WM-48

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

Radiological and Engineering Assessment

CDH #20092

Vicinity Property No. DUR 028

Remedial Actions
Contractor
for the
Uranium Mill Tailings
Remedial Actions
Project

MORRISON
KNUDSEN

Vicinity Property No. DUR 028

URFO-7

FINAL

THE RADIOLOGICAL AND ENGINEERING ASSESSMENT

AND FINAL DESIGN

FOR

DURANGO PROPERTY

DU-028

CDH #20092

May 14, 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-028 is a private residence located at 54 Rio Vista Circle, Durango, CO.

1.2 Evaluation and Recommendation

1.2.1 Residual Radioactive Material Involvement

A majority of the property is contaminated. There is no interior contamination.

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 $25,400.00.

1.2.4 Schedule

The estimated duration of the remedial action effort is 10 to 15 days.

2.0 ENGINEERING FIELD SURVEY

2.1 Property Description

2.1.1 Property Use and Occupancy

Property DU-028 is a private residence located at 54 Rio Vista Circle, Durango, Colorado and owned by Robert and Joann Armstrong. 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 No. 488534 follows:

Lot 12, Block 2, Riverview Park Second Resubdivision, in the City of Durango.

2.1.3 Bordering Properties

The lot is zoned R-1, single family residence. 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 wood frame structure on a concrete foundation with an attached single car carport. A concrete driveway extends from the carport to the street. A concrete sidewalk extends along the street outside the west property line, from the street to the front porch of the house, and from the back of the carport 25 feet into the rear yard. A 4'x8' wood storage shed is built into the east end of the carport.

The front yard and north side yard are graveled. Two mature evergreen trees are located on the north end of the front yard and an evergreen hedge on the south side of the driveway. A flower garden is located along the south side of the carport. The rear yard is fenced with both chain link and wood fences and is partially grassed between the house and the concrete retaining wall which extends the width of the property. A garden plot has been laid out south of the rear yard walk. A large deciduous bush is in the center of the grassed area in the rear yard.

Behind the retaining wall the property slopes steeply upward to the east fence line. This plot is dotted by trees, bushes. A length of buried plastic pipe traverses the rear yard from the retaining wall to the house and connects the perforated pipe drain behind the wall to the sanitary sewer under the house.

The house is less than 50 years old and therefore meets the 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.

2.2.2 Utilities

Utilities are serviced to the property as follows:

Electric power - Overhead to the southeast corner of the house.

Telephone - Overhead to the southeast corner of the 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 Figure 2.3.

Table 2.1

PROPERTY SURVEY DATA

GENERAL:

Site Location: Durango

Property Address: 54 Rio Vista Circle

Owner's Name: Robert & Joann Armstrong Address: 23 Prairie Dunes, Hutchinson KS

Lot No.: 12 Property Type: Residence - Rental Unit

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

Survey Completed By: R. Livengood/C. Sanders-Meena Date: 5-16-84

Property Description - Exterior:

Dwelling: Sq. Ft.: N/A

Levels: Single Story with Crawl Space

Construction Type: Brick Veneered Wood Frame

Foundation: Poured Concrete

Garage: Single Car Attached Wood Frame Carport on South Side of House

Storage Bldg: Prefab:

Other: 4'x8' Wood Built in to East End of Carport

Improvement to Dwellings: Additions: None Porches: None

Deck: None Patio: None

Other:

Driveway: Concrete: From Street to Carport Paved:

Gravel: Other:

Sidewalks: Concrete/Paved: As Noted on Drawing

Other:

Fences/Gates: Wood: 6' Cedar-North Side Back Yard/3' Wood on N and E Side Back Yard

Chain Link: 3' High on South Side Back Yard to Retaining Wall

Table 2.1 (cont'd)

PROPERTY SURVEY DATA

Site Location: Durango

Property Address: 54 Rio Vista Circle

Grounds:
- Lawn: Partially Grassed Back Yard
- Trees: As Noted on Drawing
- Shrubs: As Noted on Drawing
- Garden: Along South Side of Carport into Back Yard
- Grading: 20% from Retaining Wall to East Lot Line
- Other:

Soil Type:

Existing Survey Plot: Yes

Property Description - Interior: No Interior Contamination

Room	Floor	Walls E	Walls W	Walls N	Walls S	Ceiling	Comments

Utilities:

Heating: Gas: X Electric:

Hot Water: Other:

Air Cond: Gas: Heat Pump:

Table 2.1 (cont'd)

PROPERTY SURVEY DATA

Site Location: Durango

Property Address: 54 Rio Vista Circle

Electric Line Location: Overhead from SE Utility Pole to SE Corner of House

Gas Line Location: Underground from Rear (East) of Lot

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

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

Telephone Line Location: Overhead from SE Utility Pole to SE Corner of House

Building Codes and Zoning:

Codes	Local	State	Federal
Building Work	UBC		
Plumbing			
HVAC			
Electrical			
Other			

Zoning District: City of Durango

Present Dwelling Zoning: R-1 Residence District

Setbacks: Front:

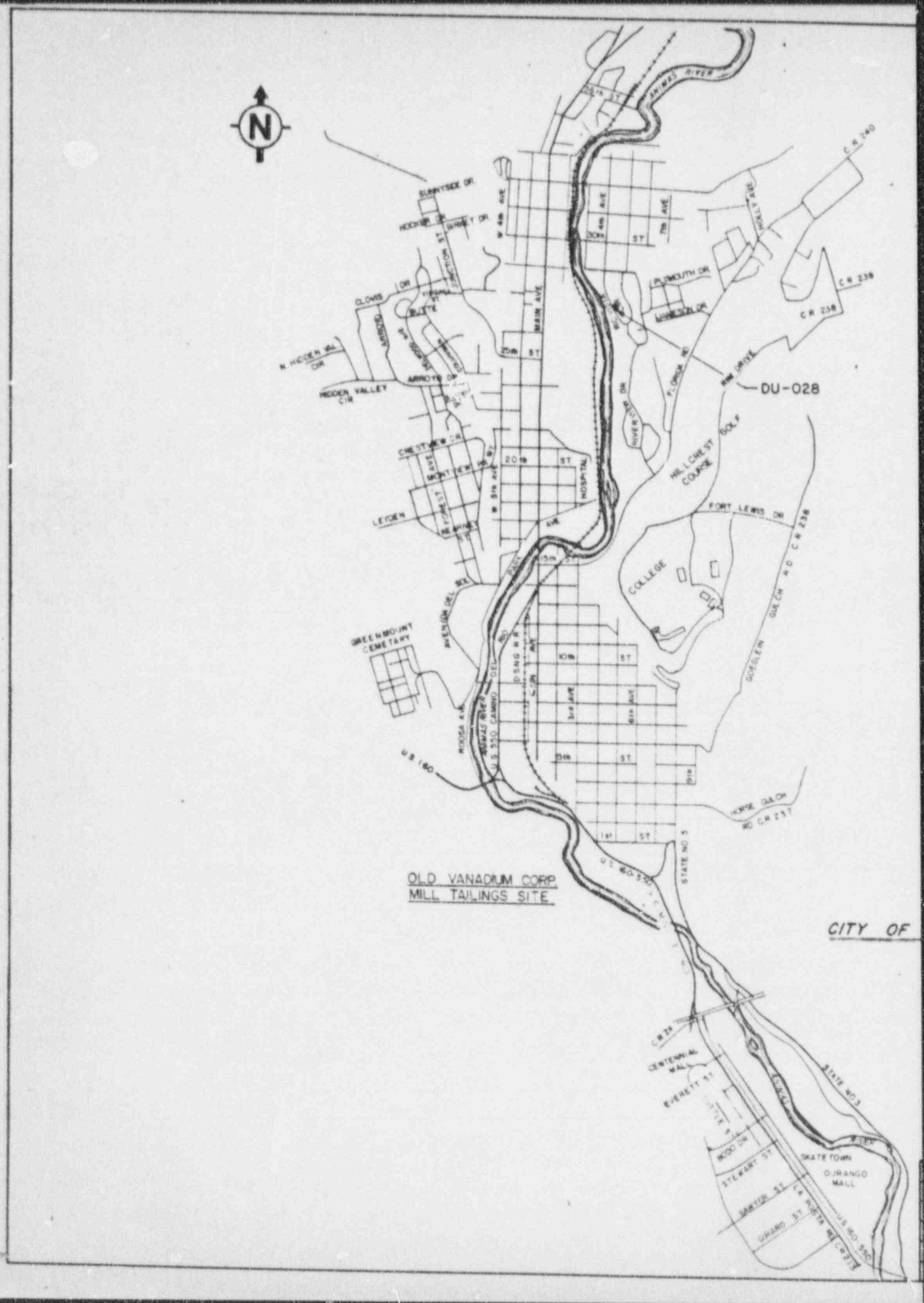
Rear:

