

Appendix D

RAPTOR SURVEY

RAPTOR SURVEY OF THE RIGHT FORK
AND THE
STARPOINT FORK
OF
DEADMAN CANYON, AND STRAIGHT CANYON

FOR

TOWER RESOURCES, INC. - PINNACLE MINE, et. al

TO

AMCA COAL LEASING
Walker Bank 2nd Floor, Room 1
82 West Main
Price, Utah 84501

FROM

CLAYTON M. WHITE
Department of Zoology
Brigham Young University
Provo, Utah 84602

INTRODUCTION

Only scant references to birds in Carbon County are available in the literature and these citations contain even less data on raptors.

Although a variety of raptors breed in the Price area (Dalton, et al. 1978) their distribution or abundance is often spotty and poorly known. Frequently, raptors will accumulate in one region to breed because of specific environmental conditions but may be absent from a seemingly identical or at least similar adjacent region. This phenomenon is not completely understood nor is the lack of them from seemingly suitable habitat understood. It is apparently related in some fashion to the productivity of the land (Newton, 1976). Such situations are mentioned because they relate to that seen in Right Fork, Starpoint and Straight Canyons. Outwardly, these three canyons, especially Straight Canyon, appears to have excellent physiographic or floral features that support good raptor populations. However, after spending five days working in these canyons, we found no currently active raptor nests.

METHODS

Right Fork, Starpoint and Straight Canyons were examined on foot on five different occasions in the months of April (2 days) May (1 day) and June (1 day). Each canyon was examined from about a 2 km radius around the proposed mine portals although only a 1 km survey was required.

Each canyon was surveyed on five different occasions; 29-30 April, 9 May, 23 May and 6 June. All observations were chronicled and recorded.

HABITAT

The major floral types were sage, pinyon-juniper, box elder, riparian forms, Douglas fir and ponderosa pine. The stream side (riparian) vegetation was seemingly the best nesting habitat for such species as sharp-shinned hawk, Cooper's hawk and long-eared owl. The fir and pine habitat was seemingly best for goshawk and buteos while the surrounding cliff structures is that habitat most suitable to eagles, falcons and great-horned owls. All these habitat were specifically searched.

FINDINGS

Only one raptor nest was found. That nest was in a poplar tree along the streamside in Right Fork and appeared to be of a Cooper's hawk though it had not been used recently. The nest was farther than 1 km downstream from the proposed mine portal.

On the following pages are the observations by date and locality of all raptors seen during this study.

SPECIFIC OBSERVATIONS

April 29, 1980

Right Fork

1. two golden eagles soaring above canyon
2. American kestrel hunting
3. adult red-tailed hawk interacting with an adult Cooper's hawk.

Starpoint Canyon

1. one immature red-tailed hawk crusing over canyon.

April 30, 1980

Straight Canyon

1. one golden eagle sitting on rocks in middle of canyon about 2 km up the canyon from the mouth.
2. two adult golden eagles in courtship flight about 2 km down the canyon from the mine.

May 9, 1980

Straight Canyon

1. American kestrel soaring with food near mine area.
2. turkey vulture soaring over the canyon.

May 9, 1980 (cont.)

Starpoint Canyon

1. adult Cooper's hawk flying high over canyon

May 23, 1980

Right Fork

1. adult sharp-shinned hawk along the stream near the construction area.

Starpoint Canyon

1. American kestrel hunting near the mine area

Straight Canyon

1. golden eagle perched on cliffs near mouth of canyon
2. Cooper's hawk hunting near top of mountain about 0.9 km from the mine portal site.

June 6, 1980

Straight Canyon

1. pair of American kestrels 0.5 km from mine portal
2. two other kestrels near head of canyon
3. pair golden eagles soaring near mouth of canyon.
4. regurgitation pellet of owl (size suggests that of a great-horned owl) about 1.0 km from mine site.

June 6, 1980 (cont.)

Starpoint Canyon

1. kestrel in middle portion of canyon.

CONCLUSIONS, ASSESSMENT, AND RECOMMENDATIONS

Based on our findings one can suggest that (1) a pair of golden eagles is using Straight Canyon as a portion of their hunting range and part of that range overlaps the 1 km radius around the mine portal, (2) a pair of American kestrels nest somewhere near the middle portion of Straight Canyon and may occur near the mine portal, (3) an additional pair nests in Straight Canyon, and (4) perhaps the kestrels from Straight Canyon hunt in Starpoint Canyon or another pair occurs in Starpoint.

Clearly, none of the canyons has a modest density of raptors. Their densities may be called poor. We were surprised not to see more buteos than we did. Since one pair of red-tails were interacting with a Cooper's hawk it can be suggested that the territory of the red-tails overlaps part of Starpoint Canyon. We have no conclusive data to show, however, that in fact they were defending a breeding territory.

From the distributions of the observations it can be suggested that no raptors nest within 1 km of any of the proposed mine portal sites. If in subsequent years some nests are found close to the portals they will most likely be that of an American kestrel, Cooper's hawk, or great-horned owl.

It is recommended that additional studies on raptors are not necessary in these three canyons. Further, any species that might be found nesting within 1 km of the mine portal will probably be a common and wide spread species eg. kestrel. It is recommended that no special effort be undertaken to make additional searches for golden eagle nests since they will probably be greater than 1 km from the proposed mine portals.

LITERATURE CITED

Dalton, L. B., et al. 1978. Vertebrate species of southeastern Utah.

Publ. 78-16, Utah Division Wildlife Resources, 68 pp.

Newton, I. 1976. Breeding of sparrowhawks in different environments.

J. Animal. Ecol. 45:831-49.

Appendix E

COAL QUALITY & DRILL HOLE LOGS

Tower Resources, Inc.

ABERDEEN SEAM:

A. HEATING RANGE (BTU'S/LB.):

AS RECEIVED

10,967 - 13,434

DRY BASIS

11,058 - 13,914

B. AVERAGE HEAT (BTU'S/LB.):

AS RECEIVED

12,517

DRY BASIS

13,138

C. MINERAL ANALYSIS OF ASH:

	<u>IGNITED BASIS</u> <u>% WEIGHT</u>
PHOS, PENTOXIDE, P_2O_5	0.17
SILICA, SiO_2	53.92
FERRIC OXIDE, Fe_2O_3	5.0
ALUMINA, Al_2O_3	13.53
TITANIA, TiO_2	0.91
LIME, CaO	11.13
MAGNESIA, MgO	3.30
SULFUR TRIOXIDE, SO_3	9.26
POTASSIUM OXIDE, K_2O	0.35
SODIUM OXIDE, Na_2O	0.99
UNDETERMINED	<u>1.44</u>
	100.00

D. PROXIMATE ANALYSIS:

	<u>AS RECEIVED</u>		<u>DRY BASIS</u>	
	\bar{x}	σ	\bar{x}	σ
% MOISTURE	4.65	1.57	-----	-----
% ASH	7.63	5.73	7.93	5.80
% VOLATILE MATTER	38.63	2.21	40.54	2.55
% FIXED CARBON	49.09	3.46	51.53	3.71
% SULFUR	0.60	0.29	0.62	0.30
BTU/LB.	12,517	805.34	13,138	875.35

Tower Resources, Inc.

E. ULTIMATE ANALYSIS (\bar{X}):

	<u>AS RECEIVED</u>	<u>DRY BASIS</u>
% MOISTURE	5.16	-----
% CARBON	70.03	73.85
% HYDROGEN	4.82	5.09
% NITROGEN	1.44	1.49
% CHLORINE	0.03	.03
% SULFUR	0.64	0.68
% ASH	7.07	7.46
% OXYGEN (DIFF.)	<u>10.81</u>	<u>11.40</u>
	100.00	100.00

F. WATER SOLUBLE ALKALIES:

$$\text{Na}_2\text{O} = 6.0 \times 10^{-5}\%$$

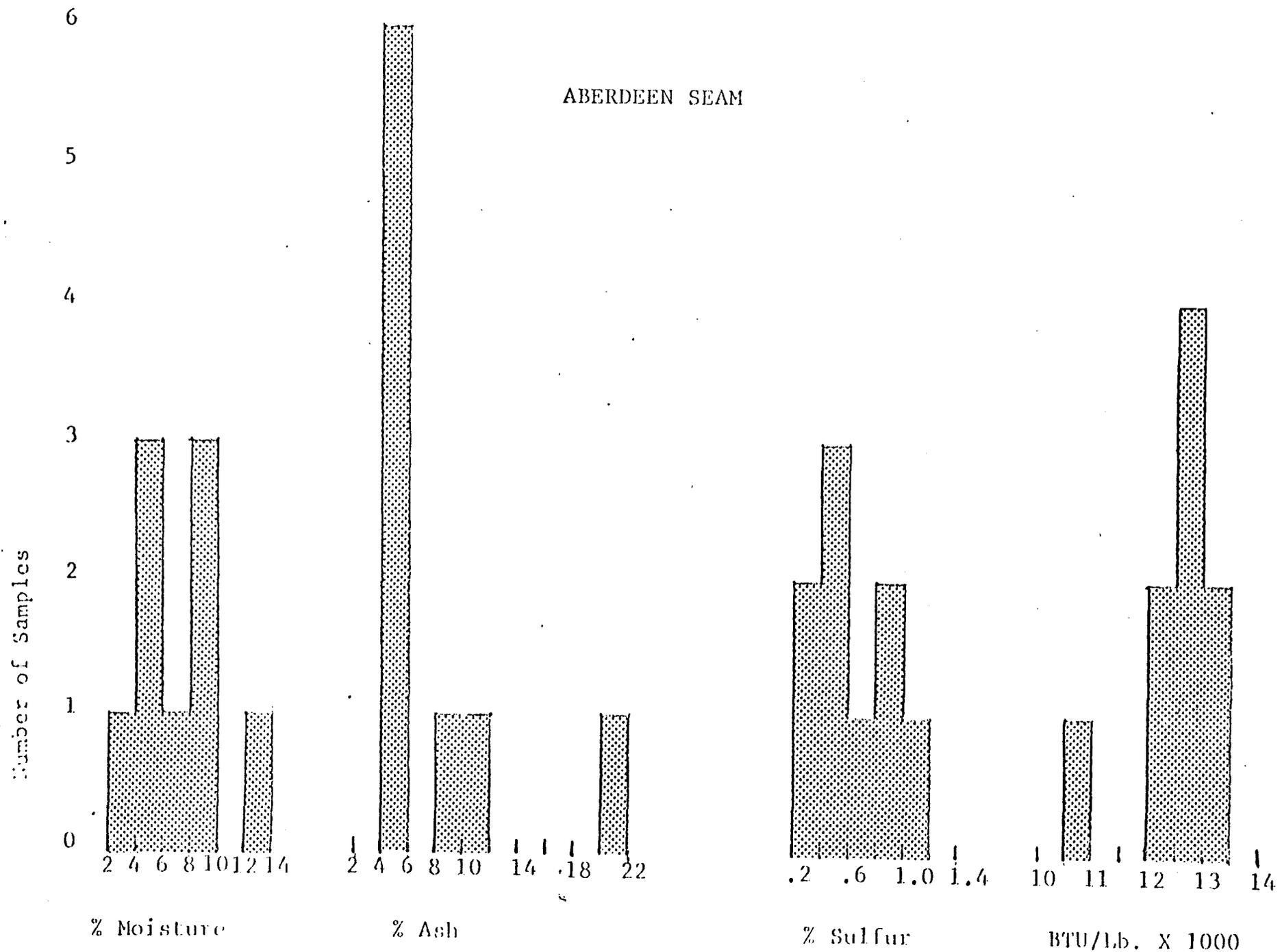
G. ALKALI AS Na_2O OF THE ASH = 0.99%

H. FUSION TEMPERATURE OF ASH ($^{\circ}\text{F}$):

	<u>REDUCING</u>	<u>OXIDIZING</u>
INITIAL DEFORMATION	2150	2185
SOFTENING (H=W)	2210	2220
SOFTENING (H= $\frac{1}{2}$ W)	2280	2305
FLUID	2370	2435

I. GRINDABILITY (HARDGROVE INDEX) = 45.2

ABERDEEN SEAM



Tower Resources, Inc.

GILSON SEAM:

A. HEATING RANGE (BTU'S/LB.):

AS RECEIVED

11,944 - 12,542

DRY BASIS

12,419 - 13,085

B. AVERAGE HEAT (BTU'S/LB.):

AS RECEIVED

12,124

DRY BASIS

12,777

C. MINERAL ANALYSIS OF ASH:

	<u>IGNITED BASIS</u> <u>% WEIGHT</u>
PHOS, PENTOXIDE, P_2O_5	0.09
SILICA, SiO_2	51.56
FERRIC OXIDE, Fe_2O_3	3.98
ALUMINA, Al_2O_3	25.70
TITANIA, TiO_2	0.74
LIME, CaO	7.41
MAGNESIA, MgO	1.50
SULFUR TRIOXIDE, SO_3	6.94
POTASSIUM OXIDE, K_2O	0.50
SODIUM OXIDE, Na_2O	0.51
UNDETERMINED	1.07
	100.00

D. PROXIMATE ANALYSIS:

	<u>AS RECEIVED</u>		<u>DRY BASIS</u>	
	\bar{x}	σ	\bar{x}	σ
% MOISTURE	5.07	1.32	-----	-----
% ASH	8.54	2.60	8.95	2.66
% VOLATILE MATTER	36.92	1.88	38.99	2.22
% FIXED CARBON	50.00	1.95	52.79	1.76
% SULFUR	0.60	0.11	0.63	0.13
BTU/LB.	12,124	263.76	12,777	309.01

Tower Resources, Inc.

E. ULTIMATE ANALYSIS (\bar{X}):

	<u>AS RECEIVED</u>	<u>DRY BASIS</u>
% MOISTURE	5.76	-----
% CARBON	68.88	73.09
% HYDROGEN	4.72	5.01
% NITROGEN	1.39	1.47
% CHLORINE	0.01	0.01
% SULFUR	0.61	0.65
% ASH	7.93	8.42
% OXYGEN (DIFF.)	<u>10.70</u>	<u>11.35</u>
	100.00	100.000

F. WATER SOLUBLE ALKALIES:

$$\text{Na}_2\text{O} = 5.0 \times 10^{-3}\%$$

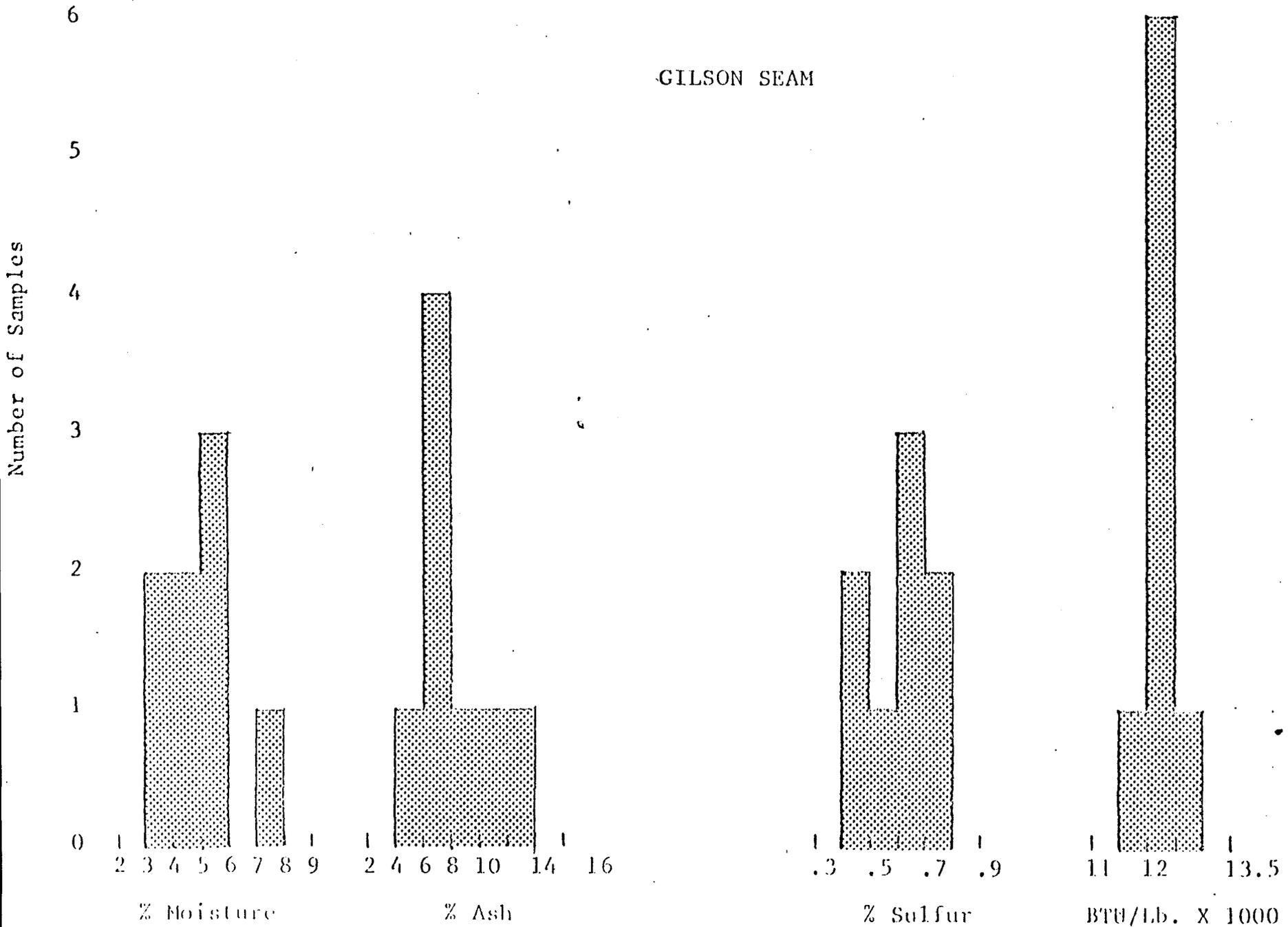
G. ALKALI AS Na_2O OF THE ASH: = 0.51%

H. FUSION TEMPERATURES OF ASH ($^{\circ}\text{F}$):

	<u>REDUCING</u>	<u>OXIDIZING</u>
INITIAL DEFORMATION	2380	2410
SOFTENING (H=W)	2460	2470
SOFTENING (H= $\frac{1}{2}$ W)	2550	2560
FLUID	2590	2620

I. GRINDABILITY (HARDGROVE INDEX) = 47.2

GILSON SEAM



Tower Resources, Inc.

