NOTE:
SUPPLEMENTAL
STANDARDS

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

Radiological and Engineering Assessment

Vicinity Property No. DUR 616(S)

Remedial Actions
Contractor
for the
Uranium Mill Tailings
Remedial Actions
Project

Vicinity Property No. DUR 616(S)

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

UMTRA-4

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PDR WASTE
WM-39 PDR

Radiological and Engineering Assessment: Property DU-616S

ADDRESS: South of Highway 160
1/8 Mile West of
Highway 160/550
Durango, CO 81301

OWNER'S NAME: Colorado Department of Highways

OWNER'S ADDRESS (IF DIFFERENT)

TENANTS NAME: _____

TELEPHONE NUMBER _____
(if available)

TELEPHONE NUMBER _____
(if available)

PROPERTY DATA:

Structures and utilities are shown on Drawing DU-616-010.

Property Use: Single Residence _____; Commercial X ; School _____
Multiple Residence _____; Vacant Lot _____; Church _____; Open Land _____

Age of structures: Less than 50 years old _____;
Greater than 50 years old _____ (attach form _____)

Adjacent included/spillover vicinity properties:

North - V.P. # N/A
South - V.P. # N/A
East - V.P. # Mill Site
West - V.P. # N/A

Interior Involvement: Yes _____; No X

Major Structural _____; Minor Structural _____; Dislocation _____

RADIOLOGICAL DATA:

Summary

MK-Ferguson proposes that an application of supplemental standards be applied to a portion of this vicinity property. The remediation performed would consist of the removal of the top 18 inches of contaminated material. Surveys revealed that contamination is present to depths of 20 feet and this material would remain in place.

Gamma Exposure Rate Survey

Survey Method

An outdoor gamma survey was conducted in accordance with the RAC Procedure 011. This survey was conducted over the entire property, with particular attention to the areas identified in the inclusion survey, and in other areas as described in this document.

Survey Results

Surface gamma readings on the property range from 20 to 55 micro R/hr (Tables 3.1 and 3.4). This may be compared with the background for the Durango site of 14 micro R/hr.

This property is directly across Lightner Creek from the processing site and readings are elevated due to lateral gamma flux. Exterior areas suspected of being contaminated may be seen on Drawing DU-616-015 and DU-616-016.

Borehole Survey

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 010. In addition, a track hoe was used to dig test pits in several locations.

Survey Results

Contamination was found in 41 of the 64 outdoor holes augered and in 5 of the 7 test pits. The location and depth of the contamination are described in Tables 3.1 and 3.2 and are shown on Drawing DU-616-015 and DU-616-016.

Radon/Radon Daughter Survey

No radon/radon daughter surveys were performed inside buildings at the property, since the structures on the west end of the property are not permanent structures.

Soil Samples

A total of 76 outdoor soil samples were taken (Table 3.3); of the 64 soil samples collected from the top 6" layer of soil, 27 exceed EPA standards. The 12 remaining soil samples were collected from 6" layers at various depths and 7 of these exceed EPA standards.

JUSTIFICATION CHECKLIST FOR APPLICATION OF SUPPLEMENTAL STANDARDS

Application of Supplemental Standards (SS) is in accordance with 40 CFR 192.22 Subpart (x) (check appropriate Subpart)

_____ a) Risk injury to worker/public

_____ b) Environmental harm

__x__ c) High cost relative to long-term benefits

JUSTIFICATION CHECKLIST FOR APPLICATION OF SUPPLEMENTAL STANDARDS CONT'D.

____ d) High cost of cleaning up building relative to benefits

____ e) No known remedial action

____ f) Radionuclides other than Ra226 exist

Brief Condition Description and Justification:

A portion of the property, Area A, is the steep slopes of the highway right-of-way between U.S. Hwy. 160 and Lightner Creek. Contamination on the north boundary of Area A extends to a depth of 20' and runs north under U.S. Hwy. 160. As local topography slopes off to the south in Area A, the average depth of contamination at the south boundary is 8'. Land usage in this area is not expected to change. With the top 13" of contaminated material removed and 18" of backfill on this area relative health risks are minimized.

Area B is the steep slopes of the Lightner Creek stream bank at the west end of the property. The presence of very large rip rap and the steepness of the slopes make remediation of this area extremely costly. Land use of this area is not expected to change and the contamination that would remain in place poses a minimal health hazard.

When remedial action is complete, surface exposure rates will range from 14 to 30 micro R/hr. Background for the Durango area is 14 micro R/hr. If a person spent 8 hours a day, 5 days a week, for 50 weeks in a 30 micro R/hr radiation field, he would receive about 60 millirem of gamma exposure in one year. This is about one-tenth the amount allowed the general public (10 CFR 20.105).

Additional cost without application of Supplemental Standards = $910,850.00 (further breakdown provided in Table 4.2 of this REA).

This is a 943 percent increase over the estimated remedial action cost for the preferred option.

Yes	No	If Supplemental Standards are Applied:
X		1. Open Land?
X		2. Occupied Building? (Occupational only)
	X	3. If yes to No. 2, is contaminated area beneath or within 10 ft. of building?
	X	4. Anticipated change of land use within next 5 years?

X	5.	If yes to No. 4, then will land use produce health risk?
X	6.	Is contamination in habitable area?
X	7.	Have owners comments been solicited? See Appendix B.

Estimated volume of contaminated material to remain = 16,250 (cy) in Area A and 208 (cy) in Area B.

Contaminated area to remain = 3,900 (sy) in Area A and 416 (sy) in Area B.

Range for contaminated areas = background in Area A, and background to 30 (micro R/h) in Area B [at 3 feet above surface].

Range Ra-226 concentration in soil in contaminated area= 1.3 to 234.7 (pCig/) in Area A and 1.3 to 28.3 (pCi/g) in Area B.

If tailings are below or within 10 feet of the structure, radon daughter concentration = N/A (WL).

Engineering Assessment

Work to be done is shown on Drawings DU-616-020, DU-550-021 and DU-550-022. Estimated quantities are shown in Table 4.1.

Occupant relocation: Required _____; Not Required ____X____.

Application of Supplemental Standards

A portion of the property, Area "A", is the steep slope of the highway right-of-way between U.S. Highway 160 and Lightner Creek. Land usage in this area is not expected to change. With the top 18" of contaminated material removed and 18" of backfill on this area relative health risks are minimized.

Area "B" is the steep slope of the Lightner Creek stream bank at the west end of the property. The presence of very large riprap and the steepness of the slopes make remediation of this area extremely costly. Land use of this area is not expected to change and the contamination that would remain in place poses a minimal health hazard.

Remedial Action Option (Complex Properties Only)

N/A

Table 3.1
OUTDOOR GAMMA AND BOREHOLE SURVEY
Property DU-616

BOREHOLE	LOCATION	CONTAMINATION DEPTH	MICRO R/HR
1	4+20,17L	18"	27
2	4+21,22L	None	24
3	4+28,17L	Surface	26
4	4+20,11L	None	24
5	4+11,17L	None	22
6	2+34,27L	30"	24
7	2+34,22L	42"	28
8	2+35,38L	None	24
9	2+34,06L	18"	34
10	2+33,03R	Surface	29
11	2+49,20L	30"+	26
12	2+57,17L	None	25
13	2+62,05L	None	25
14	2+42,05L	None	23
15	2+29,22L	30"	29
16	2+24,25L	48"+	25
17	2+17,27L	48"+	24
18	2+05,30L	None	24
19	1+98,32L	42"+	23
20	1+90,33L	48"+	24

+Depth of contamination not reached.

Table 3.1 Cont'd.
OUTDOOR GAMMA AND BOREHOLE SURVEY
Property DU-616

BOREHOLE	LOCATION	CONTAMINATION DEPTH	MICRO R/HR
21	1+60,39L	48"+	22
22	1+28,41L	42"+	24
23	0+96,46L	54"	24
24	0+65,59L	None	23
25	0+83,56L	42"	24
26	2+13,04L	18"+	38
27	1+92,03L	42"	26
28	1+67,09L	42"+	22
29	1+59,00R	42"+	23
30	0+85,07L	30"+	32
31	0+55,15L	24"+	35
32	0+49,11L	48"+	55
33	0+23,06R	42"	29
34	0+04,35R	None	22
35	0+71,39L	36"+	40
36	4+35,17L	42"+	23
37	5+11,29L	None	21
38	5+39,14R	None	20
39	3+80,16R	None	21
40	3+70,04L	54"+	23

Table 3.1 Cont'd.
OUTDOOR GAMMA AND BOREHOLE SURVEY
Property DU-616

BOREHOLE	LOCATION	CONTAMINATION DEPTH	MICRO R/HR
41	3+47,08R	None	22
42	3+57,08R	Surface	29
43	3+44,31L	48"	23
44	3+88,27L	None	24
45	3+90,37L	None	25
46	4+45,40L	None	25
47	4+62,24L	30"+	24
48	4+75,25L	None	22
49	4+61,06R	None	25
50	4+20,00L	36"+	26
51	4+46,16L	30"+	25
52	4+31,00L	18"+	24
53	4+32,05R	24"+	25
54	4+41,01L	None	24
55	3+82,05L	36"	26
56	4+67,45L	None	24
57	4+62,08L	None	25
58	3+58,04L	None	24
59	3+00,02L	30"	22
60	2+93,09R	18"+	24

Table 3.1 Cont'd.
OUTDOOR GAMMA AND BOREHOLE SURVEY
Property DU-616

BOREHOLE	LOCATION	CONTAMINATION DEPTH	MICRO R/HR
61	-1+58,35R	24"	41
62	-0+55,38R	18"	32
63	-1+67,13R	12"	27
64	-1+59,13R	Surface	25

Table 3.2
OUTDOOR GAMMA AND TEST PIT SURVEY
Property DU-616

TEST PIT	LOCATION	CONTAMINATION DEPTH	MICRO R/HR
1	0+32,15L	20'+	N/A*
2	0+72,45L	20'+	N/A
3	2+00,35L	20'+	N/A
4	4+28,30L	20'	N/A
5	-1+00,38R	None	N/A
6	-0+50,75R	None	N/A
7	0+25,20L	6'	N/A

*Test pits, surface readings not taken.

Table 3.3
SURFACE SOIL SAMPLE SURVEY
Property DU-616

LOCATION	SAMPLE ID	DEPTH	Ra-226 CONCENTRATION (pCi/g)
4+20,17L	12657	0-6"	14.3
5+43,07R	12837	0-6"	1.9
4+81,05R	12838	0-6"	3.2
4+79,05R	12839	0-6"	2.3
4+20,03L	12840	0-6"	4.2
3+94,08L	12841	0-6"	2.8
4+20,31L	12842	0-6"	2.7
4+50,36L	12843	0-6"	2.4
2+33,16L	12853	0-6"	23.8
2+20,08L	12854	0-6"	14.1
1+97,07L	12855	0-6"	1.5
1+80,08L	12856	0-6"	4.0
1+20,08L	12857	0-6"	1.5
0+86,07L	12858	0-6"	6.9
0+54,14L	12859	0-6"	22.4
0+54,14L	12860	6-12"	33.8
0+36,08L	12861	0-6"	234.7
0+36,03R	12862	0-6"	4.0
-0+10,35R	12863	0-6"	4.3
-0+55,38R	12864	0-6"	5.3
-1+58,35R	12865	0-6"	15.0

Table 3.3 Cont'd.
SURFACE SOIL SAMPLE SURVEY
Property DU-616

LOCATION	SAMPLE ID	DEPTH	Ra-226 CONCENTRATION (pCi/g)
4+28,17L	12959	0-6"	6.6
3+44,07L	12960	0-6"	7.0
3+44,05R	12961	0-6"	13.5
2+34,38L	12962	0-6"	2.3
2+57,17L	12963	0-6"	2.7
2+29,22L	12964	0-6"	3.7
1+28,41L	12965	36-42"	8.7
2+13,04L	12969	12-18"	110.1
3+85,34L	12970	0-6"	2.0
3+60,30R	12971	0-6"	2.2
0+30,06R	12972	0-6"	2.4
0+90,65L	12973	0-6"	1.4
4+35,17L	12977	0-6"	2.6
5+11,29L	12979	0-6"	2.3
5+39,14R	12985	0-6"	2.1
3+88,27L	13168	0-6"	2.5
4+52,05R	13185	0-6"	5.4
2+93,09R	13209	0-6"	4.5

Table 3.3 Cont'd.
SURFACE SOIL SAMPLE SURVEY
Property DU-616

LOCATION	SAMPLE ID	DEPTH	Ra-226 CONCENTRATION (pCi/g)
Test Pit 1	13207	17'	4.7
Test Pit 1	13210	18'	33.7
Test Pit 1	13208	20'	45.0
Test Pit 2	13216	17'	11.7
Test Pit 2	13217	20'	28.0
Test Pit 2	13215	20'	122.0
Test Pit 4	13220	18'	2.7
Test Pit 4	13221	11'	22.0
Test Pit 5	13226	17'	1.8
-1+58,35R	13255	0-6"	28.3
-0+55,38R	13256	0-6"	18.0
-1+67,13R	13260	0-6"	16.2
-1+63,30L	13263	0-6"	3.6
-1+59,75L	13264	0-6"	2.3
-1+61,47L	13265	0-6"	8.8
-0+50,29R	13266	0-6"	4.8
-0+84,40R	13262	0-6"	5.1
-1+59,00R	13270	0-6"	3.9
-1+59,13R	13271	0-6"	10.5
-1+39,30R	13272	0-6"	5.2
-1+45,25R	13273	0-6"	6.4

Table 3.3 Cont'd.
SURFACE SOIL SAMPLE SURVEY
Property DU-616

LOCATION	SAMPLE ID	DEPTH	Ra-226 CONCENTRATION (pCi/g)
-1+86,28R	13274	0-6"	10.4
-1+94,26R	13275	0-6"	2.9
3+66,20R	12654	0-6"	1.3
3+36,31L	12655	0-6"	4.5
3+45.10L	12656	0-6"	4.7
1+90,34L	12658	0-6"	3.0
0+36,08L	12659	0-6"	162.7
0+60,15L	12660	0-6"	15.3
1+69,10L	12661	0-6"	4.8
2+33,09L	12662	0-6"	13.6
2+35,18L	12704	0-6"	4.1
2+50,15L	12705	0-6"	2.6
2+15,02L	12706	0-6"	5.6
0+85,07L	12707	0-6"	9.5
0+65,30L	12708	0-6"	9.1
4+10,05L	12709	0-6"	3.3
-1+51,47L	13425	0-6"	3.4
-1+71,47L	13426	0-6"	3.0

Table 3.4
OUTDOOR GAMMA SCREENING
Property DU-616

LOCATION	CONTACT	1 METER
3+85,34L	24	24
4+80,36L	21	22
5+40,00R	22	23
3+60,30R	20	19
2+70,25R	26	26
1+50,06R	23	23
0+30,06R	26	27
0+30,30L	23	25
0+90,65L	24	26
2+10,54L	23	25

Table 4.1
Remedial Action Option Cost Estimates

RECOMMENDED OPTION

Activity No.	Activity	Unit Price	Quantity	Estimated Cost
1.3	Slope Excavation (Bulk)	9.60	2,335 cy	$22,416.00
2.0	Common Fill	15.96	567 cy	9,049.00
4.0	Top Soil	30.85	196 cy	6,047.00
6.0	Seeding	0.87	1,176 sy	1,023.00
7.0	Aggregate Base Course	20.46	89 cy	1,821.00
20.0	Replace Trees	125.00	28 ea	3,500.00
616.1	Remove Trees	558.00	LS	558.00
616.2	Riprap	25.90	854 cy	22,119.00
616.5	Filter Fabric	3.60	2,967 sy	10,681.00
	Subtotal			$ 77,214.00
	5% Subcontractor's Contingency			3,861.00
	20% Overhead & Profit			15,443.00
	Total (Rounded)			$ 96,550.00

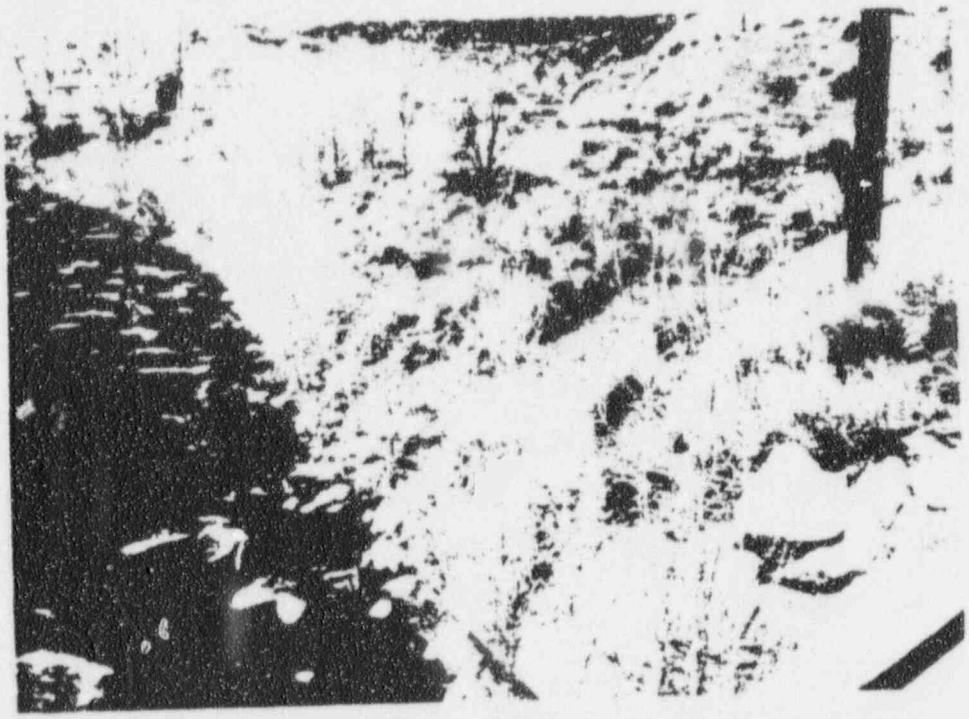
Table 4.2

Cost For Not Applying Supplemental Standards

Activity No.	Activity	Unit Price	Quantity	Estimated Cost
1.3	Slope Excavation (Bulk)	9.60	31,554 cy	$302,918.00
2.2	Bulk Common Fill	11.06	24,509 cy	371,070.00
4.0	Top Soil	30.85	248 cy	7,651.00
6.0	Seeding	0.87	1,486 sy	1,293.00
7.0	Aggregate Base Course	20.46	89 cy	1,821.00
20.0	Replace Trees	125.00	28 ea	3,500.00
616.1	Remove Trees	558.00	LS	558.00
616.2	Riprap	25.90	1,708 cy	44,237.00
616.3	Steel Sheet Piling	8.87	18,080 sf	160,370.00
616.4	Remove, Salvage & Replace Shed	190.00	LS	190.00
616.5	Filter Fabric	3.60	3,415 sy	12,294.00

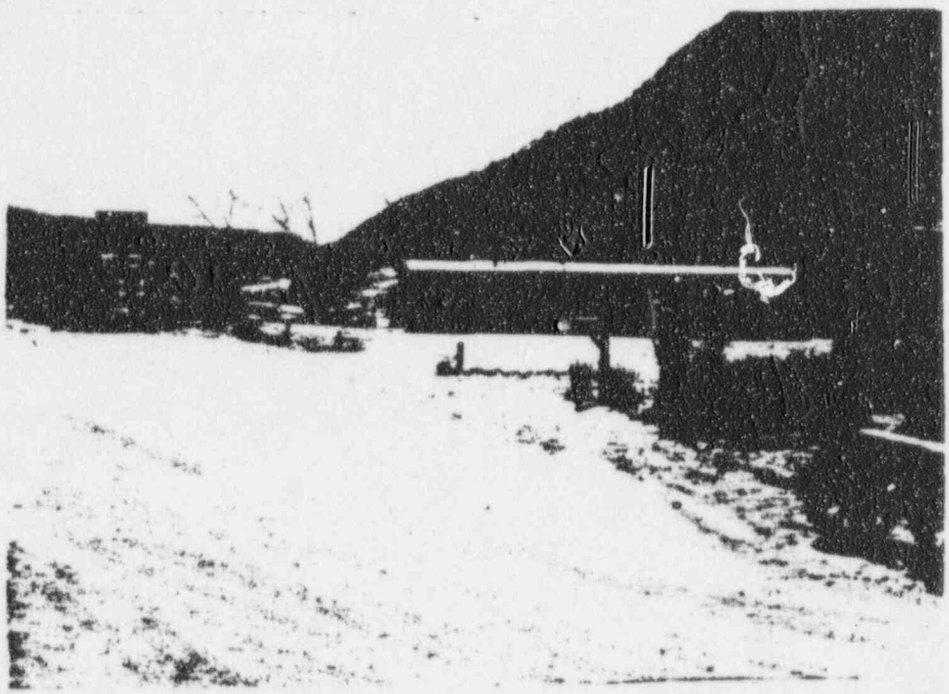
Subtotal	$805,902.00
5% Subcontractor's Contingency	40,295.00
20% Overhead & Profit	161,180.00
Total (Rounded)	$1,007,400.00

