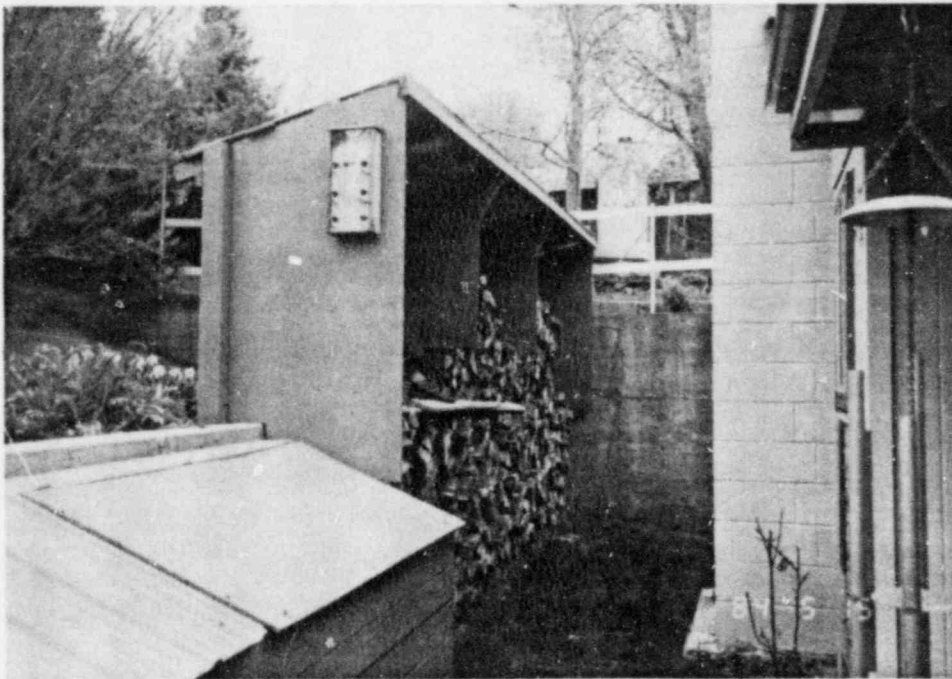


Rear of House Looking West

Figure 2.3 Property Photos



Rear of Yard Looking North



Rear of Yard Looking South

Figure 2.4 Property Photos



House Addition Looking West



House Addition Looking East

Figure 2.5 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, Vicinity Property DU-030, ORNL, May 1983) 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 yard with a gamma scintillometer to identify the boundary of the contamination.

An indoor gamma survey was not conducted inside the house, since the inclusion survey reported that there was no contamination either inside the house or under its foundation. However, a gamma survey was conducted inside the garage and the addition to the house.

At a later date, additional survey data were collected in the garage and the addition to the house at Property DU-030. These data were collected to more precisely define the limits of contamination in these portions of the property.

3.1.2 Survey Results

Outdoor surface gamma readings on the property, as reported in Table 3.1, range from 15 to 300 micro R/hr. 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 16 micro R/hr.

Surface gamma measurements in the garage range from 26 to 54 micro R/hr and in the addition to the house in back of the garage, readings are 15 to 26 micro R/hr. Table 3.2 lists surface gamma readings in these parts of the house.

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. In a few instances, holes were hand-dug with a shovel because the auger could not penetrate the very rocky soil. Three holes were angled under the metal shed in the backyard to check a report by the Colorado Department of Health of contamination in that area.

3.2.2 Survey Results

Contamination was found in 16 of the 24 outdoor holes and all three of the holes augered in the garage. The location and depth of the contamination is described in Table 3.3 and is shown in Figure 3.1.

No contamination was found in any of the five basement boreholes. These holes are described in Table 3.4 and are shown in Figure 3.1. Two of the three angled boreholes under the shed showed low-level contamination. It is probable that contamination above EPA standards is found under this shed. The holes are described in Table 3.4 and are shown in Figure 3.1.

3.4 Radon/Radon Daughter Survey

No radon/radon daughter surveys were performed inside the house at the property, since the inclusion survey indicated no evidence of contamination in or under the house.

3.4 Estimated Extent of Contamination

Note: For REA purposes, the vicinity property side of the street or sidewalk is assumed to be the property line and, therefore, the limit of remedial action covered by this REA. If contamination is found to extend under the sidewalk or street, it will be handled per a separate REA with the City of Durango.

Three areas of contamination were identified in the survey.

Area A is the major contaminated area of this property. It includes the entire front yard, the area on both sides of the house, and under the garage. The estimated depth of contamination is 30 inches throughout the area. Boreholes were augered in the garage, and the depth of contamination is 24 inches near the east wall and 42 inches deep at the main door.

The depth of contamination in Area B could not be ascertained but is probably about 12 inches.

Area C is a small area with an estimated depth of contamination of 12 inches.

Areas B and C are small, relatively low-level areas and if these were isolated spots, they could safely be left in place. However, since remedial action is definitely needed in Area A on this property, it is prudent to excavate Areas B and C at the same time as Area A.

Area D is contaminated to a depth of 24 inches. It is behind the garage under the addition to the house.

Table 3.1
SURFACE GAMMA SURVEY
Property DU-030

POINT	MICRO R/hr
0+00,00R	21
0+10,00R	17
0+30,00R	18
0+40,00R	17
0+60,00R	17
0+67.5,00R	29
0+00,10R	24
0+10,10R	18
0+20,10R	18
0+30,10R	18
0+40,10R	17
0+50,10R	17
0+60,10R	18
0+67.5,10R	18
0+00,20R	18
0+10,20R	23
0+20,20R	45
0+30,20R	24

Table 3.1 - Cont'd.
SURFACE GAMMA SURVEY
Property DU-030

POINT	MICRO R/hr
0+40,20R	27
0+50,20R	49
0+60,20R	23
0+67.5,20R	19
0+00,25R	23
0+10,25R	22
0+20,25R	42
0+30,25R	83
0+40,25R	64
0+50,25R	300
0+60,25R	48
0+67.5,25R	22
0+00,30R	32
0+05,30R	31
0+62,30R	68
0+67.5,30R	26
0+00,40R	31
0+05,40R	36
0+62,40R	44
0+67.5,40R	28

Table 3.1 - Cont'd.
SURFACE GAMMA SURVEY
Property DU-030

POINT	MICRO R/hr
0+00,50R	24
0+05,50R	25
0+62,50R	48
0+00,60R	17
0+05,60R	17
0+50,60R	21
0+60,60R	22
0+00,70R	18
0+05,70R	17
0+00,80R	18
0+10,80R	18
0+50,80R	17
0+60,80R	17
0+00,90R	17
0+00,90R	17
0+10,90R	19
0+10,10L	21
0+20,10L	44
0+30,10L	57
0+40,10L	61

Table 3.1 - Cont'd.
SURFACE GAMMA SURVEY
Property DU-030

POINT	MICRO R/hr
0+50,10L	48
0+60,10L	45
0+67.5,10L	43

Table 3.2
SIDE STRUCTURE GAMMA SURVEY
Property DU-030

LOCATION	MICRO R/hr
Garage - Center	36
Garage - Northeast	37
Garage - Southeast	54
Garage - Southwest	27
Garage - Northwest	26
Room off Garage	31
House Addition - Center	18
Garage - Northeast	16
Garage - Southeast	17
Garage - Southwest	18
Garage - Northwest	17