LOWER SUNNYSIDE SEAM:

A. HEATING RANGE (BTU's/LB.):

<u>AS RECEIVED</u>	<u>DRY BASIS</u>
12,025 - 12,549	12,858 - 13,198

B. AVERAGE HEAT (BTU'S/LB.):

<u>AS RECEIVED</u>	<u>DRY BASIS</u>
12,276	12,969

C. MINERAL ANALYSIS OF ASH:

	<u>IGNITED BASIS</u> <u>% WEIGHT</u>
PHOS, PENTOXIDE, P ₂ O ₅	1.11
SILICA, SiO ₂	58.05
FERRIC OXIDE, Fe ₂ O ₃	5.08
ALUMINA, Al ₂ O ₃	18.08
TITANIA, TiO ₂	0.69
LIME, CaO	6.91
MAGNESIA, MgO	1.90
SULFUR TRIOXIDE, SO ₃	5.65
POTASSIUM OXIDE, K ₂ O	0.58
SODIUM OXIDE, Na ₂ O	0.66
UNDETERMINED	<u>1.29</u>
	100.00

D. PROXIMATE ANALYSIS:

	<u>AS RECEIVED</u>		<u>DRY BASIS</u>	
	<u>\bar{x}</u>	<u>σ</u>	<u>\bar{x}</u>	<u>σ</u>
% MOISTURE	5.33	1.15	-----	-----
% ASH	7.64	2.54	8.05	2.60
% VOLATILE MATTER	37.88	1.16	40.02	1.38
% FIXED CARBON	49.15	1.29	51.92	1.52
% SULFUR	0.62	0.11	0.66	--0.11
BTU/LB.	12,276	331.82	12,969	347.84

Tower Resources, Inc.

E. ULTIMATE ANALYSIS (\bar{X}):

	<u>AS RECEIVED</u>	<u>DRY BASIS</u>
% MOISTURE	6.45	-----
% CARBON	68.37	73.09
% HYDROGEN	4.68	5.00
% NITROGEN	1.43	1.53
% CHLORINE	0.03	0.03
% SULFUR	0.66	0.71
% ASH	7.31	7.81
% OXYGEN (DIFF.)	<u>11.07</u>	<u>11.83</u>
	100.00	100.00

F. WATER SOLUBLE ALKALIES:

$$\text{Na}_2\text{O} = 12.0 \times 10^{-5}\%$$

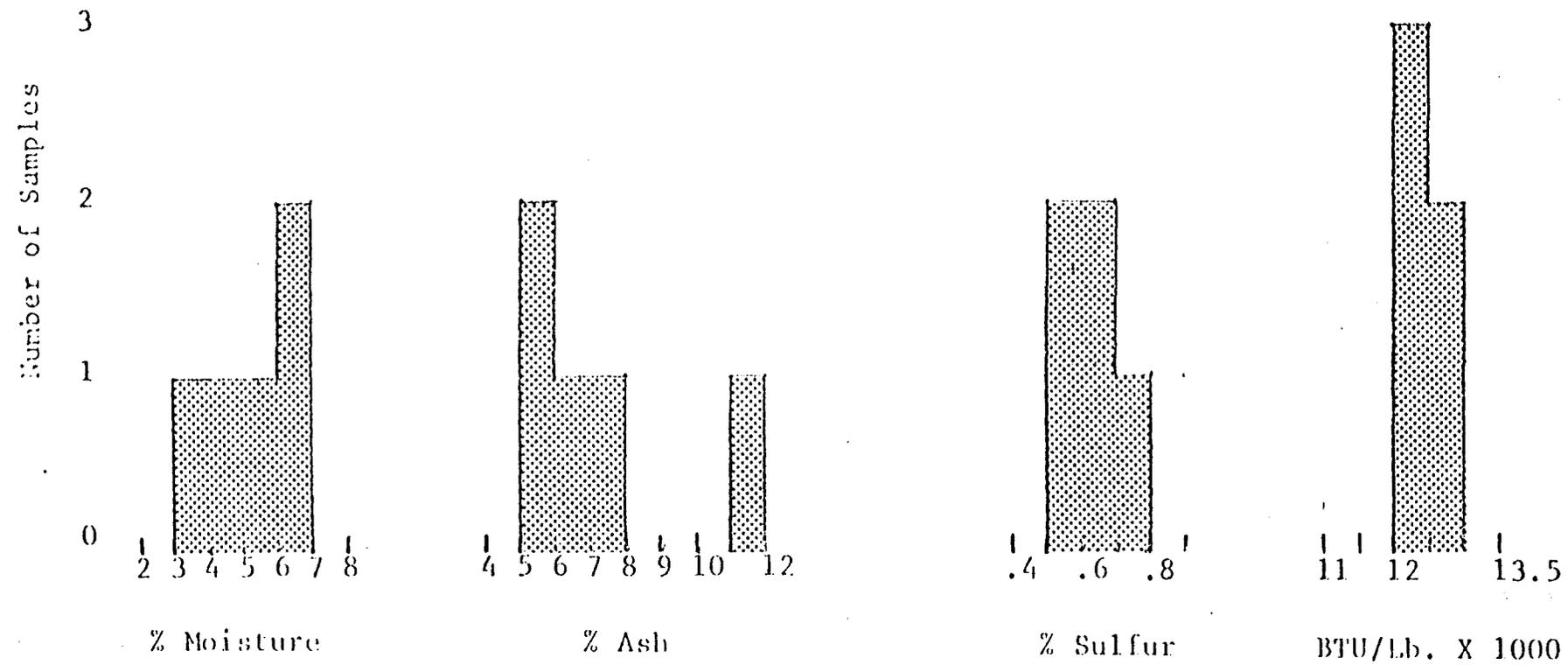
G. ALKALI AS Na_2O OF THE ASH = 0.66%

H. FUSION TEMPERATURES OF ASH ($^{\circ}\text{F}$):

	<u>REDUCING</u>	<u>OXIDIZING</u>
INITIAL DEFORMATION	2380	2415
SOFTENING (H=W)	2455	2500
SOFTENING (H= $\frac{1}{2}$ W)	2540	2575
FLUID	2630	2650

I. GRINDABILITY (HARDGROVE INDEX) = 48.0

LOWER SUNNYSIDE SEAM



PROPERTY (CENTENNIAL COAL ASSOCIATES) D.H..NC.
 LARSON LEASE #6 (Page 1 of 3)

LOCATION NW Corner of SE½ of SW¼
 Section 5, T13S, R11E, SLM
 Collar Elevation 8558 T.D.
 2275

DATE BEGIN DATE COMPLETE
 December 9, 1971 March 22, 1972

LITHOLOGIC LOG NQ Wireline
 E. J. Longyear

INTERVAL DESCRIPTION

GENERALIZED GEOLOGIC LOG OF DRILL HOLE #6		
Depth	Thickness	
0 - 675'	675'	Rock bit. Limestone of Flagstal Formation, sandstones and shales of the North Horn Formation.
675' -1725'	1050'	Sandstones and shales interbedded, massive, typical of the North Horn, Price River, and Castlegate formations.
1725' -1756'	31'	Shale, gray to black, often carbonaceous.
1756' -1756' 10"	0' 10"	<u>Coal</u>
1756' 10"-1784'	27' 2"	Sandstone, marbled gray to white, with occasional thin, shaley beds.
1784' -1784' 6"	0' 6"	<u>Coal</u>
1784' 6"-1798' 10"	14' 4"	Shale, dark gray to black, organic.
1798' 10"-1802' 9"	3' 11"	<u>Coal</u> - <u>LOWER SUNNYSIDE</u>
1802' 9"-1879'	76' 3"	Sandstone, gray to marbled-gray and black, medium-grained, generally crossbedded.
1879' -1881' 2"	2' 2"	<u>Coal</u> - <u>CENTENNIAL SEAM</u>
1881' 2"-1886' 11"	5' 9"	Shale, Black, carbonaceous.
1886' 11"-1891' 4"	4' 5"	Shale, gray, sandy, organic.
1891' 4"-1894' 4"	3' 0"	<u>Coal</u>
1894' 4"-1918' 8"	24' 4"	Sandstone, marbled gray and white, fine-grained.
1918' 8"-1928'	9' 4"	Shale, gray.
1928' -1929'	1' 0"	<u>Coal</u> , dirty, poor quality
1929' -1937'	8' 0"	Shale, light gray to gray, sandy.
1937' -1956' 6"	19' 6"	Sandstone, marbled gray and white, fine-grained, varved.

LOCATION

NW Corner of SE $\frac{1}{2}$ of SW $\frac{1}{2}$
Section 5, T13S, R11E, SLM
Collar Elevation 8558

T.D.

2275

DATE BEGIN

December 9, 1971

DATE COMPLETE

March 22, 1972

LITHOLOGIC LOG

NQ Wireline

E. J. Longyear

INTERVAL

DESCRIPTION

Depth	Thickness	
1956' 6"-1958' 6"	2' 0"	<u>Coal</u>
1958' 6"-1975' 6"	17' 0"	Shale, black, carbonaceous with thin coal seams and boney bands.
1975' 6"-1977'	1' 6"	<u>Coal</u>
1977' -1989'	12' 0"	Sandstone, white to dark gray, fine-grained, shaley.
1989 -1995	6' 0"	Shale.
1995' -1998' 10"	3' 10"	<u>Coal</u> - <u>GILSON SEAM</u>
1998' 10"-1999' 1"	0' 3"	Shale, black, carbonaceous, boney.
1999' 1"-2005'	4' 11"	Shale, dark gray.
2005' -2006' 7"	1' 7"	<u>Coal</u>
2006' 7"-2025'	18' 5"	Shale, gray, with some carbonaceous matter.
2025' 5"-2028' 10"	3' 5"	Sandstone, white, fine-grained with detrital material.
2028' 10"-2029' 6"	0' 8"	<u>Coal</u>
2029' 6"-2031' 6"	2' 0"	Shale, gray.
2031' 6"-2042'	10' 6"	Sandstone and shale interbedded gray and white, varved.
2042' -2045'	3' 0"	Shale, gray.
2045' -2047' 6"	2' 6"	<u>Coal</u> , boney, poor quality.
2047' 6"-2066' 6"	19' 0"	Sandstone, white to gray, fine-grained, varved.
2066' 6"-2067' 5"	1' 0"	<u>Coal</u>
2067' 6"-2072' 6"	5' 0"	Shale, gray.
2072' 6"-2083'	10' 6"	Sandstone, white to gray, fine-grained.
2083' -2100' 6"	17' 6"	Shale, gray to black, contains Pelecypods.

PROPERTY

(CENTENNIAL COAL ASSOCIATES)

D.H.N.C.

LARSON LEASE

#6 (Page 3 of 3)

LOCATION

NW Corner of SE½ of SW½
Section 5, T13S, R11E, SLM
Collar Elevation 8558

T.D.

2275

DATE BEGIN

December 9, 1971

DATE COMPLETE

March 22, 1972

LITHOLOGIC LOG

NQ Wireline
E. J. Longyear

INTERVAL

DESCRIPTION

<u>Depth</u>	<u>Thickness</u>		
2100' 6"-2101' 6"	1' 0"	<u>Coal</u>	
2101' 6"-2110' 6"	9' 0"	Sandstone, white to gray, fine-grained, shaley.	
2110' 6"-2188'	77' 6"	Sandstone, gray, medium-grained, subrounded, crossbedded, 10-15% dark minerals. KENILWORTH SANDSTONE.	
2188' -2204' 8"	16' 8"	Shale, gray, sandy.	
2204' 8"-2205' 11"	1' 3"	<u>Coal</u>	
2205' 11"-2207' 9"	1' 10"	Boney, carbonaceous particles	} <u>UPPER ABERDEEN</u>
2207' 9"-2211' 6"	3' 9"	<u>Coal</u>	
2211' 6"-2252'	40' 6"	Sandstone, gray and white, very fine-grained, shaley.	
2252' -2256' 3"	4' 3"	<u>Coal</u> - <u>LOWER ABERDEEN SEAM</u>	
2256' 3"-2275'	18' 9"	Sandstone, gray, medium-grained, crossbedded, 5-7% dark minerals. ABERDEEN SANDSTONE.	

Logged by Samuel Quigley
March 23, 1972

AMCA COAL LEASING INC. - DRILL HOLE LOG

CARBON COUNTY, UTAH

HOLE NO. DH - NACC - 6

LOCATION ZIONS FEE VICINITY

ELEVATION 7,460'

ANGLE 90°

BEARING _____

DEPTH APPROX. 1,020'

COORDINATES N. 62,160

E. 50,185

SECTION SE 1/4 SE 1/4 SE 1/4 SEC 1

T. 13 S, R. 10 E.

FROM: SE CORNER 200' N.

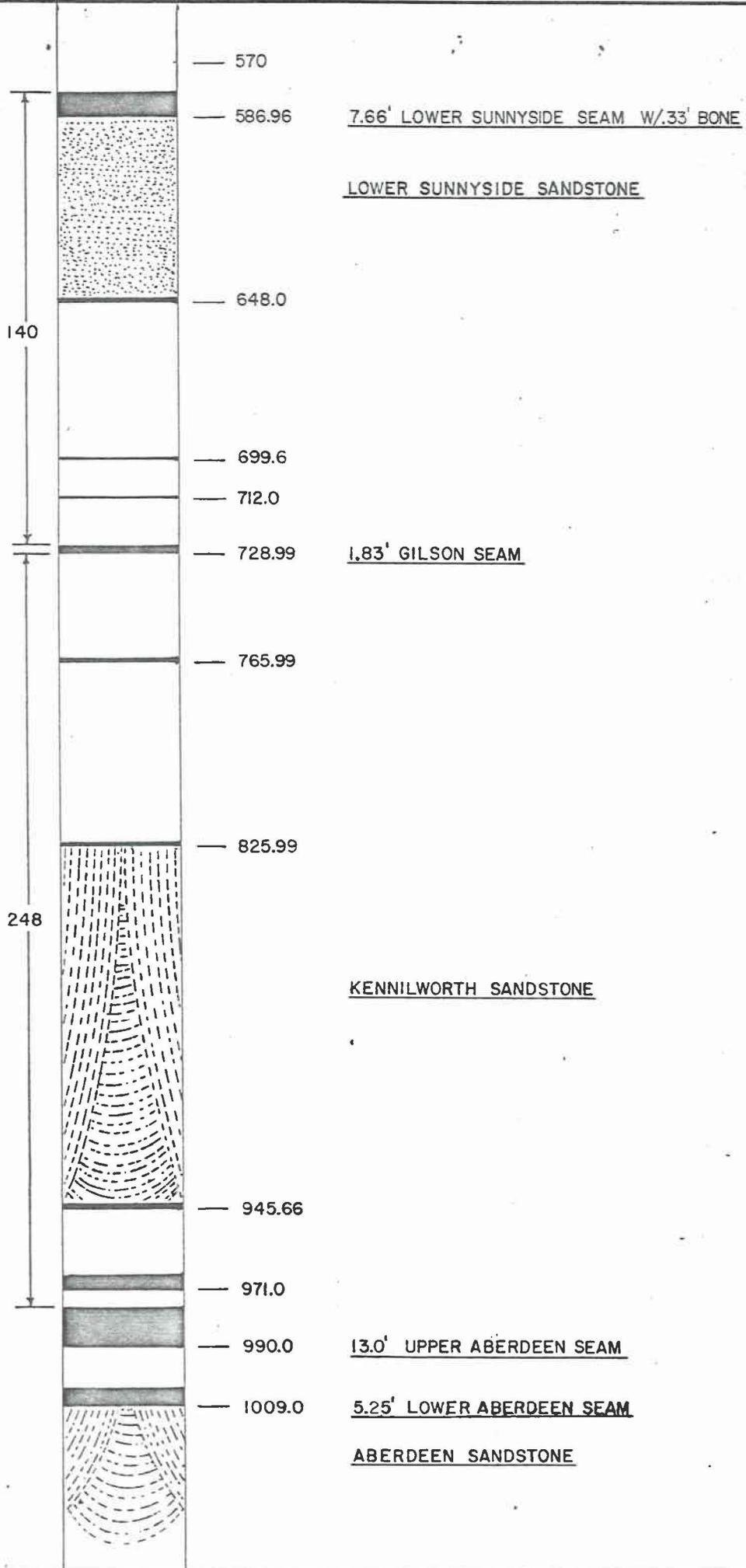
DATE STARTED APPROX. 1948

COMPLETED APPROX. 1948

LOGGED BY _____

SCALE: 1" = 50'

655' W.