Looking East from North Access Bridge



Looking West from North Access Bridge North of Lightner Creek

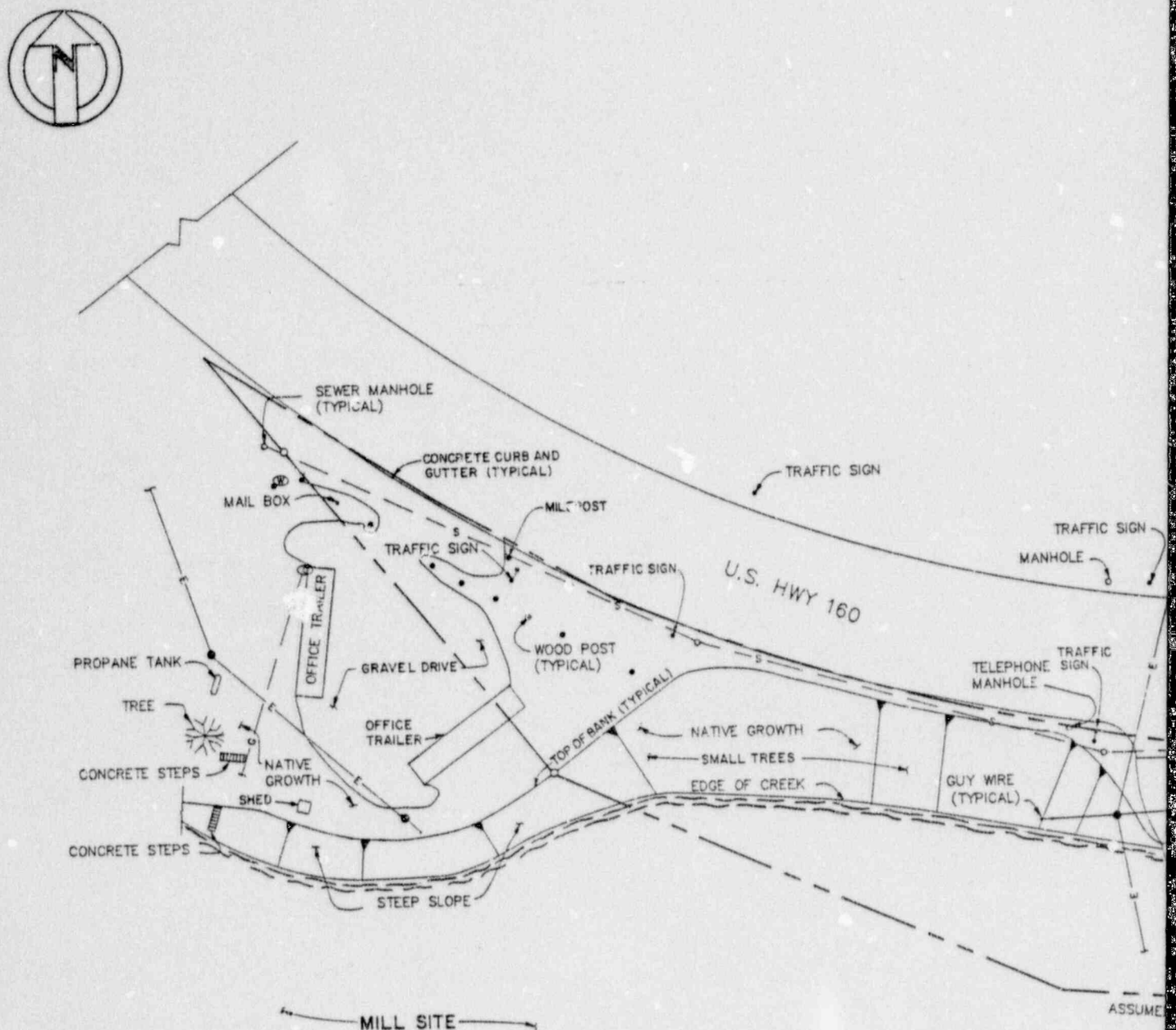
Figure 1 Property Photos



Looking East from West Property Corner

Looking Southeast from Southwest Property Pin

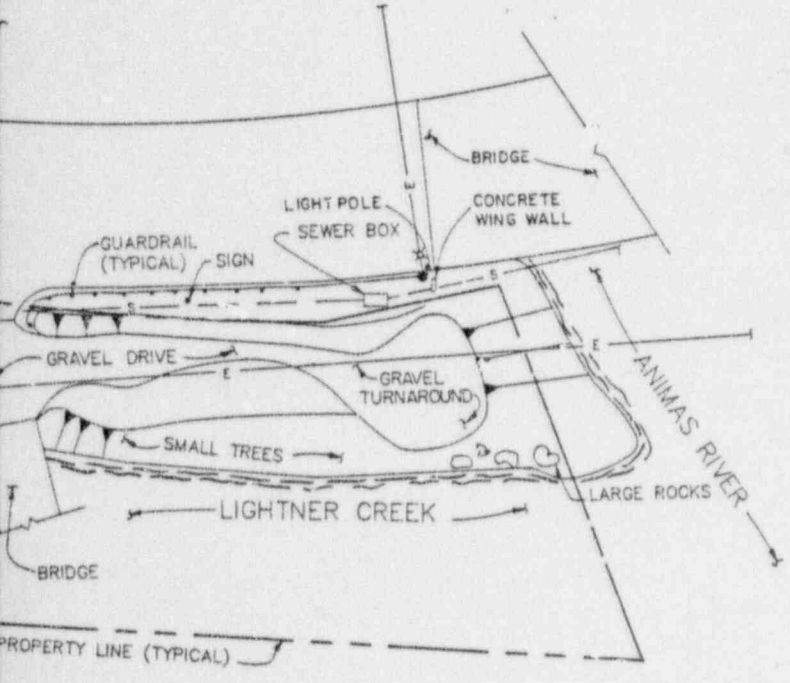
Figure 2 Property Photos


N
SEWER MANHOLE (TYPICAL)
CONCRETE CURB AND GUTTER (TYPICAL)
MAIL BOX
MILEPOST
TRAFFIC SIGN
TRAFFIC SIGN
TRAFFIC SIGN
MANHOLE
U.S. HWY 160
OFFICE TRAILER
PROPANE TANK
GRAVEL DRIVE
WOOD POST (TYPICAL)
TELEPHONE MANHOLE
TRAFFIC SIGN
TREE
OFFICE TRAILER
TOP OF BANK (TYPICAL)
NATIVE GROWTH
SMALL TREES
EDGE OF CREEK
GUY WIRE (TYPICAL)
CONCRETE STEPS
NATIVE GROWTH
SHED
CONCRETE STEPS
STEEP SLOPE
MILL SITE
ASSUME
0 20 40 80 120 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
—x—x—x—x—	FENCE LINE
⊕ G,W or E	METER
⊗ G or W	VALVE
○	PROPERTY PIN
●	POWER POLE

OVERHEAD SERVICE DENOTED BY SOLID LINE
UNDERGROUND SERVICE DENOTED BY DASHED LINE



ANSTEC APERTURE CARD

Also Available on Aperture Card

9707080351-01

NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPROV. LDE	APPROV. DH	PROJ. ENG	APPROV. DOE
A	2 JUNE 97	FINAL REA [illegible]MITTAL	CRW	[illegible]	SM	[illegible]	DSS	—

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED	DRAWN
C.M.	S.M.

CHECKED
REVIEWED
RECOMMENDED

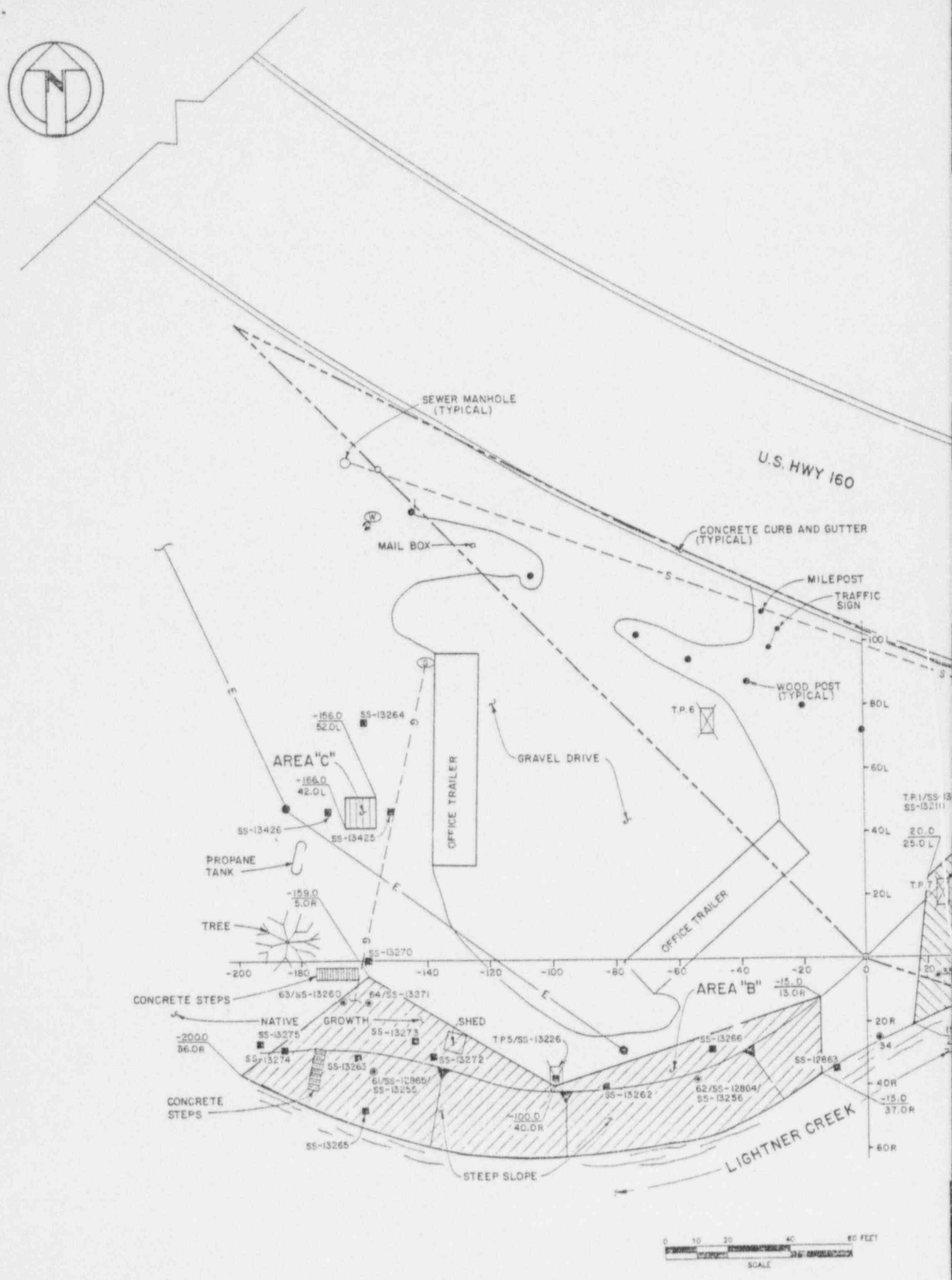
SITE PLAN
DU-616

DURANGO, COLORADO
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

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

MK-FERGUSON
A MORRISON KNUDSEN COMPANY

PROJECT NO. DE-AC04-83AL10796
DRAWING NO. DU-616-010 REV. A


SEWER MANHOLE (TYPICAL)
U.S. HWY 160
CONCRETE CURB AND GUTTER (TYPICAL)
MAIL BOX
MILEPOST
TRAFFIC SIGN
WOOD POST (TYPICAL)
T.P.6
-166.0 52.0L
SS-13264
AREA "C"
-166.0 42.0L
SS-13426
SS-13425
OFFICE TRAILER
GRAVEL DRIVE
PROPANE TANK
-159.0 5.0R
TREE
SS-13270
OFFICE TRAILER
CONCRETE STEPS
63/SS-13260
64/SS-13271
AREA "B"
-15.0 13.0R
NATIVE GROWTH
SS-13275
SS-13273
SHED
-200.0 36.0R
SS-13274
SS-13263
SS-13272
T.P.5/SS-13226
SS-13266
SS-12863
61/SS-12865/ SS-13255
SS-13262
62/SS-12864/ SS-13256
CONCRETE STEPS
-100.0 40.0R
SS-13265
STEEP SLOPE
LIGHTNER CREEK
-15.0 37.0R
T.P.1/SS-13
SS-13211
20.0 25.0L
T.P.7
100L
80L
60L
40L
20L
20R
40R
60R
-200
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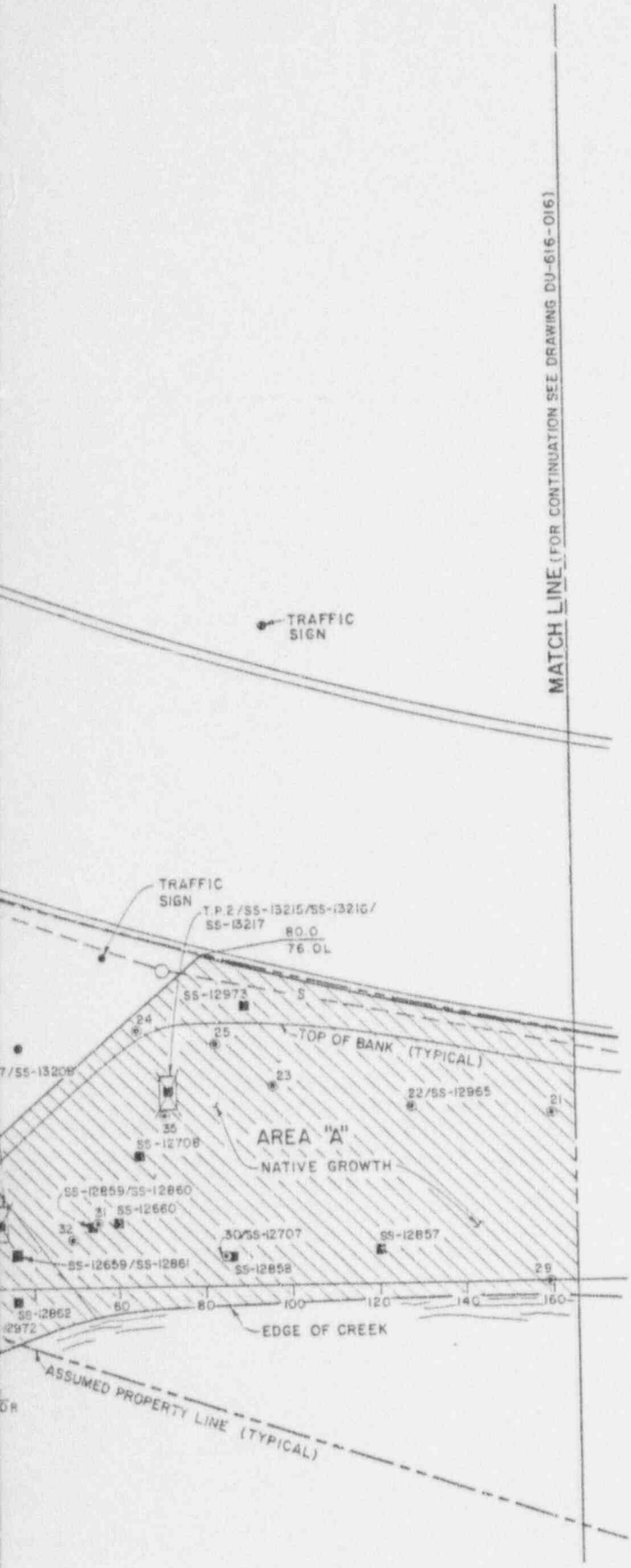
-100
-80
-60
-40
-20
0
20
34
0 10 20 40 60 FEET
SCALE



LEGEND

- 24 — BOREHOLE DESIGNATION
- SS-12857 — SOIL SAMPLE DESIGNATION
- T.P.6 — TEST PIT DESIGNATION
- 22/SS-12965 — BOREHOLE AND SOIL SAMPLE DESIGNATION
- T.P.5/SS-13226 — TEST PIT AND SOIL SAMPLE DESIGNATION

ESTIMATED DEPTH OF CONTAMINATION

- 6"
- VARIES FROM 1'-0" TO 2'-0"
- 20'-0"

NOTES:

1. SEE DRAWING DU-616-016 FOR CONTINUATION OF RADIOLOGICAL DATA.
2. SUPPLEMENTAL STANDARDS IN ACCORDANCE WITH 40 CFR 192.22 (a) AND (c) SHALL APPLY TO LOW LEVEL RADIOACTIVELLY CONTAMINATED MATERIAL TO REMAIN IN PLACE IN AREA "A" FROM BELOW 1'-6" TO 20'-0" BELOW EXISTING GRADE AND IN AREA "B" FROM A DEPTH RANGING FROM 1'-0" TO 2'-0" BELOW EXISTING GRADE. AN APPROXIMATE VOLUME OF 12,337 CUBIC YARDS SHALL REMAIN IN PLACE.