Table 3.3
BOREHOLE SURVEY
Property DU-030

HOLE	LOCATION	CONTAMINATION DEPTH
1	0+10,10L	0-15"+
2	0+34,02R	0-15"+
3	0+10,10R	0-21"
4	0+10,25R	0-24"+
5	0+64,6L	0-30"
6	0+62,30R	0-30"
7	0+62,50R	0-18"
8	0+50,27R	0-30"
9	0+20,20R	0-18"
10	0+00,40R	0-30"+
11	0+12,78R	0-12"
12	0+64,54R	0-18"
13	0+36,80R	None
14	0+40,28R	0-21"+
15	0+04,50R	0-19"+
16	0+55,63R	0-24"
17	0+20,110R	None
18	0+40,100R	None
19	0+20,105R	None
20	0+40,95R	0-12"
21	0+45,95R	None
22	0+40,90R	None

Table 3.3 - Cont'd.
BOREHOLE SURVEY
Property DU-030

HOLE	LOCATION	CONTAMINATION DEPTH
23	0+35,95R	None
24	0+40,105R	None

NOTE: All holes were drilled until large rocks prevented additional depth.

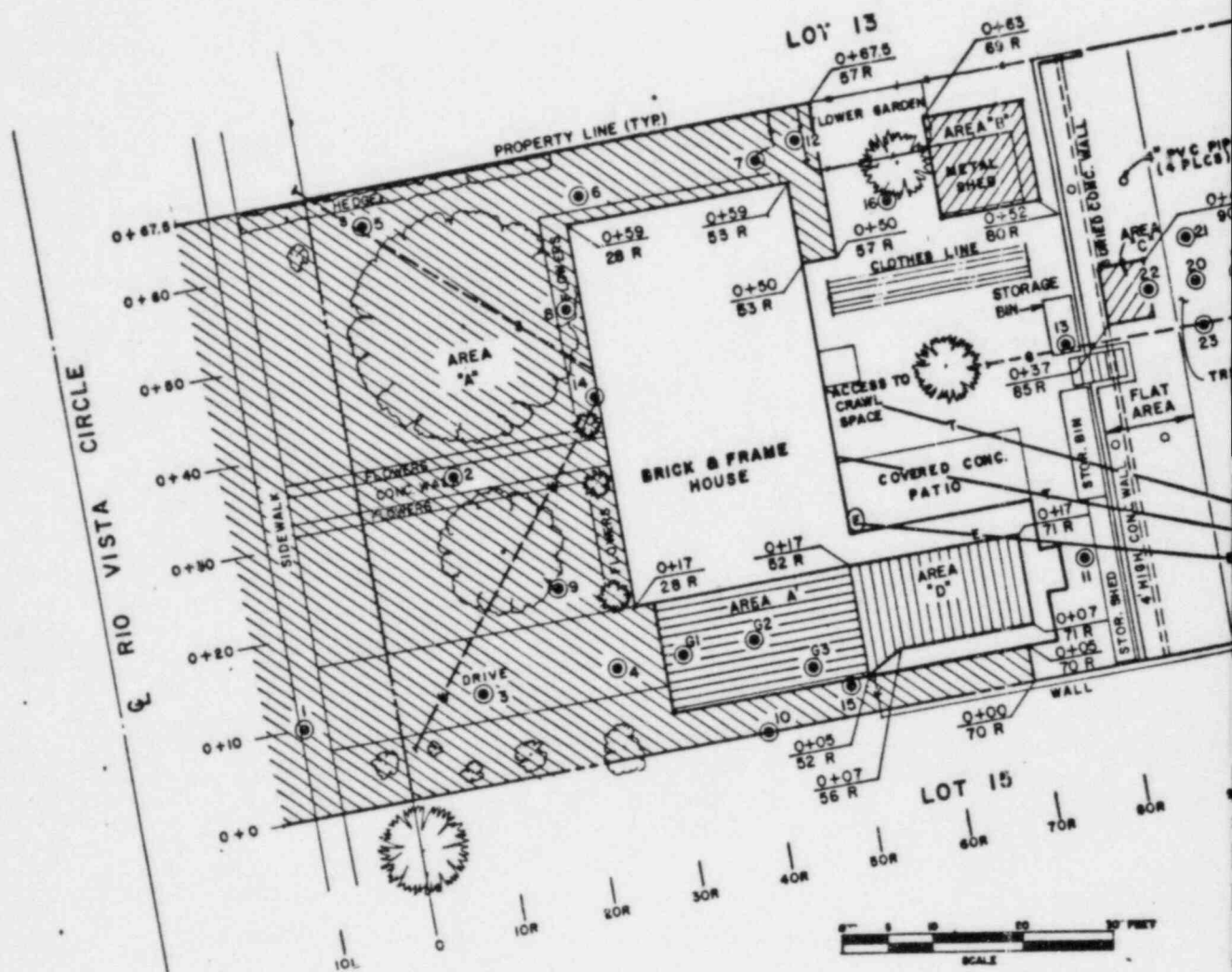
Table 3.4
INDOOR AND ANGLED BOREHOLE SURVEY
Property DU-030

HOLE	LOCATION	CONTAMINATION DEPTH
B-1	North Wall	None
B-2	West Wall	None
B-3	West Wall at Water Pipe	None
B-4	South Wall	None
B-5	East Wall	None
H-1	South of Shed	None
H-2	East of Shed	0-12"*
H-3	North of Shed	0-7"*
G-1	Garage	0-42"
G-2	Garage	0-12"+
G-3	Garage	0-24"

Note: All holes augered below footings.

*Low-level contamination present.




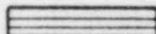
+Depth of contamination not reached.

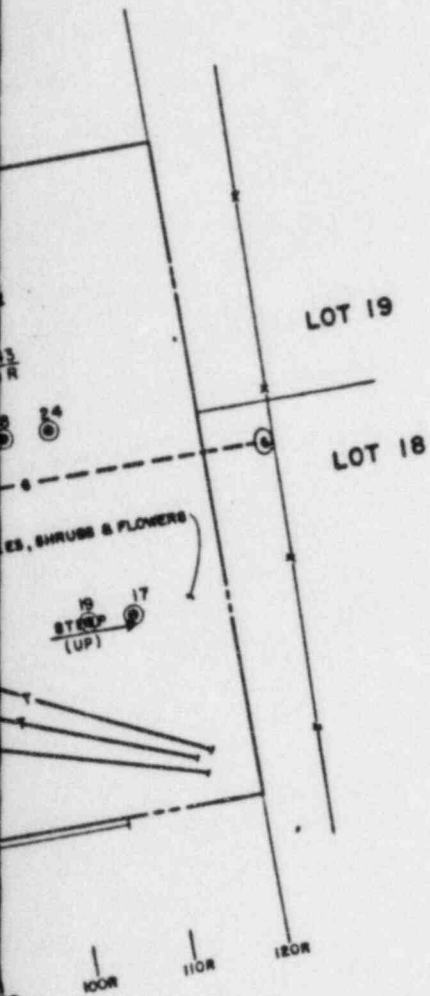


LEGEND

⊙ AUGER HOLE DESIGNATION

ESTIMATED DEPTH OF CONTAMINATION

	12"
	24"
	30"
	42"



Also Available On
Aperture Card

TI
APERTURE
CARD

8507090285 -03

U. S. DEPARTMENT OF ENERGY ALBUQUERQUE, NEW MEXICO

FIGURE 3.1

RADIOLOGICAL SURVEY DATA DU-030

DURANGO, COLORADO

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

DESIGNED BY MRA
REL MRA
CHECKED
REVIEWED
RECOMMENDED
APPROVED

NR

DATE

DOE PROJECT MANAGER

DATE

DOE PROJECT ENGINEER

DATE

NR

NR

PROJECT NO.