AMCA COAL LEASING INC. - DRILL HOLE LOG
CARBON COUNTY, UTAH

HOLE NO. DH-5

ELEVATION 7,275'

ANGLE 90°

BEARING _____

DEPTH 832'

LOCATION ZION FEE VICINITY

COORDINATES N. 59,955

E. 54,535

SECTION SE 1/4 SW 1/4 NE 1/4 SEC 7

T. 13 S, R. 11 E.

FROM: CENTER 545' N

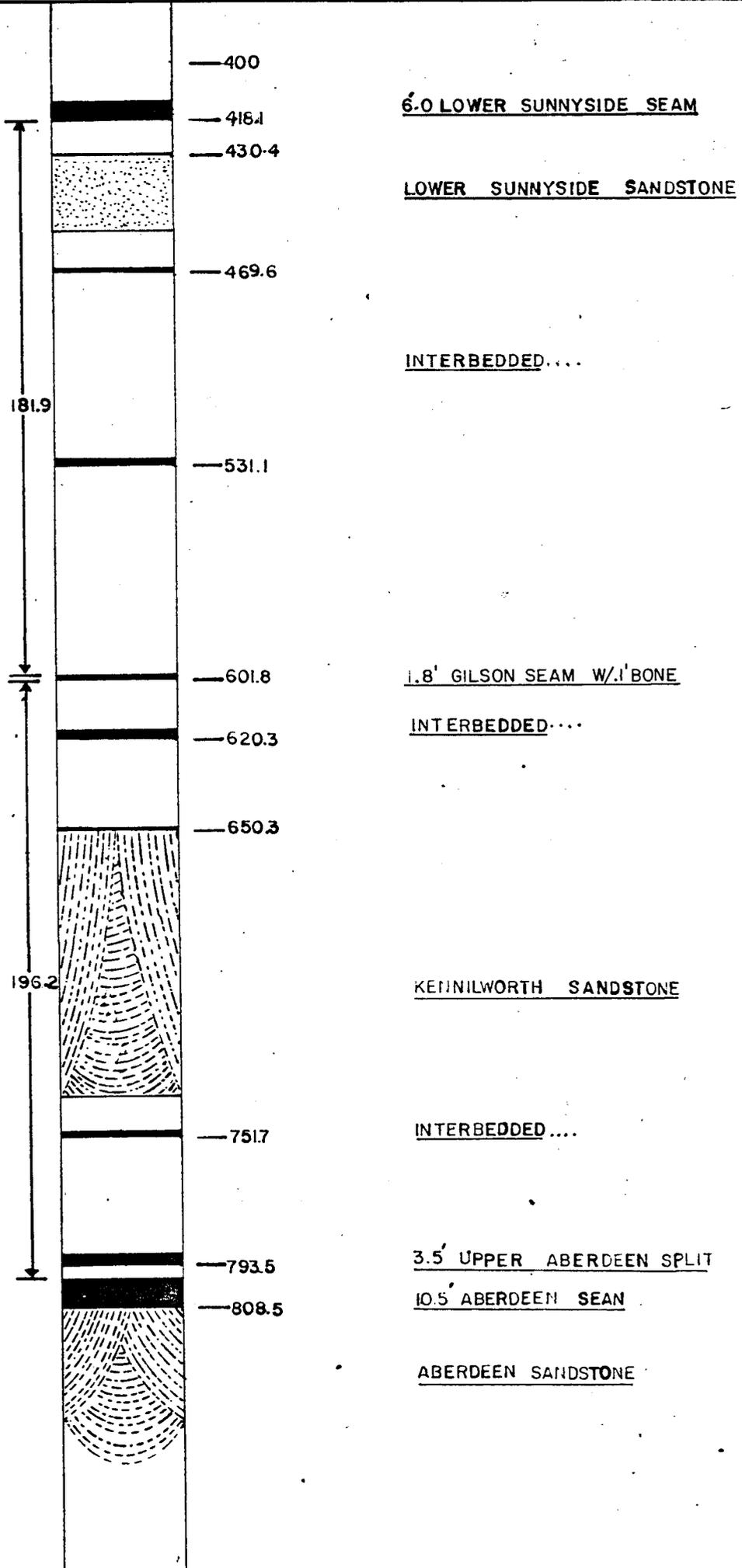
930' E

DATE STARTED 12-10-71

COMPLETED 1-4-72

LOGGED BY S-QUIGLEY

SCALE: 1" = 50'



AMCA COAL LEASING INC. - DRILL HOLE LOG

CARBON COUNTY, UTAH

HOLE NO. DH-2

ELEVATION 7,275

ANGLE 90°

BEARING _____

DEPTH 580

LOCATION ZION FEE VICINITY

COORDINATES N. 60,960

E. 51,320

SECTION SW1/4NW1/4NW1/4SEC 7

T. 13 S, R. 11 E.

FROM: CENTER 1,535 N.

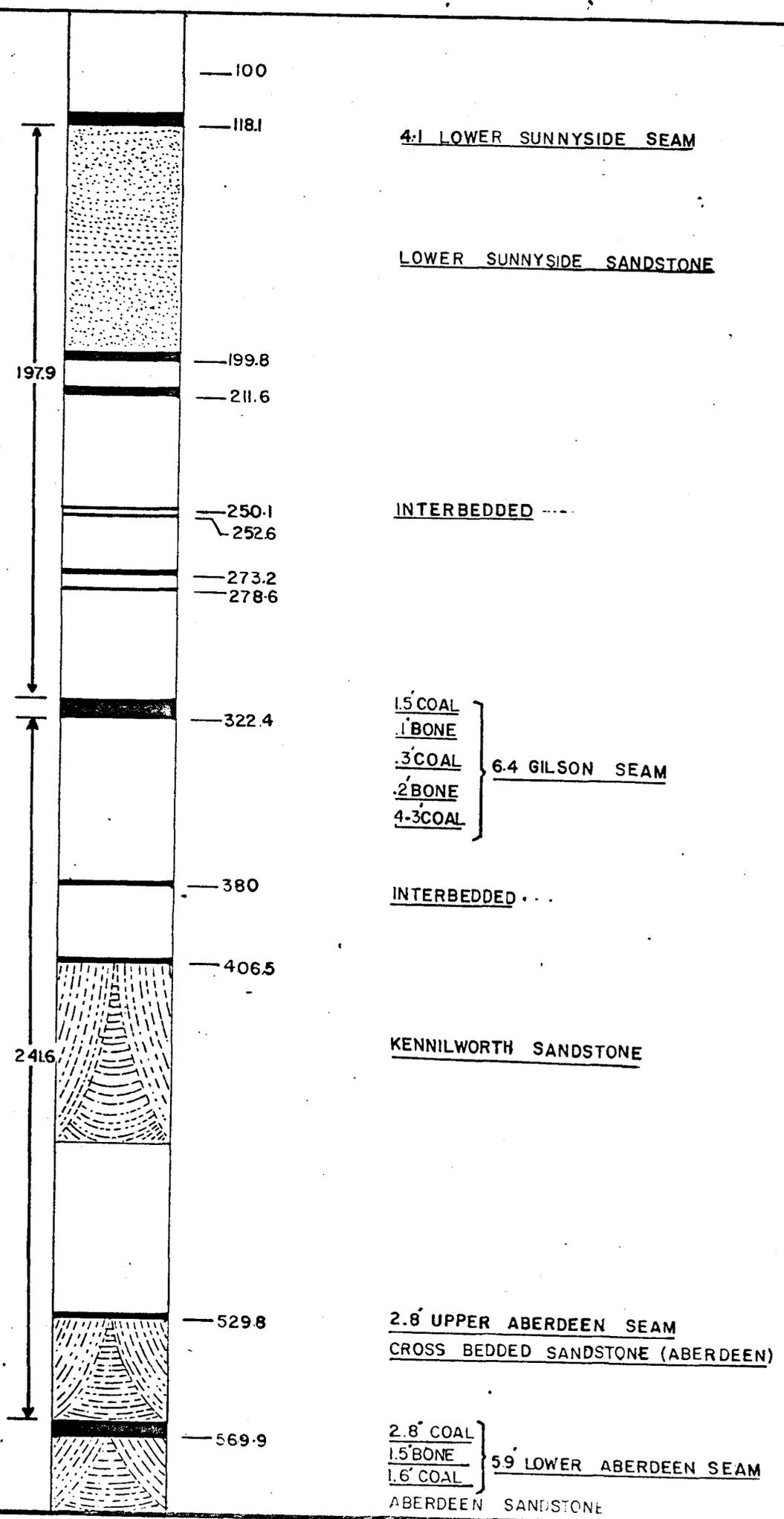
2,270 W.

DATE STARTED 11-15-71

COMPLETED 11-19-71

LOGGED BY S. QUIGLEY

SCALE: 1" = 50'



AMCA COAL LEASING INC. - DRILL HOLE LOG
 CARBON COUNTY, UTAH

HOLE NO. DH-2-A

ELEVATION 7,165'

ANGLE 90°

BEARING _____

DEPTH 303'

LOCATION ZIONS FEE VICINITY

COORDINATES N. 58,180

E. 53,840

SECTION SW 1/4 NW 1/4 SE 1/4 SEC 7

T. 13 S, R. 11 E.

FROM: CENTER, 1,235 S.

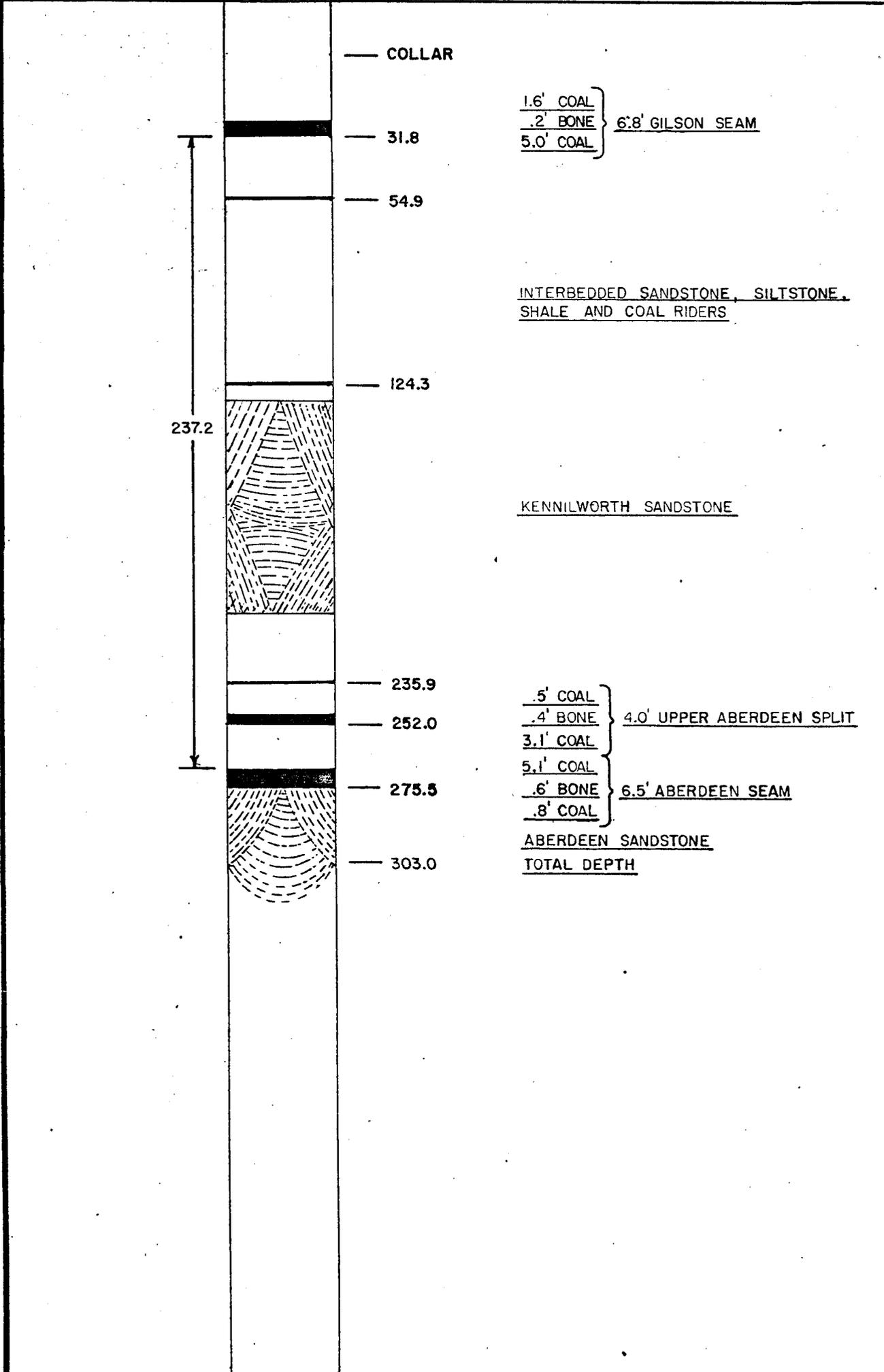
250 E.

DATE STARTED 11/8/71

COMPLETED 11/12/71

LOGGED BY S. QUIGLEY

SCALE: 1" = 50'



AMCA COAL LEASING INC. - DRILL HOLE LOG
CARBON COUNTY, UTAH

HOLE NO. 77-6-CP

ELEVATION 7,080'

ANGLE 90°

BEARING _____

DEPTH 80'

LOCATION ZIONS FEE

COORDINATES N. 56,825

E. 53,330

SECTION NE 1/4 NE 1/4 NW 1/4 SEC 18

T. 13 S, R. 11 E.

FROM: CENTER, 2,635 N.

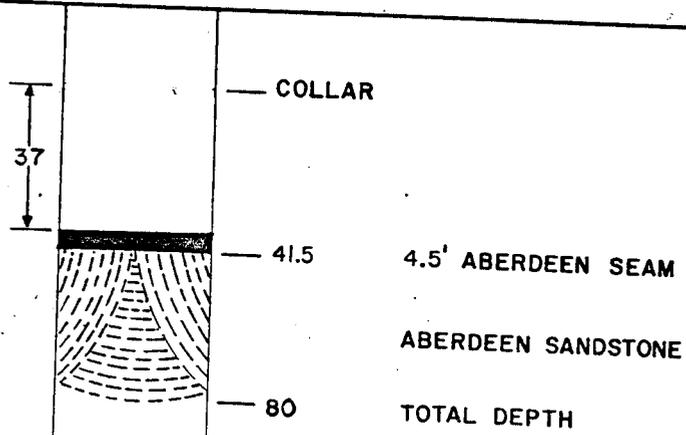
255 W.

DATE STARTED 11/14/77

COMPLETED 11/14/77

LOGGED BY M. GLASSON

SCALE: 1" = 50'



AMCA COAL LEASING INC. - DRILL HOLE LOG
CARBON COUNTY, UTAH

HOLE NO. 77-7-CP

LOCATION ZIONS FEE

ELEVATION 7,010'

COORDINATES N. 56,780

ANGLE 90°

E. 53,430

BEARING _____

SECTION NE 1/4 NE 1/4 NW 1/4 SEC 18

DEPTH 45'

T. 13 S, R. 11 E.

DATE STARTED 11/14/77

FROM: CENTER, 2,605 N.

COMPLETED 11/14/77

160 W.

LOGGED BY M. GLASSON

SCALE: 1" = 50'

13.8



— COLLAR

— 16.0 2.2' ABERDEEN SEAM

ABERDEEN SANDSTONE

— 45 TOTAL DEPTH

AMCA COAL LEASING INC. - DRILL HOLE LOG
CARBON COUNTY, UTAH

HOLE NO. 77-5-CP

ELEVATION 7,085'

ANGLE 90°

BEARING _____

DEPTH 85'

LOCATION ZIONS FEE

COORDINATES N. 56,870

E. 53,305

SECTION SE 1/4 SE 1/4 SW 1/4 SEC 7

T. 13 S, R. 11 E.

FROM: CENTER, 2,620 S.

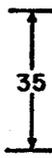
290 W.

DATE STARTED 11/14/77

COMPLETED 11/14/77

LOGGED BY M. GLASSON

SCALE: 1" = 50'



COLLAR

33.5

40.2

5.2' ABERDEEN SEAM

ABERDEEN SANDSTONE

85'

TOTAL DEPTH

AMCA COAL LEASING INC. - DRILL HOLE LOG
CARBON COUNTY, UTAH

HOLE NO. 77-4-CP

ELEVATION 7070'

ANGLE 90°

BEARING _____

DEPTH 105'

LOCATION ZIONS FEE

COORDINATES N. 56880

E. 53540

SECTION SE 1/4 SE 1/4 SW 1/4 SEC. 7

T. 13 S, R. 11 E.

FROM: CENTER, 2,520' S.

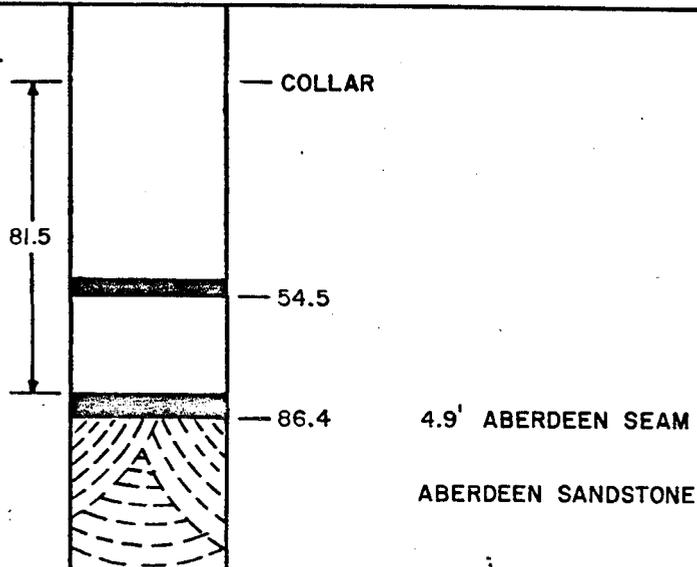
60' W.