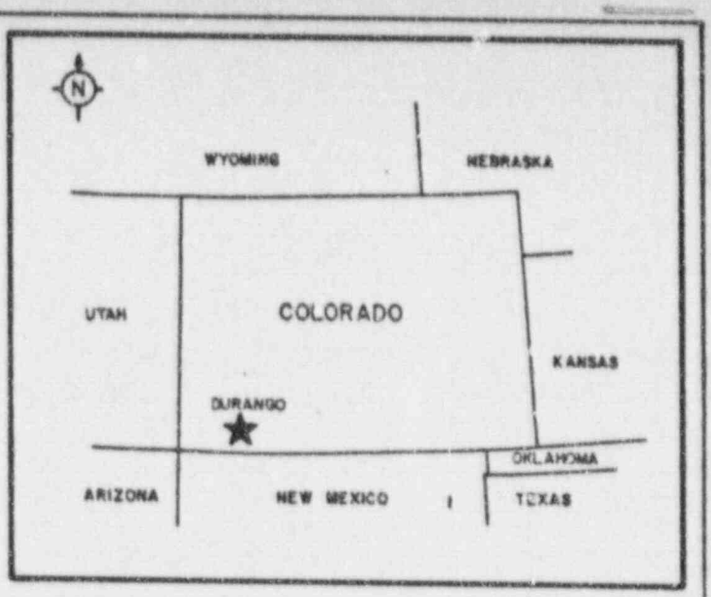
Side:

Other:

Photographs:

Roll Frame	Description	Direction
2-9	Front of House	Looking East
2-6	Rear of House	Looking Northwest


N
DU-028
OLD VANADIUM CORP
MILL TAILINGS SITE
CITY OF



DURANGO, COLORADO

R Ed Parnell
4/11/85

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED		DRAWN	GJW				
CHECKED	Tom Reinhold						
REVIEWED	J Nay						
RECOMMENDED							
APPROVED	NR	DATE	DOE PROJECT MANAGER	NR	DATE	DOE PROJECT ENGINEER	NR	DATE

FIGURE 2.1

VICINITY MAP DU-028

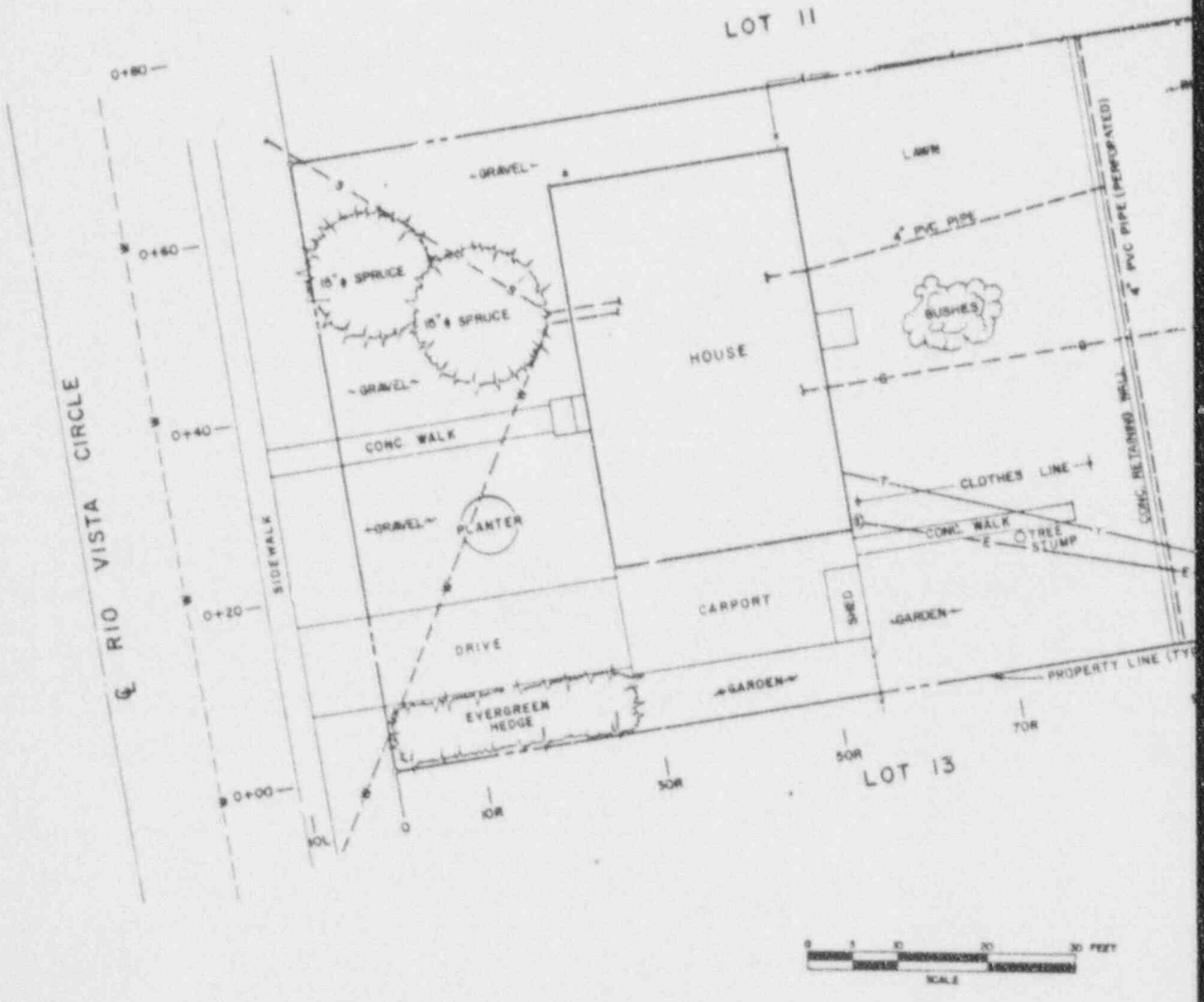
DURANGO, COLORADO
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPROVAL ENGR	APPROVAL QA	PROJ ENGR	APPROVAL DOE
0	4-2-85	ISSUE FOR CONSTRUCTION	GJW	TLR	TLR	JM	KLB	—

MORRISON KNUDSEN

PROJECT NO. DE-AC04-83AL18796

DRAWING NO. DU-028-005 REV. 0


N
LOT 11
0+80
0+60
0+40
0+20
0+00
℄ RIO VISTA CIRCLE
SIDEWALK
GRAVEL
15" ø SPRUCE
15" ø SPRUCE
HOUSE
LAWN
4" PVC PIPE
BUSHES
4" PVC PIPE (PERFORATED)
CONC. RETAINING WALL
CONC WALK
CLOTHES LINE
PLANTER
TREE STUMP
CARPORT
SHED
GARDEN
DRIVE
EVERGREEN HEDGE
PROPERTY LINE (TYP.)
10L
0
10R
30R
50R
70R
LOT 13
0
5
10
20
30 FEET
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
	FENCE LINE
G, W or E	METER
G or W	VALVE
	PROPERTY PIN
	POWER POLE
	REMEDIAL ACTION AREA