DE-AC04-83AL18796

DRAWING NO. DU-030-015 REV. A



MORRISON
KNUDSEN

NO.	DAYS	REVISIONS	DRAWN BY	CHECKED BY	APPROVAL LDE	APPROVAL DH	PROJ ENG	APPROVAL DOE
1								
2								
3								
4								
5								
6								
7								
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FINAL REA SUBMITTAL

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-030:

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 involve the following:

- o Relocate metal shed and replace when construction has been completed.
- o Demolish, remove and replace concrete driveway, sidewalk and shed slab.
- o Demolish, remove and replace garage and room addition as per Figures 4.1, 4.2 and 4.3.
- o Remove and replace landscaping as required for excavation.
- o Excavate areas of contamination to the limits and depths illustrated in Figure 4.1.
- o Backfill excavated areas with common fill. Top with structural fill in concrete areas. Top with topsoil and sod in lawn area.

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 30 to 40 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 \$59,800.00.

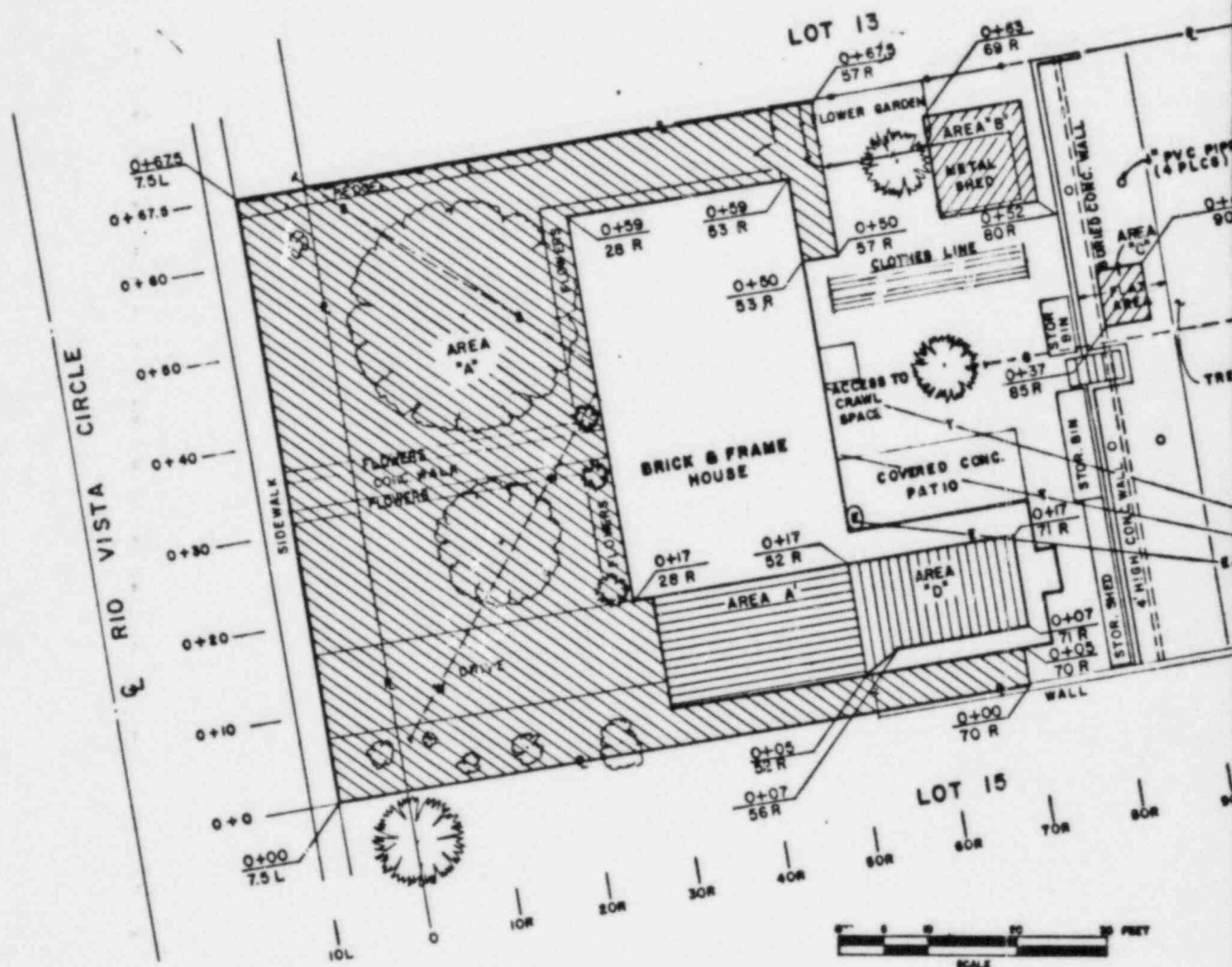
Table 4.1
OPTION 2 COSTS

<u>Activity</u>	<u>Unit Price</u>	<u>Quantity</u>	<u>Estimated Cost</u>
Remove and Store Garage and Household Items	960.00	LS	960.00
Remove Patio Cover	125.00	LS	125.00
Relocate and Replace Metal Shed	200.00	LS	200.00
Remove Fence	2.75	16 lf	44.00
Relocate Hot Water Heater with Temporary Hookup	250.00	LS	250.00
Remove Trees	150.00	2 ea	300.00
Remove Shrubs	20.00	18 ea	360.00
Demolish Garage and Room Addition	3.80	603 sf	2,291.40
Demolish Concrete Sidewalk, Driveway, Shed Slab, Garage Slab, and Room Addition Slab	3.00	1171 sf	3,513.00
Demolish Concrete Stemwall, Garage and Room Addition	670.00	LS	670
Excavation (Machine)	8.30	386 cy	3,203.80
Excavation (Hand)	59.05	1 cy	59.05
Common Backfill (Machine)	7.20	260 cy	1,872.00
Common Backfill (Hand)	22.40	1 cy	22.40
Structural Fill	26.40	22 cy	580.80
Topsoil	26.40	54 cy	1,425.60
Sod	3.00	280 cy	840.00
Construct Stemwalls, Garage and Room Addition	1,860.00	LS	1,860.00

Table 4.1 - Cont'd.
OPTION 2 COSTS

<u>Activity</u>	<u>Unit Price</u>	<u>Quantity</u>	<u>Estimated Cost</u>
Construct Concrete Sidewalk, Driveway, Shed Slab, Garage Slab and Room Slab	3.50	1171 sf	4,098.50
Construct Garage	20.00	286 sf	5,720.00
Construct Room Addition	32.00	317 sf	10,144.00
Replace Patio Cover	550.00	LS	550.00
Replace Trees	200.00	2 ea	400.00
Replace Shrubs	50.00	18 ea	900.00
Replace Hotwater Heater	105.00	LS	105.00
Replace Fence (With Salvaged Material)	5.00	16 lf	80.00
Relocate Garage and Household Items	720.00	LS	720.00