DATE STARTED 11/13/77

COMPLETED 11/13/77

LOGGED BY M. GLASSON

SCALE: 1" = 50'



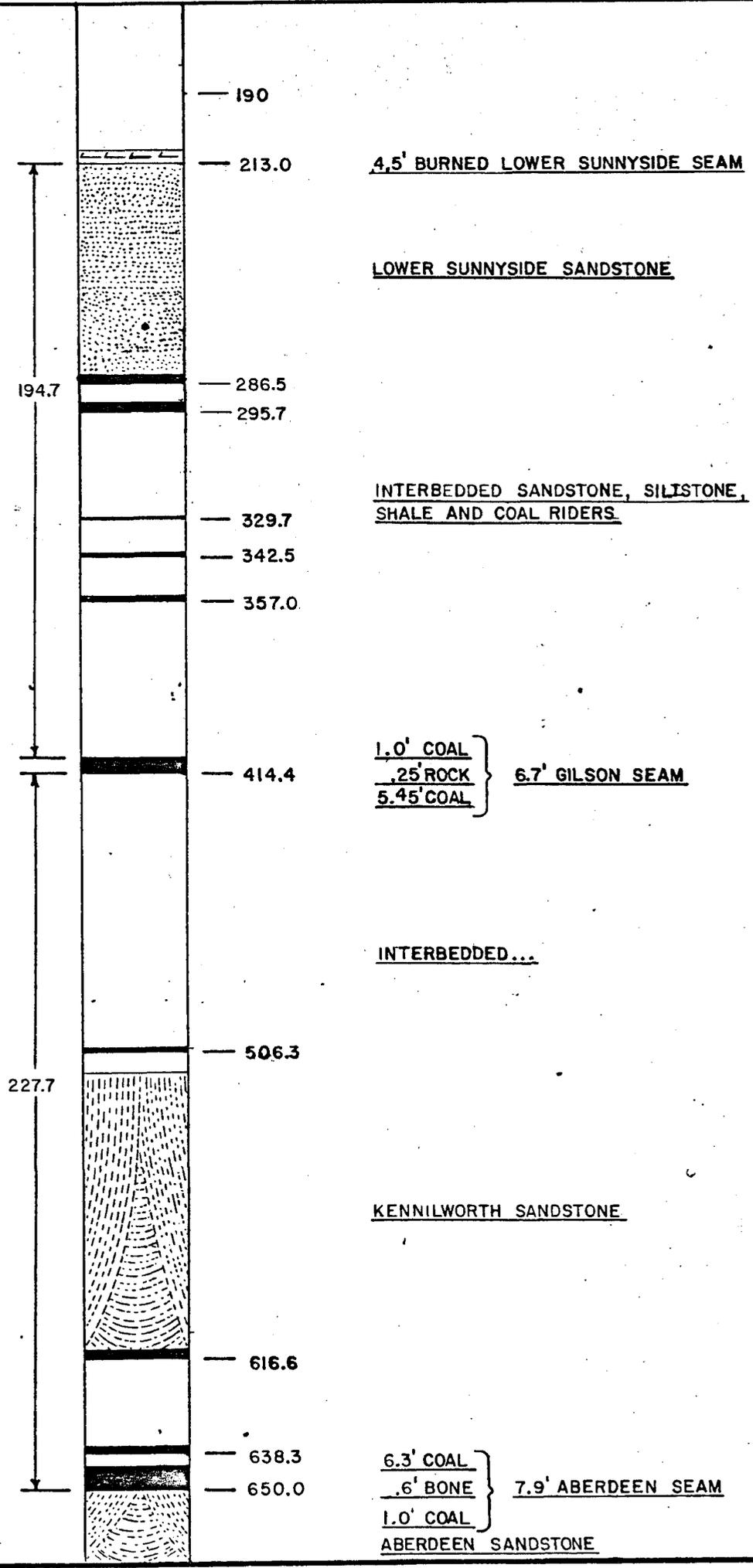
AMCA COAL LEASING INC. - DRILL HOLE LOG

CARBON COUNTY, UTAH

HOLE NO. 77-2-CP
 ELEVATION 7520'
 ANGLE 90°
 BEARING _____
 DEPTH 690'
 DATE STARTED 10-28-77
 COMPLETED 11-2-77
 LOGGED BY M. GLASSON

LOCATION ZIONS FEE
 COORDINATES N. 58,510
 E. 53,200
 SECTION SE 1/4 NE 1/4 SW 1/4 SEC. 7
 T. 13 S, R. 11 E.
 FROM: CENTER - 905' SOUTH
395' WEST

SCALE: 1" = 50'



AMCA COAL LEASING INC. - DRILL HOLE LOG

CARBON COUNTY, UTAH

HOLE NO. DH-NACC-7

ELEVATION 7,192

ANGLE 90°

BEARING _____

DEPTH _____

LOCATION ZIONS FEE VICINITY

COORDINATES N. 58,285

E. 49,955

SECTION SW 1/4 NE 1/4 SE 1/4 SEC 12

T. 13 S, R. 10 E.

FROM: SE CORNER 1,440 N.

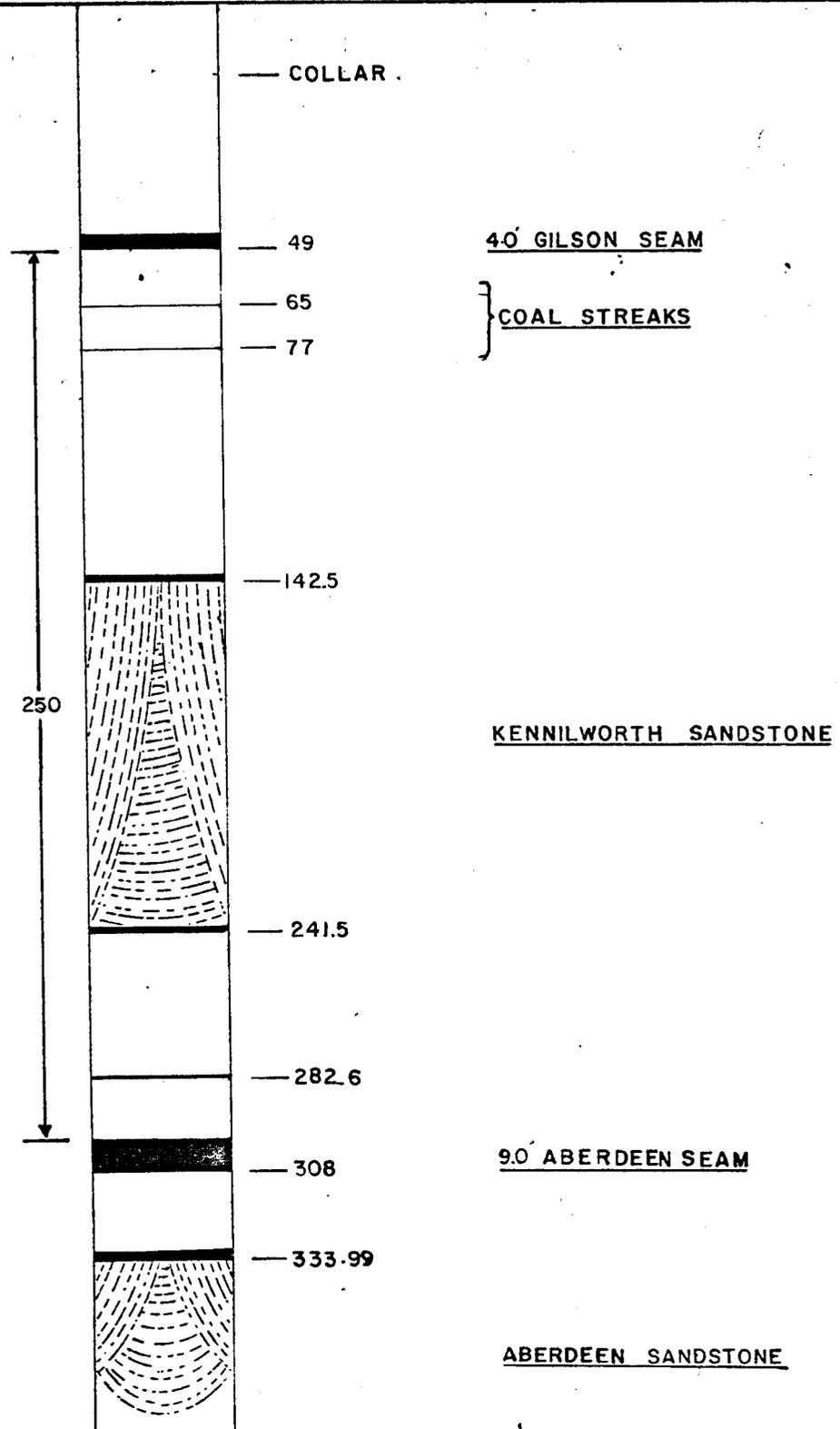
935 W.

DATE STARTED APPROX. 1948

COMPLETED APPROX. 1948

LOGGED BY S. QUIGLEY

SCALE: 1" = 50'

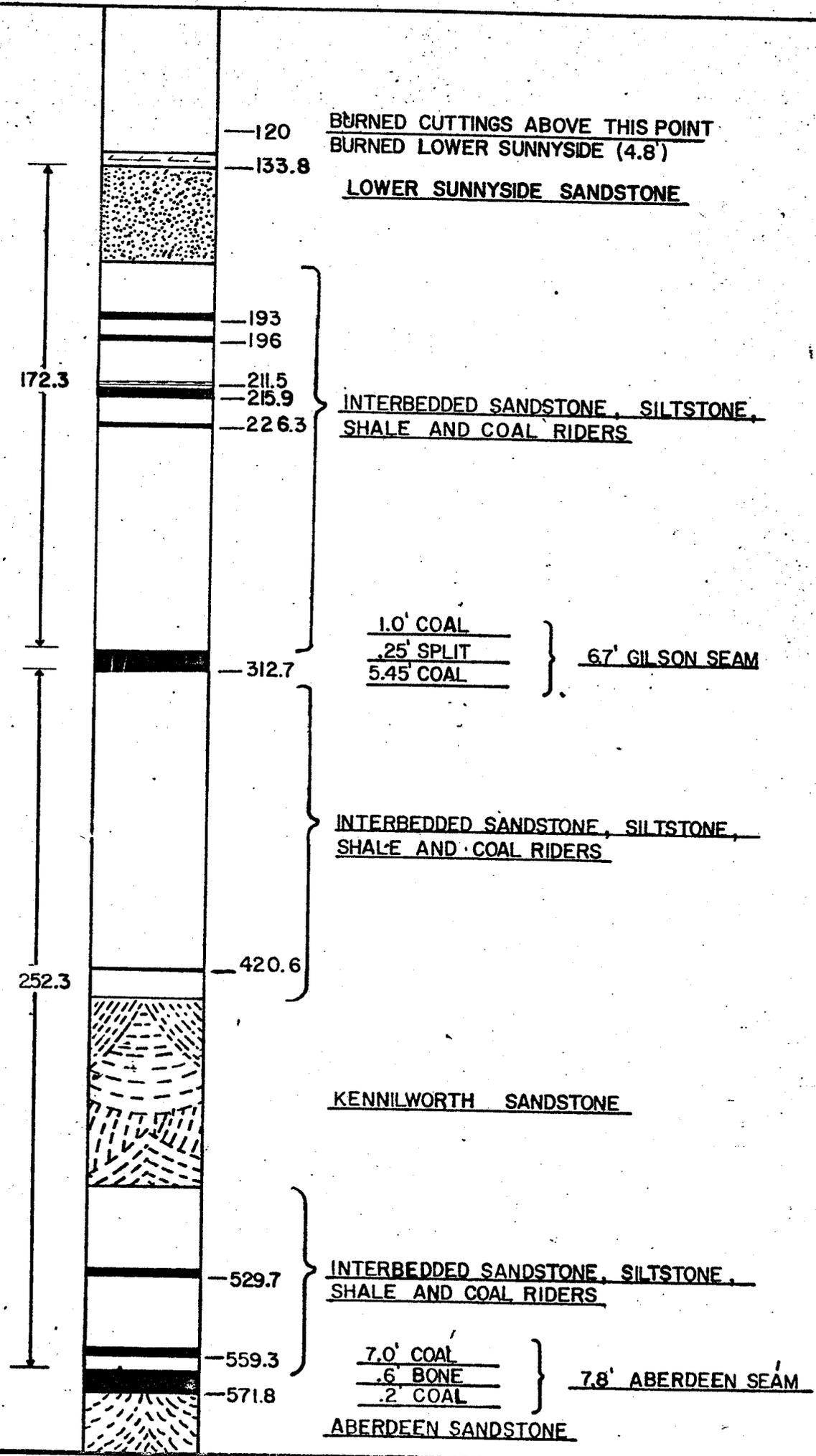


AMCA COAL LEASING INC. - DRILL HOLE LOG
CARBON COUNTY, UTAH

HOLE NO. 77-1-CP
 ELEVATION 7555'
 ANGLE 90°
 BEARING _____
 DEPTH 675'

LOCATION ZIONS FEE
 COORDINATES N 58,000
 E. 52,430
 SECTION NE 1/4 SE 1/4 SW 1/4, SEC 7
 T. 13 S, R. 11 E.
 FROM: CENTER 1,140 W
1,415 S

DATE STARTED 10/24/77
 COMPLETED 10/28/77
 LOGGED BY M. GLASSON SCALE: 1" = 50'



Appendix F

EMISSION INVENTORY

Emission Inventory

Table 1 shows all of Tower's potential Point & Non-fugitive and Fugitive particulate emission sources. These sources were arrived at using EPA's Region VIII interim policy paper. Some of the emission sources described in that paper do not apply to Tower's operation since this inventory is for those surface sources relating to underground mining rather than sources resulting from surface mining operations. Unrelated sources include blasting, overburden & topsoil removal, drilling, overburden & topsoil shaping and topsoil & overburden stockpile erosion.

Sources which relate to Tower's underground mining facility can be controlled to a large degree. Some methods of control which are pointed out in the interim policy paper are: spray systems, enclosures, and minimizing drop distances. This control can be accomplished by maintaining a stockpile which effectively minimizes the drop distance. These controls have efficiencies of anywhere from 25 to 90%.

Table 2 shows the worst case emission sources, the EPA formula used to calculate emissions, the control methods to be used and the control efficiency where:

s = silt content of all weather gravel surface (17%)
or, silt content of coal (8%)

S = average speed traveled over roads (40 mph)

W = wet days per year ≥ 0.01 ppt (37.25)

U = average wind speed (4.13 meters/sec., 9.2 mph)

A = rock & gravel or clay factor (0.025)

I = 38 tpy (rock & gravel) } 42.5 tpy
47 tpy (clay) }

K = 1.0

C = 0.5

L' = 1.0

V' = 1.0

W = vehicle weight in tons, pick up (2.5)

d = dry days per year (327.75)

Y = loader, truck, or railcar capacity
(10, 41, 148 yd³ respectively)

M = moisture content of coal (10%)

Table 3 shows average wind speeds and precipitation for this area, based on U.S. Weather Bureau statistics, gathered at the Price Area Bureau of Land Management Office.

Table 4 shows the potential versus controlled emissions for Tower's 1.5 million tpy mine. Following Table 4 are calculations showing the emission source, the EPA formula used and the potential emissions given in tons per year, lbs. per hour and lbs. per day.

TABLE 1

Emission Inventory

The emissions as related to Tower's underground mining can be subdivided into four major categories, as follows:

A. Coal Handling, Processing and Transportation

1. Fugitive

- a. Haul Roads
- b. Paved Roads

2. Point and Non-fugitive

- a. Conveyor Belts
- b. Crushing
- c. Truck Loading
- d. Truck Dumping
- e. Coal drop (transfer)
- f. Railcar Loading
- g. Screening

B. Wind Erosion

1. Fugitive

- a. Coal Storage Piles
- b. Disturbed Areas

C. Personnel and Support Access

1. Fugitive

- a. Access Roads

D. Road Maintenance

1. Fugitive

- a. Haul Roads
- b. Access Roads

TABLE 2

Worst Case Emission Rates

Emission Source	EPA Formula	Control	Control Efficiency
1. Point & Non-fugitive			
A. Coal Handling			
1. Conveyors	0.05 lbs./ton	} 10% mine run moisture content	40%
2. Transfers	0.15 lbs./ton		
3. Truck Loading	} 0.0018 (s/5) (U/5) ----- (M/2) ² (Y/6)		
4. Truck Dumping			
5. Rail Car Loading			
B. Coal Processing			
1. Crushing		} covered (enclosed)	90%
a. Primary	0.05 lbs./ton		
b. Secondary	0.15 lbs./ton		
2. Screening	0.15 lbs./ton	water spray	50%

TABLE 2, Continued
Worst Case Emission Rates

Emission Source	EPA Formula	Control	Control Efficiency
2. Fugitive Dust			
A. Haul Roads	$0.81 s \frac{(S/30) (365-W)}{(365)}$ lbs./VMT	Watering @ shift changes	50%
B. Paved Roads	0.01345 lbs./VMT		
C. Wind Erosion			
1. Storage Piles	1.6 u lbs./acre-hr.	Chemical stabilization on dead storage	25%
2. Disturbed Areas	$\frac{AKCL'V'}{\text{tons/acre/year}}$		
D. Access Roads	$5.9 \frac{(s/12)(S/30)(W/3) \cdot 8}{(d/365)} \text{ lbs./VMT}$	Restrict speed, water @ shift	60%
E. Haul & Access Road Maintenance	32 lbs./hr. grader use	Post maintenance watering	40%

TABLE 3

Precipitation - (days per year with $> 0.01''$)

	1974	1975	1976	1977
Jan.	7	5	0	1
Feb.	1	4	2	2
March	0	4	1	0
April	1	0	3	3
May	0	4	4	9
June	0	9	1	3
July	7	6	4	7
Aug.	2	2	3	6
Sept.	1	4	8	4
Oct.	8	2	2	3
Nov.	2	3	0	2
Dec.	<u>3</u>	<u>1</u>	<u>0</u>	<u>5</u>
	32	44	28	45

avg. = 37.25 (yearly)

Wind Speed (mph)

Jan.	7.2
Feb.	8.2
March	10.5
April	9.8
May	10.2
June	9.3
July	10.3
Aug.	9.3
Sept.	10.6
Oct.	8.4
Nov.	8.7
Dec.	<u>8.3</u>

Avg. = 9.2 mph = 4.13 meters/sec.