ANSTEC APERTURE CARD

Also Available on Aperture Card

9707080351-02

NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPROVAL LOE	APPROVAL DH	PROJ ENG	APPROVAL DOE
A	2/10/97	FINAL REA SUBMITTAL	CRW					

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

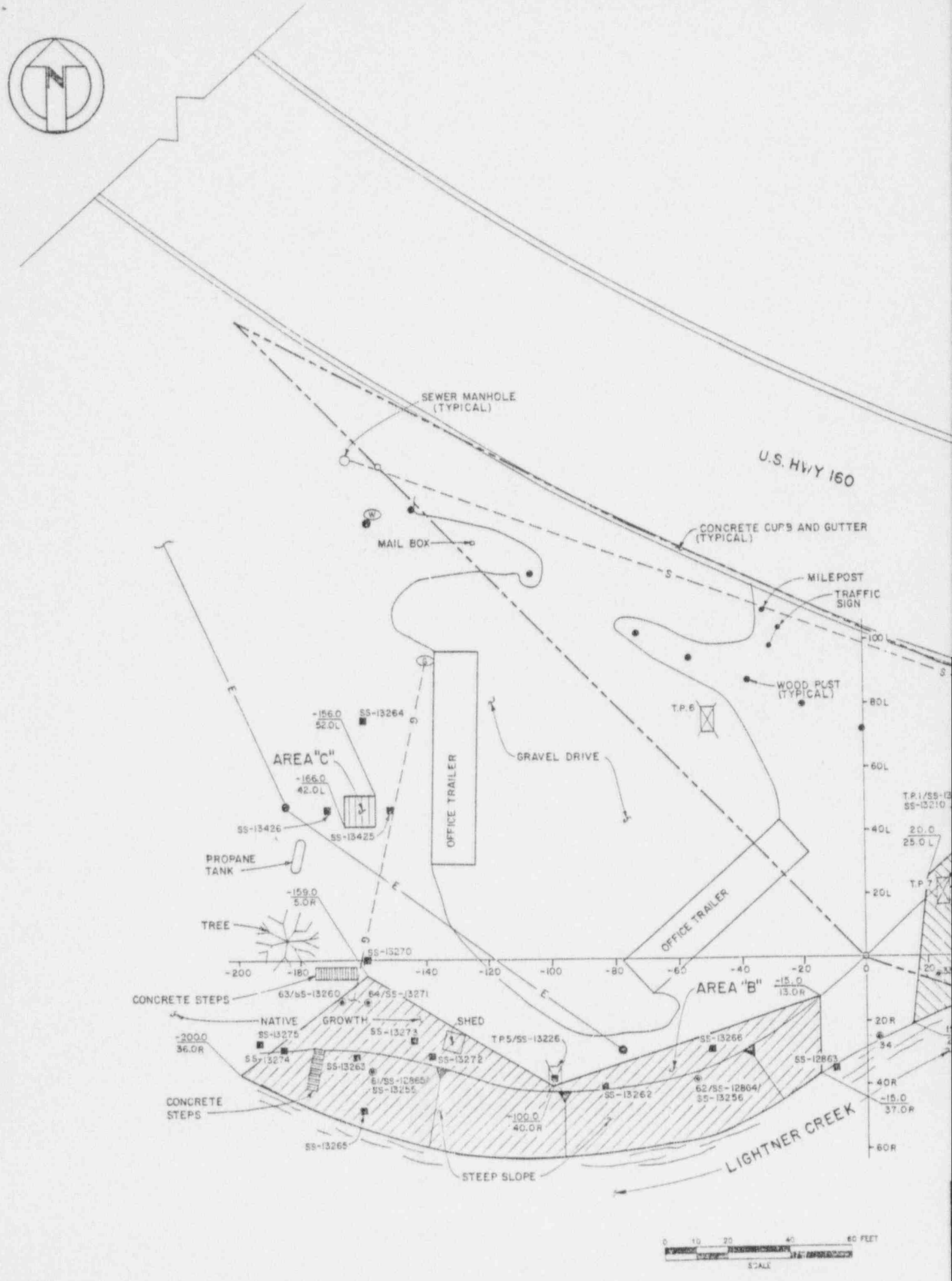
DESIGNED	DRAWN S.M
CHECKED	
REVIEWED	
RECOMMENDED	

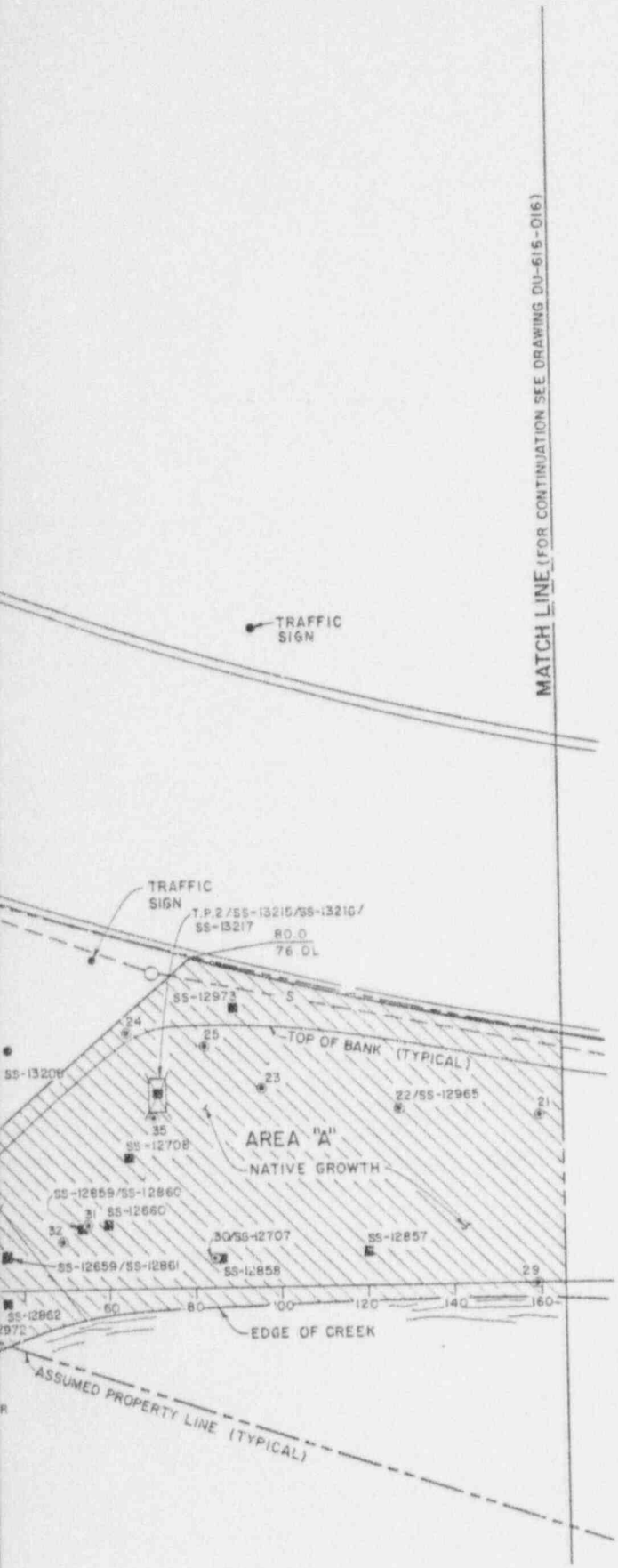
RADIOLOGICAL SURVEY DATA
DU-616
DURANGO, COLORADO
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

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

MK-FERGUSON
A MORRISON KNUDSEN COMPANY

PROJECT NO. DE-AC04-83AL18796
DRAWING NO. DU-616-015 REV. A


SEWER MANHOLE (TYPICAL)
U.S. HWY 160
CONCRETE CURB AND GUTTER (TYPICAL)
MAIL BOX
MILEPOST
TRAFFIC SIGN
WOOD POST (TYPICAL)
T.P.6
T.P.1/SS-13210
T.P.7
-156.0 52.0L
SS-13264
AREA "C"
-166.0 42.0L
SS-13426
SS-13425
OFFICE TRAILER
GRAVEL DRIVE
PROPANE TANK
-159.0 5.0R
TREE
SS-13270
OFFICE TRAILER
AREA "B"
-15.0 13.0R
CONCRETE STEPS
63/SS-13260
64/SS-13271
NATIVE GROWTH
SS-13275
SS-13273
SHED
TP5/SS-13226
SS-13266
-200.0 36.0R
SS-13274
SS-13263
SS-13272
SS-12863
61/SS-12865/ SS-13255
62/SS-12864/ SS-13256
SS-13262
CONCRETE STEPS
-100.0 40.0R
SS-13265
STEEP SLOPE
LIGHTNER CREEK
20.0 25.0L
-15.0 37.0R
100L
80L
60L
40L
20L
20R
40R
60R
-200
-180
-140
-120
-100
-80
-60
-40
-20
0
20
34
0 10 20 40 60 FEET
SCALE



LEGEND

- 24 — BOREHOLE DESIGNATION
- SS-12857 — SOIL SAMPLE DESIGNATION
- T.P.6 — TEST PIT DESIGNATION
- 22/SS-12965 — BOREHOLE AND SOIL SAMPLE DESIGNATION
- T.P.5/SS-13226 — TEST PIT AND SOIL SAMPLE DESIGNATION

ESTIMATED DEPTH OF CONTAMINATION

- 6"
- VARIES FROM 1'-0" TO 2'-0"
- 20'-0"

NOTES:

1. SEE DRAWING DU-616-016 FOR CONTINUATION OF RADIOLOGICAL DATA.
2. SUPPLEMENTAL STANDARDS IN ACCORDANCE WITH 40 CFR 192.22 (a) AND (c) SHALL APPLY TO LOW LEVEL RADIOACTIVELLY CONTAMINATED MATERIAL TO REMAIN IN PLACE IN AREA "A" FROM BELOW 1'-6" TO 20'-0" BELOW EXISTING GRADE AND IN AREA "B" FROM A DEPTH RANGING FROM 1'-0" TO 2'-0" BELOW EXISTING GRADE. AN APPROXIMATE VOLUME OF 12,337 CUBIC YARDS SHALL REMAIN IN PLACE.

ANSTEC APERTURE CARD

Also Available on Aperture Card

9707080351-02

NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPROVAL LOE	APPROVAL DH	PROJ. ENG	APPROVAL DOE
1	6/97	FINAL REA SUBMITTAL	CRW					

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

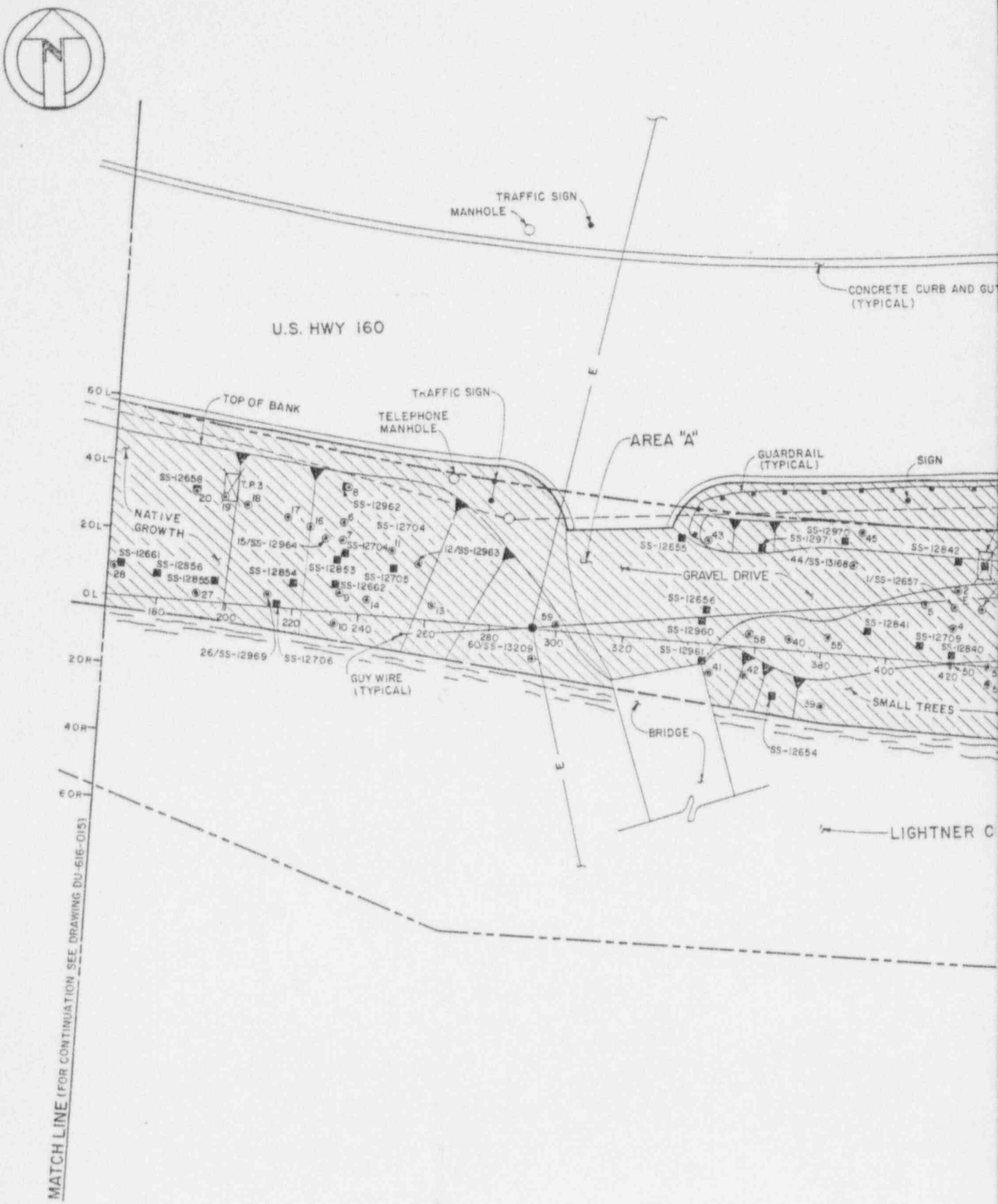
DESIGNED	DRAWN	RADIOLOGICAL SURVEY DATA
	S.M.	DU-616
CHECKED		DURANGO, COLORADO
REVIEWED		URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT
RECOMMENDED		

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

MK-FERGUSON
A MORRISON KNUDSEN COMPANY

PROJECT NO. DE-AC04-83AL18796

DRAWING NO. DU-616-015 REV. A


TRAFFIC SIGN
MANHOLE
CONCRETE CURB AND GUT
(TYPICAL)
U.S. HWY 160
60 L
40 L
20 L
0 L
20 R
40 R
60 R
TOP OF BANK
TRAFFIC SIGN
TELEPHONE
MANHOLE
AREA "A"
GUARDRAIL
(TYPICAL)
SIGN
NATIVE
GROWTH
SS-12658
T.P.3
SS-12962
SS-12704
SS-12704
SS-12964
SS-12963
SS-12666
SS-12856
SS-12855
SS-12854
SS-12853
SS-12705
SS-12662
SS-12655
SS-12970
SS-12971
SS-12842
GRAVEL DRIVE
SS-13168
SS-12657
SS-12656
SS-12960
SS-12841
SS-12709
SS-12840
SS-12961
SMALL TREES
BRIDGE
SS-12654
26/SS-12969
SS-12706
GUY WIRE
(TYPICAL)
60/SS-13209
LIGHTNER C
MATCH LINE (FOR CONTINUATION SEE DRAWING DU-616-015)

LEGEND

- 17 — BOREHOLE DESIGNATION
- SS-12843 — SOIL SAMPLE DESIGNATION
- T.P.3 — TEST PIT DESIGNATION
- 36/SS-12977 — BOREHOLE AND SOIL SAMPLE DESIGNATION
- T.P.4/SS-13220/ SS-13221 — TEST PIT AND SOIL SAMPLE DESIGNATION

ESTIMATED DEPTH OF CONTAMINATION

20'-0"

NOTES:

1. SEE DRAWING DU-616-015 FOR GENERAL NOTES AND CONTINUATION OF RADIOLOGICAL DATA.

ANSTEC APERTURE CARD

Also Available on Aperture Card

9707080351-03

0 10 20 40 60 FEET

SCALE

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED	DRAWN S.M.
CHECKED	
REVIEWED	
RECOMMENDED	

RADIOLOGICAL SURVEY DATA
DU-616
DURANGO, COLORADO
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

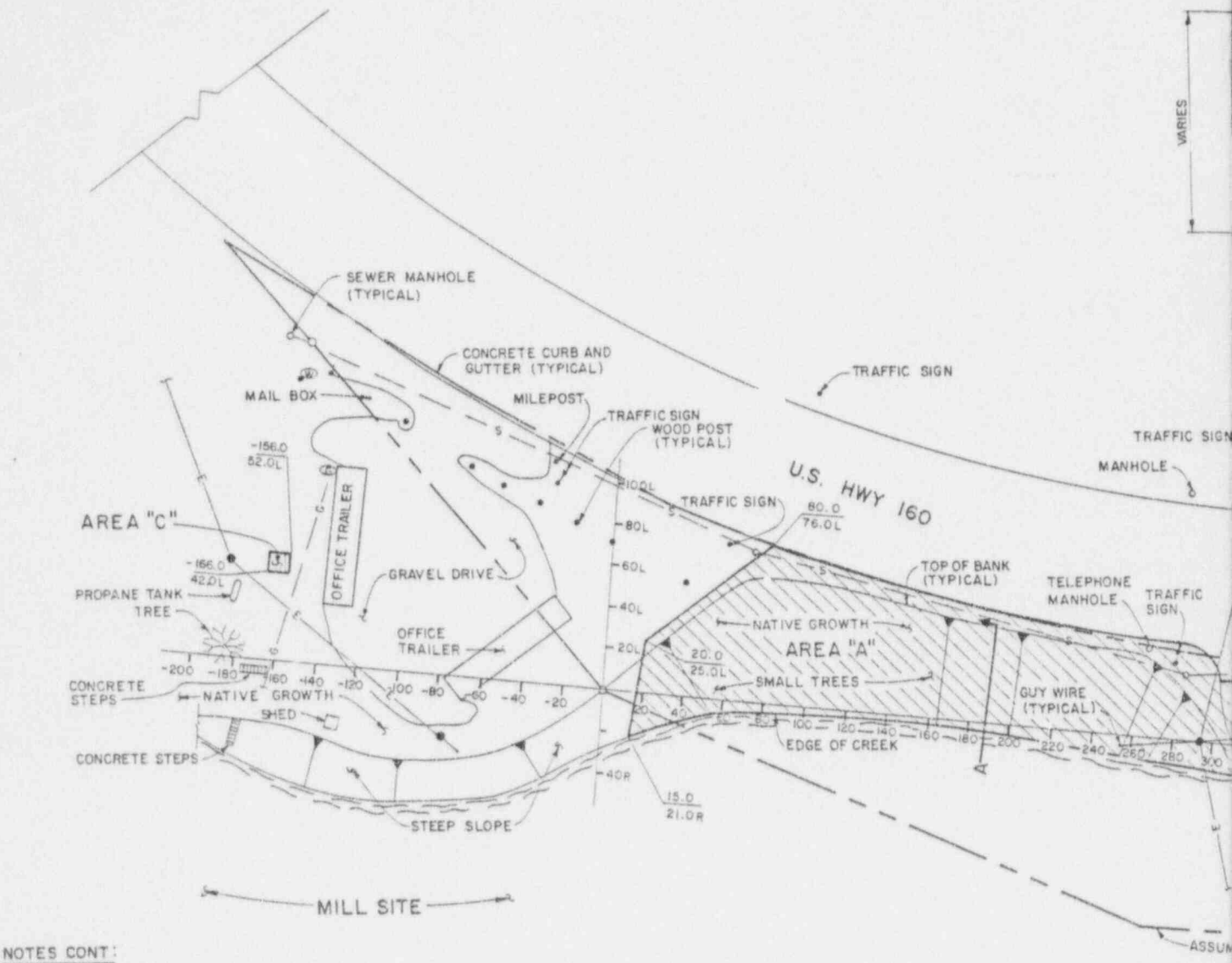
APPROVED	DATE	DOE PROJECT MANAGER	DATE	DOE PROJECT ENGINEER	DATE
NR		NR		NR	

MK-FERGUSON
A MORRISON KNUDSEN COMPANY

PROJECT NO. DE-AC04-83AL18796

DRAWING NO. DU-616-016 REV. A

NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPRVL LOE	APPRVL DH	PROJ ENG	APPRVL DOE
A	12JUN97	FINAL REA SUBMITTAL	CRW					



NOTES CONT:

5. REMOVE TREES AND BUSHES AS REQUIRED BY REMEDIAL ACTION. AFTER COMPLETION OF REMEDIAL ACTION REPLACE TREES WITH NURSERY STOCK OF THE SAME TYPE AS THAT REMOVED. PLANT TREES AT 15' SPACING ON TOP OF LIGHTNER CREEK BANK ALONG EDGE OF U.S. HIGHWAY 160. THE SIZE OF REPLACEMENT STOCK SHALL BE DETERMINED BY THE CONTRACTOR'S REPRESENTATIVE.

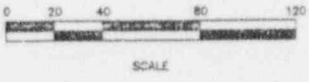
6. REMOVE ROAD SIGNS IN REMEDIAL ACTION AREA. REPLACE IN ORIGINAL LOCATION AFTER REMEDIAL ACTION IS COMPLETE.

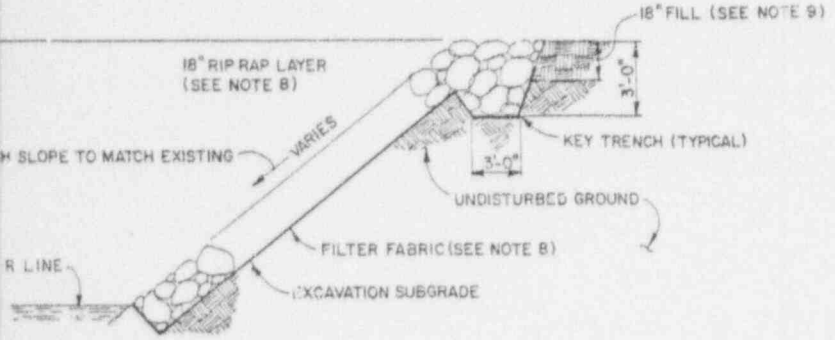
7. SEWER LINE MAY COINCIDE WITH EXCAVATION. SUBCONTRACTOR TO VERIFY SEWER MAIN LOCATION PRIOR TO START OF REMOVAL ACTION. SUBCONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE AND REPAIR TO SEWER LINE DURING REMEDIAL ACTION.