Subtotal	41,294.55
5% Subcontractor's Contingency	2,064.73
20% Overhead and Profit	<u>8,671.86</u>
Subtotal	52,031.14
15% Contingency	<u>7,804.67</u>
Total (Rounded)	59,800.00



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APERTURE
CARD

SCOPE OF WORK:

AREA "A"

- PROTECT SIDEWALK ALONG RIO VISTA CIRCLE DURING EXCAVATION.
- DEMOLISH AND REMOVE CONCRETE SIDEWALK AND DRIVEWAY.
- REMOVE TREES AND SHRUBS NOTING SIZE, TYPE AND LOCATION OF EACH.
- REMOVE, SALVAGE AND REPLACE FENCE.
- EXCAVATE AREA "A" TO A DEPTH OF 30 INCHES.
- BACKFILL EXCAVATED AREA WITH COMMON FILL. TOP WITH 6 INCHES OF TOPSOIL IN LAWN AREA AND SOD. TOP WITH 12 INCHES OF TOPSOIL IN PLANTER AREA. TOP WITH 6 INCHES OF STRUCTURAL FILL IN CONCRETE AREAS.
- CONSTRUCT NEW 4 INCH THICK DRIVEWAY AND SIDEWALK TO SAME SIZE AND ELEVATION OF THAT REMOVED.
- REPLACE TREES AND SHRUBS WITH SIMILAR TYPE AND SIZE AS APPROVED BY CONTRACTOR'S REPRESENTATIVE.

AREA "A₁"

- HOT WATER HEATER TO BE RELOCATED SO AS TO MAINTAIN SERVICE TO RESIDENCE DURING EXCAVATION.
- REMOVE AND SALVAGE ITEMS AS NOTED IN FIGURE 4.3.
- DEMOLISH AND REMOVE GARAGE AS NOTED IN FIGURE 4.2.
- DEMOLISH AND REMOVE CONCRETE SLAB AND STEPMALL.
- EXCAVATE AREA "A₁" TO A DEPTH OF 42 INCHES.
- BACKFILL EXCAVATED AREA WITH COMPACTED COMMON FILL AND TOP WITH 6 INCHES OF COMPACTED STRUCTURAL FILL.
- CONSTRUCT NEW GARAGE AS PER FIGURE 4.3.

AREA "B"

- RELOCATE METAL SHED DURING EXCAVATION AND REPLACE WHEN CONSTRUCTION HAS BEEN COMPLETED.
- DEMOLISH AND REMOVE CONCRETE SLAB.
- EXCAVATE AREA "B" TO A DEPTH OF 12 INCHES.
- BACKFILL EXCAVATED AREA WITH COMMON FILL. TOP WITH 6 INCHES OF STRUCTURAL FILL IN SLAB AREA. TOP WITH 6 INCHES OF TOPSOIL IN LAWN AREA AND SOD.

AREA "C"

- PROTECT BURIED CONCRETE WALL DURING EXCAVATION.
- HAND EXCAVATE AREA "C" TO A DEPTH OF 12 INCHES.
- BACKFILL EXCAVATED AREA WITH COMMON FILL AND TOP WITH 6 INCHES OF TOPSOIL.

AREA "D"

- REMOVE AND STORE HOUSEHOLD ITEMS DURING EXCAVATION.
- REMOVE, SALVAGE AND REPLACE PATIO COVER.
- PROTECT CONCRETE PATIO DURING EXCAVATION.
- REMOVE AND SALVAGE ITEMS AS NOTED IN FIGURE 4.3.
- DEMOLISH AND REMOVE ROOM ADDITION AS PER FIGURE 4.2.
- DEMOLISH AND REMOVE CONCRETE SLAB AND STEPMALL AND EXCAVATE AREA "D" TO A DEPTH OF 24 INCHES.
- CONSTRUCT NEW ROOM ADDITION AS PER FIGURE 4.3.

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.

NOTES:

1. THE LATEST REVISION OF THE FOLLOWING TECHNICAL SPECIFICATIONS APPLY TO THE REMEDIAL ACTION WORK REQUIRED FOR PROPERTY NO. DU-030.

SECTION 02050
DEMOLITION

SECTION 02110
CLEARING AND GRUBBING

SECTION 02150
UNDERPINNING

SECTION 02130
CONTAMINATED MATERIAL REMOVAL

SECTION 02200
EXCAVATION AND BACKFILL

SECTION 02480
LANDSCAPING

SECTION 03300
CAST-IN-PLACE CONCRETE

SECTION 04200
BRICK

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.
4. UNDERPIN FOUNDATION AS REQUIRED.

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FIGURE 4.1

EXCAVATION RESTORATION PLAN DU-030

DURANGO, COLORADO

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

DESIGNED	DRAWN
REL	MRA
CHECKED	
REVIEWED	
RECOMMENDED	
APPROVED	

NR

NR

NR

PROJECT NO.