Source: U.S. Weather Bureau

TABLE 4

Summary of Potential and Controlled Emissions

1.5 Million Ton per Year

Point and Non-fugitive Sources

"Worst Case"

Point & Non-fugitive Sources	TPY	Potential		Control (%)	Controlled		
		lbs/day	lbs/hr		TPY	lbs/day	lbs/hr
A. Coal Handling							
1. Conveyors	37.5	205.5	8.6	40	22.5	123.3	5.16
2. Transfer	112.5	616.4	25.7	40	67.5	369.84	15.42
3. Truck Loading	0.3	1.6	0.1	--	0.3	1.6	0.1
4. Truck Dumping	0.02	0.1	0.01	--	0.02	0.1	0.01
5. Railcar Loading	0.006	0.04	0.001	--	0.006	0.04	0.001
B. Coal Processing							
1. Crushing							
a. Primary	37.5	205.5	8.6	90	3.75	20.55	.86
b. Secondary	112.5	616.4	25.7	90	11.25	61.64	2.57
2. Screening	112.5	616.4	25.7	50	56.25	308.2	12.85
Totals:	412.83	2261.50	94.4	64	161.58	885.27	36.97

TABLE 4, Continued

"Worst Case"

Fugitive Sources	Potential			Control (%)	Controlled		
	TPY	lbs/day	lbs/hr		TPY	lbs/day	lbs/hr
A. Coal Transportation							
1. Haul Roads	70.0	583.6	24.3	50	35.0	291.8	12.2
2. Paved Roads	2.1	17.5	0.7	--	2.1	17.5	0.7
B. Wind Erosion							
1. Storage Piles							
a. Minesite	6.1	33.3	1.4	25	4.6	25.0	1.1
b. Railroad Loadout	16.5	90.4	3.8	25	12.4	67.8	2.9
2. Disturbed Areas							
a. Minesite	1.2	6.8	0.3	--	1.2	6.8	0.3
b. Railroad Loadout	3.7	20.3	0.8	--	3.7	20.3	0.8
C. Personnel & Support Access							
1. Access Roads	13.1	72.0	3.0	60	5.2	28.8	1.2
D. Road Maintenance							
1. Haul & Access Roads	6.7	36.5	1.5	40	4.0	21.9	0.9
Totals:	119.4	860.4	35.8	43	68.2	479.9	20.1

CALCULATIONS

POINT AND NON-FUGITIVE SOURCES

1.5 MILLION TONS PER YEAR

A. Coal Handling

1. Conveyors

$$EF = 0.05 \text{ lbs./ton} \times 1.5 \text{ million tons/year}$$

$$EF = 75,000 \text{ lbs./year} \div 2,000 \text{ lbs./ton}$$

$$EF = \underline{37.5 \text{ tons/year}} \div 365 \text{ days/year}$$

$$EF = .10 \text{ tons/day} \times 2,000 \text{ lbs./ton}$$

$$EF = \underline{205.5 \text{ lbs./day}} \div 24 \text{ hrs./day}$$

$$EF = \underline{8.6 \text{ lbs./hr.}}$$

2. Coal Transfer

$$EF = 0.15 \text{ lbs./ton} \times 1.5 \text{ million tons/year}$$

$$EF = 225,000 \text{ lbs./year} \div 2,000 \text{ lbs./ton}$$

$$EF = \underline{112.5 \text{ tons/year}} \div 365 \text{ days/year}$$

$$EF = .31 \text{ tons/day} \times 2,000 \text{ lbs./ton}$$

$$EF = \underline{616 \text{ lbs./day}} \div 24 \text{ hrs./day}$$

$$EF = \underline{25.7 \text{ lbs./hr.}}$$

3. Truck Loading (3 locations)

$$EF = .0018 \frac{(s/5)(U/5)}{(M/2)^2(Y/6)} \text{ lbs./ton}$$

Where: s = 8%

U = 9.2 mph

M = 10%

Y = 10 yd³ (loader)

$$\therefore EF = .0018 \frac{(8/5)(9.2/5)}{(10/2)^2(10/6)} \text{ lbs./ton}$$

$$EF = .0001 \text{ lbs./ton} \times 3 \text{ locations}$$

$$EF = .0004 \text{ lbs./ton} \times 1.5 \text{ million tons/year}$$

$$EF = 572 \text{ lbs./year} \div 2,000 \text{ lbs./ton}$$

$$EF = \underline{0.3 \text{ tons/year}} \div 365 \text{ days/year}$$

$$EF = .0008 \text{ tons/day} \times 2,000 \text{ lbs./ton}$$

$$EF = \underline{1.6 \text{ lbs./day}} \div 24 \text{ hrs./day}$$

$$EF = \underline{0.1 \text{ lbs./hr.}}$$

4. Truck Dumping (1 location)

$$EF = .0018 \frac{(s/5)(U/5)}{(M/2)^2(Y/6)} \text{ lbs./ton}$$

Where Y = 41 yd³ (28 ton truck)

$$\therefore EF = .0018 \frac{(8/5)(9.2/5)}{(10/2)^2(41/6)} \text{ lbs./ton}$$

$$EF = .00003 \text{ lbs./ton} \times 1.5 \text{ million ton/year}$$

$$EF = 47 \text{ lbs./year} \div 2,000 \text{ lbs./ton}$$

$$EF = \underline{0.02 \text{ tons/year}} \div 365 \text{ days/year}$$

$$EF = .0001 \text{ tons/day} \times 2,000 \text{ lbs./ton}$$

$$EF = \underline{0.1 \text{ lbs./day}} \div 24 \text{ hrs./day}$$

$$EF = \underline{0.01 \text{ lbs./hr.}}$$

5. Railcar Loading (1 location)

$$EF = .0018 \frac{(s/5)(U/5)}{(M/2)^2(Y/6)} \text{ lbs./ton}$$

Where Y = 148 yd³ (100 ton railcar)

$$\therefore EF = .0018 \frac{(8/5)(9.2/5)}{(10/2)^2(148/6)} \text{ lbs./ton}$$

$$EF = .000009 \text{ lbs/ton} \times 1.5 \text{ million tons/year}$$

$$EF = 12.9 \text{ lbs./year} \div 2,000 \text{ lbs./ton}$$

$$EF = \underline{0.006 \text{ tons/year}} \div 365 \text{ days/year}$$

$$EF = 0.00002 \text{ tons/day} \times 2,000 \text{ lbs./ton}$$

$$EF = \underline{0.04 \text{ lbs./day}} \div 24 \text{ hrs./day}$$

$$EF = \underline{.001 \text{ lbs./hr.}}$$

Total Coal Handling (uncontrolled): 150.33 Tons/year
823.2 lbs./day
34.4 lbs./hr.

B. Coal Processing

1. Coal Crushing

a. Primary

$$EF = 0.05 \text{ lbs./ton} \times 1.5 \text{ million tons/year}$$

$$EF = 75,000 \text{ lbs./year} \div 2,000 \text{ lbs./ton}$$

$$EF = \underline{37.5 \text{ tons/year}} \div 365 \text{ days/year}$$

$$EF = .1 \text{ tons/day} \times 2,000 \text{ lbs./ton}$$

$$EF = \underline{205.5 \text{ lbs./day}} \div 24 \text{ hrs./day}$$

$$EF = \underline{8.6 \text{ lbs./hr.}}$$

b. Secondary

$$EF = 0.15 \text{ lbs./ton} \times 1.5 \text{ million tons/year}$$

$$EF = 225,000 \text{ lbs./year} \div 2,000 \text{ lbs./ton}$$

$$EF = \underline{112.5 \text{ tons/year}} \div 365 \text{ days/year}$$

$$EF = .3 \text{ tons/day} \times 2,000 \text{ lbs./ton}$$

$$EF = \underline{616.4 \text{ lbs./day}} \div 24 \text{ hrs./day}$$

$$EF = \underline{25.7 \text{ lbs./hr.}}$$

2. Coal Screening

$$EF = 0.15 \text{ lbs./ton} \times 1.5 \text{ million tons/year}$$

$$EF = 225,000 \text{ lbs./year} \div 2,000 \text{ lbs./ton}$$

$$EF = \underline{112.5 \text{ tons/year}} \div 365 \text{ days/year}$$

$$EF = .3 \text{ tons/day} \times 2,000 \text{ lbs./ton}$$

$$EF = \underline{616.4 \text{ lbs./day}} \div 24 \text{ hrs./day}$$

$$EF = \underline{25.7 \text{ lbs./hr.}}$$

Total Coal Processing (uncontrolled): 262.5 tons/year
1438.3 lbs./day
60.0 lbs./hr.

B. Coal Processing

1. Coal Crushing

a. Primary

$$EF = 0.05 \text{ lbs./ton} \times 1.5 \text{ million tons/year}$$

$$EF = 75,000 \text{ lbs./year} \div 2,000 \text{ lbs./ton}$$

$$EF = \underline{37.5 \text{ tons/year}} \div 365 \text{ days/year}$$

$$EF = .1 \text{ tons/day} \times 2,000 \text{ lbs./ton}$$

$$EF = \underline{205.5 \text{ lbs./day}} \div 24 \text{ hrs./day}$$

$$EF = \underline{8.6 \text{ lbs./hr.}}$$

b. Secondary

$$EF = 0.15 \text{ lbs./ton} \times 1.5 \text{ million tons/year}$$

$$EF = 225,000 \text{ lbs./year} \div 2,000 \text{ lbs./ton}$$

$$EF = \underline{112.5 \text{ tons/year}} \div 365 \text{ days/year}$$

$$EF = .3 \text{ tons/day} \times 2,000 \text{ lbs./ton}$$

$$EF = \underline{616.4 \text{ lbs./day}} \div 24 \text{ hrs./day}$$

$$EF = \underline{25.7 \text{ lbs./hr.}}$$

2. Coal Screening

$$EF = 0.15 \text{ lbs./ton} \times 1.5 \text{ million tons/year}$$

$$EF = 225,000 \text{ lbs./year} \div 2,000 \text{ lbs./ton}$$

$$EF = \underline{112.5 \text{ tons/year}} \div 365 \text{ days/year}$$

$$EF = .3 \text{ tons/day} \times 2,000 \text{ lbs./ton}$$

$$EF = \underline{616.4 \text{ lbs./day}} \div 24 \text{ hrs./day}$$

$$EF = \underline{25.7 \text{ lbs./hr.}}$$

Total Coal Processing (uncontrolled): 262.5 tons/year
1438.3 lbs./day
60.0 lbs./hr.

Grand Total Non-fugitive (uncontrolled): 412.8 tons/year
2261.5 lbs./day
94.4 lbs./hr.

FUGITIVE SOURCES

1.5 MILLION TONS PER YEAR

A. Coal Transportation

1. Haul Roads

$$EF = 0.81 \text{ s } (S/30) \frac{(365 - W)}{(365)} \text{ lbs./VMT}$$

Where: $s = 0.17$

$S = 40 \text{ mph}$

$W = 37.25$

VMT = vehicle miles travelled

$\therefore EF = 0.165 \text{ lbs./VMT}$

@ 8.51 miles and 208 round trips/day

= 3540.16 miles/day

$\therefore 0.165 \text{ lbs./VMT,}$

$EF = \underline{70.0 \text{ tons/year}}$

$EF = \underline{583.6 \text{ lbs./day}}$

$EF = \underline{24.3 \text{ lbs./hr.}}$

2. Paved Roads

$EF = 0.01345 \text{ lbs./VMT}$

@ 6.26 miles and 208 round trips/day

= 1302.08 miles/day

. . @ 0.01345 lbs./VMT

EF = 2.1 tons/year

EF = 17.5 lbs./day

EF = 0.7 lbs./hr.

Total Coal Transportation (uncontrolled): 72.1 tons/year

601.1 lbs./day

25.0 lbs./hr.

B. Wind Erosion

1. Storage Piles

a. Minesite

EF = 1.6 u lbs./acre-hr.

Where u = 4.13 meters/sec.

. . EF = 6.61 lbs./acre-hr.

@ 8760 hrs./year and .21 acres

= 1839.6 acre-year

. . @ 6.61 lbs./acre-hr.

EF = 6.1 tons/year

EF = 33.3 lbs./day

EF = 1.4 lbs./hr.

b. Railroad Loadout

EF = 1.6 u lbs./acre-hr.

Where u = 4.13 meters/sec.

. . EF = 6.61 lbs./acre-hr

@ 8760 hrs/year and .57 acres

= 4993.2 acre-hrs./year

. . @ 6.61 lbs/acre-hr
 EF = 16.5 tons/year
 EF = 90.4 lbs./day
 EF = 3.8 lbs./hr.

2. Disturbed Areas

a. Minesite

EF = AIKCL'V'

Where A = 0.025

I = 42.5

K = 1.0

C = 0.5

L' = 1.0

V' = 1.0

@ 2.35 acres

. . EF = 0.53 tons/acre/year

EF = 1.2 tons/year

EF = 6.8 lbs./day

EF = 0.3 lbs./hr.

b. Railroad Loadout

EF = AIKCL'V'

EF = 0.53 tons/acre/year

@ 7.0 acres

. . EF = 3.7 tons/year

EF = 20.3 lbs./day

EF = 0.8 lbs./hr.

Total Wind Erosion (uncontrolled): 27.5 tons/year
150.8 lbs./day
6.3 lbs./hr.

C. Personnel & Support Access

1. Access Roads

$$EF = 5.9 (s/12) (S/30) (W/3) \cdot 8 (d/365) \text{ lbs./VMT}$$

$$\text{Where } s = 0.17.$$

$$S = 40.0$$

$$W = 2.5$$

$$d = 327.75$$

@ 5.82 miles and 50 round trips/day

$$= 832.8 \text{ VMT/day}$$

$$\therefore EF = 0.09 \text{ lbs./VMT} \times 832.8 \text{ VMT/day}$$

$$EF = \underline{72.0 \text{ lbs./day}}$$

$$EF = \underline{13.1 \text{ tons/year}}$$

$$EF = \underline{3.0 \text{ lbs./hr.}}$$

Total Personnel & Support (uncontrolled): 13.1 tons/year
72.0 lbs./day
3.0 lbs./hr.

D. Road Maintenance

1. Haul & Access Road Maintenance

$$EF = 32 \text{ lbs./hr. grader time}$$

@ one 8 hr. shift/week and 52 weeks/year

$$= 416 \text{ hrs./year}$$

$$\therefore EF = 13,312 \text{ lbs./year} \div 2000 \text{ lbs./ton}$$

$$EF = \underline{6.7 \text{ tons/year} \div 365 \text{ days/year}}$$

$$EF = 0.02 \text{ tons/day} \times 2000 \text{ lbs./ton}$$

$$EF = \underline{36.5 \text{ lbs./day} \div 24 \text{ hrs./day}}$$

$$EF = \underline{1.5 \text{ lbs./hr.}}$$

Total Road Maintenance (uncontrolled): 6.7 tons/year
36.5 lbs./day
1.5 lbs./hr.

Grand Total Fugitive (uncontrolled): 119.4 tons/year
860.4 lbs./day
35.8 lbs./hr.

Grand Total (uncontrolled)
Fugitive & Non-fugitive: 533.1 tons/year
3127.4 lbs./day
130.4 lbs./hr.

Appendix G

WASTEWATER DISPOSAL SYSTEM

WASTEWATER DISPOSAL SYSTEM

FOR THE

PINNACLE MINE

OFFICE BUILDING

PREPARED FOR:

TOWER RESOURCES, INC.

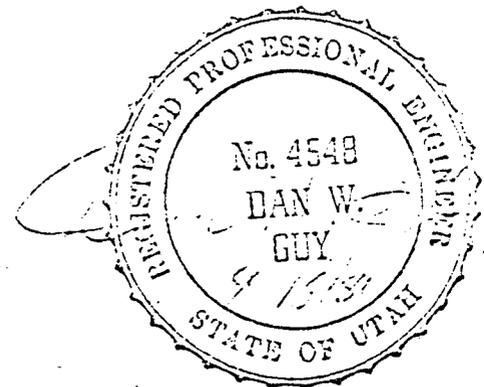
BY

DAN W. GUY

REGISTERED PROFESSIONAL ENGINEER

STATE OF UTAH NO. 4548

FOR APPROVAL
BY THE BOARD OF PROFESSIONAL ENGINEERS
STATE OF UTAH
DATE Sept 17, 1980 *Dan W. Guy*



PLAN FOR CONSTRUCTION AND MAINTENANCE
OF
WASTEWATER DISPOSAL SYSTEM.

General Description

The Pinnacle Mine is to be located in the Right Fork of Deadman Canyon, in Carbon County, some 10 miles north-east of Price, Utah. Due to the remote location, no existing sewage disposal facilities are available; therefore, this submittal encompasses a complete design for wastewater disposal from the office building on site.

Pinnacle Mine
Wastewater Disposal System Specifications

Criteria

The following criteria have been used in the design of this system:

- 1) Office facilities, complete with toilets and drinking fountains will be available.
- 2) Facilities designed for 20 men/day.
- 3) Disposal system designed for 15 gallon/day/man. (Based on average of "day workers at offices" use in Table V-2, of Part V, Small Underground Wastewater Disposal Systems).
- 4) Percolation rate of 17 inches/minute.
- 5) Design is based to comply with standards set forth in the Utah State Division of Health, Code of Waste Disposal Regulations, Part V, Small Underground Wastewater Disposal Systems.
- 6) Design is certified by a registered professional engineer, State of Utah.

Design

The system herein proposed is a septic tank/drainfield type, using proven and approved materials and techniques. It will consist of a wastewater discharge line, a septic tank, and an absorption field.