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

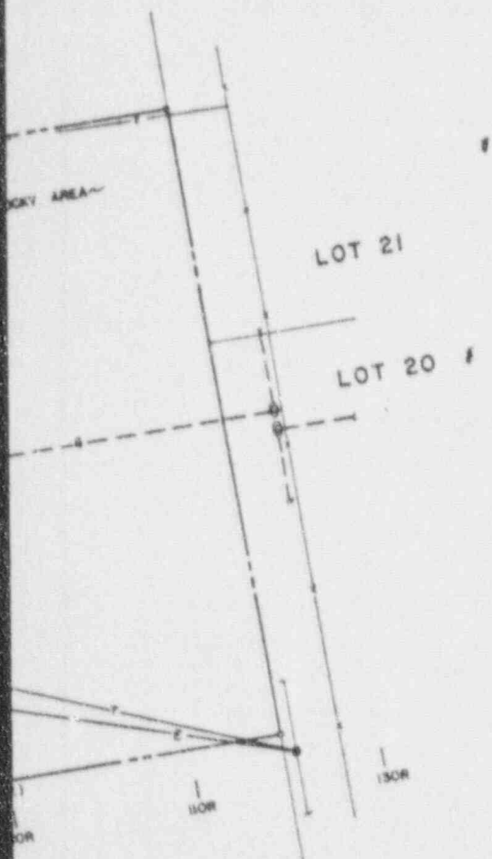


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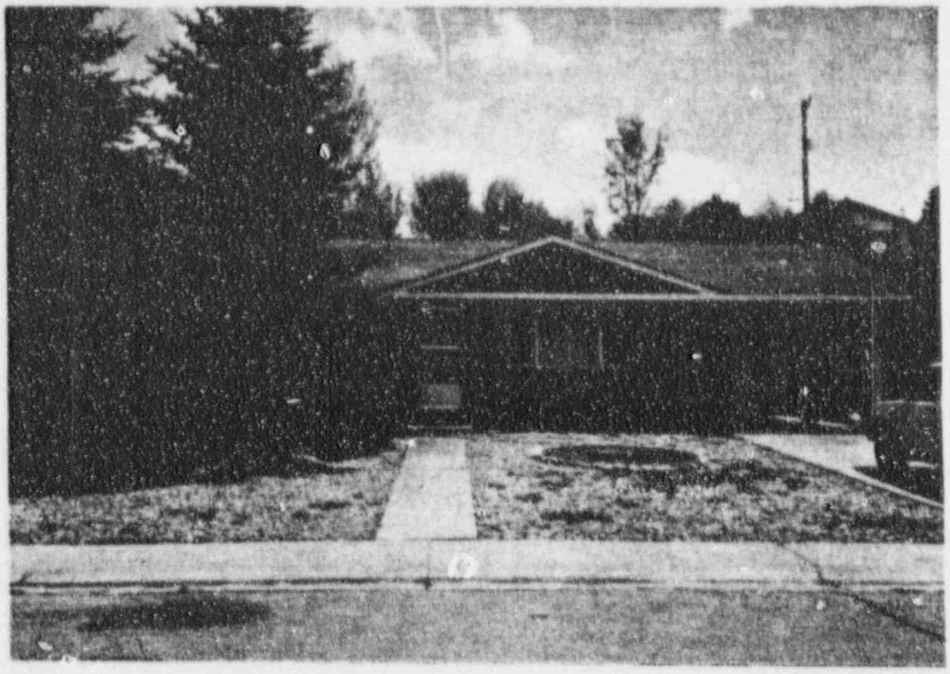
FIGURE 2.2
SITE PLAN DU-028
DURANGO, COLORADO
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

APPROVED	DATE	DOE PROJECT MANAGER	DATE	DOE PROJECT ENGINEER	DATE
NR		NR		NR	

MORRISON KNUDSEN

PROJECT NO. DE-AC04-83AL18796
DRAWING NO. DU-028-010 REV. A

NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPROVED	APPROVED	PROJ ENG	APPROVED DOE
A	1/25 1990	FINAL REA SUBMITTAL	SJW	TLP	TLP		LSD	–



Front of House Looking East

Rear of House Looking Northwest

Figure 2.3 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 Vicinity Property DU-028, 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. Gamma readings were made within one foot of the house on all four sides.

No indoor gamma survey was conducted inside the house, since the inclusion survey reported that contaminated material was not found in or under the structure and since the borehole and angle hole survey demonstrated the absence of contamination under the structure.

Sidewalks and porches were routinely surveyed as part of the general grid survey.

3.1.2 Survey Results

Surface gamma readings on the property range from 15 to 88 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.

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.

Shovel holes were dug in the garden to determine the precise limit of contamination in this region. Additionally, several holes were dug at the walls of the house and then angled underneath the house as far as possible. All these holes were surveyed as nearly as possible in accordance with the RAC Procedure 019. Shovel holes were not dug over utility lines since these lines are in areas already determined to contain contamination, as shown in Figure 3.1.

3.2.2 Survey Results

Contamination was found in 11 of the 13 outdoor holes augered. The location and depth of the contamination is described in Table 3.2 and is shown in Figure 3.1.

Two of the four shovel holes showed contamination. The location and depth of these holes are described in Table 3.3 and are shown in Figure 3.1.

Contamination was found in one of the five angled holes. This single contamination point was at the water line, where it enters the home. The other holes, all angled under the house, showed no evidence of contamination. The locations of these holes are described in Table 3.3 and shown in Figure 3.1.

3.3 Radon/Radon Daughter Survey

No radon/radon daughter surveys were performed inside the hou t the property, since the inclusion survey reported that no contamination is in or under the structure.

3.4 Estimated Extent of Contamination

One area of contamination was identified in the survey. This area, which includes most of the outside portion of the property, is divided into two areas for convenience in this assessment.

3.4.1 Area A

As shown on Figure 3.1, Area A is contaminated to an approximate depth of 24 inches. Pockets of contamination may extend to 30 inches deep. Some excavation may be required in the utility trench under the house; however, this should not affect the foundation. The depth of contamination is difficult to estimate accurately, since the rocky soil makes it impossible to drill below the contamination in most locations.

The relatively low elevation of gamma readings in the west part of the front yard is attributed to the shielding from the gravel cover.

Gamma readings above the driveway were near background. However, concrete is a good gamma shield, and gamma levels and boreholes near the driveway, including the carport, demonstrate the presence of contamination. The driveway should be removed.

3.4.2 Area B

The approximate depth of contamination in Area B ranges from 30 inches deep near the east (back) wall of the house to 6 inches deep near the concrete retaining wall.

Table 3.1
OUTDOOR SURFACE GAMMA SURVEY
Property DU-028

POINT	MICRO R/hr
0+00.10L	59
0+10,10L	81
0+20,10L	70
0+30,10L	51
0+40,10L	57
0+50,10L	60
0+60,10L	57
0+67.5,10L	42
0+00,00R	17
0+30,00R	17
0+40,00R	17
0+50,00R	20
0+60,00R	18
0+67.5,00R	27
0+00,10R	17
0+20,10R	18
0+30,10R	18
0+40,10R	21
0+50,10R	17

Table 3.1 - Cont'd.
OUTDOOR SURFACE GAMMA SURVEY
Property DU-028

POINT	MICRO R/hr
0+60,10R	26
0+67.5,10R	18
0+00,20R	19
0+20,20R	30
0+30,20R	25
0+40,20R	21
0+50,20R	20
0+60,20R	18
0+67.5,20R	17
0+00,28R	18
0+20,28R	25
0+30,28R	42
0+40,28R	26
0+50,28R	74
0+60,28R	55
0+67.5,28R	22
0+60,30R	36
0+67.5,20R	25
0+60,40R	38
0+67.5,40R	26

Table 3.1 - Cont'd.
OUTDOOR SURFACE GAMMA SURVEY
Property DU-028

POINT	MICRO R/hr
0+60,50R	66
0+67.5,50R	24
0+10,54R	25
0+20,54R	25
0+30,54R	30
0+40,54R	29
0+50,54R	88
0+60,54R	30
0+00,60R	19
0+10,60R	25
0+16,60R	29
0+20,60R	33
0+30,60R	48
0+40,60R	57
0+50,60R	40
0+60,60R	24
0+67.5,60R	19
0+00,70R	17
0+10,70R	20
0+16,70R	19
0+20,70R	18
0+30,70R	25

Table 3.1 - Cont'd.
OUTDOOR SURFACE GAMMA SURVEY
Property DU-028

POINT	MICRO R/hr
0+40,70R	22
0+50,70R	20
0+60,70R	20
0+00,80R	17
0+10,80R	17
0+20,80R	18
0+40,80R	24
0+50,80R	20
0+60,80R	17
0+67.5,100R	19
0+00,40R	19
0+00,50R	19
0+10,40R	17
0+18,35R	30
0+18,40R	31
0+10,70R (approx.)	19