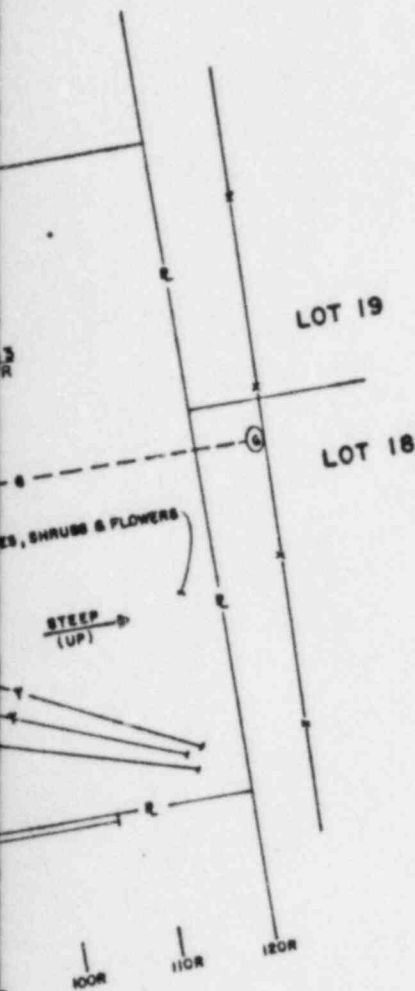
DE-AC04-83AL18796

DRAWING NO. DU-030-020

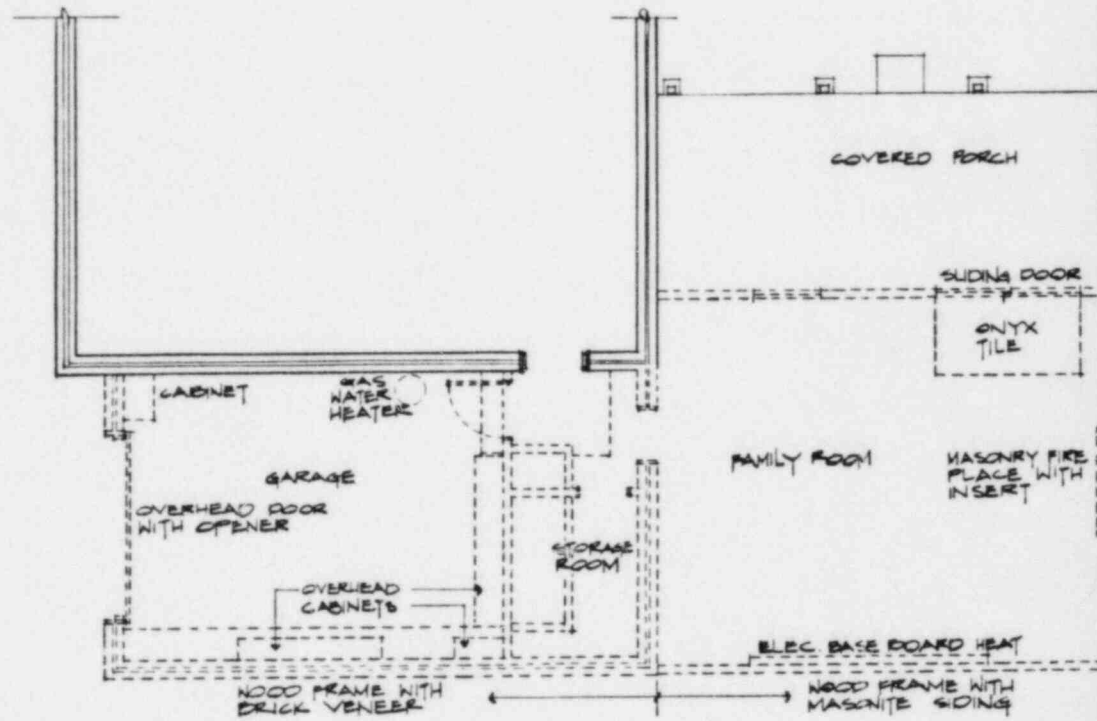
REV. A



MORRISON
KNUDSEN



DATE	REVISIONS	BY	CHKD	APPV	LOC	DR	ENG	APPV	DOE
	FINAL REA SUBMITTAL	UD	MP	MP					



DEMOLITION PLAN
SCALE 1/4" = 1'-0"

LEGEND:

===== INDICATES EXISTING STRUCTURE
TO REMAIN INTACT.

----- INDICATES EXISTING STRUCTURE
TO BE DEMOLISHED.

NOTES:

1. SEE DRAWING NO. DU-030-021 TO
DETERMINE WHAT IS TO BE SALVAGED.

Also Available On
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ALBUQUERQUE, NEW MEXICO

DESIGNED DRAWN
12/8 MRA
CHECKED
REVIEWED
RECOMMENDED
APPROVED

FIGURE 42

DEMOLITION PLAN DU-030

DURANGO, COLORADO

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

NR

NR

NR



MORRISON
KNUDSEN

PROJECT NO.

DE-AC04-83AL18796

DRAWING NO.

DU-030-021

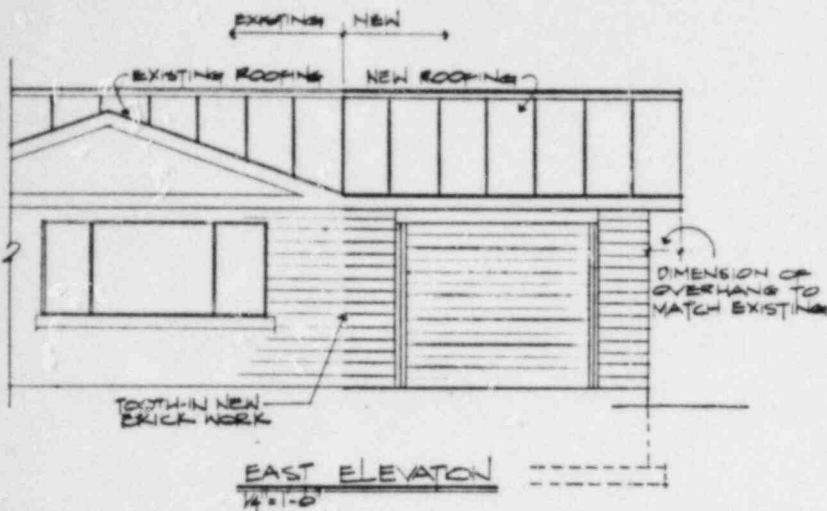
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4

FINAL REA SUBMITTAL

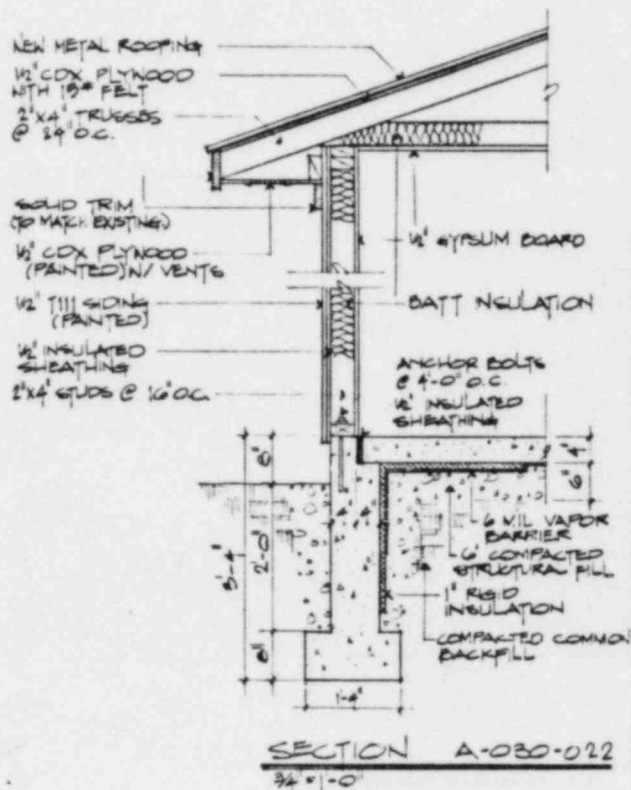
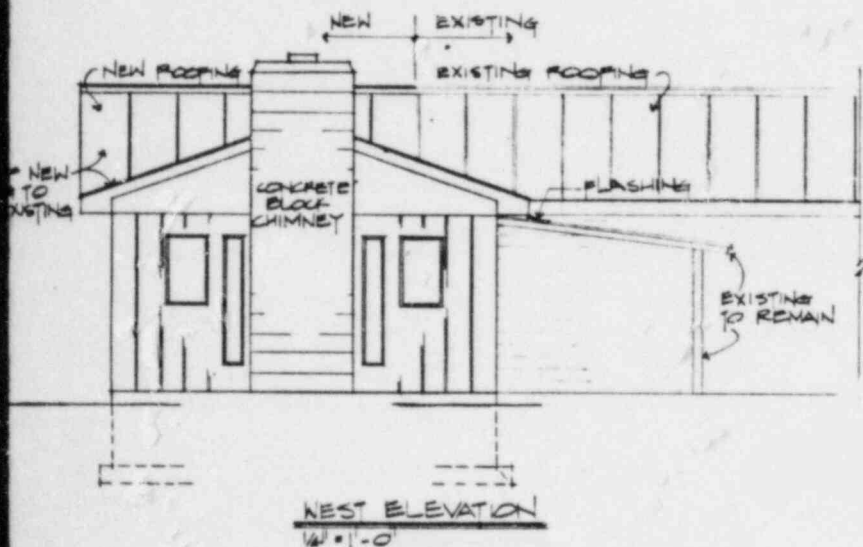
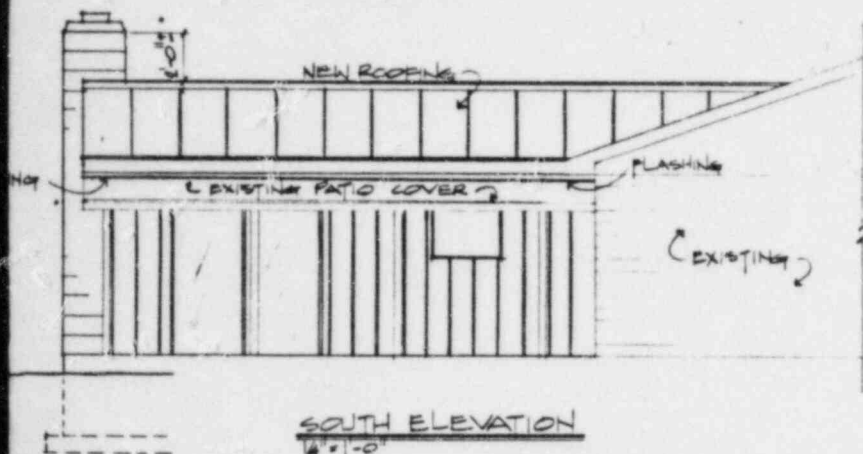
REVISIONS