Location and Installation

Location and installation of the system shall be such that, with reasonable maintenance, it will function in a sanitary manner and will not create a nuisance, health hazard or endanger the quality of any waters of the state. The proposed location of the system is shown on the attached map.

Construction Materials

All materials used in the construction of the system shall be durable, sound and not unduly subject to corrosion. Pipe, pipe fittings and similar materials shall comply with the requirements of the Utah Plumbing Code.

Wastewater Drainage Line

This line will convey wastewater from the office to the septic tank. The following criteria will be followed in the installation of this line:

- 1) It shall be of suitable, approved material and will have watertight and root-proof joints.
- 2) It will have an inside diameter of 4 inches, and will be laid on a minimum grade of 15 inches per 100 feet.
- 3) Cleanouts will be installed every 50 feet and at all changes in direction. Cleanouts will consist of 2-45° bends with cleanout.
- 4) Lines will not be closer than 10 feet horizontally to any water service pipes.

Wastewater Quantity Estimate

Estimates are based on Table V-2, "Estimated Quantity of Domestic Wastewater", Part V, Small Underground Wastewater Disposal Systems, which shows an average of 15 gal/day/person for office day workers. Using the projected manning of 20 people, the estimated daily wastewater will be:

$$20 \text{ men} \times 15 \text{ gallon/man/day} = 300 \text{ gallons/day.}$$

Septic Tank

The septic tank shall be constructed of durable material designed to withstand expected physical loads and corrosive forces. It shall be designed to provide settling of solids, accumulation of sludge and scum, and access for cleaning.

The septic tank herein proposed is a standard, approved concrete type, sold commercially under the name of Dura-crete. This tank will meet all requirements of Parts V-13 through V-20 of Part V, Small Underground Wastewater Disposal Systems. A detailed drawing of this proposed tank is attached.

Septic tank sizing is based on the requirements of V-15, a., which requires a 750 gallon septic tank for flows less than 500 gallons per day. Since Q is expected to be 300 gallons per day, V=750 gallons. The proposed tank is therefore sized at a 1,000 gallon capacity to allow for an added safety factor.

Discharge Line

The effluent from the septic tank will be conducted to the absorption field, through a watertight line meeting the requirements for house sewers. Outlet inverts will be at least 1 inch below the inlet invert.

Absorption Field

- 1) Soil Exploration: The attached drawing shows a 10' deep soil exploration test in the proposed drainfield area. This test assures at least 4' of soil between the base of the proposed absorption system and bedrock.
- 2) Installation: The field is proposed to be placed level, with all trenches interconnected.
- 3) Sizing: The percolation rate for this area is found to be 17 minutes per inch. A copy of the percolation test report is attached. Based on this rate, an allowable rate of application to the field will be 1.2 gallons per square foot per day, requiring a minimum of 250 square feet of absorption area for the expected wastewater discharge of 300 gallons per day. The proposed field will consist of 2-50' long x 36" wide trenches, separated by a minimum of 7.5' of undisturbed earth (wall to wall). This will provide an absorption area of 345 square feet, including side trenches, slightly

more than required.

- 4) Criteria: The absorption field will consist of gravel filled trenches provided with perforated pipes to distribute septic tank effluent in the gravel fill, from which it will percolate through the trench walls and bottom into the surrounding sub-surface soil.
 - a) The portion of the trenches below the distribution lines shall be in natural or acceptably stabilized earth.
 - b) The proposed system will be level, with all trench bottoms constructed at the same elevation. Distribution lines and trenches will be level and interconnected.
 - c) Effluent distribution lines shall be 4" diameter, perforated pipe of suitable material.
 - d) The gravel fill in the trench shall be of $\frac{1}{2}$ " to $2\frac{1}{2}$ " drain rock, and will completely encase the distribution pipe. The gravel will be covered with untreated building paper or straw prior to backfill.
 - e) Heavy equipment will not be driven over the trenches during backfilling or after completion of the absorption field.

Percolation Test
for
Pinnacle Mine
Office Building

The following percolation test was run at 2 points within the proposed drainfield site for the Pinnacle Mine Office Building on Sept. 2, 1980. The test was performed by Mr. Mike Glasson, under the direction of Dan W. Guy, a registered professional engineer, State of Utah.

The test was performed as follows:

- 1) 2 holes were dug in the area of the proposed absorption field. Each hole was 6 inches in diameter, with vertical sides, and dug to the depth of the bottom of the proposed field. Hole locations are shown on the enclosed map.
- 2) The sides and bottom of each hole was roughened, and all loose materials were removed. Two inches of coarse sand were placed in the bottom of each hole to prevent scouring.
- 3) The holes were filled with water greater than 12 inches above the sand, and each hole was kept filled for 4 hours.
- 4) The water level was adjusted to 6 inches over the sand. The drop in water level was then measured from a fixed reference point, at 30 minute intervals for a period of 4 hours. The water level was brought back to a depth of 6 inches after each measurement.

5) The drop during the final 30 minute period was used to calculate the percolation rate.

6) The following table is a tabulation of all measurements:

WEST HOLE #1

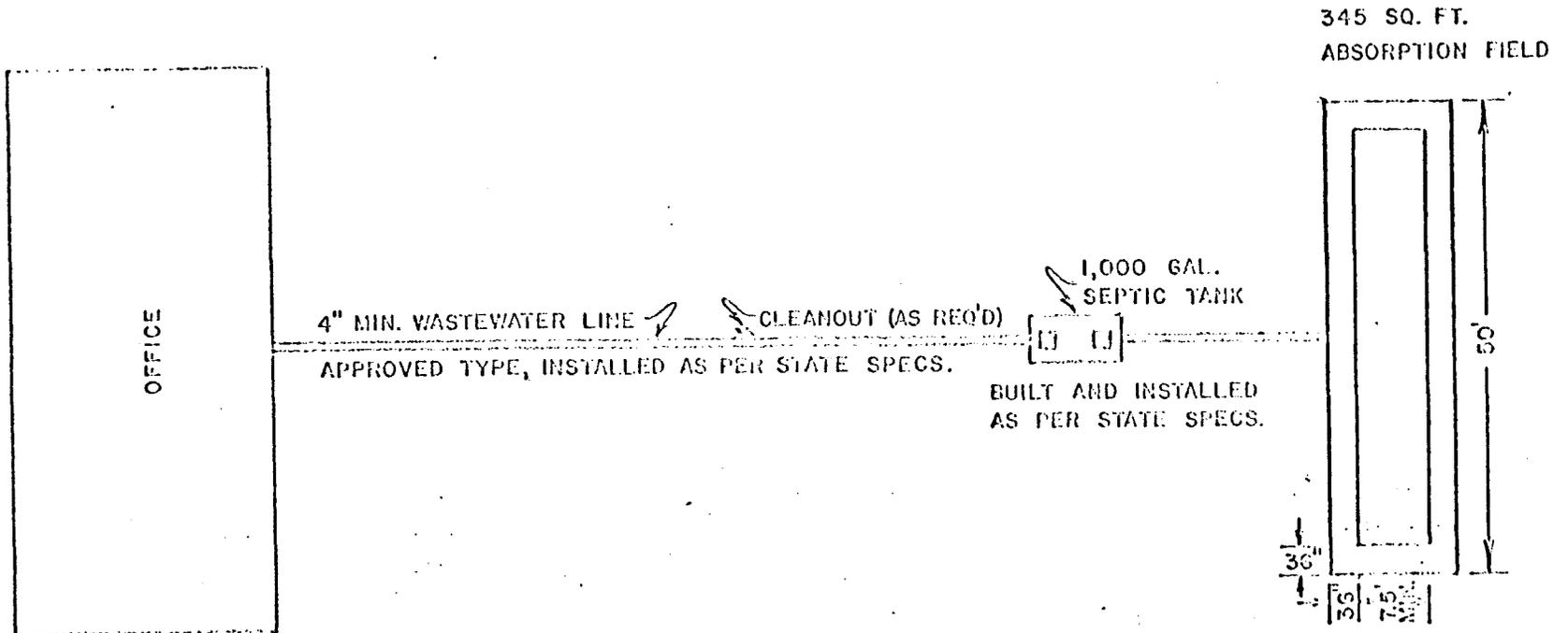
Measurement No.	Time (start 10:15)	Water Level Drop
1	10:45	3-3/8"
2	11:15	3-1/8"
3	11:45	2-5/8"
4	12:15	2-1/8"
5	12:45	1-7/8"
6	1:15	1-3/4"
7	1:45	1-3/4"
8	2:15	1-3/4"

EAST HOLE #2

Measurement No.	Time (start 10:25)	Water Level Drop
1	10:55	3-1/4"
2	11:25	2-3/8"
3	11:55	2-1/4"
4	12:25	2-1/8"
5	12:55	1-7/8"
6	1:25	1-7/8"
7	1:55	1-3/4"
8	2:25	1-3/4"

TOWER RESOURCES, INC.

PIREACLE MINE
OFFICE BUILDING

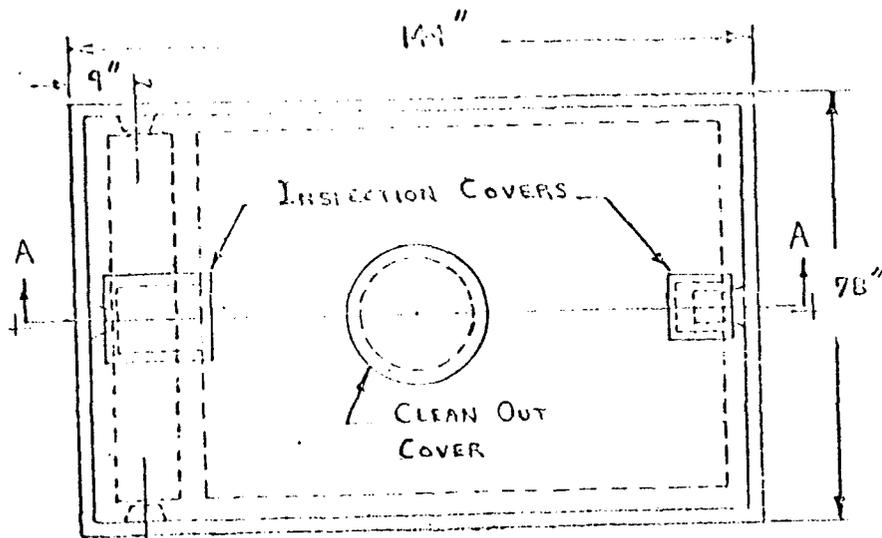


WATER DISPOSAL SYSTEM

DATE: 9-1-80

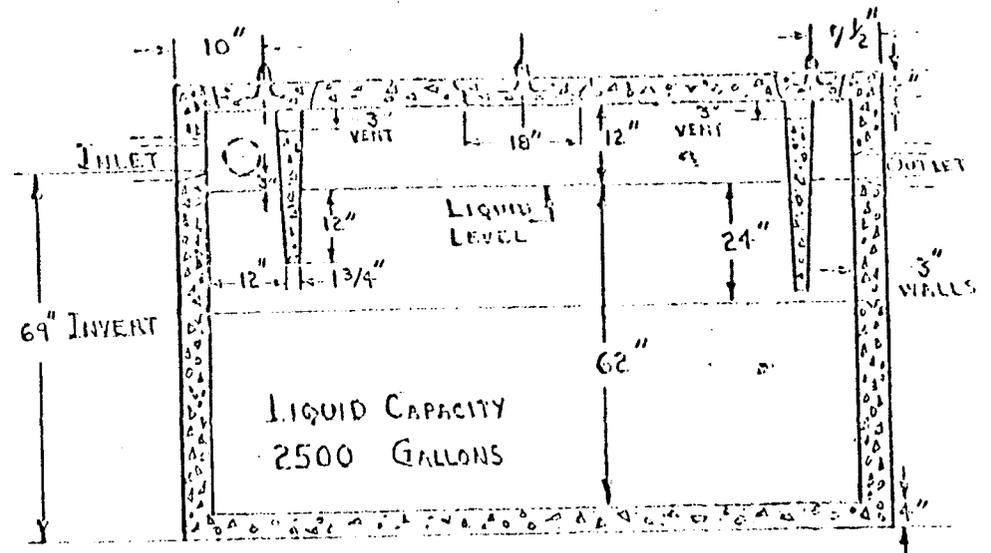
SCALE: AS SHOWN

Sept 17, 1980 *Heath Stary*



ALT. INLET
KNOCKOUTS 3 PLACES

TOP VIEW



SECTION A-A

NOTE:

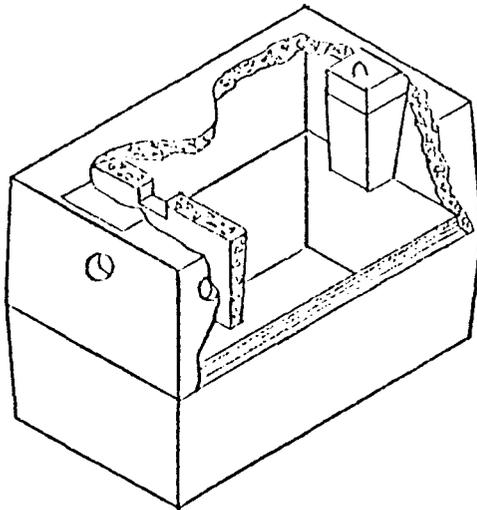
CAPACITY - 2500 GALLONS

WEIGHT - 28000 POUNDS

EXCAVATION DIMENSIONS - 9' X 15'

FLOW LINE - 5'-9"

SEALED WITH ASPHALT ROPE AND REINFORCED
WITH 4" X 4" - 4 X 4 WELDED FABRIC



CUTAWAY ISOMETRIC

2500 GALLON - TWO PEICE SEPTIC TANK

SCALE: NONE

APPROVED BY:

DRAWN BY

DATE: 4-29-74

REVISED

DURA - CRETE, INC.

1475 W. 3500 S.

SALT LAKE CITY, U

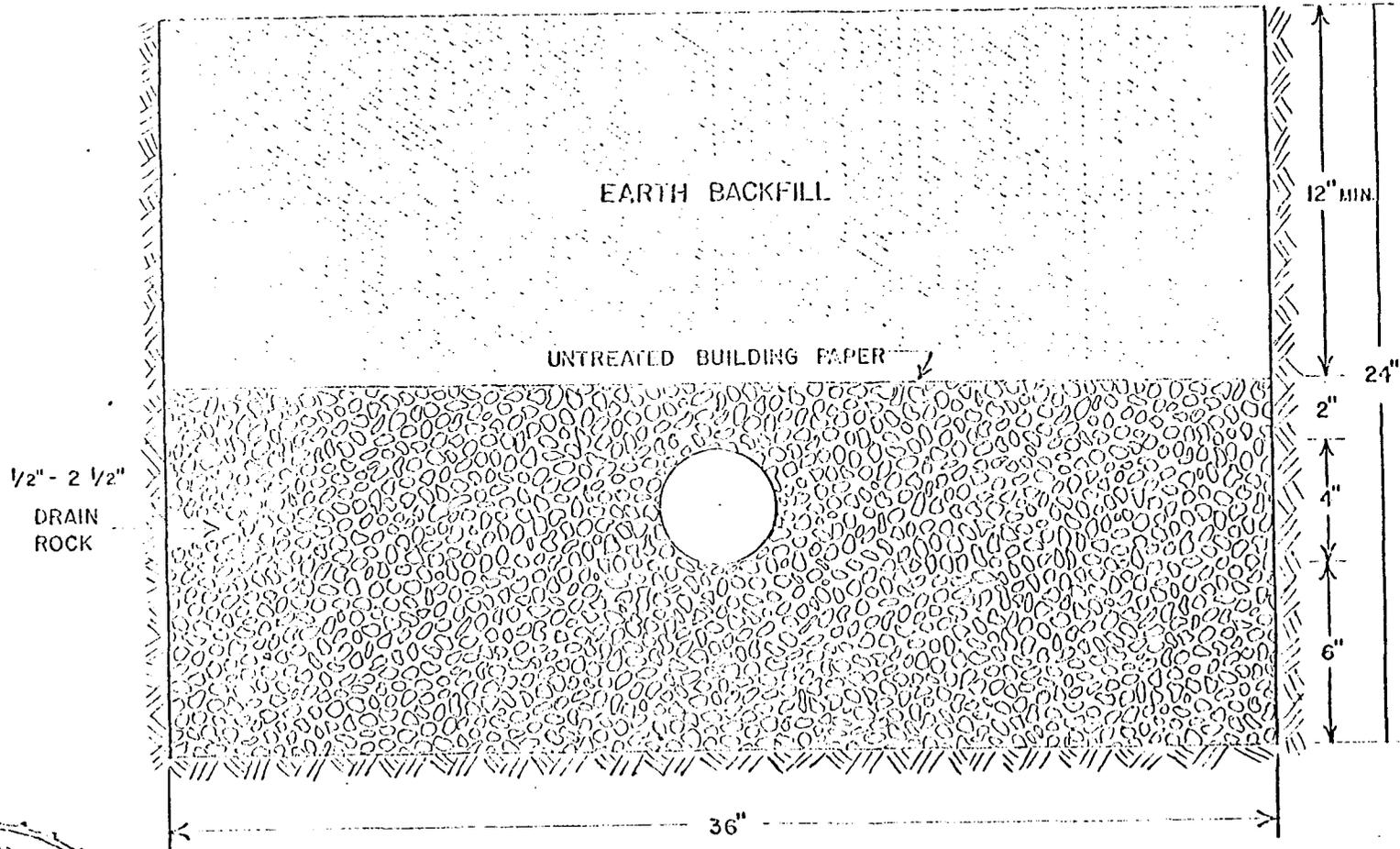
DRAWING NO.

PHONE NO. 262-1140

TOWER RESOURCES, INC.