Table 3.2
BOREHOLE SURVEY
Property DU-028

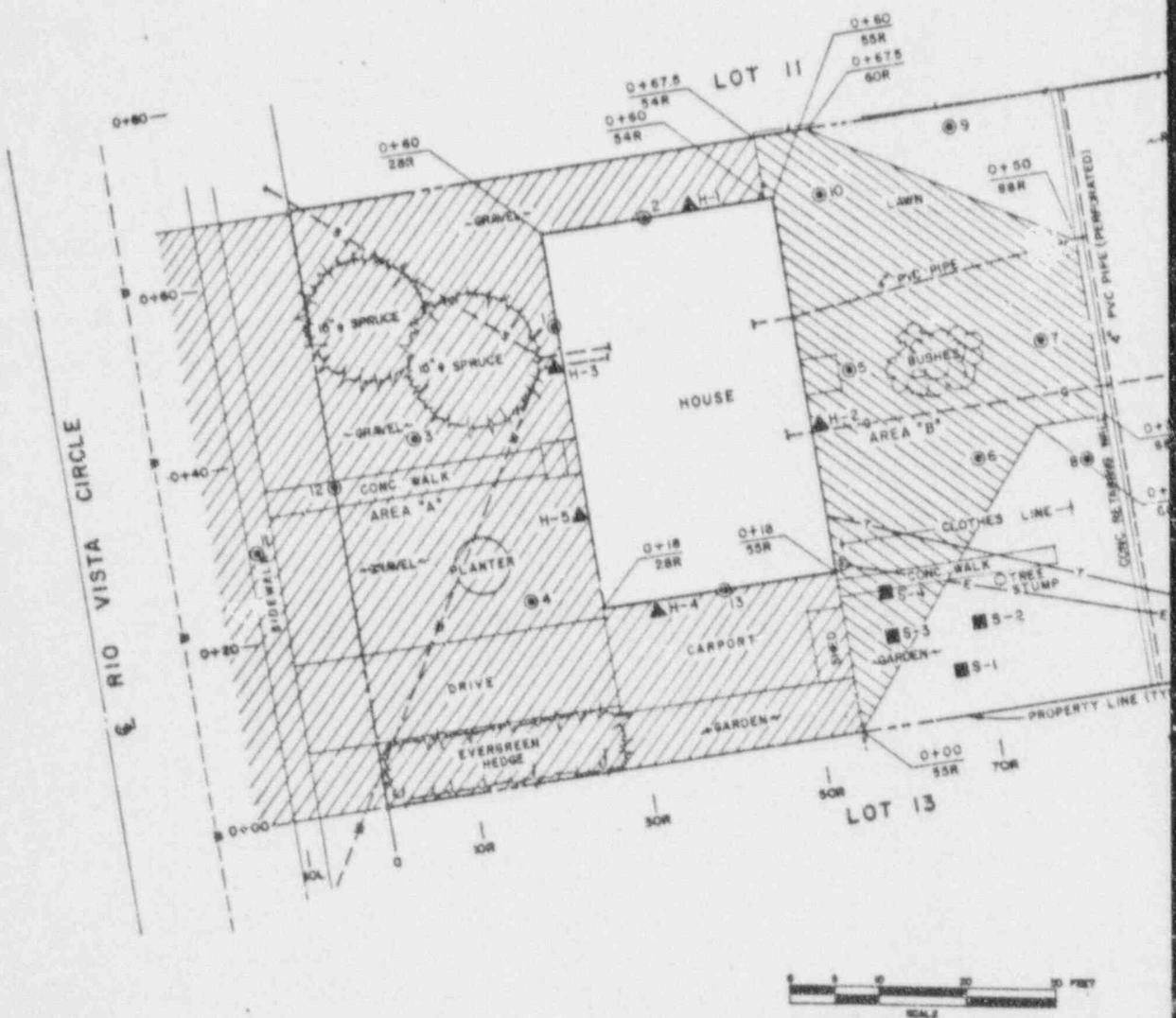
HOLE	LOCATION	CONTAMINATION DEPTH
1	0+50,28R	*0-21"+
2	0+60,40R	*0-20"+
3	0+40,10R	0-18"
4	0+20,20R	*0-24"+
5	0+40,60R	*0-27"+
6	0+28,73R	0-18"
7	0+40,82R	0-6"
8	0+26,85R	None
9	0+65,76R	None
10	0+60,60R	0-6"
11	0+30,10L	*0-14"+
12	0+36,00R	*0-10"+
13	0+18,42R	*0-30"+

*Could not drill deeper because of large rocks below the surface.
+Depth of contamination not reached.

Table 3.3
SHOVEL AND ANGLED HOLE SURVEY
Property DU-038

HOLE	LOCATION	CONTAMINATION DEPTH
S-1*	0+05,67R	None
S-2	0+10,70R	None
S-3	0+10,60R	0-6"
S-4	0+15,60R	0-12"+
H-1*	North wall	None
H-2	East wall	None
H-3	West wall at water line	0-19"+
H-4	South wall	None
H-5	West wall, 15' S of water line	None

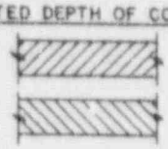
*S indicates shovel holes; H denotes angled (toward the horizontal) holes.
+Depth of contamination not reached.


N
LOT 11
LOT 13
RIO VISTA CIRCLE
HOUSE
AREA "A"
AREA "B"
CONC WALK
GRAVEL
PLANTER
DRIVE
CARPORT
GARDEN
LAWN
BUSHES
EVERGREEN HEDGE
SIDEWALK
CLOTHES LINE
TREE STUMP
PROPERTY LINE
4" PVC PIPE (PERFORATED)
10" ø SPRUCE
0+60
55R
0+67.5
60R
0+67.5
54R
0+60
54R
0+60
28R
0+50
88R
0+40
0+20
0+00
0+18
28R
0+18
55R
0+00
55R
50R
50R
10R
10L
H-1
H-2
H-3
H-4
H-5
S-1
S-2
S-3
S-4

LEGEND

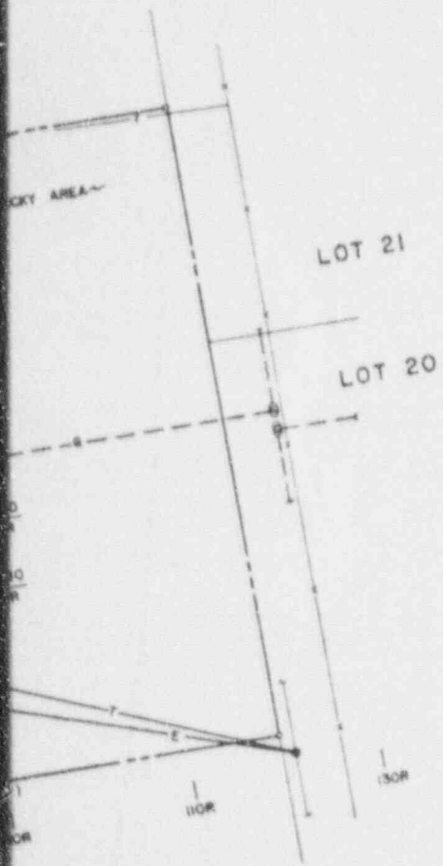
- ⊕4 AUGER HOLE DESIGNATION
- ■S-4 SHOVE HOLE DESIGNATION
- ▲H-4 SLANT (ANGLE) HOLE DESIGNATION

ESTIMATED DEPTH OF CONTAMINATION



AREA "A" 24"

AREA "B" 30" @ HOUSE, SLOPING UNIFORMLY TO 6" @ RETAINING WALL



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NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPROVED LOE	APPROVED DH	PROJ ENG	APPROVED DOE
0	7/25/1985	FINAL REA SUBMITTAL	GJW					

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED DRAWN
CHECKED
REVIEWED
RECOMMENDED
APPROVED NR DATE
DOE PROJECT MANAGER NR DATE
DOE PROJECT ENGINEER NR DATE

FIGURE 3.1
RADIOLOGICAL SURVEY DATA DU-028
DURANGO, COLORADO
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

MORRISON KNUDSEN

PROJECT NO. DE-AC04-83AL18796
DRAWING NO. DU-028-015 REV A

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-028:

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 includes the following:

- Excavate contaminated materials in areas as shown in Figure 4.1.

- Backfill excavated areas with common fill. Top with topsoil in lawn area.

- Top with gravel in graveled areas and top with structural fill in concrete areas.

- Contamination under the sidewalk will be removed in accordance with the general construction drawing DU-024-021. If contamination is found to extend under the street, it will be handled in a separate REA with the City of Durango.

- Remove, salvage, and replace shed in carport area and share carport roof.

- Demolish, remove and replace entire concrete driveway, sidewalk and front stoop.

- Remove and replace hedges and bushes.