8. AFTER AREA "A" HAS BEEN EXCAVATED TO A DEPTH OF 1'-6", FILTER FABRIC SHALL BE INSTALLED ON THE FACE OF ALL SLOPES ALONG LIGHTNER CREEK AND THE ANIMAS RIVER AS SHOWN IN RESTORATION SECTION A. AN 18" LAYER OF WELL GRADED RIPRAP STONE CONFORMING TO THE STATE OF COLORADO STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION #506.02 SHALL BE PLACED AND SPREAD OVER THE FABRIC. FILTER FABRIC TO BE MIRAFI 700X OR APPROVED EQUAL, INSTALLED PER MANUFACTURER'S RECOMMENDATION.

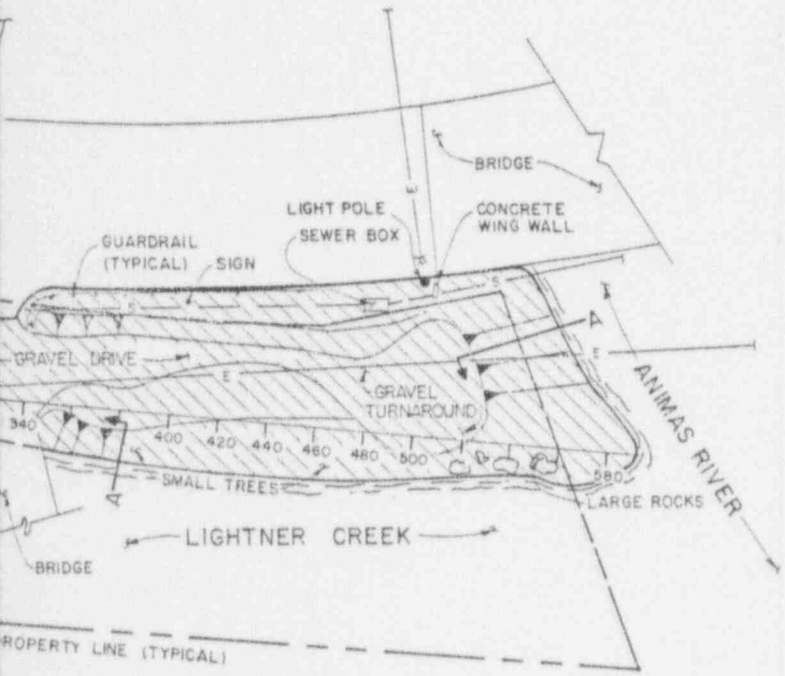
9. ALL REMAINING AREAS SHALL BE BACKFILLED WITH COMPACTED COMMON FILL. 6 INCHES OF AGGREGATE BASE COURSE SHALL BE PLACED IN THE GRAVEL DRIVE AND TURNAROUND. ALL OTHER AREAS SHALL BE TOPPED WITH 6 INCHES OF TOPSOIL AND SEEDED WITH A NATIVE SEED MIX.

10. ALL GUARDRAILS ALONG U.S. HIGHWAY 160 IN THE EXCAVATION AREA MUST BE PROTECTED FROM DAMAGE BY THE SUBCONTRACTOR. SUBCONTRACTOR SHALL BE RESPONSIBLE FOR REPLACEMENT OF GUARDRAILS DAMAGED DURING REMEDIAL ACTION, AS DETERMINED BY CONTRACTOR'S REPRESENTATIVE.





SECTION A
SLOPE RESTORATION (TYPICAL)
(NOT TO SCALE)



LEGEND

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

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-616

   SECTION 02050
   DEMOLITION

   SECTION 02110
   CLEARING AND GRUBBING

   SECTION 02130
   CONTAMINATED MATERIAL REMOVAL

   SECTION 02200
   EXCAVATION AND BACKFILL

   SECTION 02480
   LANDSCAPING

2. UTILITY LOCATIONS ARE FOR REFERENCE ONLY. SUBCONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE ACTUAL LOCATION OF UTILITIES 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. EXCAVATE THE FOLLOWING AREAS TO THE LIMITS INDICATED ON THIS DRAWING:

   AREA "A" TO A DEPTH OF 1'-6"
   AREA "C" TO A DEPTH OF 6"

ANSTEC
APERTURE
CARD

Also Available on
Aperture Card

9707080351-04

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED	DRAWN
SAT	S.M.

CHECKED
REVIEWED
RECOMMENDED

EXCAVATION AND RESTORATION PLAN

DU-616

DURANGO, COLORADO
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

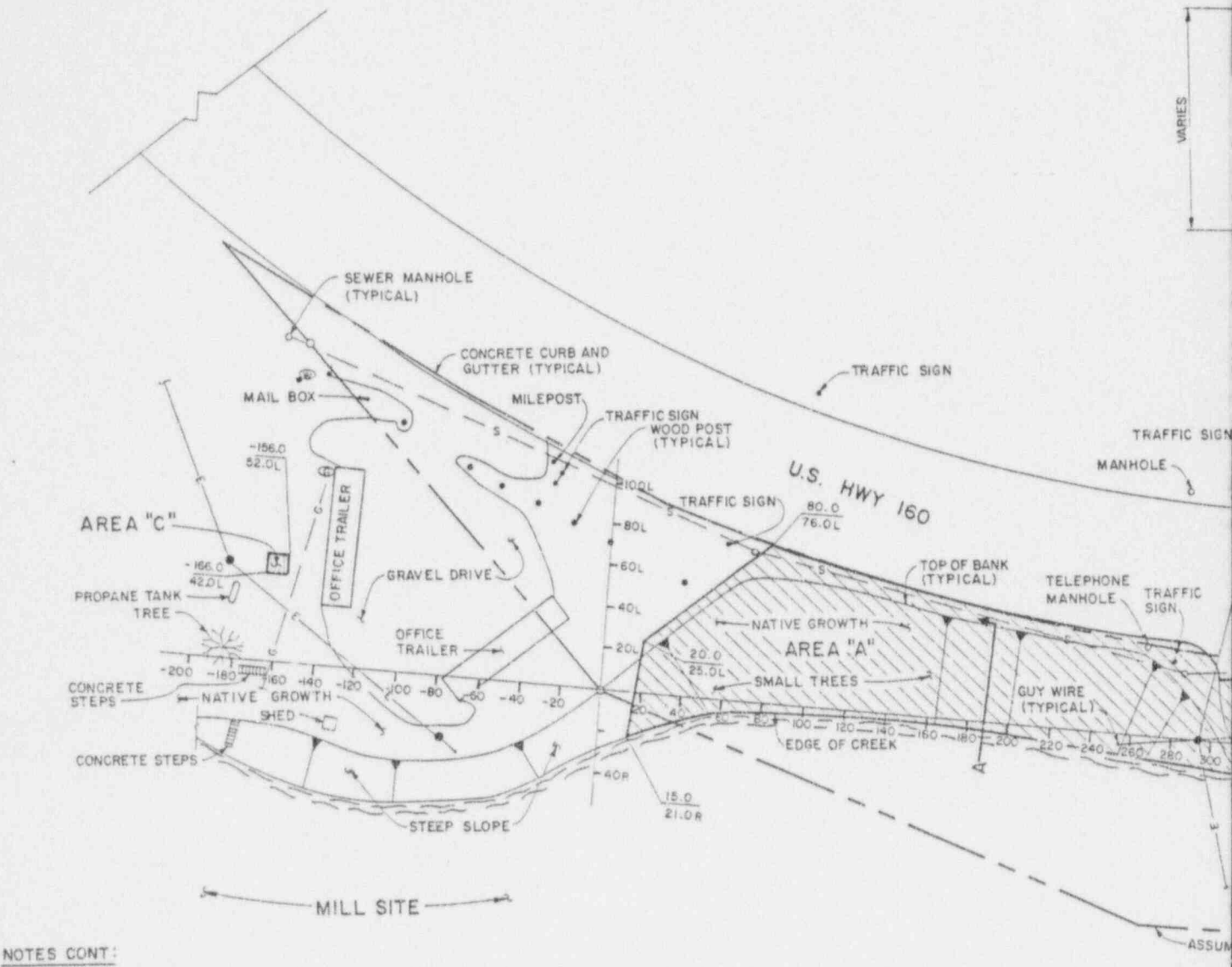
APPROVED	DATE	DOE PROJECT MANAGER	DATE	DOE PROJECT ENGINEER	DATE
NR		NR		NR	

MK-FERGUSON
A MORRISON KNUDSEN COMPANY

PROJECT NO. DE-AC04-83AL18796

DRAWING NO. DU-616-020 REV A

NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPROV. LDE	APPROV. DH	PROJ. ENG	APPROV. DOE
2	2/28/89	FINAL REA SUBMITTAL	CRW	KCL	SAT		DBA	



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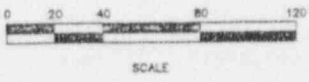
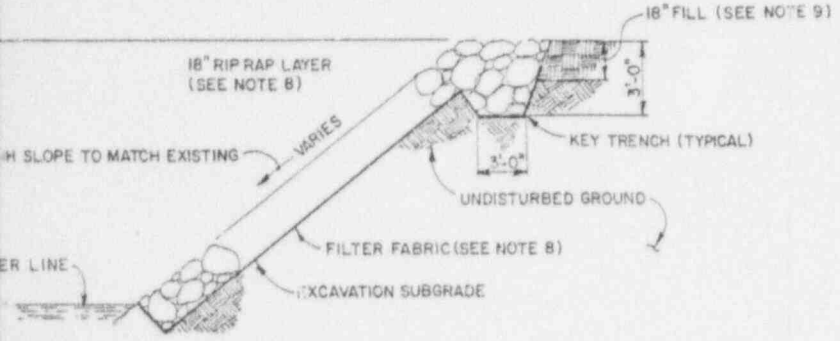
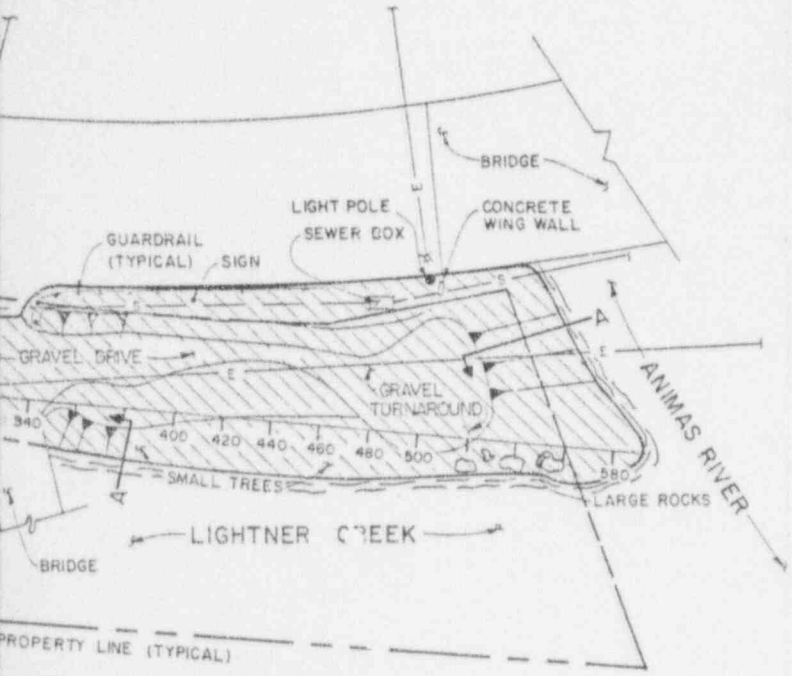




SECTION A
SLOPE RESTORATION (TYPICAL)
(NOT TO SCALE)



LEGEND

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

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-616

   SECTION 02050
   DEMOLITION

   SECTION 02110
   CLEARING AND GRUBBING

   SECTION 02130
   CONTAMINATED MATERIAL REMOVAL

   SECTION 02200
   EXCAVATION AND BACKFILL

   SECTION 02480
   LANDSCAPING

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4. EXCAVATE THE FOLLOWING AREAS TO THE LIMITS INDICATED ON THIS DRAWING:

   AREA "A" TO A DEPTH OF 1'-6"
   AREA "C" TO A DEPTH OF 6"

ANSTEC APERTURE CARD

Also Available on Aperture Card

9707080351-04

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED	DRAWN
SAT	S.M.

CHECKED
REVIEWED
RECOMMENDED
APPROVED NR

EXCAVATION AND RESTORATION PLAN

DU-616

DURANGO, COLORADO
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

DATE	DOE PROJECT MANAGER	DATE	DOE PROJECT ENGINEER	DATE
	NR		NR	

MK-FERGUSON
A MORRISON KNUDSEN COMPANY

PROJECT NO. DE-AC04-83AL18796
DRAWING NO. DU-616-020 REV. A

NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPRVL LOE	APPRVL DH	PROJ ENG	APPRVL DOE
1	12/30/91	FINAL REA SUBMITTAL	CRW	AGH	SAT	[illegible]	[illegible]	

APPENDIX A

RADIOLOGICAL SURVEY DATA

DU-616

Survey Notes

Introduction

This property is a backfilled abuttment to Highway 160 owned by the Colorado Dept. of Health and the Colorado Dept. of Highways. There are two mobile homes located on the graded, graveled west side of the property. The rest of the property is natural terrain covered with sage brush, scrub trees, and some large boulders. The southside of the property is bordered by Lightner Creek with an access bridge crossing the creek to the processing site.

Exterior Gamma Survey

A complete gamma scan of the property was performed where several areas showed anomalous readings. Because of the proximity to the tailings and the nature of the subsurface contamination, an open probe correlation was difficult to ascertain.

Subsurface Investigation

Test pits, boreholes, and soil samples support the presence of contamination at various levels throughout the property. Subsurface investigation at the edge of the creek was made impossible due to either the steep slope or the presence of large boulders. Borehole readings and samples indicated that further investigation was needed to find depth of contamination. Seven test pits were dug at various locations on the property. Samples and readings in Test Pits #1-#4 indicate contamination at levels between 3 and 20 feet below curb level. Test Pits #5 and #6 showed no elevated readings, whereas readings in Test Pit #7 show elevated readings 3 feet at the east end and 5 feet at the west end. Open probe readings were taken at the west end of the property, (backfilled and graveled area) where gamma readings were elevated because of the proximity to the tailings pile.

Spillover

Surface contamination runs over in the S.W. corner of the property. The approximate survace contamination is 200 square feet, as defined by soil sample and gamma scan. It appears to be windblown and does not extend deeper than 6 inches.

Derek Workman
4/25/89

BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300
GOLDEN, COLORADO 80401
PHONE (303) 277 1887

1455 DEMING WAY, SUITE 15
SPARKS, NEVADA 89431
PHONE (702) 358 1158

MK-Ferguson
P.O. Box 9136
Albuquerque, NM 87119

ATTN: Helene Langlois

Client No. Durango Log No. 9619 Client PO No. 3050-511-9659, Req. #468

Sample Type: soil

Date Collected: 2/23/89 Date Received: 2/27/89 Date Reported: 4/4/89

RESULTS OF ANALYSIS

Sample Identification	Ra-226 pCi/gram ±Precision*	Th-230 pCi/gram ±Precision*	Uranium ug/gram
DU-SS-12654 LC #1	1.2 ± 0.6	1.2 ± 0.5	1.4
DU-SS-12655 LC #2	5.3 ± 1.1	5.1 ± 0.9	5.8
DU-SS-12656 LC #3	5.6 ± 1.2	6.7 ± 1.1	4.1
DU-SS-12657 LC #4	15 ± 2	17 ± 2	22.3
DU-SS-12658 LC #5	2.5 ± 0.9	3.1 ± 0.7	2.8
DU-SS-12659 LC #6	160 ± 10	190 ± 10	105
DU-SS-12660 LC #7	23 ± 3	34 ± 2	17.1
DU-SS-12661 LC #8	5.5 ± 1.2	6.5 ± 1.0	9.3
DU-SS-12662 LC #9	16 ± 2	29 ± 2	16.9

* Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 2σ

Approved by Susan K Barbay

15000 W. 6th Avenue
Suite 300
Golden, CO 80401
(303) 277-1687

MK-Ferguson
P.O. Box 9136
Albuquerque, NM 87119

ATTN: Helene Langlois

LGN: 9619

QUALITY CONTROL DATA SHEET

Time Received: 9:30 Date: 2/27/89 By: Gina Reichert Via: UPS

Sample Container Type: can
Sample Type: soil

Preservative When Received: None

Additional Lab Preparation: 100 mesh

Parameter	Reference	LLD	Preservative	Analyst	Date(s) of Analysis
Radium 226	4,7	0.2 pCi/g	none	M. Howard	3/1-3/8/89
Thorium 230	11	0.2 pCi/g	none	J. Ortiz	3/17-3/22/89
Uranium	10,15	0.3 ug/g	none	B. Tonning	3/7-3/13/89

DUPLICATES

Sample Identification	Parameter	Result	Result	Relative Deviation From Mean
DU-SS-12661 LC #8	Radium 226	5.1 ± 1.1	5.9 ± 1.2	7.8%
DU-SS-12662 LC #9	Radium 226	17 ± 2	16 ± 2	3.0%
DU-SS-12662 LC #9	Thorium 230	29 ± 2	29 ± 2	0.0%
DU-SS-12662 LC #9	Uranium	17.1	16.6	1.5%

QUALITY CONTROL STANDARDS

Parameter	Result	Certified Result	Acceptable Target Range	Relative Deviation From Known
Radium 226	569 ± 26	604	574 - 634	5.8%
Thorium 230	285 ± 22	267	254 - 280	6.7%
Uranium	32	34	32 - 36	5.9%

Approved by Susan K Barkley

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

LABORATORY SERVICES AUTHORIZATION FORM (CONTINUATION PAGE)

I.D. No.	Date Collected	Description	Volume
BU-SS-12662 LC#9	02 / 23 / 89	3508 cpt Δ 836	563.5
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(\DW4\FORMS\LAF)

OUTDOOR GAMMA SCREENING
SURVEY DATA SHEET

LOGGING CREW: Ron Jacobs, Terry Herman
Jim Smith, Dave Beyer

SHEET _____ OF _____ PAGE 1

DATE: 3-28-89

PROPERTY ID: DU-616

INSTRUMENT ID NO.: Ludl 2220 * 31975 / 4410 * 019838

BACKGROUND CALCULATION:

#1 _____ + #2 _____ + #3 _____ = _____ ÷ 3 = _____ COUNTS/.1MIN

AREA: Contact		AREA: 1 meter		AREA:		AREA:	
POINT ID	READING COUNTS/.1MIN	POINT ID	READING COUNTS/.1MIN	POINT ID	READING COUNTS/.1MIN	POINT ID	READING COUNTS/.1MIN
#1 3+55.34L	2815 uR/hr 23.9		2842 uR/hr 24.1				
#2 4+20.36L	2385 20.8		2537 22.3				
#3 5+40.00R	2481 21.9		2675 23.1				
#4 3+60.30R	2158 20.0		2051 19.4				
#5 2+20.25R	3211 26.2		3130 25.8				
#6 1+50.06R	2609 22.7		2607 22.7				
#7 0+30.06R	3120 25.7		3391 27.3				
#8 0+30.20L	2723 23.4		2925 24.5				
#9 0+40.75L	2757 23.6		3106 25.6				
#10 2+10.54L	2718 23.3		2986 24.9				