PRICE, UTAH

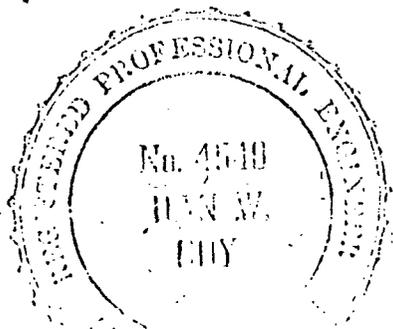
PINNACLE MINE



TRENCH DETAIL

SCALE 1" = 6"

DATE 4-7-80

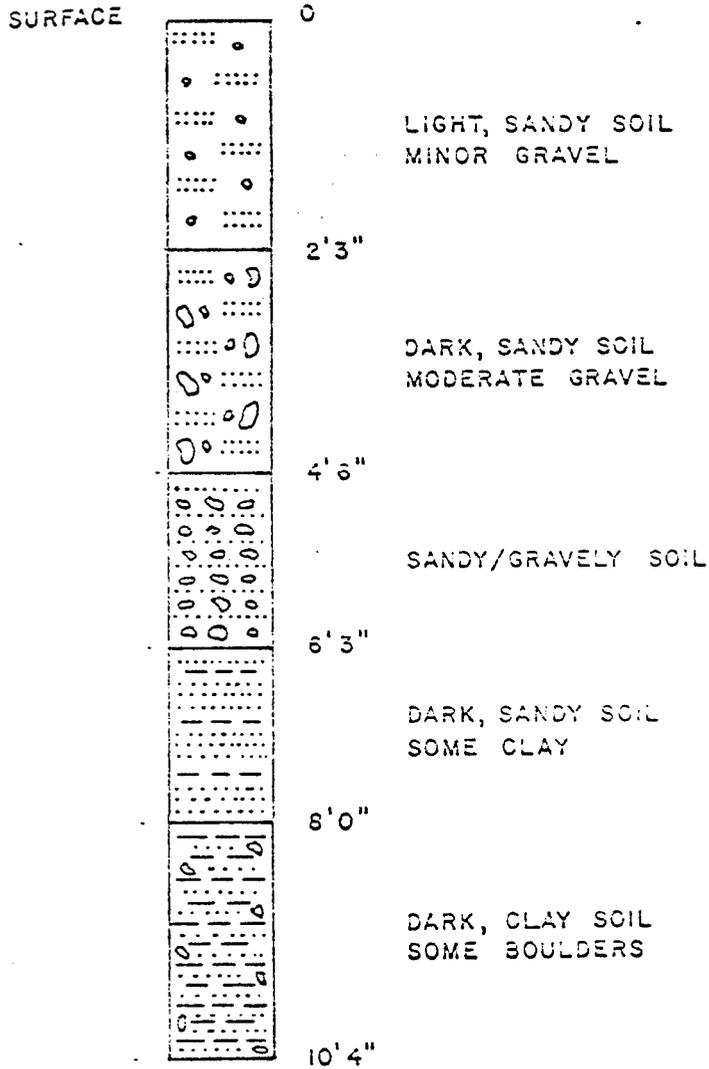


TOWER RESOURCES, INC.

TEST HOLE

AT

DRAINFIELD SITE
PINNACLE MINE
OFFICE BUILDING



WASTEWATER DISPOSAL SYSTEM
FOR THE
PINNACLE MINE

PREPARED FOR:
TOWER RESOURCES, INC.
BY
DAN W. GUY
REGISTERED PROFESSIONAL ENGINEER
STATE OF UTAH NO. 4548



PLAN FOR CONSTRUCTION AND MAINTENANCE
OF
WASTEWATER DISPOSAL SYSTEM

General Description

The Pinnacle Mine is to be located in the Right Fork of Deadman Canyon, in Carbon County, some 10 miles north-east of Price, Utah. Due to the remote location, no existing sewage disposal facilities are available; therefore, this submittal encompasses a complete design for wastewater disposal on site.

Pinnacle Mine

Wastewater Disposal System Specifications

Criteria

The following criteria have been used in the design of this system:

- 1) Bathhouse facilities, complete with showers, toilets and drinking fountains will be available.
- 2) Facilities designed for 45 men/day.
- 3) Disposal system designed for 35 gallon/day/man. (Based on average of factory use in Table V-2, of Part V, Small Underground Wastewater Disposal Systems).
- 4) Percolation rate of 17 minutes/inch.
- 5) Design is based to comply with standards set forth in the Utah State Division of Health, Code of Waste Disposal Regulations, Part V, Small Underground Wastewater Disposal Systems.
- 6) Design is certified by a registered professional engineer, State of Utah.

Design

The system herein proposed is a septic tank/drainfield type, using proven and approved materials and techniques. It will consist of a wastewater discharge line, a septic tank, and an absorption field.

Location and Installation

Location and installation of the system shall be such that, with reasonable maintenance, it will function in a sanitary manner and will not create a nuisance, health hazard or endanger the quality of any waters of the state. The proposed location of the system is shown on the attached map.

Construction Materials

All materials used in the construction of the system shall be durable, sound and not unduly subject to corrosion. Pipe, pipe fittings and similar materials shall comply with the requirements of the Utah Plumbing Code.

Wastewater Drainage Line

This line will convey wastewater from the bathhouse to the septic tank. The following criteria will be followed in the installation of this line:

- 1) It shall be of suitable, approved material and will have watertight and root-proof joints.
- 2) It will have an inside diameter of 4 inches, and will be laid on a minimum grade of 15 inches per 100 feet.
- 3) Cleanouts will be installed every 50 feet and at all changes in direction. Cleanouts will consist of 2-45° bends with cleanout.
- 4) Lines will not be closer than 10 feet horizontally to any water service pipes.

Wastewater Quantity Estimate

Since no actual figures are available for this operation, discharge quantity has been estimated from discussions with Mr. Gerald Story. This discussion determined an estimated usage of 35 gallons per day per person. Using the projected manning of 45 people, the estimated daily wastewater will be:

$$45 \text{ men} \times 35 \text{ gallon/man/day} = 1,575 \text{ gallons/day.}$$

Septic Tank

The septic tank shall be constructed of durable material designed to withstand expected physical loads and corrosive forces. It shall be designed to provide settling of solids, accumulation of sludge and scum, and access for cleaning.

The septic tank herein proposed is a standard, approved concrete type, sold commercially under the name of Duraconcrete. This tank will meet all requirements of Parts V-13 through V-20 of Part V, Small Underground Wastewater Disposal Systems. A detailed drawing of this proposed tank is attached.

Septic tank sizing is based on the following formula:

$V = 1,125 + 75\%Q$. Since Q is expected to be 1,575 gallons per day, $V = 1,125 + 0.75 (1,575)$ or 2,306.25 gallons. The proposed tank is therefore sized at a 2,500 gallon capacity to allow for an added safety factor.

Discharge Line

The effluent from the septic tank will be conducted to the absorption field, through a watertight line meeting the requirements for house sewers. Outlet inverts will be at least 1 inch below the inlet invert.

Absorption Field

- 1) Soil Exploration: The attached drawing shows a 10' deep soil exploration test in the proposed drainfield area. This test assures at least 4' of soil between the base of the proposed absorption system and bedrock.
- 2) Installation: The field is proposed to be placed level, with all trenches interconnected.
- 3) Sizing: The percolation rate for this area is found to be 17 minutes per inch. A copy of the percolation test report is attached. Based on this rate, an allowable rate of application to the field will be 1.2 gallons per square foot per day, requiring a minimum of 1,312.5 square feet of absorption area for the expected wastewater discharge of 1,575 gallons per day. The proposed field will consist of 4-100' long x 36" wide trenches, separated by a minimum of 7.5' of undisturbed earth (wall to wall). This will provide an absorption area of 1,335 square feet, including side trenches, slightly more than

required.

- 4) Criteria: The absorption field will consist of gravel filled trenches provided with perforated pipes to distribute septic tank effluent in the gravel fill, from which it will percolate through the trench walls and bottom into the surrounding sub-surface soil.
 - a) The portion of the trenches below the distribution lines shall be in natural or acceptably stabilized earth.
 - b) The proposed system will be level, with all trench bottoms constructed at the same elevation. Distribution lines and trenches will be level and interconnected.
 - c) Effluent distribution lines shall be 4" diameter, perforated pipe of suitable material.
 - d) The gravel fill in the trench shall be of $\frac{1}{2}$ " to $2\frac{1}{2}$ " drain rock, and will completely encase the distribution pipe. The gravel will be covered with untreated building paper or straw prior to backfill.
 - e) Heavy equipment will not be driven over the trenches during backfilling or after completion of the absorption field.

Percolation Test

for

Pinnacle Mine

The following percolation test was run at 2 points within the proposed drainfield site for Tower Resources' Pinnacle Mine on May 2, 1980. The test was performed by Mr. Mike Glasson, under the direction of Dan W. Guy, a registered professional engineer, State of Utah.

The test was performed as follows:

- 1) 2 holes were dug in the area of the proposed absorption field. Each hole was 6 inches in diameter, with vertical sides, and dug to the depth of the bottom of the proposed field. Hole locations are shown on the enclosed map.
- 2) The sides and bottom of each hole was roughened, and all loose materials were removed. Two inches of coarse sand were placed in the bottom of each hole to prevent scouring.
- 3) The holes were filled with water greater than 12 inches above the sand, and each hole was kept filled for 4 hours.
- 4) The water level was adjusted to 6 inches over the sand. The drop in water level was then measured from a fixed reference point, at 30 minute intervals for a period of 4 hours. The

water level was brought back to a depth of 6 inches after each measurement.

- 5) The drop during the final 30 minute period was used to calculate the percolation rate.
- 6) The following table is a tabulation of all measurements:

NORTH HOLE

Measurement No.	Time (start 11:42)	Water Level Drop
1	12:12	3-7/8"
2	12:42	3-1/4"
3	1:12	2-7/8"
4	1:42	2-3/8"
5	2:12	1-7/8"
6	2:42	1-3/4"
7	3:12	1-3/4"
8	3:42	1-3/4"

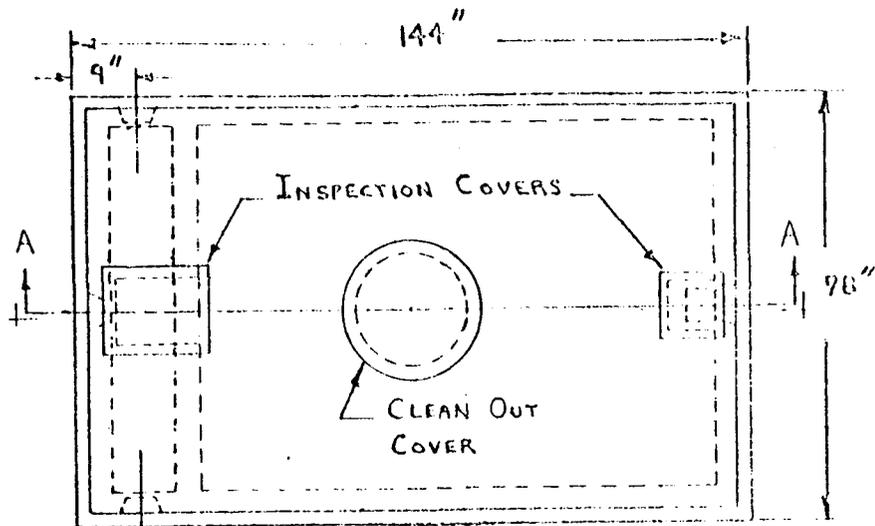
SOUTH HOLE

Measurement No.	Time (start 11:50)	Water Level Drop
1	12:20	3-1/8"
2	12:50	2-5/8"
3	1:20	2-1/4"
4	1:50	2 "
5	2:20	1-3/4"
6	2:50	1-3/4"
7	3:20	1-3/4"
8	3:50	1-3/4"

The preceding table of readings shows a percolation rate of 1.75" per 30 minute period, or a rate of 17.14 minutes per inch. Using the table (Figure V-1) on page 12 of "Small Underground Wastewater Disposal Systems", the allowable rate of application is 1.2 gallons per square foot per day.

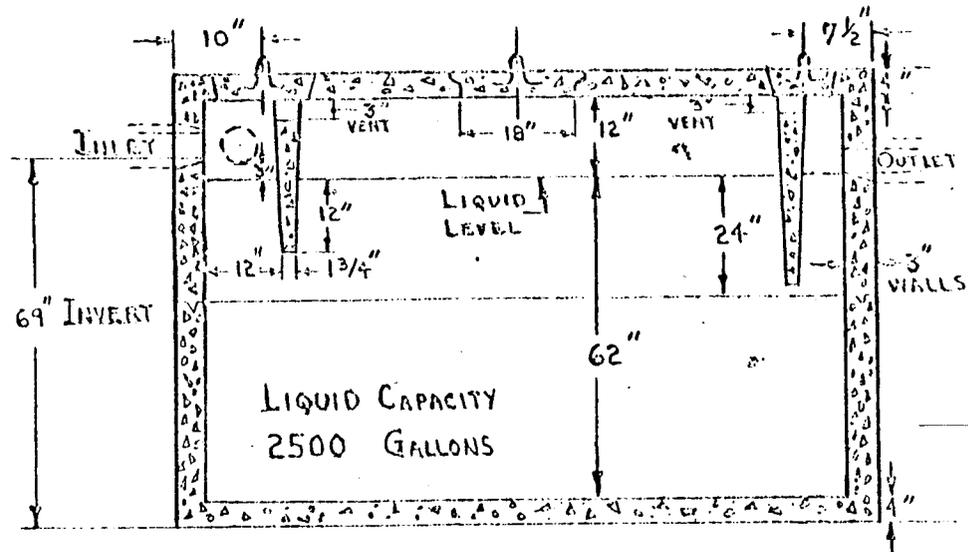
The percolation test was run under the direction of a registered professional engineer, and is hereby certified to be a true and accurate representation of the percolation capabilities of the sites herein described.





ALT. INLET
KNOCKOUTS 3 PLACES

TOP VIEW



SECTION A-A

NOTE:

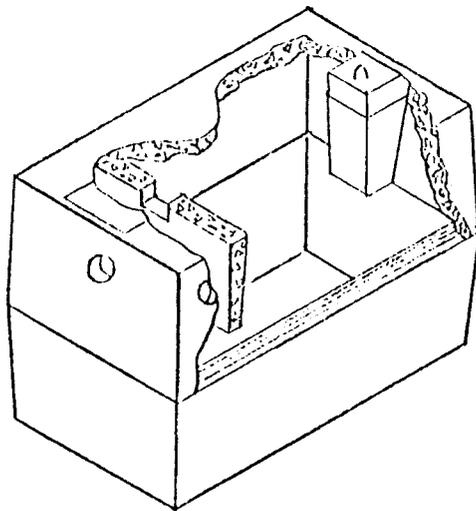
CAPACITY - 2500 GALLONS

WEIGHT - 28000 POUNDS

EXCAVATION DIMENSIONS - 9' X 15'

FLOW LINE - 5'-9"

SEALED WITH ASPHALT ROPE AND REINFORCED
WITH 4" X 4" - 4 X 4 WELDED FABRIC



CUTAWAY ISOMETRIC

2500 GALLON - TWO PEICE SEPTIC TANK

SCALE: NONE

APPROVED BY:

DRAWN BY

DATE: 4-29-74

REVISED

DURA - CRETE, INC.

1495 W. 3500 S.

SALT LAKE CITY, UT

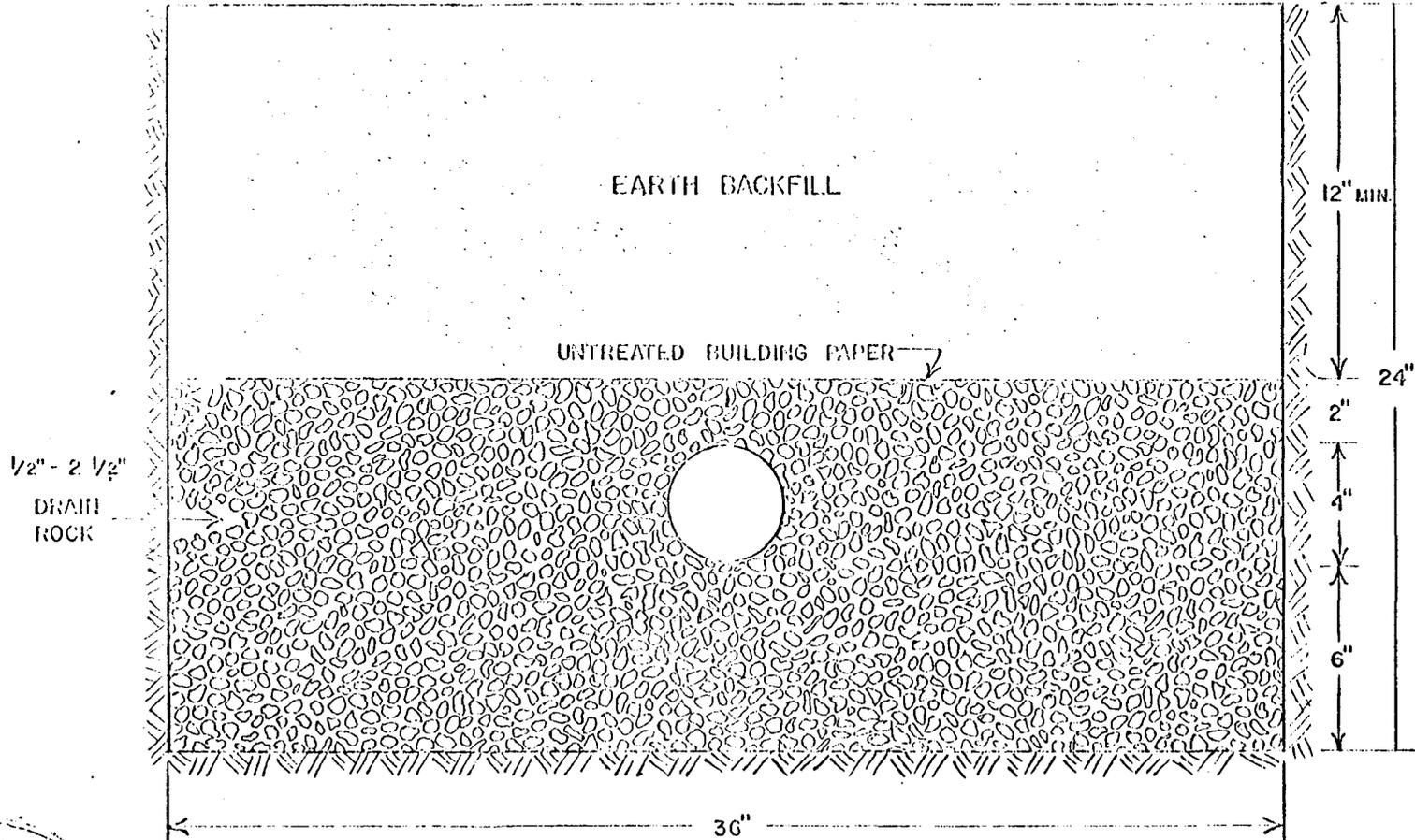
DRAWING NUMBER

PHONE NO. 262 - 1140

TOWER RESOURCES, INC.