4.1.2 Costs

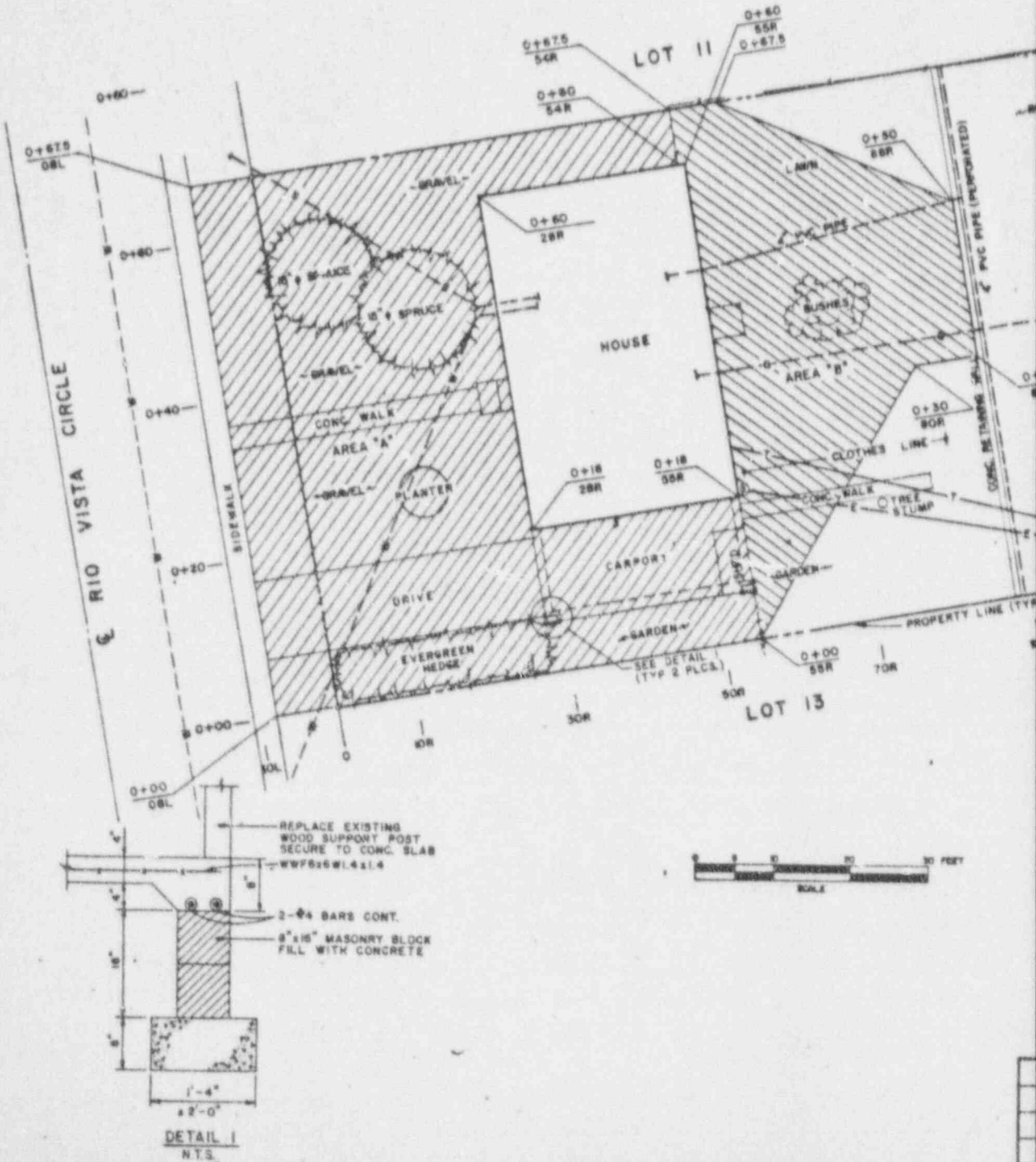
Estimated costs for the activities associated with Option 2 are detailed in Table 4.1. Costs include labor, insurance, material, equipment, supplies, overhead, profit, and contingency. All costs are listed in 1985 dollars. It is anticipated that the time required for the subcontractor to complete the work will be 10 to 15 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 $25,400.00.

Table 4.1
OPTION 2 COSTS

Activity	Unit Price	Quantity	Estimated Cost
Excavation (Hand)	59.05	22 cy	1,299.00
Excavation (Machine), Includes Hedge Removal	8.30	450 cy	3,735.00
Demolition-Concrete Driveway And Stoop	3.00	846 sq ft	2,538.00
Shoring of Carport	480.00	ls	480.00
Remove Storage Shed & Supports	627.00	ls	627.00
Remove Clothes Line and Pole	90.00	ls	90.00
Remove Spruce Trees	200.00	2 ea	200.00
Backfill (Machine)	7.20	353 cy	252.00
Backfill (Hand)	22.40	22 cy	492.00
Topsoil	26.40	26 cy	686.00
Structural fill	26.40	16 cy	422.00
Sod	3.00	153 sy	459.00
Gravel	26.40	55 cy	1,452.00
Filter Fabric (4 Mil)	1.00	225 sy	225.00
Replace Hedge & Shrubs	300.00	ls	300.00
Replace Spruce Trees	300.00	2 ea	600.00
Replace Clothes Line & Pole	90.00	ls	90.00
Replace Storage Shed & Supports	627.00	ls	627.00
Construct Concrete Driveway, Sidewalks, and Stoop	3.50	846 sq ft	2,961.00
Replace Planter	105.00	1 ea	105.00
Subtotal			$17,640.00
5% Subcontractor Contingency			882.00
20% Overhead & Profit			3,528.00
Subtotal			$22,050.00
15% Engineer's Contingency			3,308.00
Total (Rounded)			$25,400.00


N
LOT 11
LOT 13
RIO VISTA CIRCLE
HOUSE
AREA "A"
AREA "B"
CONC. WALK
SIDEWALK
DRIVE
CARPORT
PLANTER
EVERGREEN HEDGE
BUSHES
LAWN
GARDEN
CLOTHES LINE
TREE STUMP
PROPERTY LINE
SEE DETAIL 1 (TYP 2 PLCS.)
REPLACE EXISTING WOOD SUPPORT POST SECURE TO CONC. SLAB
WWF6x6 W1.4 x 1.4
2-#4 BARS CONT.
8"x16" MASONRY BLOCK FILL WITH CONCRETE
1'-4"
±2'-0"
SCALE

DETAIL 1
N.T.S.

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-028.

   SECTION 02050
   DEMOLITION

   SECTION 02110
   CLEARING AND GRUBBING

   SECTION 02130
   CONTAMINATED MATERIAL REMOVAL

   SECTION 02200
   EXCAVATION AND BACKFILL

   SECTION 02480
   LANDSCAPING

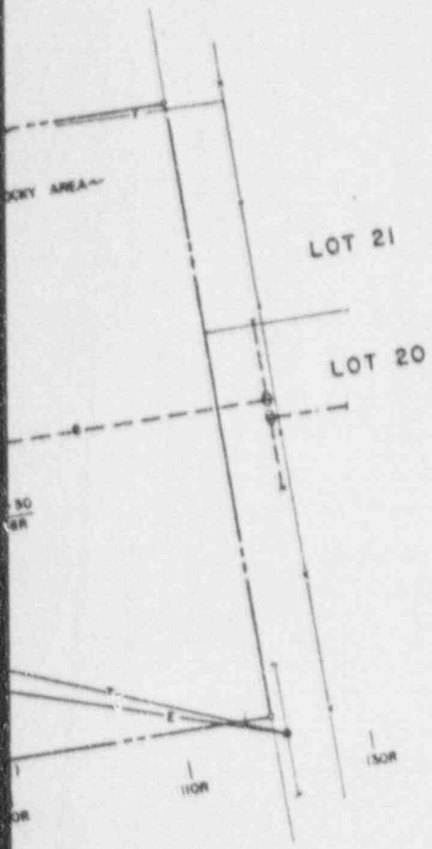
   SECTION 02700
   UNDERGROUND PIPING

   SECTION 03300
   CAST-IN-PLACE CONCRETE

   SECTION 04100
   CONCRETE BLOCK

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 CONTRACTORS REPRESENTATIVE.



SCOPE OF WORK:

AREA "A"

- DEMOLISH AND REMOVE CONCRETE DRIVEWAY, SIDEWALK AND FRONT STOOP. SHORE CARPORT ROOF AS NECESSARY FOR REMOVAL OF THE SHED AND DRIVEWAY.
- REMOVE HEDGES LOCATED SOUTH OF THE DRIVEWAY. REPLACE HEDGES WITH SIMILAR TYPE AND SIZE.
- HAND EXCAVATE AROUND THE TWO SPRUCE TREES TO A DEPTH OF 24 INCHES TAKING EXTREME CARE SO AS NOT TO DAMAGE THE TREES OR THE ROOT SYSTEM. AFTER INITIAL EXCAVATION, THE CONTRACTORS' REPRESENTATIVE WILL RESURVEY AND NOTIFY THE SUBCONTRACTOR IF FURTHER EXCAVATION AND/OR TREE REMOVAL IS REQUIRED. IF TREES ARE TO BE REMOVED, REPLACE WITH SIMILAR TYPE AND SIZE AS PRACTICAL.
- EXCAVATE REMAINING PORTION OF AREA "A" TO A DEPTH OF 24 INCHES.
- REPLACE PLANTER AREA WITH PLANTS OF SIMILAR TYPE AND SIZE.
- BACKFILL ALL CONCRETE AREAS WITH 14 INCHES OF COMMON FILL AND TOP WITH 6 INCHES OF STRUCTURAL FILL.
- CONSTRUCT NEW 4 INCH THICK DRIVEWAY AND SIDEWALK TO THE SAME SIZE AND ELEVATION OF THOSE REMOVED. REINFORCE DRIVEWAY WITH WWF 6 x 6 W1.4 x W1.4.
- CONSTRUCT NEW CONCRETE STOOP TO THE SAME SIZE AND ELEVATION OF THAT REMOVED.
- BACKFILL REMAINING PORTION OF AREA "A" WITH 24 INCHES OF COMMON FILL AND TOP WITH 3 INCHES OF GRAVEL.
- REPLACE SHED AND ROOF SUPPORTS IN CARPORT AREA.