REMARKS: _____

VP C4A

MK-FERGUSON/CHEM-NUCLEAR
OPPOSED CRYSTAL SYSTEM RECORD

SITE NAME Durango
SITE AREA

OCS #3: 984369
OCS #4: 285411
OCS SERIAL NO. #5: 285403

COUNT DATE INITIAL / 20 DAY	SAMPLE NUMBER	SAMPLE LOCATION	DATE SAMPLED	DATE SEALED	OCS# INITIAL / 20 DAY	FUNCTION NO. INITIAL / 20 DAY	MASS WET / DRY	Ra 226 INITIAL / 20 DAY	QC CHECK	LABORATORY RESULT Ra 226	LABORATORY RESULT Th 230	DEPTH <15 cm / >15 cm	TECH INITIAL / 20 DAY	REMARKS	
2-23-89 / 2-21-89	DU-SS-12654	616-LC-1	2-23		3 / 3	3.45 E02 / 393 E02	590.4 / 580.2	<MDA / <MDA				✓	RF	Rivers Edge Avg cptm 490 sent dried/counted/ Burn	3+26 / 20L
2-23-89 / 2-24-89	DU-SS-12655	616-LC-2	2-23		4 / 4	2.16 E03 / 1.89 E03	294 / 286	294 / 286				✓	RF	dried/counted/sent to Burn Lightner Creek 2340 cptm	3+36 / 31L
2-23-89 / 2-24-89	DU-SS-12656	616-LC-3	2-23		3 / 3	2.12 E03 / 1.70 E03	687.5 / 602.5	3.08 / 2.82				✓	RF	NE Corner dried Bridge Area cnted Sent to 2760 Burn	3+44 / 10L
2-23-89 / 2-24-89	DU-SS-12657	616-LC-4	2-23		4 / 4	4.90 E03 / [illegible]	617.5 / 578.5	7.94 / 6.41	✓			✓	RF	N middle of dirt road east side of bridge dried/counted Sent to Burn	BH1
2-23-89 / 2-24-89	DU-SS-12658	616-LC-5	2-23-89		3 / [illegible]	[illegible] / 9.40 E02	622.0 / 567.5	1.86 / 1.66				✓	RF	2371 cptm Δ601	4+9C / 34L
2-23-89 / 2-24-89	DU-SS-12659	616-LC-6	2-23-89		3 / 3	5.31 E04 / 5.44 E04	640.5 / 553.5	8.29 / 9.83	✓			✓	RF	16,639 cptm Δ 707 Dried Cnted sent to Burn	0+3 / 08L
2-23-89 / 2-24-89	DU-SS-12660	616-LC-7	2-23-89		4 / 4	4.62 E03 / 4.65 E03	549.1 / 469	8.41 / 9.63	✓			✓	RF	5645 cptm - Δ 2217 dried counted sent to Burn	0+60 / 15L
2-23-89 / 2-24-89	DU-SS-12661	616-LC-8	2-23-89		3 / 3	1.90 E03 / 1.61 E03	545.8 / 520.0	3.19 / 3.10	✓			✓	RF	2760 cptm Δ 865 dried counted sent to Burn	1+69 / 10L
2-23-89 / 2-24-89	DU-SS-12662	616-LC-9	2-23-89		3 / 3	4.76 E03 / 4.19 E03	626.0 / 563.5	7.60 / 7.44	✓			✓	RF	3508 cptm counted Δ 836 dried sent to Burn	2+33 / 09L
3-03-89	DU-SS-12704	616-LC-10	3-03-89		3 /	1.92 E03 /	231.1 /	2.63 /				✓	RF	2+35 15L 5466 cptm Th230 1,40	2+35 / 18L
3-03-89	DU-SS-12705	616-LC-11	3-03-89		3 /	1.13 E03 /	224.5 /	1.56 /				✓	RF	2+50, 15L 3153 cptm	2+50 / 15L
3-03-89	DU-SS-12706	616-LC-12	3-03-89		3 /	2.31 E03 /	468.2 /	3.80 /				✓	RF	2+15, 02L 4544 cptm	2+15 / 02L

NOTE: All soil sample results are in pCi/gm

REVIEWED BY _____

Site Correction Factor = 1.31(x)+.749 (10/21/88)
Count Time = 500 sec. unless noted otherwise.

VP Correction Factor= 1.35(x)+.505 MDA-5pCi/g
(2/3/88) = 1.98(x)-1.40 5-15pCi/g

MK-FERGUSON/CHEM-NUCLEAR

SITE NAME Durango

SITE AREA

OPPOSED CRYSTAL SYSTEM RECORD

OCS #3: 984369
OCS #4: 285411
OCS SERIAL NO. #5: 285403

COUNT DATE INITIAL	COUNT DATE 20 DAY	SAMPLE NUMBER	SAMPLE LOCATION	DATE SAMPLED	DATE SEALED	OCS# INITIAL	OCS# 20 DAY	FUNCTION NO. INITIAL	FUNCTION NO. 20 DAY	MASS WET	MASS DRY	Ra 226 INITIAL	Ra 226 20 DAY	QC SAMPLE	LABORATORY RESULT Ra 226	LABORATORY RESULT Th 230	DEPTH <15 cm	DEPTH >15 cm	TECH INITIAL	TECH 20 DAY	REMARKS
3-03-89		DU-SS-12707	616-LC-13	3-03-89		4		3.19E03		5804		5.56					✓		RF		0+85, 7L 3817 cptm
3-03-89		DU-SS-12708	616-LC-14	3-03-89		4		3.44E03		6461		5.32					✓		RF		0+65, 36L 4910 cptm
3-03-89		DU-SS-12709	616-LC-15	3-03-89		4		1.28E03		6143		2.08					✓		RF		4+10, 05L 3190 cptm
3-03-89		DU-SS-12837	616-1	3-16-89		4		6.16E02		5886		LMDA					✓		DJW		C=2437 cptm 5143 1m 2513 cptm dR Δ 993 cptm
3-16-89		DU-SS-12838	616-2	3-16-89		4		9.83E02		4905		2.60					✓		DJW		C=3227 cptm 4481 1m 3159 cptm 054 Δ 578 cptm
3-16-89		DU-SS-12839	616-3	3-16-89		4		6.36E02		4703		1.34					✓		DJW		C=3163 cptm 4471/054 1m 2434 cptm Δ 591 cptm
3-16-89		DU-SS-12840	616-4	3-16-89		4		1.36E03		5006		2.72					✓		DJW		C=3331 cptm 4820 1m 3119 cptm 03L Δ 752 cptm
3-16-89		DU-SS-12841	616-5	3-16-89		4		1.02E03		5913.0		1.72					✓		DJW		C=3456 cptm 3764 1m 2869 cptm 08L Δ 666 cptm
3-16-89		DU-SS-12842	616-6	3-16-89		4		8.36E02		5806		1.64					✓		DJW		C=2842 cptm 4420 1m 2568 cptm 81L Δ 613 cptm
3-16-89		DU-SS-12843	616-7	3-16-89		4		6.83E02		4849		1.41					✓		DJW		C=2837 cptm 4450 1m 2459 cptm 36L Δ=678 cptm
3-16-89		DU-SS-12853	616-8	3-16-89		4		6.17E03		4850		12.72					✓		DJW		2433 16L C=5287 cptm 1m 3817 Δ 1778
3-16-89		DU-SS-12854	616-9	3-16-89		4		3.37E03		4313		7.81					✓		DJW		2420/08L C 4123+ cptm 1m 4052 Δ 1104

NOTE: All soil sample results are in pCi/gm

Site Correction Factor = 1.31(x)+.749 (10/21/88)
Count Time = 500 sec, unless noted otherwise.

VP Correction Factor= 1.35(x)+.505 NDA-5pCi/g
(2/3/88) = 1.98(x)-1.40 5-15pCi/g

REVIEWED BY

SITE NAME Durango
SITE AREA

MK-FERGUSON/CHEM-NUCLEAR
OPPOSED CRYSTAL SYSTEM RECORD

OCS #3: 984369
OCS #4: 285411
OCS SERIAL NO. #5: 285403

COUNT DATE INITIAL / 20 DAY	SAMPLE NUMBER	SAMPLE LOCATION	DATE SAMPLED	DATE SEALED	OCS# INITIAL / 20 DAY	FUNCTION NO. INITIAL / 20 DAY	MASS WET / DRY	Ra 226 INITIAL / 20 DAY	QC SAMPLE	LABORATORY RESULT Ra 226	LABORATORY RESULT Th 230	DEPTH <15 cm / >15 cm	TECH INITIAL / 20 DAY	REMARKS
3-16-89	DU-SS-12853	616-10	3-16-89		4	3.88 E02	541 X	LMDA				✓	DJW	1497/07L C=3207 1m3431 cptm Δ916
3-16-89	DU-SS-12856	616-11	3-16-89		4	1.21 E03	470.0	257				✓	DJW	1+30/08L C=3493 1m3261 cptm Δ=839
3-16-89	DU-SS-12857	616-12	3-16-89		4	4.01 E04	525	LMDA				✓	DJW	1+20, 08L C=3644 1m2944 cptm Δ 495
3-16-89	DU-SS-12858	616-13	3-16-89		4	1.91 E03	4076	4.76				✓	DJW	0+54/07L C 4061 1m 3187 cptm Δ 1098
3-16-89	DU-SS-12859	616-14	3-16-89		4	4.72 E03	3930	120				✓	DJW	0+54 ME C=6145 1m 5187 cptm Δ 1704
3-17-89	DU-SS-12860	616-15	3-16-89		4	7.85 E03	4396	178				✓	DJW	0+54, 14L C=6126 cptm Δ=1849
3-17-89	DU-SS-12861	616-16	3-16-89		4	4.18 E04	3904	193				✓	DJW	0+36, 08L C 17710 1m 6445 cptm Δ 8259
3-17-89	DU-SS-12862	616-17	3-16-89		4	1.17 E03	4966	256				✓	DJW	0+36/03R C 4118 1m 4244 cptm Δ 1015
3-17-89	DU-SS-12863	616-18	3-16-89		4	1.24 E03	4444	279				✓	DJW	-0+10/35R C=3370 1m 4067 cptm Δ 918
3-17-89	DU-SS-12864	616-19	3-16-89		4	1.68 E03	4765	352				✓	DJW	C=3414 cptm 1m 2948 Δ 826
3-17-89	DU-SS-12865	616-20	3-16-89		4	4.15 E03	4991	831				✓	DJW	C=4440 cptm 1m 3905 Δ 1219
~~3-17-89~~	~~DU-SS-12866~~	~~616-21~~	~~3-16-89~~		3	8.20 E03	3816	261				✓	DJW	10 End Sum 950Δ cptm 540 cptm

NOTE: All soil sample results are in pCi/gm

REVIEWED BY _____

Site Correction Factor = 1.31(x)+.749 (10/21/88)
Count Time = 500 sec, unless noted otherwise.

VP Correction Factor= 1.35(x)+.505 MDA-5pCi/g
(2/3/88) = 1.98(x)-1.40 5-15pCi/g

MK-FERGUSON/CHEM-NUCLEAR

OPPOSED CRYSTAL SYSTEM RECORD

SITE NAME Durango

SITE AREA

OCS #3: 984369

OCS #4: 285411

OCS SERIAL NO. #5: 285403

COUNT DATE INITIAL / 20 DAY	SAMPLE NUMBER	SAMPLE LOCATION	DATE SAMPLED	DATE SEALED	OCS# INITIAL / 20 DAY	FUNCTION NO. INITIAL / 20 DAY	MASS WET / DRY	Ra 226 INITIAL / 20 DAY	QC SHAPE	LABORATORY RESULT Ra 226	LABORATORY RESULT Th 230	DEPTH <15 cm	DEPTH >15 cm	TECH INITIAL / 20 DAY	REMARKS
3-27-89	DU-SS-12955	616-A-2	3-27-89		3	8.82E03	4996	18.0						DJW	4+26/17L BH #3 Δ680cptm /381cptm
3-27-89	DU-SS-12956	616-A-3	3-27-89		3	3.42E03	3783	9.60							
3-27-89	DU-SS-12957	616-A-4	3-27-89		3	7.35E03	3[illegible]	[illegible].01							
3-27-89	DU-SS-12958	616-A-5	3-27-89		3	2.63E03	3470	[illegible].[illegible]							
3-27-89	DU-SS-12959	616 #21	3-27-89		3	2.88E03	6021.1	4.51						DJW	4+28/17L BH #3 Δ680cptm /381cptm
3-27-89	DU-SS-12960	616-22	3-27-89		3	3.02E03	6244	4.84						DJW	3+44/07L Δ485 cptm c 3470 1m 3035
3-27-89	DU-SS-12961	616-23	3-27-89		3	4.82E03	6381	7.55						DJW	3+44/05R Δ977 - cptm c 3479 1m 2831
3-27-89	DU-SS-12962	616-24	3-27-89		3	8.56E02	6506	1.32						DJW	2+34/38L Δ758 cptm c 2913 1m 3185
3-27-89	DU-SS-12963	616-25	3-27-89		3	1.09E3	6686	1.63						DJW	2+57/17L Δ736 BH #12 c 3006 cptm 1m 3498
3-27-89	DU-SS-12964	616-26	3-27-89		3	1.35E3	5771	2.39						DJW	2+29/22L Δ933 BH #15 c 3747 cptm 1m 3498
3-28-89	DU-SS-12965	616-27	3-27-89		3	2.84E3	5596	5.08						DJW	1+28, 41L 36"-42" 6788 cptm BH #22
3-28-89	DU-SS-12966	616 #28	3-28-89		3	3.64E4	6468	563						DJW	2+13/04L 42"-48" BH26 23,071cptm

NOTE: All soil sample results are in pCi/gm

REVIEWED BY

Site Correction Factor = 1.31(x)+.749 (10/21/88)

Count Time = 500 sec, unless noted otherwise.

VP Correction Factor= 1.35(x)+.505 MDA-5pCi/g (2/3/88) = 1.98(x)-1.40 5-15pCi/g

SITE NAME Durango
SITE AREA

MK-FERGUSON/CHEM-NUCLEAR
OPPOSED CRYSTAL SYSTEM RECORD

OCS #3: 984369
OCS #4: 285411
OCS SERIAL NO. #5: 285403

COUNT DATE / INITIAL / 20 DAY	SAMPLE NUMBER	SAMPLE LOCATION	DATE SAMPLED	DATE SEALED	OCS# / INITIAL / 20 DAY	FUNCTION NO. / INITIAL / 20 DAY	MASS / WET / DRY	Ra 226 / INITIAL / 20 DAY	QC SAMPLE	LABORATORY RESULT / Ra 226	LABORATORY RESULT / Th 230	DEPTH / <15 cm	DEPTH / >15 cm	TECH / INITIAL / 20 DAY	REMARKS
3-28-89	DU-SS-12970	6116 "29	3-28-89		3	7.24E2	662.58	<MDA				✓		DJW	uR/hr 1 c2815 cptm 1m 2841
3-28-89	DU-SS-12971	6116 "30	3-28-89		3	7.27E2	589.1	1.28				✓		DJW	uR/hr #4 c2158 cptm 1m 2051
3-28-89	DU-SS-12972	6116-31	3-28-89		3	8.09E2	585.0	1.38				✓		DJW	uR/hr #7 c3120 cptm 1m 3391
3-28-89	DU-SS-12973	6116-32	3-28-89		3	3.64E02	572.6	<MDA				✓		DJW	uR/hr #9 c2757 cptm 1m 3106
3-29-89	DU-SS-12977	6116-33	3-29-89		3	7.99E2	509.5	1.57				✓		DJW	#33 4+35/17L
3-29-89	DU-SS-12979	6116-34	3-29-89		3	7.91E2	587.2	1.35				✓		DJW	#34 5+11/29L
3-30-89	DU-SS-12985	6116-35	3-29-89		3	8.10E02	695.5	1.16				✓		RF	5+39,14R
4-11-89	DU-SS-13163	6116-36	4-11-89		3	7.84E2	529.1	1.48				✓		DJW	Δ543 cptm op 2834
4-12-89	DU-SS-13188	6116-37	4-12-89		3	1.50E03	415.7	3.61				✓		KM	BH. #53 Δ785 op 3105cptm
4-14-89	DU-SS-13209	6116-38	4-14-89		3	2.05E03	697.2	2.94					✓	KM	BH #60 Δ725 op 2820 3491 cptm
4-14-89	DUSS-8207	6116-39	4-14-89		3	2.07E3	668.4	309					✓	KM	0+34/15L
4-14-89	DU-SS-13210	6116-40	4-14-89		4	9.26E03	567.1	1653					✓	KM	Δ1455 cptm op 6326 78' deep

NOTE: All soil sample results are in pCi/gm

REVIEWED BY

Site Correction Factor = 1.31(x)+.749 (10/21/88)
Count Time = 500 sec, unless noted otherwise.

VP Correction Factor= 1.35(x)+.505 MDA-5pCi/g
(2/3/88) = 1.98(x)-1.40 5-15pCi/g

MR-FERGUSON/CHEN-NUCLEAR

OPPOSED CRYSTAL SYSTEM RECORD

SITE NAME Durango

SITE AREA

OCS #3: 984369
OCS #4: 285411
OCS SERIAL NO. #5: 285403

COUNT DATE INITIAL	COUNT DATE 20 DAY	SAMPLE NUMBER	SAMPLE LOCATION	DATE SAMPLED	DATE SEALED	OCS# INITIAL	OCS# 20 DAY	FUNCTION NO. INITIAL	FUNCTION NO. 20 DAY	MASS WET	MASS DRY	Ra 226 INITIAL	Ra 226 20 DAY	QC SAMPLE	LABORATORY RESULT Ra 226	LABORATORY RESULT Th 230	DEPTH <15 cm	DEPTH >15 cm	TECH INITIAL	TECH 20 DAY	REMARKS
4-14-89		DU-SS-13208	6116-41	4-14-84		4		1.48E4		1631.7		23.43						✓	KM		0+32/15L TP#1 Δ1178 20'Below curb OP 7103 Height OP1m
4-14-89		DU-SS-13216	6116-42	4-14-89		4		4.32E3		650.3		6.64						✓	BG		Δ 2280 cptm OP 8943 cptm 12' deep N END
4-14-89		DU-SS-13217	6116-43	4-14-89		5		1.05E4		706.7		14.86						✓	BG		Δ 1787 cptm TP#2 OP 7358 cptm 20' deep middle
4-14-89		DU-SS-13215	6116-44	4-14-89		3		4.62E4		742.1		62.3						✓	BG		Δ 2976 cptm TP#2 OP 8205 cptm 20' deep S End
4-17-89		DU-SS13220	6116-45	4-17-89		3		7.83E02		475.9		1.65						✓	KM		3655 cptm OP TP#4
4-17-89		DU-SS-13221	6116-46	4-17-89		4		5.99E03		506.4		11.83						✓	KM		OP 4504 cptm
4-17-89		DU-SS-13226	6116-47	4-17-89		3		6.99E02		719.5		0.97						✓	KM		TP #5 wet - Soil B.G. It, - 1000 cptm at bottom 17'
4-19-89		DU-SS-13255	6116-48	4-19-89		3		7.84E03		522.8		14.99						✓	RF		~~1558~~ / ~~224~~ Brtd OJU 4-24-89 -1+38/35R
4-19-89		DU-SS13256	6116-49	4-19-89		3		4.90E03		501		9.78						✓	RF		~~-0+35/33R~~ -55/38R OJU 4-24-89
4-20-89		DU-SS-13260	6116-50	4-19-89		3		3.80E03		426.5		8.91						✓			3424 OP cptm 900 Δ WIT Stake N of Shed
4-20-89		DU-SS-13261	6116-51	4-19-89		3		1.12E03		483		2.32						✓			2872 OP 22' W of Δ 600 SW corner cptm Blue tape
4-20-89		DU-SS-13264	6116-52	4-19-89		4		1.65E02		495		1.31						✓			2355 OP 61' NNW 290 Δ of Red flag W end of prop

NOTE: All soil sample results are in pCi/gm

REVIEWED BY

Site Correction Factor = 1.31(x)+.749 (10/21/88)
Count Time = 500 sec, unless noted otherwise.