DRAWN BY CHECKED BY APPROVED BY DATE



NOTES:

1. FLOOR ELEVATION IN FAMILY ROOM AND STORAGE ROOM TO BE THE SAME AS THE FLOOR ELEVATION IN THE EXISTING HOUSE.
2. FLOOR ELEVATION OF NEW GARAGE TO BE THE SAME AS THE FLOOR ELEVATION IN THE EXISTING GARAGE.
3. REMOVE AND REINSTALL: OVERHEAD GARAGE DOOR; SLIDING DOOR; ALL WINDOWS; FIREPLACE INSERT; ONYX TILE; BASEBOARD HEATING UNIT; CEILING FAN; ALL CABINETS, ALL SHELVES, WORK BENCH AND WATER HEATER.
4. EXISTING PATIO SLAB TO REMAIN INTACT. REMOVE EXISTING COLUMNS AND ROOF AS REQUIRED FOR NEW CONSTRUCTION. REINSTALL EXISTING COLUMNS AND ROOF AFTER CONSTRUCTION IS COMPLETE.
5. INTERIOR FINISHES:
THE FAMILY AND STORAGE ROOM TO HAVE CARPET SELECTED BY OWNER.
THE FAMILY AND STORAGE ROOM TO HAVE PANELING SELECTED BY OWNER.
THE GARAGE TO HAVE 1/2" GYPSUM BOARD.
ALL CEILINGS TO HAVE 1/2" GYPSUM BOARD.
ALL PAINT TO BE SELECTED BY CLIENT.



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U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

FIGURE 4.3

RESTORATION PLAN, ELEVATIONS, & DETAILS

DURANGO, COLORADO

URANIUM MILL TAILINGS REMEDIAL

DESIGNED	DRAWN
CHECKED	MRA
REVIEWED	
RECOMMENDED	
APPROVED	

NR

NR

NR



MORRISON
KNUDSEN

PROJECT NO.

DE-AC04-83AL18796

DRAWING NO.

DU-030-022

REV. A

FINAL REA SUBMITTAL

REVISIONS

DATE	BY	CHECKED	APPROVED	DATE	BY	CHECKED	APPROVED

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 02200	EXCAVATION AND BACKFILL	X
SECTION 02480	LANDSCAPING	X
SECTION 02500	PAVING AND SURFACING	X
SECTION 03300	CAST-IN-PLACE CONCRETE	X
SECTION 04200	BRICK	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-030-020	Excavation & Restoration Plan DU-030
DU-030-021	Demolition Plan DU-030
DU-030-022	Restoration Plan, Elevations, and Details

APPENDIX A
SURVEY DATA LOGS

**OUTDOOR GAMMA SCREENING
SURVEY DATA SHEET**

LOGGING CREW: ERNEST COUCH
LEVON BENALLY, JR.

SHEET 1 OF 6 PAGE 1

DATE: JUNE 1, 1984

PROPERTY ID: DU-030

INSTRUMENT ID NO.: LUDLUM 2220 #31972 W/4410 #16521

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
0100+00R	33120 23470	0100+25R	43940 34320	0150+60R	20840 26630	0100+100R	16530 14150
0110+00R	21310 23320	0110+25R	38720 47110	0160+60R	36860 38510	0110+100R	15240 15470
0120+00R	18030 24640	0120+25R	47340 51340	0100+70R	23090 20160	0120+100R	14420 14340
0130+00R	23110 37500	0130+25R	194370 47390	0105+70R	21290 18640	0130+100R	16760 16300
0140+00R	20140 30280	0140+25R	151100 12130	0130+70R	16680 17060	0140+100R	16250 16760
0150+00R	17810 24520	0150+25R	294540 169580	0140+70R	16390 17740	0150+100R	16710 16780
0160+00R	21020 27130	0160+25R	112980 56570	0150+70R	18020 17910	0160+100R	16270 16440
0167.5+00R	54230 34270	0167.5+25R	36840 52280	0160+70R	17210 22290	0167.5+100R	15720 15800
0100+10R	23260 25030	0100+30R	68340 50520	0100+80R	22730 18450	0100+110R	14570 13270
0110+10R	44380 34930	0105+30R	64850 51620	0110+80R	25310 18790	0110+110R	13760 13950
0120+10R	23230 26650	0162+30R	162130 84490	0120+80R	18700 16280	0120+110R	13040 13100
0130+10R	25420 36410	0167.5+30R	49780 67810	0130+80R	17040 15300	0130+110R	13850 13440
0140+10R	19480 27810	0100+40R	64830 51090	0140+80R	18090 16210	0140+110R	13950 14720
0150+10R	21710 27240	0105+40R	81240 54650	0150+80R	19880 15780	0150+110R	13830 14980
0160+10R	24240 28320	0162+40R	100700 72230	0160+80R	20220 18330	0160+110R	16380 14280
0167.5+10R	23730 29130	0167.5+40R	56220 74960	0167.5+80R	17440 20030	0167.5+110R	16390 15620
0100+20R	25260 31630	0100+50R	43610 32970	0100+90R	21030 15940	0100+120R	14570 12510
0110+20R	42420 41790	0105+50R	45540 33260	0110+90R	26540 18090	0110+120R	14210 12810
0120+20R	103530 69200	0162+50R	112140 91770	0120+90R	17080 16520	0120+120R	14530 13500
0130+20R	43450 64580	0167.5+50R	69030 81000	0130+90R	13930 15090	0130+120R	14380 13320
0140+20R	53020 53850	0100+60R	22110 18610	0140+90R	14560 16540	0140+120R	14480 12790
0150+20R	116640 90380	0105+60R	20710 15600	0150+90R	16120 16170	0150+120R	13780 13880
0160+20R	38800 46790	0130+60R	18040 18690	0160+90R	17390 17020	0160+120R	15320 14750
0167.5+20R	28630 32090	0140+60R	15460 15490	0167.5+90R	17140 16400	0167.5+120R	14890 13620

REMARKS: ALL READINGS ARE IN COUNTS PER MINUTE (CPM)

TOP- ARE CONTACT MEASUREMENTS

BOTTOM- ARE 1 METER ABOVE GROUND LEVEL,

L. BENALLY, JR.

OUTDOOR GAMMA SCREENING SURVEY DATA SHEET

BOREHOLE LOG

LOGGING CREW: ERNEST COUCH
LEVON BENALLY, JR
ED SCHULTZ

SHEET 3 OF 6 PAGE 3

DATE: JUNE 14, 1984

PROPERTY ID: DU-030

INSTRUMENT ID NO. Lucium 2220 #31982 #14410 #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.