AREA "B"

- DEMOLISH AND REMOVE ENTIRE CONCRETE SIDEWALK.
- REMOVE AND SALVAGE CLOTHES LINE AND POLES. REPLACE IN ORIGINAL LOCATION AND ELEVATION.
- REMOVE BUSHES IN REAR YARD. REPLACE BUSHES WITH SIMILAR TYPE AND SIZE.
- PROTECT 4 INCH PVC PIPE IN PLACE DURING EXCAVATION.
- EXCAVATE AREA "B" WITHIN THE BOUNDARIES SHOWN TO A DEPTH OF 6 INCHES AT THE CONCRETE RETAINING WALL AND SLOPING DOWN TO A DEPTH OF 30 INCHES AT THE HOUSE.
- BACKFILL EXCAVATED AREA WITH COMMON FILL AND TOP WITH 6 INCHES OF TOP SOIL AND SOD. IN SIDEWALK AREA TOP WITH 6 INCHES STRUCTURAL FILL AND CONSTRUCT NEW 4 INCH THICK CONCRETE SIDEWALK TO THE SAME SIZE AND ELEVATION OF THAT REMOVED.

9707090123-04

4/4/85

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

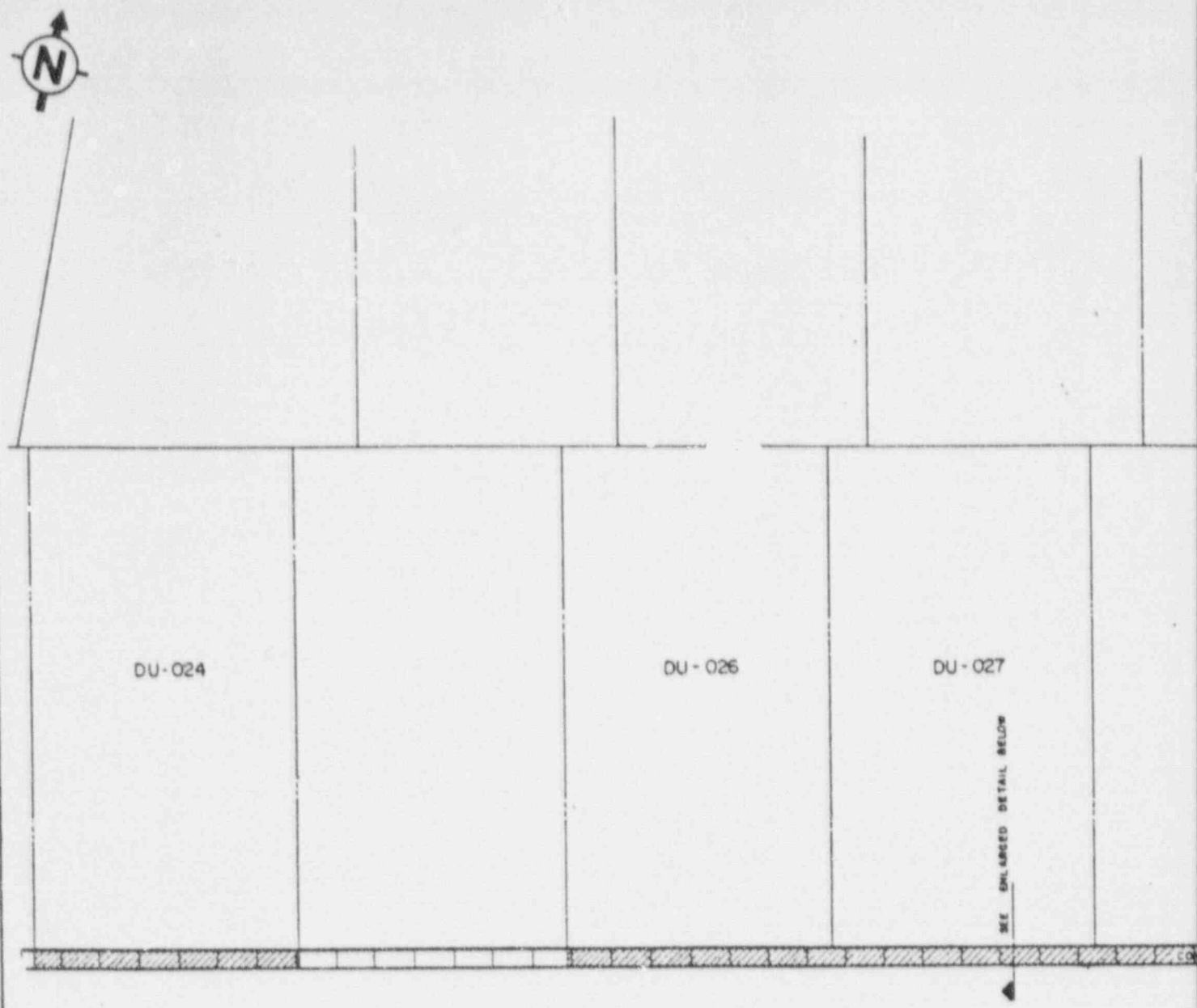
DESIGNED/DRAWN			
CHECKED			
APPROVED			
RECOMMENDED			
APPROVED	DATE	DOE PROJECT MANAGER	DATE	DOE PROJECT ENGINEER	DATE

FIGURE 4.1
EXCAVATION & RESTORATION PLAN DU-028
DURANGO, COLORADO
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPROVAL LOE	APPROVAL QA	PROJ ENG	APPROVAL DOE
0	4-2-85	ISSUE FOR CONSTRUCTION	R.W.	TVP	TLP	Mm	VCO	—

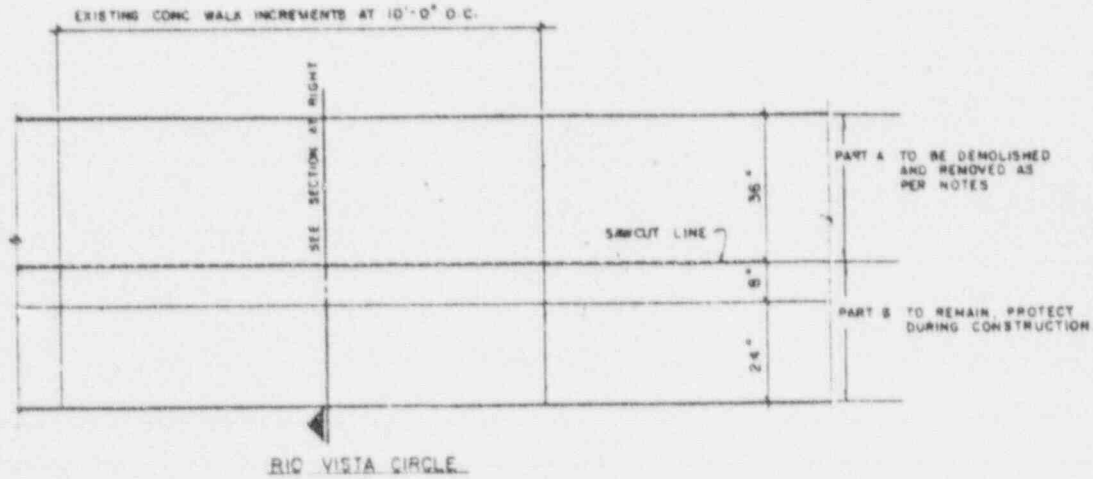
MORRISON KNUDSEN

PROJECT NO. DE-AC04-83AL18796
DRAWING NO. DU-028-020 REV. 0



PLOT PLAN

0 5 10 20 40



RIO VISTA CIRCLE

CONC WALK DETAIL

0 1 3 6

LEGEND

▨ DESIGNATES AREA TO BE DEMOLISHED AND REPLACED.