VP Correction Factor = 1.35(x)+.505 MDA-5pC1/g
(2/3/88) = 1.98(x)-1.40 5-15pC1/g

MK-FERGUSON/CHEM-NUCLEAR

OPPOSED CRYSTAL SYSTEM RECORD

SITE NAME Durango

SITE AREA _____

OCS #3: 984369
OCS #4: 285411
OCS SERIAL NO. #5: 285403

COUNT DATE INITIAL / 20 DAY	SAMPLE NUMBER	SAMPLE LOCATION	DATE SAMPLED	DATE SEALED	OCS# INITIAL / 20 DAY	FUNCTION NO. INITIAL / 20 DAY	MASS WET / DRY	Ra 226 INITIAL / 20 DAY	QC SAMPLE	LABORATORY RESULT Ra 226	LABORATORY RESULT Th 230	DEPTH <15 cm / >15 cm	TECH INITIAL / 20 DAY	REMARKS
4-20-89	DU-SS-13265	616-53	4-19-89		3	2.46 E03	4765	5.16				✓		2704 cp 32' nw 670 Δ of Ld Fk 2573 lm NE corner
4-20-89	DU-SS 13266	616-54	4-19-89		3	1.52 E3	4805	3.16				✓		4059 cp 32 E of 835 Δ utility 3878 lm pole
4-20-89	DU-SS-13262	616-55	4-19-89		4	1.32 E3	7704	3.38				✓		3621 cp 143 cf 765 Δ utility 3144 lm pole
4-20-89	DU-SS-13270	616-56	4-20-89		3	1.16 E03	459.3	2.52				✓	KM	2816 cp cpm 651 Δ 1m 2727
4-20-89	DU-SS-13271	616-57	4-20-89		3	1.87 E03	3103	6.03				✓	KM	3051 cpm 875 Δ 3710 lm
4-20-89	DU-SS-13272	616-58	4-20-89		3	1.38 E03	3995	3.45				✓	RF	2936 cp -1+34 750 Δ 30R 2833 lm
4-20-89	DU-SS-13273	616-59	4-20-89		3	2.02 E03	4160	4.39				✓	KM	6681 Δ cpm 2764 cp 2813 lm
4-20-89	DU-SS 13274	616-60	4-20-89		5	2.97 E03	4975	5.97				✓	KM	3432 cp cpm 975 Δ 4511 lm
4-20-89	DU-SS-13275	616-61	4-20-89		4	8.54 E02	4727	1.81				✓	KM	2708 cp cpm 534 Δ cpm 2528 lm cpm

NOTE: All soil sample results are in pCi/gm

REVIEWED BY _____

Site Correction Factor = 1.31(x)+.749 (10/21/88)
Count Time = 500 sec, unless noted otherwise.

VP Correction Factor= 1.35(x)+.505 MDA-5pCi/g (2/3/88) = 1.98(x)-1.40 5-15pCi/g

KNUDSEN

PROPERTY SURVEY SKETCH

Sheet _____ of _____

SITE LOCATION CU-616

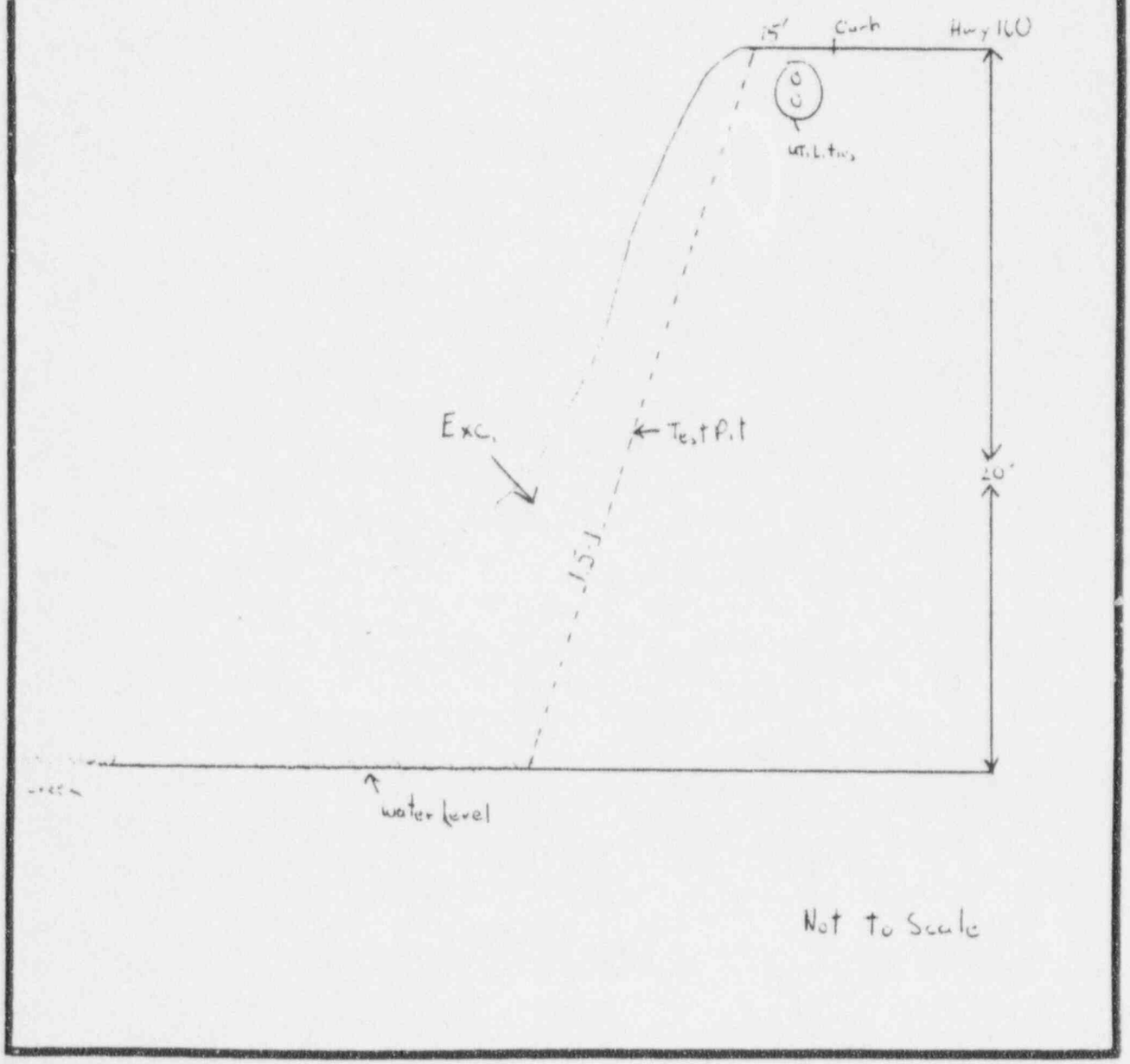
ADDRESS Durango Hwy 160

PROPERTY TYPE Backfilled abutment to Hwy. LOT NO. _____

OWNER CDH + CC DH.

SKETCH COMPLETED BY Derek J. Workman DATE 4-25-89

Soil Test Pits #1 thru #4



Not to Scale

Test Pit Samples

MK-FERGUSON/CHEM-NUCLEAR
OPPOSED CRYSTAL SYSTEM RECORD

SITE NAME Durango
SITE AREA OU-616

OCS #3: 984369
OCS #4: 285411
OCS SERIAL NO. #5: 285403

COUNT DATE INITIAL / 20 DAY	SAMPLE NUMBER	SAMPLE LOCATION	DATE SAMPLED	DATE SEALED	OCS# INITIAL / 20 DAY	FUNCTION NO. INITIAL / 20 DAY	MASS WET / DRY	Ra 226 INITIAL / 20 DAY	QC SAMPLE	LABORATORY RESULT Ra 226	LABORATORY RESULT Th 230	DEPTH <15 cm / >15 cm	TECH INITIAL / 20 DAY	REMARKS
4-14-89	OU-SS-13267	616-39	4-14-89		3	2.07E3	668.4	2.09				✓	KM	0+32/15L Δ850 OP 3633 TP=1 cpm
4-14-89	OU-SS-13210	616-40	4-14-89		4	9.46E3	547.1	16.5				✓	KM	0+32/15L Δ955 TP=1 OP 6326 18' below curb height cpm
4-14-89	OU-SS-13208	616-41	4-14-89		4	1.48E4	631.7	23.4				✓	KM	0+34/15L TP=1 Δ1778 OP 7103 20' Below curb height cpm
4-14-89	OU-SS-13216	616-42	4-14-89		4	4.32E3	650.3	6.64				✓	BG	0+72/45L TP=2 Δ2280 cpm 17' Below curb height OP 8443 N.ENG
4-14-89	OU-SS-13217	616-43	4-14-89		5	1.04E4	706.7	14.9				✓	BG	0+74/45L TP=2 Δ2787 cpm 20' Below curb height OP 7358
4-14-89	OU-SS-13215	616-44	4-14-89		3	4.62E4	746.1	63.3				✓	BG	0+72/5R TP=2 Δ2476 cpm 20 Below curb height OP 8205 S.ENG
4-17-89	OU-SS-13220	616-45	4-17-89		3	7.83E3	475.9	1.65				✓	KM	4+28/15L TP=4 OP 3655 cpm 18' below curb height
4-17-89	OU-SS-13221	616-46	4-17-89		4	5.97E3	506.7	11.8				✓	KM	4+28/2R TP=4 OP 350 cpm 11' Below curb height
4-17-89	OU-SS-13226	616-47	4-17-89		3	6.49E3	719.5	.976				✓	KM	4+00/18R TP=5 OP 1037 cpm 17' Below curb

NOTE: All soil sample results are in pCi/gm

REVIEWED BY _____

Site Correction Factor = 1.31(x)+.749 (10/21/88) VP Correction Factor= 1.35(x)+.505 MDA-5pCi/g
Count Time = 500 sec, unless noted otherwise

0334B

015-16

MK-FERGUSON/CHEM-NUCLEAR
OPPOSED CRYSTAL SYSTEM RECORD

SITE NAME Durango
SITE AREA DU-616

OCS #3: 984369
OCS #4: 285411
OCS SERIAL NO. #5: 285403

COUNT DATE INITIAL / 28 DAY	SAMPLE NUMBER	SAMPLE LOCATION	DATE SAMPLED	DATE SEALED	OCS# INITIAL / 28 DAY	FUNCTION NO. INITIAL / 20 DAY	MASS WET / DRY	Ra 226 INITIAL / 28 DAY	QC SAMPLE	LABORATORY RESULT Ra 226	LABORATORY RESULT Th 230	DEPTH <15 cm / >15 cm	TECH INITIAL / 20 DAY	REMARKS
5-1-89	DU-SS-12425	616-62	5-1-89		3	1.11E3	513.2	2.16				✓	JC	2491 OP -1+51/47L Im 2421 OPTM
5-1-89	DU-SS-12426	616-63	5-1-89		3	8.76E2	465.2	1.88				✓	JC	OP2382 -1+71/47L Im 2473

NOTE: All soil sample results are in pCi/gm

REVIEWED BY _____

Site Correction Factor = 1.31(x)+.749 (10/21/88)
Count Time = 500 sec, unless noted otherwise.

VP Correction Factor= 1.35(x)+.505 MDA-5pCi/g
(2/3/88) = 1.98(x)-1.40 5-15pCi/g

MAY 01 '89 09:59 P02
MAY 01 '89 09:59 MK-FERGUSON_DURANGO

KNUDSEN

PROPERTY SURVEY COORDINATES

Sheet _____ of _____

SITE LOCATION DU-616

ADDRESS DURANGO, HWY 160

PROPERTY TYPE Backfilled abutment to Hwy LOT NO _____

OWNER C.D.H. & C.D.O.H.

SKETCH COMPLETED BY Derek J. Workman DATE 4-25-87

Test Pit #1	~~COORDINATES~~
OP-CPTM	Depth Below Curb
7103	20'
4371	18'
6326	16'
7783	15'
17441	13'
15178	11'
10304	9'

GAMMA SCAN BOUNDARY			
	COORDINATES	POINT	COORDINATES

VP 33A

KNUDSEN

PROPERTY SURVEY COORDINATES

Sheet _____ of _____

SITE LOCATION DU-Valle

ADDRESS DURANGO, Hwy 160

PROPERTY TYPE Backfilled abutment to Hwy LOT NO. _____

OWNER CDOH + C.D.OH

SKETCH COMPLETED BY Derek J. Waasman DATE 7-25-89

Test Pit #2	COORDINATES
or LPTM 5430	Depth Below Curb 20'
14435	18'
10880	16'
4614	14'
4452	12'
3028	10'
2421	8'

GAMMA SCAN BOUNDARY			
	COORDINATES	POINT	COORDINATES

VP 03A

KNUDSEN

PROPERTY SURVEY COORDINATES

Sheet _____ of _____

SITE LOCATION DU-616

ADDRESS DURANGO, HWY 160

PROPERTY TYPE Backfilled abutment to Hwy LOT NO. _____

OWNER C.D.H - C.D.O.H.

SKETCH COMPLETED BY Derek J. Workman DATE 4-25-89

Test Pit #3	~~COORDINATES~~
or - CPTM 8370	Depth Below Curb NORTH END 20'
9870	18'
5940	16'
3413	14'
4786	12'
5360	South End 20'
18641	18'
9720	16'
9027	15'

GAMMA SCAN BOUNDARY			
	COORDINATES	POINT	COORDINATES

VP 33A

KNUDSEN

PROPERTY SURVEY COORDINATES

Sheet _____ of _____

SITE LOCATION DU-616

ADDRESS DURANGO, HWY 160

PROPERTY TYPE Backfilled abutment to Hwy LOT NO. .

OWNER CDOH - C.D.O.H.

SKETCH COMPLETED BY Derek J. Workman DATE 4-25-89

Test P.t #4	~~COORDINATES~~
Op. CPTM	Depth Below Curb
1961	20'
3655	18'
3960	14'
5345	12'
5504	11'

GAMMA SCAN BOUNDARY			
	COORDINATES	POINT	COORDINATES

VP.03A

KNUDSEN

PROPERTY SURVEY COORDINATES

Sheet _____ of _____

SITE LOCATION DU-616

ADDRESS DURANGO, HWY 160

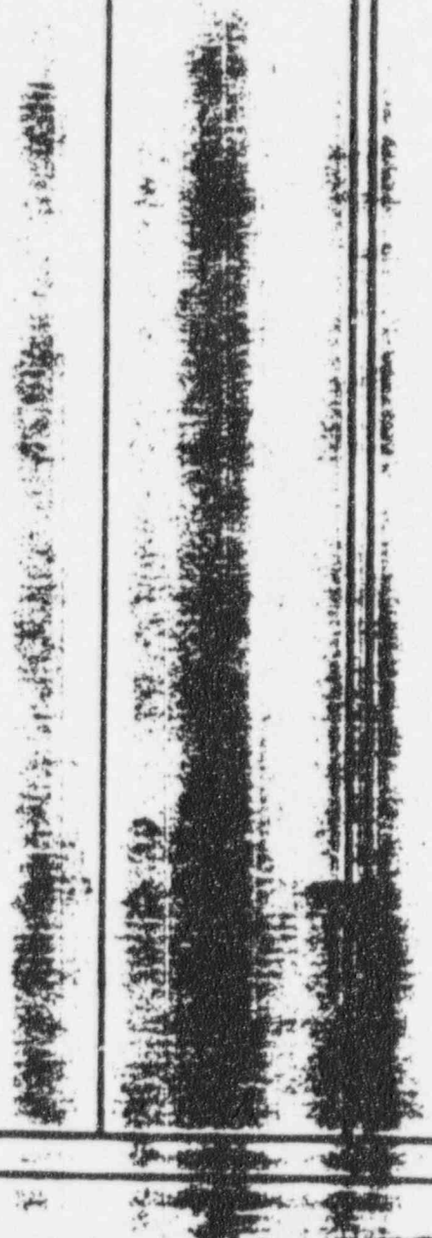
PROPERTY TYPE Backfilled abutment to Hwy LOT NO. _____

OWNER CDH. + CDOH

SKETCH COMPLETED BY Derek J. Wakeman DATE 4-25-89

Test Pit #5	COORDINATES
OP-CPTM	Depth Below Curb
2037	17'
2101	16'
2315	15'
2702	14'
2782	13'
2292	12'
2343	11'
2308	10'
2259	9'
2462	8'
2410	7'
2338	6'
2337	5'
2288	4'
2357	3'
2456	2'
2405	1'

WYOMING STATE BOUNDARY			
-	COORDINATES	POINT	COORDINATES



VP-03A

KNUDSEN

PROPERTY SURVEY COORDINATES

SHEET _____ of _____

SITE LOCATION DU-Golle

ADDRESS DURANGO, HWY 160

PROPERTY TYPE Backfilled abutment to Hwy. 5 LOT NO. _____

OWNER CDH + CDOH

SKETCH COMPLETED BY Derek J. Workman DATE 4-25-89

Test Pit #6	COORDINATES
OP - CPTM 2319	Depth Below Grade 16'
2403	15'
2413	14'
2247	13'
2193	12'
2236	11'
2469	10'
2656	9'
2669	8'
2566	7'
2625	6'
2604	5'
2630	4'
2648	3'
2531	2'
2523	1'

** GAMMA ZONE BOUNDARY			
	COORDINATES	POINT	COORDINATES

VP-03A

KNUDSEN

PROPERTY SURVEY COORDINATES

Sheet _____ of _____

SITE LOCATION DU-616

ADDRESS DURANGO - HWY 160

PROPERTY TYPE Backfilled abutment to Hwy LOT NO. _____

OWNER CDOH + C.D.O.H.

SKETCH COMPLETED BY Derek J. Workman DATE 4-25-89

Test Pit #7	~~COORDINATES~~
OP-CPTM	Depth Below Grade E. End
2333	10'
2287	11'
2356	9'
2371	8'
3157	7'
2911	6'
2699	5'
2984	4'
3407	3'
3293	2'
3147	1'
2178	W. End 10'
2326	9'
2200	8'
2163	7'
2549	6'
4153	5'
2882	4'
2622	3'
2508	2'
2616	1'

GAMMA SCAN BOUNDARY			
	COORDINATES	POINT	COORDINATES

VP-33A

KNUDSEN

BOREHOLE LOG

LOGGING CREW: Ron Jacobs, Terry Herman
Jim Smith, Dave Beyer

SHEET _____ OF _____ PAGE 2

DATE: 3-27-89

PROPERTY ID: DU-616

INSTRUMENT ID NO. Lwd 2220 #31975 / 44-10 #19878

AREA: _____

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: #1 4+20, 176		HOLE ID: #2 4+21, 226		HOLE ID: #3 4+28, 176		HOLE ID: #4 4+20, 116	
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	3403	SURFACE	2771	SURFACE	3181	SURFACE	2871
0"	3101	0"	2924	0"	3085	0"	2796
6"	3409	6"	2778	6"	3230	6"	2629
12"	3541	12"	2896	12"	3248	12"	2775
18"	3204	18"	2786	18"	3161	18"	2838
24"		~~24~~ 21"	2704	24"		24"	2495
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: _____

VP-04B

KNUDSEN

BOREHOLE LOG

LOGGING CREW: Ron Jacobs, Terry Herman
Jim Smith, Dave Beyer

INSTRUMENT ID NO. Ld 2220 * 31975 / 44-10 * 19878

SHEET _____ OF _____ PAGE 3

DATE: 3-27-89

PROPERTY ID: 04-616

AREA: _____

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: #5 4+11,172 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #6 2+34,276 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #7 2+34,226 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #8 2+35,286 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	2443	SURFACE	2[illegible]	SURFACE	3493	SURFACE	2913
0"	2366	0"	[illegible]	0"	4043	0"	3001
6"	2355	6"	26[illegible]	6"	5114	6"	2510
12"	2317	12"	2998	12"	8593	12"	2631
18"	2229	18"	3115	18"	11533	18"	3095
24"	2212	24"	3854	24"	5341	24"	[illegible]
30"	2218	30"	2982	30"	4300	30"	
36"		36"		36"	4454	36"	
42"		42"		42"	3108	42"	
48"		48"		48"	2284	48"	
54"		54"		54"	2235	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: _____

VP-04B

MORRISON KNUDSEN

BOREHOLE LOG

LOGGING CREW: Ron Jacobs, Terry Herman
Jim Smith, Dave Beyer

SHEET _____ OF _____ PAGE 4

DATE: 3-27-89

PROPERTY ID: DX-6116

INSTRUMENT ID NO. Gud 2220 31975 W/4470 #19878

AREA: _____

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 2134,126		HOLE ID: #10 2133,038		HOLE ID: #11 2149,201		HOLE ID: #12 2157,176	
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	4562	SURFACE	3710	SURFACE	3124	SURFACE	3006
0"	4638	0"	3225	0"	3428	0"	2940
6"	5350	6"	3122	6"	3732	6"	2547
12"	3717	12"	3059	12"	4406	12"	2506
18"	2839	18"	2589	18"	3522	18"	2581
24"	3043	24"	2459	24"	3249	24"	2624
30"	3131	30"	2728	30"	4905	30"	2698
36"	A.R	36"	A.R.	36"	A R	36"	2536
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: _____