①		②		③		④	
HOLE ID: <u>0+10+10L</u>		HOLE ID: <u>0+34+2K</u>		HOLE ID: <u>0+10+10R</u>		HOLE ID: <u>0+10+25R</u>	
TIME DRILLED: _____		TIME DRILLED: _____		TIME DRILLED: _____		TIME DRILLED: _____	
TIME LOGGED: _____		TIME LOGGED: _____		TIME LOGGED: _____		TIME LOGGED: _____	
SOIL TYPE: <u>V</u>		SOIL TYPE: <u>X</u>		SOIL TYPE: <u>X</u>		SOIL TYPE: <u>X</u>	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE		SURFACE		SURFACE		SURFACE	
0"	181000	0"	104600	0"	72270	0"	205360
6"	418170	6"	271900	6"	236780	6"	536150
12"	297710	12"	165800	12"	159080	12"	953600
18" 15"	151920	18" 15"	103930	18" 14"	109670	18"	899360
24"		24"		24" 18"	67800	24"	291800
30"		30"		30" 21"	44920	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 THE HOLES THAT WERE DRILLED UNTIL ROCK BOTTOM

* CORE BORE THROUGH CONCRETE

BACKGROUND MEASUREMENTS 23,000 CPM

BOREHOLE LOG

LOGGING CREW: ERNEST COUCH
LEVON BENALLY, JR
ED SCHULTZ

SHEET 4 OF 6 PAGE 4

DATE: JUNE 8, 1984

PROPERTY ID: 04-030

INSTRUMENT ID NO. LYDLUM 2228 #31982 W/441016528 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.

⑤		⑥		⑦		⑧	
HOLE ID: <u>0164+66</u>		HOLE ID: <u>0162+30R</u>		HOLE ID: <u>0162+50R</u>		HOLE ID: <u>0150+27R</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		SURFACE		SURFACE		SURFACE	
0"	59950	0"	120540	0"	110030	0"	291180
6"	156640	6"	190970	6"	236650	6"	339140
12"	155330	12"	198170	12"	141230	12"	170740
18"	118430	18"	92400	18"	67140	18"	102104
24"	78680	24"	50540	24"	37220	24"	75440
30"	44020	30"	32750	30"	26610	30"	44150
36"	32180	36"	28640	36"	26630	36"	43190
42"	30010	42"	27710	42"		42"	
48"	30660	48"	26670	48"		48"	
54"	30650	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 HOLES DRILL TO ROCK BOTTOM

BACK GROUND MEASUREMENTS 23,000 CPM

BOREHOLE LOG

LOGGING CREW: ERNEST COUCH
LEVON BENALLY, JR.
ED SCHULTZ

SHEET 5 OF 6 PAGE 5

DATE: JUNE 8, 1984

PROPERTY ID: DU-030

INSTRUMENT ID NO. Ludlum 2220 #31982 w/4410 #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.

⑨		⑩		⑪		⑫	
HOLE ID: <u>0120120R</u>		HOLE ID: <u>0100140R</u>		HOLE ID: <u>0112170R</u>		HOLE ID: <u>0164154R</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		SURFACE		SURFACE		SURFACE	
0"	<u>98820</u>	0"	<u>72390</u>	0"	<u>36380</u>	0"	<u>72410</u>
6"	<u>210890</u>	6"	<u>288070</u>	6"	<u>55470</u>	6"	<u>124450</u>
12"	<u>154990</u>	12"	<u>459580</u>	12"	<u>55230</u>	12"	<u>99270</u>
18"	<u>88790</u>	18"	<u>265660</u>	18"	<u>35030</u>	18"	<u>53200</u>
24"	<u>5590</u>	24"	<u>94750</u>	24"	<u>24950</u>	24"	<u>34420</u>
30"		30"	<u>53000</u>	30"	<u>21740</u>	30"	<u>28270</u>
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 HOLES THAT WERE DRILLED UNTIL ROCK BOTTOM
WAS HIT

BACK GROUND MEASUREMENT 23,000 CPM.

BOREHOLE LOG

LOGGING CREW: ERNEST COACH SHEET 6 OF 6 PAGE 6
LEVON BENALLY, JR DATE: JUNE 15, 1984
ED SCHULTZ PROPERTY ID: DH-030
 INSTRUMENT ID NO. LUDlum 2220 #31982 w/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>0+36+80R</u>		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		SURFACE		SURFACE		SURFACE	
0"	22430	0"		0"		0"	
6"	30250	6"		6"		6"	
12"	26800	12"		12"		12"	
18"	23610	18"		18"		18"	
24"	22510	24"		24"		24"	
30"	22130	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 THE HOLES WERE DRILLED UNTIL ROCK BOTTOM.

BACK GROUND MEASUREMENTS 23,000 CPM

BOREHOLE LOG
Supplemental Data

LOGGING CREW:

*Ernest Couch
Edward Schultz
Julius Buttrick*

SHEET

OF

PAGE

DATE:

October 29, 1984

PROPERTY ID:

DU-030

INSTRUMENT ID NO.

LVP2220 #39814/4410 #6529

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+40+28R		HOLE ID: 0+4+50R		HOLE ID: 0+55+63R		HOLE ID: 0+20+110R	
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	470490	SURFACE	52450	SURFACE	27190	SURFACE	
0"	416530	0"	64330	0"	30240	0"	13730
6"	756290	6"	123470	6"	43720	6"	12880
12"	806000	12"	197910	12"	55710	12/10	13150
18"	420490	18"	121540	18"	48470	18"	
24/31	199800	24/19	88920	24/23	35910	24"	
30"	ROCK	30"	ROCKS	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 holes are due to rocky
*soil encountered background is 23000 cpm
all counts in CPM.*

BOREHOLE LOG

Supplemental Data

LOGGING CREW: Ernest Couch
Edward Schultz
Julius Butzky

SHEET 2 OF 9 PAGE 2
 DATE: October 29, 1984
 PROPERTY ID: DU 230
 AREA: Durango, Colorado

INSTRUMENT ID NO 2220 #39824410 #16528

- 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>6+40+100R</u>	HOLE ID: <u>6+20+105R</u>	HOLE ID: <u>6+40+95R</u>	HOLE ID: <u>6+45+95R</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		SURFACE	<u>13820</u>	SURFACE	<u>44680</u>	SURFACE	<u>15980</u>
0"	<u>17100</u>	0"	<u>14990</u>	0"	<u>34230</u>	0"	<u>16150</u>
6"	<u>19720</u>	6"	<u>19010</u>	6"	<u>42570</u>	6"	<u>18740</u>
12"	<u>22410</u>	12"	<u>21940</u>	12"	<u>35410</u>	12"	<u>21170</u>
18" <u>14</u>	<u>23180</u>	18" <u>14</u>	<u>24290</u>	18"		18"	
24"		24" <u>16</u>	<u>24260</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: Shovel holes, shallow holes are due
to rocky ground, background is 23000 cpm,
all counts in CPM.