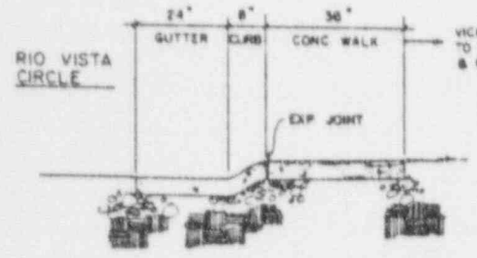
NOTES

- FOR GENERAL NOTES SEE FIGURE 4.1 DU-024-020
- SAWCUT ALONG TOP OF CURB SEE CONCRETE WALK DETAIL FOR DIMENSIONS
- DEMOLISH AND REMOVE CONCRETE WALK WHERE DESIGNATED EXCAVATE AT A DEPTH OF 18" IF FURTHER CONTAMINATION EXISTS EXCAVATE AS REQUIRED BY CONTRACTOR'S REPRESENTATIVE
- BACKFILL WITH COMMON FILL AND TOP WITH 6" STRUCTURAL FILL
- RECONSTRUCT 6" THICK CONCRETE WALK IN 10'-0" SECTIONS TO MATCH EXISTING WALK SLOPE TO MATCH EXISTING WALK PROTECT CURB AND GUTTER
- USE 1/2" EXPANSION JOINT BETWEEN CURB CUT AND NEW CONCRETE WALK

DU-028 DU-029 DU-030

CONC WALK

℄ RIO VISTA CIRCLE



SECTION

9707090123-05

10457

NO	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPROVAL LOE	APPROVAL DOE	PROJ ENG	APPROVAL DOE
0	4-20-95	ISSUE FOR CONSTRUCTION	WL	BL	VCB	VCB	VCB	—

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED CAM
CHECKED
REVIEWED
RECOMMENDED

FIGURE 4.2

SIDEWALK REMEDIAL PLAN
DU-024, 026, 027, 028, 029, 030

DURANGO, COLORADO
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

APPROVED	DATE	DOE PROJECT MANAGER	DATE	DOE PROJECT ENGINEER	DATE
NR		NR		NR	

MORRISON KNUDSEN

PROJECT NO
DE-AC04-83AL18796

DRAWING NO
DU-024-021

REV. 0

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	TITLE		
SECTION 02050	DEMOLITION	X	
SECTION 02130	CONTAMINATED MATERIAL REMOVAL	X	
SECTION 02200	EXCAVATION AND BACKFILL	X	
SECTION 02480	LANDSCAPING	X	
SECTION 03300	CAST-IN-PLACE CONCRETE	X	
SECTION 04100	CONCRETE BLOCK	X	

6.0 CONSTRUCTION DRAWINGS

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

Drawing Number	Drawing Title
DU-028-020	Excavation & Restoration Plan DU-028
DU-024-021	Sidewalk Remedial Plan DU-024, 026, 027, 028, 029, 030

APPENDIX A

SURVEY DATA LOGS

MORRISON KNUDSEN

OUTDOOR GAMMA SCREENING
SURVEY DATA SHEET

LOGGING CREW: E. Collett
L. Benally, Jr

SHEET 1 OF 7 PAGE 1

DATE: June 6, 1984

PROPERTY ID: DU-028

INSTRUMENT ID NO.: Ludlum 2220 #31972 HV 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+10L	13960 / 13640	0+00+20L	27640 / 24090	0+30+54R	62460 / 55370	0+17.5'30R	16230 / 15960
0+10+10L	13685 / 15240	0+03+20R	15880 / 15140	0+40+54R	54620 / 44710	0+10+90R	16660 / 16350
0+20+10L	16650 / 13570	0+20+20R	63570 / 53340	0+50+54R	147340 / 93440	0+10+90R	16530 / 16380
0+30+10L	11990 / 13350	0+30+20R	47900 / 39770	0+60+54R	64540 / 60260	0+20+90R	16420 / 17330
0+40+10L	13610 / 15590	0+40+20R	35660 / 41910	0+16+60R	60650 / 37880	0+30+90R	17470 / 17260
0+50+10L	14157 / 17620	0+50+20R	29780 / 37610	0+20+60R	69380 / 49020	0+40+90R	16340 / 18560
0+60+10L	13850 / 17350	0+60+20R	25220 / 31510	0+30+60R	112275 / 90880	0+50+90R	17260 / 17070
0+17.5'10L	9567 / 11230	0+17.5'20R	21470 / 28370	0+40+60R	132740 / 92100	0+60+90R	16660 / 18140
0+00+00R	20740 / 23920	0+00+20R	23620 / 29560	0+50+60R	91760 / 74480	0+16+90R	15220 / 17210
0+10+00R	16460 / 21310	0+10+20R	16570 / 16750	0+60+60R	44880 / 47740	0+10+100R	16170 / 16390
0+20+00R	18110 / 21470	0+20+20R	48200 / 57150	0+17.5'60R	25150 / 28950	0+10+100R	15370 / 14560
0+30+00R	20490 / 24410	0+30+20R	95250 / 56360	0+16+70R	25590 / 24580	0+20+100R	14660 / 15480
0+40+00R	20750 / 20330	0+40+20R	51700 / 39340	0+20+70R	24010 / 27190	0+30+100R	13140 / 14840
0+50+00R	29110 / 41440	0+50+20R	172810 / 83240	0+30+70R	48140 / 41030	0+40+100R	13600 / 14970
0+60+00R	22410 / 26640	0+60+20R	124610 / 63940	0+40+70R	37600 / 48320	0+50+100R	13640 / 15750
0+17.5'00R	5370 / 45110	0+67.5'20R	35420 / 42260	0+50+70R	30740 / 36440	0+10+100R	15150 / 16630
0+00+10R	20330 / 24140	0+60+30R	80520 / 61490	0+60+70R	30480 / 31320	0+16+100R	28730 / 26760
0+10+10R	14690 / 16140	0+17.5'30R	48210 / 59880	0+67.5'70R	18720 / 21840	0+00+110R	15990 / 15250
0+20+10R	25140 / 27140	0+60+40R	85770 / 78840	0+16+80R	17380 / 19530	0+10+110R	17180 / 15400
0+30+10R	25320 / 20020	0+67.5'40R	49470 / 60470	0+20+80R	22670 / 18400	0+20+110R	16370 / 14560
0+40+10R	34010 / 37120	0+60+50R	156410 / 54470	0+30+80R	17840 / 21450	0+30+110R	15270 / 14720
0+50+10R	21770 / 24450	0+67.5'50R	43760 / 40740	0+40+80R	43040 / 28160	0+40+110R	16010 / 15940
0+60+10R	49470 / 58410	0+16+54R	47490 / 40150	0+54+80R	30970 / 24090	0+50+110R	16570 / 15440
0+67.5'10R	22320 / 27750	0+20+54R	45730	0+60+80R	22650 / 20220	*	

6/19/84

REMARKS: ALL READINGS ARE COUNTS PER MINUTE (CPM)
TOP - CONTACT MEASUREMENTS
BOTTOM - MEASUREMENTS TAKEN AT 1 METER GROUND LEVEL
L. BENALLY TR

VP-04A * 0+60 & 0+66+110R in Road

MORRISON KNUDSEN

OUTDOOR GAMMA SCREENING
SURVEY DATA SHEET

LOGGING CREW: E. COACH
L. BENALLY, JR
E. SCHULTZ

SHEET 2 OF 7 PAGE 2

DATE: 6-19-84

PROPERTY ID: DU-028

INSTRUMENT ID NO.: LUDLUM #31972

BACKGROUND CALCULATION:

#1 _____ + #2 _____ + #3 _____ = _____ ÷ 3 = 11,500 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+120R	15460 / 14270						
0+10+120R	14620 / 14680						
0+20+120R	14925 / 14650						
0+30+120R	15158 / 14220						
0+40+120R	14920 / 14160						
0+50+120R	14740 / 14310						
X							

REMARKS: ALL READINGS ARE IN COUNTS PER MINUTE (CPM)
TOP - ARE CONTACT READINGS
BOTTOM - THESE READINGS WERE TAKEN 1 METER ABOVE GROUND LEVEL.

VP.04A X = 0+00 & 0+60 +120R in Ranch

MORRISON KNUDSEN

OUTDOOR GAMMA SCREENING
SURVEY DATA SHEET

LOGGING CREW: Benally
Court
Lewis

SHEET 3 OF 7 PAGE 3

DATE: 6-20-84

PROPERTY ID: DU-028

INSTRUMENT ID NO.: Ludlum #21972

BACKGROUND CALCULATION:

#1 _____ + #2 _____ + #3 _____ = _____ ÷ 3 = 14,500 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+40R	26090 25650						
0+00+50R	26800 23040						
0+10+40R	20320 19800						
0+10+50R	16370 21100						
0+18+35R	64710 38840						
0+18+40R	66740 34540						
Below Readings are random taken in garden without disturbing area							
	27630 25340						
	20810 20890						
	17600 17090						

REMARKS: All readings are in cpm
(Top) Contact readings
(Bottom) 1 meter readings

VP-04A

MCGARRISON KNUDSEN

BOREHOLE LOG

LOGGING CREW: Ennis
Benally
Couch & Schultz

INSTRUMENT ID NO. Ludlum # 31952

SHEET 4 OF 7 PAGE 4

DATE: 1-19-84

PROPERTY ID: DU028

AREA: Durango, Co.