KNUDSEN

BOREHOLE LOG

LOGGING CREW: Ron Jacobs, Terry Herman
Jim Smith, Dave Beyer

SHEET _____ OF _____ PAGE 5

DATE: 3-27-89

PROPERTY ID: DU-616

AREA: _____

INSTRUMENT ID NO. Lud # 2220 # 31975 4/44-10 # 19878

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: #13 2162,056 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #14 2142,056 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #15 2189,226 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #16 2144,254 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	2974	SURFACE	2663	SURFACE	3747	SURFACE	3075
0"	3225	0"	2876	0"	4248	0"	3118
6"	2652	6"	2301	6"	5711	6"	3014
12"	2608	12"	2404	12"	6383	12"	3889
18"	2615	18"	2473	18"	4828	18"	4969
24"	2665	24"	2593	24"	3545	24"	3893
30"	2677	30"	2636	30"	3177	30"	4024
36"	2666	36"	2728	36"	A R	36"	5917
42"		42"		42"		42"	6328
48"		48"		48"		48"	6695
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: _____

VP-04B

KNUDSEN

BOREHOLE LOG

LOGGING CREW: Ron Jacob, Terry Herman, Jim Smith, Dave Beyer

SHEET _____ OF _____ PAGE 6

DATE: 3-27-89

PROPERTY ID: DU-616

INSTRUMENT ID NO. Lud 2220 #3 1975 4/44-10 #1987B

AREA: _____

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: #17 2+17,22L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #18 2+05 35L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #19 1+98,32L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #20 1+90,33L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	2836	SURFACE	2782	SURFACE	2732	SURFACE	2836
0"	3098	0"	2697	0"	2974	0"	2654
6"	2716	6"	2238	6"	2706	6"	2381
12"	2859	12"	2279	12"	2640	12"	2479
18"	2948	18"	2296	18"	2392	18"	2299
24"	3001	24"	2184	24"	2706	24"	2196
30"	3563	30"	2102	30"	3398	30"	2268
36"	5919	36"	2138	36"	5028	36"	2681
42"	7336	42"	AR	42"	8834	42"	3510
48"	4383	48"		48"	out of reach	48"	3662
54"		54"		54"		54"	out of reach
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: _____

VP-04B

KNUDSEN

BOREHOLE LOG

LOGGING CREW: Ron Jacobs, Terry Herman, Jim Smith, Dave Beyer

SHEET _____ OF _____ PAGE 7

DATE: 3-27-89

PROPERTY ID: DIA-616

INSTRUMENT ID NO. Lud 2220* 31975/44-10* 19878

AREA: _____

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: *21 1160,396		HOLE ID: *22 1128,416		HOLE ID: *23 0996,466		HOLE ID: *24 0965,576	
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	2535	SURFACE	2797	SURFACE	2786	SURFACE	2716
0"	2933	0"	2826	0"	2783	0"	2779
6"	2482	6"	2532	6"	2339	6"	2440
12"	2740	12"	2843	12"	2381	12"	2436
18"	2557	18"	2674	18"	2174	18"	2103
24"	2902	24"	3102	24"	2677	24"	1908
30"	4024	30"	4954	30"	3852	30"	1971
36"	4871	36"	6788	36"	6130	36"	1923
42"	4955	42"	6922	42"	6394	42"	1973
48"	4773	48"	out of reach	48"	3813	48"	2020
54"	out of reach	54"		54"	2461	54"	2004
60"		60"		60"	2208	60"	2190
66"		66"		66"		66"	2210
72"		72"		72"		72"	out of reach
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"		90"	
96"		96"		96"		96"	

REMARKS: _____

VP-04B

KNUDSEN

BOREHOLE LOG

LOGGING CREW: Ron Jacobs, Terry Herman, Jim Smith, Dave Beyer

SHEET _____ OF _____ PAGE 8

DATE: 3-27-89

PROPERTY ID: DU-616

INSTRUMENT ID NO. WD 2220 # 31975/44-10.1988

AREA: _____

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: #25 0353,561 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #26 2113,041 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #27 1192031 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #28 1167,096 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	2772	SURFACE	5146	SURFACE	3100	SURFACE	2528
0"	2762	0"	6435	0"	4045	0"	3093
6"	2201	6"	12325	6"	6795	6"	3098
12"	2046	12"	23071	12"	11680	12"	4352
18"	1932	18"	31022	18"	24389	18"	8341
24"	2376	24"	A.R	24"	36314	24"	15506
30"	2793	30"		30"	22444	30"	19483
36"	3857	36"		36"	13440	36"	21036
42"	2967	42"		42"	12119	42"	24065
48"	2131	48"		48"	AR.	48"	Out of reach
54"	1980	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: _____

VP-04B

BOREHOLE LOG

LOGGING CREW: Ron Jacobs, Terry Herman
Jim Smith, Dave Beyer

SHEET _____ OF _____ PAGE 9

DATE: 3-27-89

PROPERTY ID: DU-1616

INSTRUMENT ID NO. Lud 2220 #31975 / 44-10 #19878

AREA: _____

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: #29 1159.00R TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #30 0+85.07L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #31 0+55.15L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #32 0+49.11L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	2541	SURFACE	4188	SURFACE	4727	SURFACE	8000
0"	2429	0"	6394	0"	3380	0"	7211
6"	1993	6"	13904	6"	4010	6"	9555
12"	2488	12"	17567	12"	5802	12"	11797
18"	3439	18"	30824	18"	7949	18"	12880
24"	5702	24"	42287	24"	8808	24"	13844
30"	8744	30"	59880	30"	AR	30"	12892
36"	9306	36"	A.R	36"		36"	12468
42"	9515	42"		42"		42"	11671
48"	A R	48"		48"		48"	11820
54"		54"		54"		54"	out of reach
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: _____

VP-04B

BOREHOLE LOG

LOGGING CREW: Ron Jacobs, Terry Herman
Jim Smith, Dave Beyer

SHEET _____ OF _____ PAGE 10

DATE: 3-27-89

PROPERTY ID: DU-1616

INSTRUMENT ID NO. Ludl 2228 #31975 44/44-10 #19878

AREA: _____

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: #33 6623,6628 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #34 0+43,35R TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #35 0+71,39L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #36 4+35,17L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	36664	SURFACE	2534	SURFACE	5526	SURFACE	2642
0"	31696	0"	2744	0"	62662	0"	2966
6"	4844	6"	2328	6"	12123	6"	2809
12"	5663	12"	2554	12"	19788	12"	2984
18"	6027	18"	2761	18"	27246	18"	3340
24"	66683	24"	2756	24"	42435	24"	3586
30"	5305	30"	2441	30"	54890	30"	3466
36"	3970	36"	AR	36"	55398	36"	3568
42"	3223	42"		42"	AR	42"	4402
48"	out of reach	48"		48"		48"	AR
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: _____

BOREHOLE LOG

LOGGING CREW: Ron Jacobs, Terry Herman
Jim Smith Dave Beyer

SHEET _____ OF _____ PAGE 11

DATE: 3-29-89

PROPERTY ID: DU-1616

INSTRUMENT ID NO. Lud 2220 #31975/44-40 #PR78

AREA: _____

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: #37 5+11, 29L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #38 5+39, 14R TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #39 3+89 16R TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #40 3+70, 04L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	2382	SURFACE	2203	SURFACE	2310	SURFACE	26660
0"	2439	0"	2570	0"	2398	0"	2891
6"	2282	6"	2304	6"	1954	6"	2702
12"	2208	12"	2694	12"	1643	12"	3290
18"	2199	18"	2803	18"	1478	18"	3374
24"	2267	24"	2277	24"	AR	24"	3434
30"	2452	30"	AR	30"		30"	3413
36"	2575	36"		36"		36"	3362
42"	2561	42"		42"		42"	3124
48"	AR	48"		48"		48"	3495
54"		54"		54"		54"	3696
60"		60"		60"		60"	AR
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: _____

VP-04B

BOREHOLE LOG

LOGGING CREW: Ron Jacobs, Terry Herman, Jim Smith, Dave Beyer

SHEET _____ OF _____ PAGE 12

DATE: 3-29-88

PROPERTY ID: DU-1616

INSTRUMENT ID NO. Lud 2220 #31975 / 4410 19878

AREA: _____

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: #41 3+47,0258 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #42 3+57,0258 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #43 3+44,316 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #44 , 3+88, 274 TIME DRILLED: _____ TIME LOGGED: _____ SO L TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	2561	SURFACE	3645	SURFACE	2638	SURFACE	2834
0"	1470	0"	3079	0"	2481	0"	2812
6"	2283	6"	2218	6"	2203	8"	2262
12"	2043	12"	2145	12"	2402	12"	2206
18"	1901	18"	1929	18"	2457	18"	2056
24"	1943	24"	1839	24"	2607	24"	1980
30"	1964	30"	1801	30"	2636	30"	2047
36"	1778	36"	1889	36"	3263	36"	2148
42"	1733	42"	AR	42"	3998	42"	2136
48"	AR	48"		48"	2709	48"	2179
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: _____

BOREHOLE LOG

LOGGING CREW: Ron Jacobs, Derek Workman

SHEET _____ OF _____ PAGE 13

DATE: 4-11-89

PROPERTY ID: DY 616

INSTRUMENT ID NO. Lud 2220 #3975 / 44-10 19878

AREA: _____

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: #45 190,37L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #46 4+45,4DL TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #47 4+60,24L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #48, 4+75 25L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	2989	SURFACE	2941	SURFACE	2757	SURFACE	2573
0"	2801	0"	2813	0"	2846	0"	2632
6"	2225	6"	2254	6"	2570	6"	2327
12"	2186	12"	2298	12"	2631	12"	2369
18"	2238	18"	2266	18"	2628	18"	2427
24"	2347	24"	2261	24"	3085	24"	2510
30"	2212	30"	2377	30"	3400	30"	2588
36"	1969	36"	2246	36"	AR	36"	2716
42"	1993	42"	2376	42"		42"	2706
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: _____

VP-04B

BOREHOLE LOG

LOGGING CREW: Ron Jacobs, Derek Workman

SHEET _____ OF _____ PAGE 14

DATE: 4-11-89

PROPERTY ID: DU 616

INSTRUMENT ID NO. Lud 2220 31975/44-ID 19878

AREA: _____

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: #49 4461,06E TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #50 4520,00E TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #51 4446,16E TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #52 4431,00E TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	2950	SURFACE	3093	SURFACE	2917	SURFACE	2796
0"	2985	0"	2633	0"	3169	0"	3283
6"	2528	6"	2951	6"	2712	6"	3224
12"	2893	12"	3564	12"	2622	12"	3483
18"	3219	18"	4241	18"	2662	18"	3713
24"	3215	24"	4378	24"	2535	24"	AR
30"	2866	30"	4577	30"	3541	30"	
36"	AR	36"	3774	36"	AR	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: _____

VP.04B

BOREHOLE LOG

LOGGING CREW: Ron Jacobs, Derek Workman

SHEET _____ OF _____ PAGE 15

DATE: 4-11-89

PROPERTY ID: DU-616

INSTRUMENT ID NO. LWD 2220 #31975 / 44-10 19878

AREA: _____

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: #53 4132,05R TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #54 4141,01L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #55 3152, 5L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #56 4167,45L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	3081	SURFACE	2848	SURFACE	3151	SURFACE	2815
0"	3081	0"	3135	0"	3242	0"	2746
6"	3167	6"	2732	6"	2855	6"	2318
12"	3657	12"	2817	12"	3121	12"	2310
18"	3724	18"	2924	18"	3286	18"	2423
24"	3338	24"	2931	24"	3487	24"	2521
30"	AR	30"	3034	30"	3390	30"	2372
36"		36"	2867	36"	3060	36"	2854
42"		42"		42"	2908	42"	
48"		48"		48"	2907	48"	
54"		54"		54"	2902	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: _____

VP-04B

BOREHOLE LOG

LOGGING CREW: Ron Jacobs, Derek Workman

INSTRUMENT ID NO. Lud 2220 #31975/44-10 #19878

SHEET _____ OF _____ PAGE 16

DATE: 4-11-89

PROPERTY ID: DU 6116

AREA: _____

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: #57 4Ha2,84 TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #58 3158,04L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #59 3B0,2L TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #60 2H3,09R TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	2434	SURFACE	2767	SURFACE	2487	SURFACE	2822
0"	2581	0"	2795	0"	3074	0"	3491
6"	2500	6"	2617	6"	2159	6"	3237
12"	2700	12"	2463	12"	2347	12"	3303
18"	2712	18"	2120	18"	2961	18"	3325
24"	2918	24"	2501	24"	3384	24"	AR
30"	2946	30"	2194	30"	3161	30"	
36"	3004	36"	A.R.	36"	AR	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: _____

VP-04B

BOREHOLE LOG

LOGGING CREW: Ron Jacobs, Derek Workman

SHEET _____ OF _____ PAGE 17

DATE: 4-19-89

PROPERTY ID: DU 6116

INSTRUMENT ID NO. Ludl 2226 #31975/44-46 19878

AREA: _____

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: #61 -1+43.3R TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #62 -55/38R TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #63 -1+62.13R TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____		HOLE ID: #64 -1+54.13R TIME DRILLED: _____ TIME LOGGED: _____ SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE	5732	SURFACE	4130	SURFACE	3424	SURFACE	3051
0"	5460	0"	4415	0"	3603	0"	2762
6"	5752	6"	4209	6"	3738	6"	2388
12"	5154	12"	3688	12"	3244	12"	2324
18"	4446	18"	3198	18"	2566	18"	1832
24"	3220	24"	2782	24"	2350	24"	2152
30"	2635	30"	2695	30"	AR	30"	2161
36"	2351	36"	2164	36"		36"	2246
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: _____

VP-04B

No Deed Exists For This Property

(State Owned Property)

APPENDIX B

APPLICATION OF SUPPLEMENTAL STANDARDS

DEPARTMENT OF ENERGY/STATE AND OWNER COMMENTS

ENGINEERS
AND
CONSTRUCTORS

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

HEADQUARTERS OFFICE
ONE ERIEVIEW PLAZA
CLEVELAND, OHIO U.S.A. 44114
PHONE: (216) 523-5600/TELEX: 985542

REPLY TO: MK-FERGUSON COMPANY
REMEDIAL ACTIONS
CONTRACTOR-UMTRA PROJECT
P.O. BOX 9136
ALBUQUERQUE, NEW MEXICO U.S.A. 87119

June 7, 1989

Edward L. Bischoff
UMTRAP Program Manager
Colorado Department of Health
4210 East 11th Avenue
Denver, CO 80220

SUBJECT: Use of Supplemental Standards - DU-616

Dear Mr. Bischoff:

In accordance with the Uranium Mill Tailings Radiation Control Act (UMTRA) of 1978, Public Law 95-604, the Department of Energy (DOE) included property (DU-616), a portion of which you own, for remedial action. Further evaluation of the contamination on your property has been performed and a recommendation has been proposed to excavate the contaminated material on the east half of the property, between Lightner Creek and U.S. Highway 160 to a depth of 18" and backfill over the remaining contaminated material. On the west half of the property a recommendation has been proposed to leave the contaminated material on the steep banks of Lightner Creek in place. These recommendations are proposed per the Code of Federal Regulations 40 CFR 192, Supplemental Standards. We are basing the recommendation on the criteria presented below. A Radiological and Engineering Assessment (REA) for DU-616 has been included for your use in solicitation of CDH comments/concurrence.

The Radiological and Engineering Assessment (REA) performed on the property (DU-616) has revealed that radioactive contaminated materials are present over the entire areal extent of the east half of the property. Contamination in this area is present in most areas to a depth of 20'. The contamination on the bank of Lightner Creek, on the west half of the property varies in depth from 6 to 24".

Because of the cost involved in cleaning up the material, coupled with the low health hazard, we are recommending that the contaminated material in these areas be left in place. This action is permitted under Title 40, Code of Federal Regulations, Section 192.21 and 22. The sections of the EPA Standards, which are established for the cleanup of Uranium mill tailings, allow residual radioactive materials to remain in place when certain conditions are met. The criteria defining when remedial action need not take place (Supplemental Standards) are as follows:

(1) The estimated cost of remedial action is unreasonably high relative to the long-term benefits, and the residual radioactive materials do not pose a clear present or future hazard.

The application of Supplemental Standards requires that the remedial action remove as much of the contaminated material as is reasonably possible. To meet this goal, contaminated materials on the east half of the property will be excavated to a depth of 18" and backfilled. Also a small area on the west property line will be excavated and backfilled.

After the proposed remedial action occurs and the eastern area has been covered with 18" of backfill general area radiation levels will range from 14 to 30 micro R/hr. Background for the Durango area is 14 micro R/hr. If a person spent 8 hours a day, 5 days a week, for 50 weeks in a 30 micro R/hr radiation field, he would receive about 60 millirem of gamma exposure in one year. This is about one-tenth the amount allowed the general public (10 CFR 20.105). The actual amount of contaminated material that will remain in place after remedial action is approximately 16,500 cubic yards.

In compliance with the EPA regulations found in the Code of Federal Regulations 40 192.21, we solicit your comments concerning this action. We are attaching a copy of the applicable sections of the Code of Federal Regulations for your convenience in responding to this proposed action. To comply with EPA regulations, we must receive a written response with your concurrence/comments. We have included a self-addressed, postage-paid envelope for your convenience. We request your response by June 23, 1989.

If you have any questions or need additional information concerning this matter, please call either Rob Pommerening of my staff at 1-800-443-4379, or Ms. Jolene Garcia of the U.S. Department of Energy at (505) 846-1238.

Sincerely,

MK-Ferguson Company

For J.G. Oldham
Project Director

JGO/RAP/RDJ/ss
Enclosures
cc: w/o enclosures:
G.A. Franz, CDH
J. Garcia, DOE/UMTRA
C. Moore, TAC/UMTRA
Document Control

bcc: w/o enclosures:
M. Thomson - DUR
R. Stearns
R. Cooney
R. Pommerening
R. Jacobs
File - EDT

STATE OF COLORADO

COLORADO DEPARTMENT OF HEALTH

4210 East 11th Avenue
Denver, Colorado 80220
Phone (303) 320-8333

Roy Romer
Governor

Thomas M. Vernon, M.D.
Executive Director

July 17, 1989

J.G. Oldham
UMTRA Project Director
MK-Ferguson Company
P.O. Box 9136
Albuquerque, New Mexico 87119

Re: Radiological and Engineering Assessment Report - Vicinity Property DU-616, dated June 8, 1989 Supplemental Standards Application for Durango. File DUR-XXI

Dear Mr. Oldham:

At your request, herin are our comments on the Supplemental Standards Application for Vicinity Property DUR-616. Our comments are provided in part because the State of Colorado is the landowner of this area. The application covers three areas north of the processing area and to the north of Lightner Creek. Areas A and B are steep areas located adjacent to Lightner Creek. Area A will be excavated and then backfilled to a depth of 18 inches. No work is planned in Area B because of the steep slope and presence of large riprap. Area C appears to be in a flat area somewhat distant from the creek, and it contains a non-permanent structure. No description is presented for the proposed work here.

Area A: We concur with the plans for this area with one caution. It may be necessary to reinforce the toe of this slope with riprap or other materials to prevent erosion and undercutting of the reworked slope by Lightner Creek.

Area B: The justification is adequate for this area. We concur with the proposed plan.

Area C: No description or justification for supplemental standards was given for the work proposed here. This area appears to be flat, useable, and covered by a temporary structure. We request either that this area be cleaned up to usual radiological standards due to its present and future use potential, or the contractor provide a good description and justification for the proposed work.

Pat Martinek of my staff will be visiting the site next week. If she has any additional comments, I will forward them to you next week.

If you have any questions, please contact Pat at (303) 331-4828.

Sincerely,

Edward L. Bischoff
UMTRA Project Manager
Hazardous Materials and
Waste Management Division

ELB:lh

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

REVIEW COMMENTS

UMTRA Project No. DE-AC04-83AL18796

Date July 19, 1989

Page 1 of 1

Site Name Durango Site

Site No. DU-616

Document Reviewed

Radiological and Engineering Assessment (RE.)