BOREHOLE LOG
Supplemental Data

LOGGING CREW:

*Ernest Couch
Edward Gschultz
Julian Butzilly*

 SHEET 3 OF 9 PAGE 3

 DATE: October 29, 1984

 PROPERTY ID: DU-030

 INSTRUMENT ID NO. WD 2220 #31932 4440 #16528

 AREA: Orange, 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: 0+40+90R		HOLE ID: 0+35+95R		HOLE ID: 0+40+105R		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		SURFACE	17510	SURFACE	16310	SURFACE	
0"	17520	0"	18320	0"	16630	0"	
6"	20070	6"	18100	6"	20730	6"	
12" 8	21440	12" 8	20460	12" 9	24340	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:

*Shovel holes, shallow holes are due to
 rocky ground, back ground is 23000 cpm,
 all counts in CPM.*

BOREHOLE LOG
Supplemental Data

 LOGGING CREW: Ernest Couch
Edward Schultzy
Julius Buttrill
 INSTRUMENT ID NO WD2220 #3982 44410 F16528

 SHEET 4 OF 9 PAGE 4
 DATE: October 16, 1984
 PROPERTY ID: DU-030
 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.

①

③

④

HOLE ID: <u>N. wall</u>	HOLE ID: <u>W. wall</u>	HOLE ID: <u>Water pipe</u>	HOLE ID: <u>So. wall</u>
TIME DRILLED: _____	TIME DRILLED: _____	TIME DRILLED: <u>long</u>	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>21700</u>	SURFACE	<u>22110</u>	SURFACE		SURFACE	<u>20760</u>
0"	<u>23170</u>	0"	<u>22270</u>	0"	<u>21440</u>	0"	<u>21610</u>
6"	<u>23030</u>	6"	<u>24050</u>	6"	<u>21210</u>	6"	<u>23180</u>
<u>12" 9"</u>	<u>23770</u>	<u>12" 7"</u>	<u>24720</u>	<u>12" 5"</u>	<u>22230</u>	<u>12" 9"</u>	<u>24090</u>
18"	<u>26" below</u>	18"	<u>26" Below</u>	18"		18"	
24"	<u>footing</u>	24"	<u>FOOTING.</u>	24"	<u>25"</u>	24"	<u>3" UNDER</u>
30"		30"		30"	<u>below</u>	30"	<u>FOOTING</u>
36"		36"		36"	<u>footing</u>	36"	<u>READING</u>
42"		42"		42"		42"	<u>25790</u>
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: Inside of Basement, shallow holes
are due to rocky ground, Background is
23000 cpm, all counts in CPM.

BOREHOLE LOG

Supplemental Data

LOGGING CREW: Ernest Couch
Edward Schultz
Julius Btrilly
 INSTRUMENT ID NO. 1402220 #71982 #4910 #16528

SHEET 5 OF 9 PAGE 5
 DATE: October 16, 1984
 PROPERTY ID: DU-630
 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>E. Wall</u>	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	<u>18780</u>	SURFACE		SURFACE		SURFACE	
0"	<u>18400</u>	0"		0"		0"	
6"	<u>18580</u>	6"		6"		6"	
<u>HOLE 2"</u> <u>18570</u>		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: Inside of basement, shallow holes are
due to rocky ground, Background is
23000 cpm, all counts in CPM.

BOREHOLE LOG

Supplemental Data

LOGGING CREW:

*Ernest Couch
Edward Schultz
Julius Buttrick*

SHEET

6

OF

9

PAGE

4

DATE:

October 30, 1984

PROPERTY ID:

DU-030

INSTRUMENT ID NO.

LUDZ170 #14982 #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: <u>1</u>		HOLE ID: <u>2</u>		HOLE ID: <u>3</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	23110	SURFACE	21690	SURFACE	31490	SURFACE	
0"	26740	0"	24908	0"	28640	0"	
6"	27230	6"	33490	6"	38380	6"	
12"	27190	12"	37890	12'7	35960	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:

*Holes were angled under apron
See sketch for location. Background is 23000cpm
all counts in CPM.*

PROPERTY SURVEY SKETCH

Supplemental Data

Sheet

7 of 9

SITE LOCATION

Durango, Colorado

ADDRESS

PROPERTY TYPE

LOT NO.

DU-030

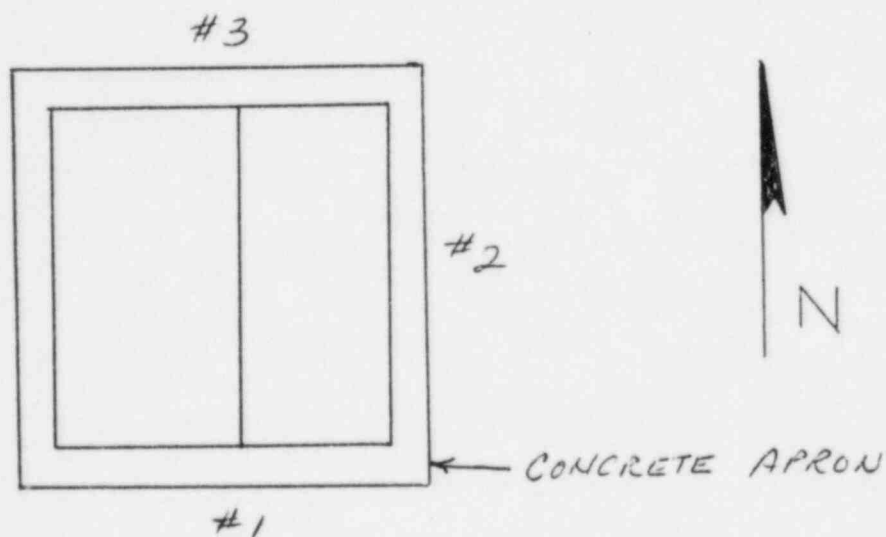
OWNER

SKETCH COMPLETED BY

Edward Schultz

DATE

October 30, 1984



STORAGE SHED

BORE HOLE

LOCATIONS

SEE PAGE 6 FOR READINGS.

INTERIOR SURVEY DATA LOG/HOT SPOT

SURVEY CREW

Ernest Couch
Edward Schultz
Julius Bitsilly

Supplemental Data
 SHEET 9 OF 9 PAGE 9
 DATE October 29, 1984
 PROPERTY ID # DU-030
 PROJECT _____

GAMMA SCINTLLATOR HOT SPOT DATA

39884/4410 #16529

2220 INSTRUMENT ID # _____ 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.

HOT SPOT ID #	COUNTS /0.1MIN	RATE ^{surface} uR/h	HOT SPOT ID #	COUNTS /0.1MIN	RATE uR/h	HOT SPOT ID #	COUNTS /0.1MIN	RATE uR/h
LOCATION: <u>Addition</u>			LOCATION:			LOCATION:		
<u>NW</u>	<u>18010</u> <u>16630</u>	<u>17</u>						
<u>N E</u>	<u>15800</u> <u>16850</u>	<u>16</u>						
<u>E</u>	<u>21240</u> <u>20460</u>	<u>18</u>						
<u>SE</u>	<u>17030</u> <u>18560</u>	<u>17</u>						
<u>SW</u>	<u>20060</u> <u>19050</u>	<u>18</u>						
LOCATION:			LOCATION:			LOCATION:		



MORRISON-KNUDSEN COMPANY, INC.

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