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: 0+50+28R		HOLE ID: 0+60+40R		HOLE ID: 0+40+10R		HOLE ID: 0+20+20R	
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	320260	SURFACE	159920	SURFACE	47300	SURFACE	117810
0"	~~631570~~	0"	—	0"	~~6~~ —	0"	—
6"	631510	6"	222460	6"	62940	6"	174340
12"	663640	12"	119200	12"	51170	12"	225430
18"	333800	18"	60290	18"	32760	18"	105540
~~24~~ 21"	146310	~~20~~	57310	24"	27780	24"	71310
30"		30"		~~30~~ 28"	26830	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: Background bore hole ave 23,000 cpm
All holes drilled untill rock prevented further drilling

EJR

VP.048

MORRISON KNUDSEN

BOREHOLE LOG

LOGGING CREW: ENNIS
BENALLY
Schulte & Couch
INSTRUMENT ID NO. Ludlum #31952

SHEET 5 OF 7 PAGE 5
DATE: 6-19-84
PROPERTY ID: DU-028
AREA: Durango, Co.

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 TYP_ AND THICKNESS IF USED, CONCRETE CORES AND THICKNESS, OBSTRUCTIONS, UTILITIES, ETC., IN THE REMARKS SECTION.

(5)		(6)		(7)		(8)	
HOLE ID: 0+40+60R TIME DRILLED: TIME LOGGED: SOIL TYPE:		HOLE ID: 0+28+73R TIME DRILLED: TIME LOGGED: SOIL TYPE:		HOLE ID: 0+40+82R TIME DRILLED: TIME LOGGED: SOIL TYPE:		HOLE ID: 0+26+85R TIME DRILLED: TIME LOGGED: SOIL TYPE:	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	168710	SURFACE	68120	SURFACE	41290	SURFACE	19280
0"	—	0"	—	0"	—	0"	—
6"	346190	6"	108110	6"	48330	6"	20760
12"	513530	12"	69050	12"	30410	12"	20310
18"	288710	18"	37290	18"	23210	18"	20160
24"	104510	24"	37360	24"	21210	24"	19790
~~30~~ 27"	86730	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: Background bore hole ave 23,000 cpm
All holes drilled until rock prevented further drilling
Ray Couch

VP.MB

MORRISON KNUDSEN

BOREHOLE LOG

LOGGING CREW: Innis Couch, Brendly and Schultz

INSTRUMENT ID NO.

SHEET 6 OF 7 PAGE 6

DATE: 6-19-84

PROPERTY ID: DU-028

AREA: Durango, Co.

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: 9 OF65+76R TIME DRILLED: TIME LOGGED: SOIL TYPE:		HOLE ID: 10 OF60+60R TIME DRILLED: TIME LOGGED: SOIL TYPE:		HOLE ID: TIME DRILLED: TIME LOGGED: SOIL TYPE:		HOLE ID: TIME DRILLED: TIME LOGGED: SOIL TYPE:	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	16410	SURFACE	42500	SURFACE		SURFACE	
0"	—	0"	—	0"		0"	
6"	19810	6"	45170	6"		6"	
12"	21920	12"	33010	12"		12"	
18"	21690	18"	25970	18"		18"	
24"	22680	24"	24600	24"		24"	
30"	22800	~~30~~ 27"	23430	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: Back ground bore hole ave. 23,000 cpm
All holes drilled untill rock prevented further drilling

VP.04R

MORRISON KNUDSEN

BOREHOLE LOG

LOGGING CREW: ERNEST COLICH
LEVON BENALLY, JR.
ED SCHMITZ

SHEET 7 OF 7 PAGE 7

DATE: JUNE 14, 1984

PROPERTY ID: DU-028

INSTRUMENT ID NO. LUDLUM 2220 #3195

AREA: Durango Co.

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.

(11) (12) (13)

HOLE ID: 01-30+10L	HOLE ID: 01-36+00K	HOLE ID: 01-18+42K	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	101090	SURFACE	
0"	232320	0"	95470	0"	—	0"	
6"	606100	6"	232870	6"	330300	6"	
12"	557890	12"/10"	206230	12"	301210	12"	
18"/14"	424800	18"		18"	102770	18"	
24"		24"		24"	53320	24"	
30"		30"		30"	58480	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: Core bored through side walk at edge of street and walk to front door
Background bore hole are 23,000 cpm
Holes drilled until rock prevented further drilling

VP 048

MORRISON KNUDSEN

OUTDOOR GAMMA SCREENING
SURVEY DATA SHEET

Supplemental Information

LOGGING CREW: Ernest Couch
Edward Schultz
Julius Bitzilly

SHEET 1 OF 4 PAGE 1

DATE: October 18, 1984

PROPERTY ID: DU-028

INSTRUMENT ID NO.: LV2202 #31998 #4445 #16529

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+10 +60R	35540 31180	surface	25				
0+10 +20R	24750 23450		20				
0+10 +80R	17420 18800		17				
0+00 +60R	22800 20790		19				
0+00 +20R	17760 17210		17				
0+00 +80R	17650 17320		17				

REMARKS: Top readings are contact, lower readings are 1 meter distance, all counts in CPM.

VP-04A

MORRISON KNUDSEN

BOREHOLE LOG

Supplemental Information

LOGGING CREW: Ernest Couch
Edward Schultz
Julius Bitsilly

SHEET 2 OF 4 PAGE 2

DATE: October 18, 1984

PROPERTY ID: DU-028

INSTRUMENT ID NO. HO #10 #1982 & #10 #1658

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.

S-1 C-3 C-4

HOLE ID: 0+15+67R TIME DRILLED: TIME LOGGED: SOIL TYPE:		HOLE ID: 0+10+70R TIME DRILLED: TIME LOGGED: SOIL TYPE:		HOLE ID: 0+10+60R TIME DRILLED: TIME LOGGED: SOIL TYPE:		HOLE ID: 0+15+60R TIME DRILLED: TIME LOGGED: SOIL TYPE:	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	34210	SURFACE		SURFACE	38450	SURFACE	97430
0"	23780	0"	23210	0"	35300	0"	101600
6"	26610	6"	29650	6"	40260	6"	145580
12"	24280	~~12~~ 8	29080	12"	30190	12"	88810
18"		~~18~~ 10	27020	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: Normal holes, shallow holes are due to rocky ground. background is ≈3000 cpm, all count is CPM.

MORRISON KNUDSEN

BOREHOLE LOG

Supplemental Investigation

LOGGING CREW: Ernest Couch
Edward Schultz
Julian Estrella

SHEET 3 OF 4 PAGE 3
DATE: October 16, 1984
PROPERTY ID: DU-028
AREA: Durango, Colorado

INSTRUMENT ID NO. HLP 2230 #349 82 4/4490 #1858

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.

H-1 H-2 H-3 H-4

HOLE ID: N. WALL TIME DRILLED: TIME LOGGED: SOIL TYPE:		HOLE ID: E. WALL TIME DRILLED: TIME LOGGED: SOIL TYPE:		HOLE ID: W. WALL TIME DRILLED: TIME LOGGED: SOIL TYPE:		HOLE ID: S. WALL TIME DRILLED: TIME LOGGED: SOIL TYPE:	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	26930	SURFACE	20330	SURFACE	21320	SURFACE	20700
0"	21140	0"	19860	0"	30320	0"	21180
6"	20170	6"	21520	H# 4	51040	H# 3"	21220
H# 4"	19560	H#4"	21180	H# 12	101840	12"	
18"		18"		H# 18	110660	18"	
24"		24"		H# 24	100920	24"	
30"		30"		30"	Existing	30"	
36"		36"		36"	hole	36"	
42"		42"		42"	under	42"	
48"		48"		48"	Foundation	48"	
54"		54"		54"	@ water	54"	
60"		60"		60"	line	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: H + number equals the hole was angled and # of inches under spread footing. Shallow holes are due to rocky ground, background is 23000 cpm, all counts in CPM.

VP-04B

MORRISON KNUDSEN

BOREHOLE LOG

Supplemental Information

LOGGING CREW: Ernest Couch
Edward Schultz
Julius Bitzilla

SHEET 4 OF 4 PAGE 4

DATE: October 16, 1984

PROPERTY ID: DU-028

INSTRUMENT ID NO. HP2220 #31987 & Ludlum #1652

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: WEST WALL	HOLE ID:	HOLE ID:	HOLE ID:
~~TIME DRILLED~~: 15' 30"	TIME DRILLED:	TIME DRILLED:	TIME DRILLED:
~~TIME LOGGED~~: OF H_2O	TIME LOGGED:	TIME LOGGED:	TIME LOGGED:
~~SOIL TYPE~~: LINE	SOIL TYPE:	SOIL TYPE:	SOIL TYPE:

DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	20200	SURFACE		SURFACE		SURFACE	
0"	20380	0"		0"		0"	
6"	20480	6"		6"		6"	
H 12" 1"	21940	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: H + number equals the hole was angled and # of inches under spread footing, shallow holes are due to rocky ground. Background is 23000 cpm, all counts in CPM.

VP-MR

MORRISON-KNUDSEN COMPANY, INC.

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