Reference (Drwg. No., Spec. Sec., Etc.)	Reviewer	Comment	Resolution
	CDH	Area A: We concur with the plans for this area with one caution. It may be necessary to reinforce the toe of this slope with riprap or other materials to preevnt erosion and undercutting of the reworked slope by Lightner Creek.	Agreed - As called for in Note 8 and Section A of Drawing DU-616-020, Filter Fabric and Rip Rap will be placed on all excavated slopes along Lightner Creek, conforming to the State of Colorado Standard specification for road and bridge construction.
	CDH	Area B: Justification is adequate for this area. We concur with the proposed plan.	Area B: As part of the site Remedial Action will be verified as discussed in the meeting between the RAC, DOE and CDH representatives.
	CDH	Area C: No description or justification for supplemental standards was given for the work proposed here. area appears to be flat, useable, and covered by a temporary structure. We request either that this area be cleaned up to usual radiological standards due to its present and future use potential, or the contractor provide a good description and justification for the proposed work.	Area C will be completely cleaned of contaminated material as part of the Site Remedial Action.

2264F

ENGINEERS
AND
CONSTRUCTORS

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

HEADQUARTERS OFFICE
ONE ERIEVIEW PLAZA
CLEVELAND, OHIO U.S.A. 44114
PHONE (216) 523-5600/TELEX 985542

REPLY TO: MK-FERGUSON COMPANY
REMEDIAL ACTIONS
CONTRACTOR-UMTRA PROJECT
P.O. BOX 9136
ALBUQUERQUE, NEW MEXICO U.S.A. 87119

June 7, 1989

Alfred A. Shablo
District Engineer
Colorado Department of Highways
214 West 6th Street
Durango, CO 81301

SUBJECT: Use of Supplemental Standards - DU-616

Dear Mr. Shablo:

In accordance with the Uranium Mill Tailings Radiation Control Act (UMTRA) of 1978, Public Law 95-604, the Department of Energy (DOE) included property (DU-616), a portion of which you own, for remedial action. Further evaluation of the contamination on your property has been performed and a recommendation has been proposed to excavate the contaminated material on the east half of the property, between Lightner Creek and U.S. Highway 160 to a depth of 18" and backfill over the remaining contaminated material. On the west half of the property a recommendation has been proposed to leave the contaminated material on the steep banks of Lightner Creek in place. These recommendations are proposed per the Code of Federal Regulations 40 CFR 192, Supplemental Standards. We are basing the recommendation on the criteria presented below. Your comments/concurrence are requested.

The Radiological and Engineering Assessment (REA) performed on the property (DU-616) has revealed that radioactive contaminated materials are present over the entire areal extent of the east half of the property. Contamination in this area is present in most areas to a depth of 20'. The contamination on the bank of Lightner Creek, on the west half of the property varies in depth from 6 to 24".

Because of the cost involved in cleaning up the material, coupled with the low health hazard, we are recommending that the contaminated material in these areas be left in place. This action is permitted under Title 40, Code of Federal Regulations, Section 192.21 and 22. The sections of the EPA Standards, which are established for the cleanup of Uranium mill tailings, allow residual radioactive materials to remain in place when certain conditions are met. The criteria defining when remedial action need not take place (Supplemental Standards) are as follows:

(1) The estimated cost of remedial action is unreasonably high relative to the long-term benefits, and the residual radioactive materials do not pose a clear present or future hazard.

The application of Supplemental Standards requires that the remedial action remove as much of the contaminated material as is reasonably possible. To meet this goal, contaminated materials on the east half of the property will be excavated to a depth of 18" and backfilled. Also a small area on the west property line will be excavated and backfilled.

After the proposed remedial action occurs and the eastern area has been covered with 18" of backfill general area radiation levels will range from 14 to 30 micro R/hr. Background for the Durango area is 14 micro R/hr. If a person spent 8 hours a day, 5 days a week, for 50 weeks in a 30 micro R/hr radiation field, he would receive about 60 millirem of gamma exposure in one year. This is about one-tenth the amount allowed the general public (10 CFR 20.105). The actual amount of contaminated material that will remain in place after remedial action is approximately 16,500 cubic yards.

In compliance with the EPA regulations found in the Code of Federal Regulations 40 192.21, we solicit your comments concerning this action. We are attaching a copy of the applicable sections of the Code of Federal Regulations for your convenience in responding to this proposed action. To comply with EPA regulations, we must receive a written response with your concurrence/comments We have included a self-addressed, postage-paid envelope for your convenience. We request your response by June 23, 1989.

If you have any questions or need additional information concerning this matter, please call either Rob Pommerening of my staff at 1-800-443-4379, or Ms. Jolene Garcia of the U.S. Department of Energy at (505) 846-1238.

Sincerely,

MK-Ferguson Company

R F Stearns

For J.G. Oldham
Project Director

JGO/RAP/RDJ/ss
Enclosures
cc: w/o enclosures:
J. Garcia, DOE/UMTRA
C. Moore, TAC/UMTRA
Document Control

bcc: w/o enclosures:
M. Thomson - DUR
R. Stearns
R. Cooney
R. Pommerening
R. Jacobs
File - EDT

DU-616

STATE OF COLORADO

FILE

DEPARTMENT OF HIGHWAYS
District V
214 West 6th Street
Durango, Colorado 81301
(303) 259-1241

A.A. SHABLO
DISTRICT ENGINEE

June 22, 1989

MK-FERGUSON CO.
ALBUQUERQUE
JUN 26 1989
RECEIVED

J.G. Oldham, Project Director
M.K. Ferguson Company
Remedial Actions
Contractor-UMTRA Project
P.O. Box 9136
Albuquerque, NM 87119

Dear Mr. Oldham:

In reply to your letter of June 7, 1989, we have reviewed the scope of the work that you propose within the Colorado Department of Highways right-of-way along U.S. Highway 160 with Mr. Phil Teaque of your company, and we have no objections to the work, as described by Mr. Teaque.

Any work requiring lane closures or other traffic handling must be done in conformance with the Manual on Uniform Traffic Control Devices.

Should the guardrail located between the approach to the project site and the bridge over the Animas River need to be replaced following your work, it will need be done in accordance with the attached M Standard.

Please let me know if you need any additional information.

Sincerely,

Jon T. Vickers
Maintenance Superintendent

JTV:CJW:jd

cc: Shablo/Watson/File

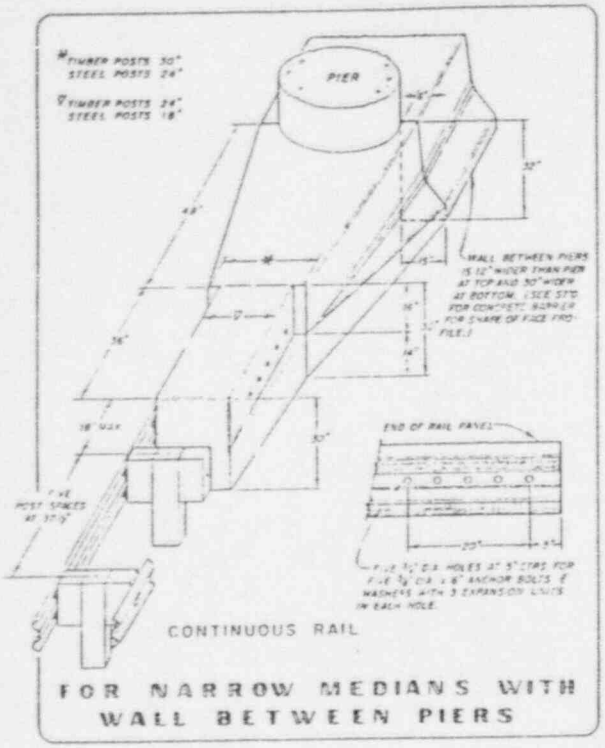
JUN 1989
RECEIVED
MK-FERGUSON
Durango Office
UMTRAP

Init.	Dist.	Info.	Action
	M. THOMSON	✓	
	C. GALLIER	✓	
	D. FAZZAN	✓	
	A. ENGLISH	✓	
	P. TEAQUE	✓	
	K. SEALEY	✓	
	T. MONTGOMERY		
	R. STEELE		
	B. GALLAGHER	✓	
FILE: DU-616 4.9			

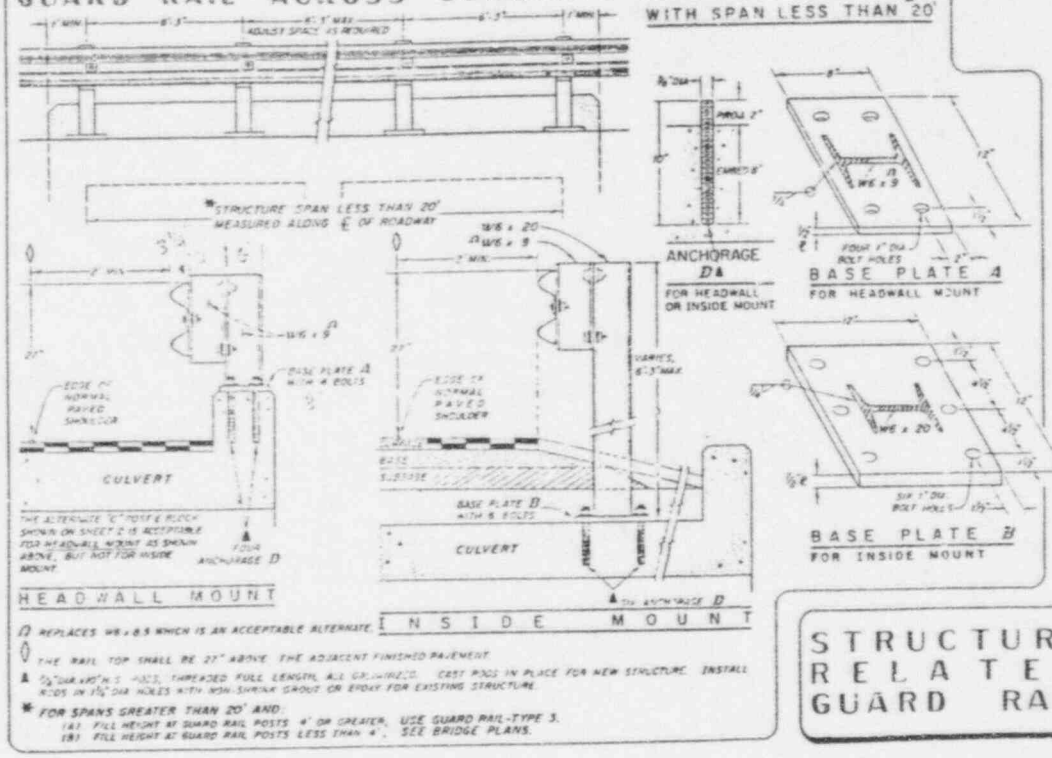
REP	INFO	DIST	REP	INFO	DIST
	✓	JGO			PDC
	✓	RFS			MWH
	✓	REC			RAP
		JBH/CRJ			HRM
		CDW		✓	JSL/MIKE
		JBH			GG/PD
		JJD			JEJ
	✓	MDT			TBS
		JGP			DEW
		DPB			JWS
		SJS/DC			WAZ
					RSW
ORIG. FILE		ST of CO			
WORK FILE		DUR			

STANDARD M-606-1

(SHEET 8)
(JANUARY, 1982)



GUARD RAIL ACROSS CONCRETE BOX CULVERT * WITH SPAN LESS THAN 20'



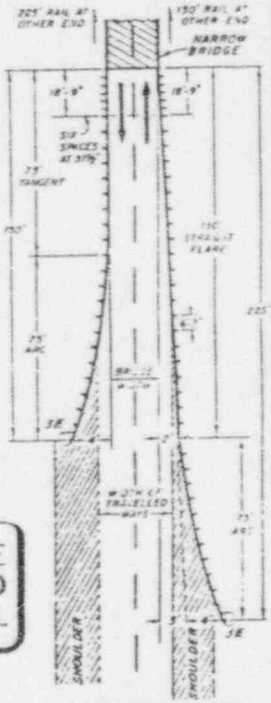
△ REPLACES W8 x 8.5 WHICH IS AN ACCEPTABLE ALTERNATE

◇ THE RAIL TOP SHALL BE 27" ABOVE THE ADJACENT FINISHED PAVEMENT.

▲ 5/8" DIA. ANCHOR RODS, THREADED FULL LENGTH, ALL GALVANIZED. CAST RODS IN PLACE FOR NEW STRUCTURE. INSTALL RODS IN 1 3/4" DIA. HOLES WITH NON-SHRINK GROUT OR EPOXY FOR EXISTING STRUCTURE.

* FOR SPANS GREATER THAN 20' AND:
(A) FILL HEIGHT AT GUARD RAIL POSTS 4' OR GREATER, USE GUARD RAIL-TYPE 3.
(B) FILL HEIGHT AT GUARD RAIL POSTS LESS THAN 4', SEE BRIDGE PLANS.

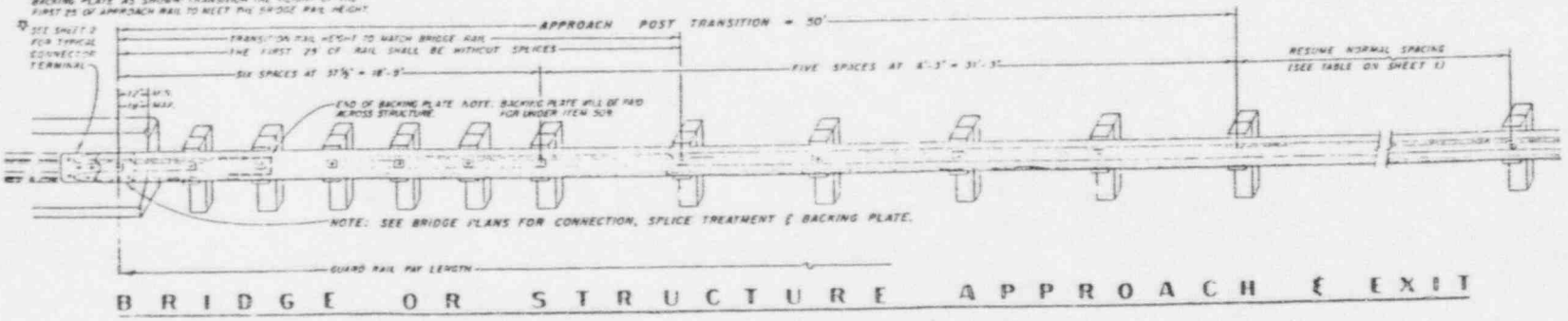
NARROW BRIDGE APPROACH



PAVEMENT MARKING, DELINEATION & SIGNING SHALL BE IN ACCORDANCE WITH MUTCD.

STRUCTURE RELATED GUARD RAIL

▽ IF RAIL CONTINUES ACROSS STRUCTURE, OMIT CONNECTOR TERMINAL AND USE BACKING PLATE AS SHOWN. TRANSITION THE HEIGHT OF THE FIRST 25' OF APPROACH RAIL TO MEET THE BRIDGE RAIL HEIGHT.



BRIDGE OR STRUCTURE APPROACH & EXIT

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS

GUARD RAIL-TYPE 3
W BEAM

3050-89-720

RADIOLOGICAL AND ENGINEERING ASSESSMENT (REA)
Review Form

DOE Location No. DU 6165 Rev. No. 0

RAC

PRIORITY: ☐ ROUTINE ☒ URGENT DATE 6-15-89
REQUESTED RESPONSE BY 6-29-89
COMMENTS: Please note that MK-Ferguson is recommending Supplemental Standards

Roberto Pomo — VP MANAGER
6-15-89 — DATE
CONT. ON ATTACHED SHEET NO. ____

TAC

DATE RECEIVED 6/16/89
☐ RECOMMEND APPROVAL ☑ RECOMMEND APPROVAL AS NOTED BELOW ☐ DO NOT RECOMMEND APPROVAL AS NOTED BELOW

COMMENTS:

cm for Carl Moore — TAC
6/30/89 — DATE
CONT. ON ATTACHED SHEET NO. one

STATE

DATE TRANSMITTED ____
☐ APPROVED ☐ APPROVED AS NOTED ☐ NOT APPROVED AS NOTED

RESPONSE DATE ____ ATTACHED RESPONSE ON SHEET NO. ____

NRC

DATE TRANSMITTED ____
☐ APPROVED ☐ APPROVED AS NOTED ☐ NOT APPROVED AS NOTED

RESPONSE DATE ____ ATTACHED RESPONSE ON SHEET NO. ____

TRIBE

DATE TRANSMITTED ____
☐ APPROVED ☐ APPROVED AS NOTED ☐ NOT APPROVED AS NOTED

RESPONSE DATE ____ ATTACHED RESPONSE ON SHEET NO. ____

DOE-UMTRA

DATE RECEIVED 6/16/89
☒ APPROVED ☒ APPROVED AS NOTED ☐ NOT APPROVED AS NOTED

COMMENTS:

MK-FERGUSON CO.
ALBUQUERQUE
JUL 03 1989
RECEIVED

J. Garcia — DOE VP MANAGER
6/30/89 — DATE
SHEET NO. 1 OF 2

RADIOLOGICAL AND ENGINEERING ASSESSMENT (REA)
Review Form

Date Received: 06/18/89
Date due DOE: 06/29/89

DOE Location No. DU-616

[X] RECOMMEND APPROVAL AS NOTED BELOW

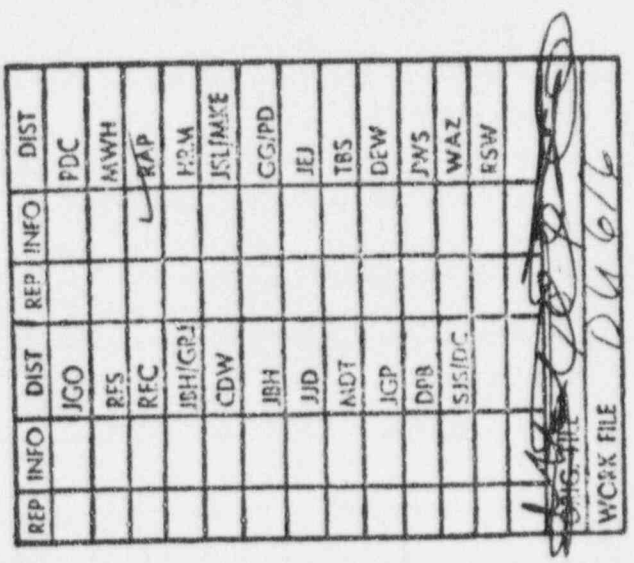
[ ] DO NOT RECOMMEND APPROVAL AS NOTED BELOW

REVIEWED BY: JOHN LONGLEY DATE: 06/29/89

REVIEWED BY: _____ DATE: _____

VP MANAGER: on fa Carol Moore DATE: 6/30/89

PAGE	COMMENT
Page 4	(1) The property should be more clearly identified as the owned by the State of Colorado. The property line in the drawings confuses the fact that it is a division between Highway and Health Department land. A clear definition of property use is also necessary as it may impact future land use. (2) Additional text should be added to state that the riprap in area A will prevent future dispersion of contaminated materials in Lightner creek.



MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

REVIEW COMMENTS

UMTRA Project No. DE-AC04-83AL18796

Date July 19, 1989

Page 1 of 1

Site Name: Durango Site

Site No.: DU-616

Document Reviewed: Radiological and Engineering Assessment (REA)

Reference (Drwg. No., Spec. Sec., Etc.)	Reviewer	Comment	Resolution
	TAC	The property should be more clearly identified as the owned by the State of Colorado. The property line in the drawings confuses the fact that it is a division between Highway and Health Department land. A clear definition of property use is also necessary as it may impact future land use.	MK-Ferguson has re-surveyed the property and determined that the highway Right-of-Way and site boundaries are as shown on the REA drawings. There is a problem with the State site property as a private individual is currently residing on a portion of that property. (A portion of the property is Right-of-Way for Highway 160 and a portion is State site.)
	TAC	Additional text should be added to state that the riprap in area A will prevent future dispersion of contaminated materials in Lightner Creek.	As described in Note 8 and shown in section A of drawing DU-616-020, riprap will be placed to insure the integrity of Lightner Creek's sloping bank.

2263F

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY
UMTRA PROJECT OFFICE
P.O. BOX 9136
ALBUQUERQUE, NEW MEXICO 87119