PRICE, UTAH

PINNACLE MINE



TRENCH DETAIL

SCALE 1" = 6"
DATE 4-7-80

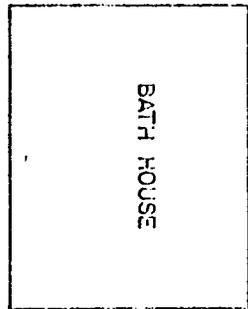


TOWER RESOURCES, INC.

PRICE, UTAH

PINNACLE MINE

1335 SQ. FT. ABSORPTION FIELD

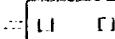


4" MIN. WASTEWATER LINE

CLEANOUT (AS REQ'D)

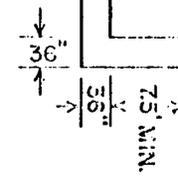
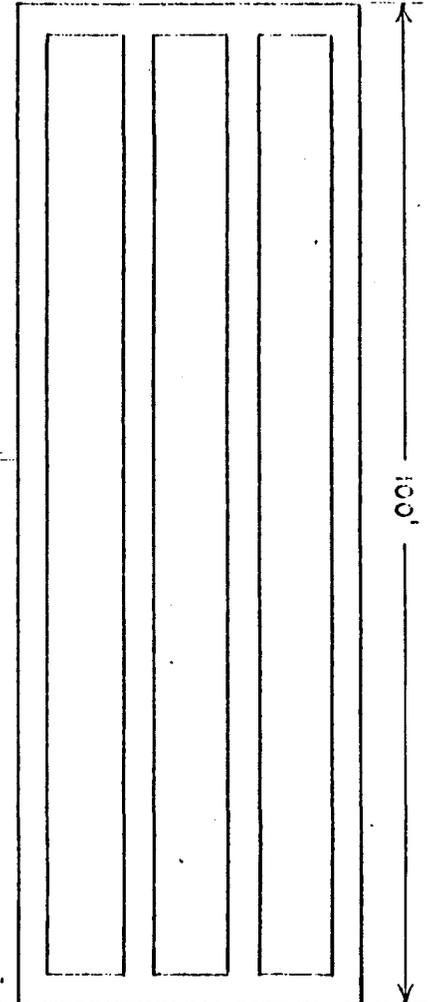
APPROVED TYPE, INSTALLED AS PER STATE SPECS.

2500 GAL.
SEPTIC TANK



6.5' x 12' x 6.7'

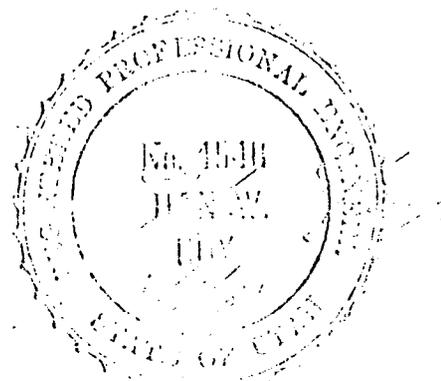
BUILT AND INSTALLED
AS PER STATE SPECS.



WATER DISPOSAL SYSTEM

DATE: 4-6-80

SCALE AS SHOWN



Appendix H

WATER WELL INFORMATION & WATER QUALITY

Zimmerman Well Service

4081 Sunnydale Drive O Moab, Utah 84532

Sept. 25, 1980

Tower Resources
Box 1027
Price, Utah 84501

Pump Test on Wells drilled for Tower Resources

Well #1

Depth 130' Static water level 58' Drawdown to
67' after 4 Hrs. at 50 GPM.

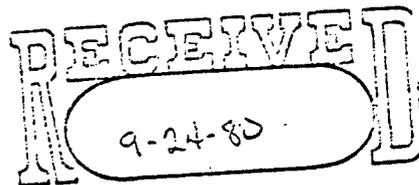
Well #2

Depth 155' Static water level 57' Drawdown to 88'
after 2 Hrs. at 30 GPM.

Depth 280' Static water level 57' Drawdown 100' after
1 Hr. at 30 GPM.

Was pumping 25 GPM at end of test.

For Tower Resources
 P.O. Box 1027
 Price, Utah 84501



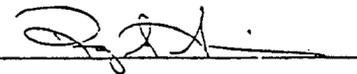
Lab. No. 1319

Sample ID: Well #1 Pinnacle Mine

Date Rec'd. 08-29-80

Date Sampled 08-29-80

<u>PARAMETER</u>	<u>VALUE</u>	
pH	7.5	
Total Alkalinity	452.6	mg/l CaCo ₃
Acidity	0	mg/l CaCo ₃
Chloride	26.4	mg/l
Conductivity	1290	umhos/cm
Hardness (Ca&Mg)	2.54	mg/l CaCo ₃
Cyanide	*	
Flouride	*	
Nitrogen, Ammonia	*	
Nitrogen, Nitrate	*	
Nitrogen, Nitrite	*	
Phenol	*	
Phosphorus, Ortho	Less than 0.1	mg/l
Phosphorus, Total	Less than 0.1	mg/l
Total Dissolved Solids	846	mg/l
Total Suspended Solids	4.0	mg/l
Sulfate	251.4	mg/l
Turbidity	1.1	NTU
Aluminum	Less than 0.5	mg/l
Antimony	Less than 0.5	mg/l
Barium	Less than 0.2	mg/l
Boron	2680	ug/l
Cadnium	Less than 0.02	mg/l
Calcium	1.0	mg/l
Chromium	0.08	mg/l
Cobalt	Less than 0.05	mg/l
Copper	Less than 0.02	mg/l
Iron, Total	0.04	mg/l
Lead	Less than 0.1	mg/l
Magnesium	14.08	mg/l
Manganese	0.01	mg/l
Molybdenum	*	
Nickel	Less than 0.06	mg/l
Potassium	5.8	mg/l
Silica	8.56	mg/l
Sodium	22.8	mg/l

Respectfully Submitted 

For Tower Resources
P.O. Box 1027
Price, Utah 84501

Sample ID: Well #1 Pinnacle Mine

Lab. No. 1319 (cont'd)
Date Rec'd. 08/29/80
Date Sampled 08/29/80

<u>PARAMETER</u>		<u>VALUE</u>	
Cyanide	Less than	0.50	mg/l
Flouride		0.30	mg/l
Nitrogen, Ammonia		0.10	mg/l
Nitrogen, Nitrate		0.36	mg/l
Phenol	Less than	0.10	mg/l
Arsenic		0.7	µg/l
Mercury		3.5	µg/l
Selenium	Less than	0.2	µg/l

Respectfully Submitted



For Tower Resources
P.O. Box 1027
Price, Utah 84501

Sample ID: Well #1 Pinnacle Mine

Lab. No. 1319 (cont'd)

Date Rec'd. _____

Date Sampled _____

<u>PARAMETER</u>	<u>VALUE</u>	
Vanadium	Less than 0.6	mg/l
Zinc	Less than 0.01	mg/l
Silver	Less than 0.03	mg/l
Arsenic	*	
Mercury	*	
Selenium	*	
Bicarb. Alkalinity	452.6	mg/l CaCo ₃
Carbinate Alkalinity	0	mg/l CaCo ₃

Respectfully Submitted 

For Tower Resources
P.O. Box 1027
Price, Utah 84501

Lab. No. 1327 (cont'd)

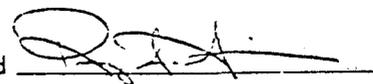
Sample ID: Well #2 Pinnacle Mine

Date Rec'd. _____

Date Sampled _____

<u>PARAMETER</u>		<u>VALUE</u>	
Aluminum	less than	0.06	mg/l
Antimony	less than	0.35	mg/l
Barium	less than	0.20	mg/l
Boron		700	ug/l
Cadmium	less than	0.02	mg/l
Calcium		54.50	mg/l
Chromium	less than	0.05	mg/l
Cobalt	less than	0.05	mg/l
Copper	less than	0.03	mg/l
Total Iron	less than	0.05	mg/l
Lead	less than	0.05	mg/l
Magnesium		27.6	mg/l
Manganese	less than	0.01	mg/l
Molybdenum	less than	0.1	mg/l
Nickle	less than	0.04	mg/l
Potassium		12.8	mg/l
Silica		7.49	mg/l
Sodium		39.3	mg/l
Vanadium	less than	0.02	mg/l
Zinc	less than	0.01	mg/l
Silver	less than	0.01	mg/l
Arsenic		1.3	ug/l
Mercury	less than	0.2	ug/l
Selenium	less than	0.2	ug/l
Bicarb. Alkalinity		461.2	mg/l
Carb. Alkalinity		0	

Respectfully Submitted



For Tower Resources
P.O. Box 1027
Price, Utah 84501

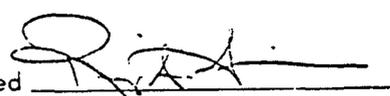
Sample ID: Well #2 Pinnacle Mine

Lab. No. 1327

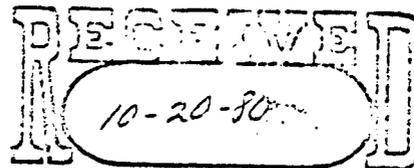
Date Rec'd. 09/11/80

Date Sampled 09/07/80

<u>PARAMETER</u>	<u>VALUE</u>	
pH	7.7	
Total Alkalinity	461.2	mgCaCo3/L
Acidity	-0-	
Chloride	41.0	mg/l
Conductivity	1690	umhos/cm
Cyanide less than	0.5	mg/l
Flouride	.219	mg/l
Nitrogen, Ammonia	0.50	mg/l
Nitrogen, Nitrate	0.37	mg/l
Phenol less than	0.1	mg/l
Phosphorus, Ortho less than	0.1	mg/l
Phosphorus, Total less than	0.1	mg/l
Total Dissolved Solids	1164	mg/l
Total Suspended Solids	105	mg/l
Sulfate	483.9	mg/l
Turbidity	7.4	NTU

Respectfully Submitted 

For Tower Resources
 P.O. Box 1027
 Price, Utah 84501



Lab. No. 1340

Sample ID: Pinnacle Mine Well #3

Date Rec'd. 10/02/80

Date Sampled 09/29/80

<u>PARAMETER</u>	<u>VALUE</u>	
pH	8.2	
Total Alkalinity	315.8	mg Ca Co ₃ /L
Acidity	0	
Chloride	58.6	mg/l
Conductivity	2150	umhos/cm
Cyanide	less than 0.5	mg/l
Flouride	0.304	mg/l
Nitrogen, Ammonia	0.18	mg/l
Nitrogen, Nitrate	0.71	mg/l
Nitrogen, Nitrite	*	
Phenol	less than 0.1	mg/l
Phosphorus, Ortho	0.42	mg/l
Phosphorus, Total	0.62	mg/l
Total Dissolved Solids	1791	mg/l
Total Suspended Solids	4.5	mg/l
Sulfate	318.9	mg/l
Turbidity	2.6	NTU
Aluminum	less than 0.06	mg/l
Antimony	less than 0.35	mg/l
Barium	less than 0.2	mg/l
Boron	240	mg/l
Cadnium	less than 0.02	mg/l
Calcium	303.8	mg/l
Chromium	less than 0.05	mg/l
Cobalt	less than 0.05	mg/l
Copper	0.23	mg/l
Total Iron	0.68	mg/l
Lead	0.05	mg/l
Magnesium	41.0	mg/l
Manganese	0.18	mg/l
Molybdenum	less than 0.1	mg/l
Nickle	less than 0.04	mg/l
Potassium	12.9	mg/l
Silica	10.5	mg/l

Respectfully Submitted 

For Tower Resources
P.O. Box 1027
Price, Utah 84501

Lab. No. 1340 (cont'd)

Sample ID: Pinnacle Mine Well #3

Date Rec'd. _____

Date Sampled _____

<u>PARAMETER</u>		<u>VALUE</u>	
Sodium		58.0	mg/l
Vanadium	less than	0.2	mg/l
Zinc	less than	0.01	mg/l
Silver	less than	0.05	mg/l
Arsenic		*	
Mercury		*	
Selenium		*	
Bicarb. Alkalinity		315.8	mg/l
Carb. Alkalinity		0	

* To be reported at a later date.

Respectfully Submitted



Appendix I

POWER LINE & SUBSTATION DESIGN

AMCA COAL LEASING, INC.

P. O. BOX 1027
PRICE, UTAH 84501
801-637-5385

RLG 12078-1
Rev. 1/18/79

A M C A C O A L L E A S I N G , I N C .

46 KV POWER TRANSMISSION LINE

SPECIFICATIONS

1. GENERAL

All construction work shall be done in a thorough and workmanlike manner in accordance with the Plans, Specifications, and Construction Drawings, and shall be subject to the acceptance of the Owner.

Deviation from the Plans, Specifications, and Construction Drawings shall not be permitted except upon the written permission of the Owner.

If any construction problem arises that is not covered by these Specifications, the Contractor shall consult with the Owner for approval on material, type of construction, reclamation, or procedure to be followed.

2. DRAWINGS AND MAPS

The Vicinity Map is presented to show the general route of the transmission line. Each Plan and Profile sheet, as listed separately hereinafter, becomes part of these Plans and Specifications. The Construction Drawings and the Pole Data sheets showing the type of construction to be used, where indicated on the Plan and Profile, are also listed and are part of these Plans and Specifications. No deviation from the Plan and Profile drawings or Specifications shall be made without the written approval of the Owner.

3. LOCATIONS OF STRUCTURE

Structure, guys, etc., shall be placed in locations determined by the Engineer and staked by the Engineer as shown on the Plan and Profile sheets and structure lists. Structures, guys, etc., shall not be erected in any other location without prior approval of the Owner.

Survey stakes established by the Owner shall be preserved by the Contractor. Any stakes destroyed or ruined by the Contractor without the Owner's approval shall be replaced at the Contractor's expense.

4. RIGHT-OF-WAY CLEARING

The Contractor shall clear the right-of-way of all trees, brush and other obstructions as required for stringing conductors and as specified hereinafter or as otherwise specified by Owner.

The Contractor shall clear all trees, brush, stumps, and large boulders from around each pole and anchor location for a radius of fifteen (15) feet and as close to the ground as possible.

Trees, brush or other vegetation which has grown to within ten (10) feet of the nearest conductor, or if when turned in an arc from it's base would strike within ten (10) feet of the nearest conductor, shall be removed by the Contractor.

Any hazard to the transmission line shall be removed by the Contractor as specified by the Owner. A hazard to the transmission line shall include any tree, boulder, stump, or other object within the right-of-way, which may, at some future time, fall or roll onto, or come in contact with the transmission line causing damage. Any hazard apparent outside the right-of-way shall be noted and a request for removal shall be made to the Bureau of Land Management.

All areas cleared along the right-of-way shall be vegetated, as dictated by the Owner, to prevent erosion and unnecessary damage.

5. CONSTRUCTION & ACCESS ROADS

The Contractor shall use the right-of-way furnished by the Owner for construction where practical. Access to the right-of-way shall be from intersecting or adjacent public or private roads.

No access or construction road shall be built by the Contractor, whether on or off the right-of-way, without the Owner's consent. Such roads, as approved by the Owner, shall be built and maintained by the Contractor. Upon completion of the job, access roads which have been built shall be obliterated, the soil shall be reseeded with vegetation and the terrain returned to it's original form, as dictated by the Owner.

Any existing access roads used by the Contractor shall be left in as good or better condition than when the Contractor's use commenced.

6. POLES

A. All poles shall conform to American National Standard Institute (ANSI) 05.1-1972 standards with respect to fiber stresses, class, dimensions, and defect limitations.

B. All poles shall be fully treated Douglas Fir conforming to EEI standard TD-100.

C. All poles are to possess a low conductivity. The measured resistance over a twenty (20) foot length of pole must be greater than 1,000,000 ohms.

D. All poles are to be new and free of splits, splinters, and other signs of visible abuse.

E. Poles shall not be dropped in unloading or handling.

F. All poles are to be set and buried at not less than their standard depths; the minimum setting depths shall be as follows:

<u>Pole Length</u> (feet)	<u>Setting Depth</u> (feet)
45	6.5
50	7.0
55	7.5
60	8.0
65	8.5
70	9.0

G. For multiple pole structures, holes shall be carefully dug to the setting depth specified by the Engineer, except that the distance from the butt to the girth shall be measured for each pole and the depth of holes adjusted as required. If necessary, the top of one pole of a multiple pole structure shall be cut and reframed to bring crossarms level.

On sloping ground, the depth of the hole shall always be measured from the low side of the hole.

Holes shall be approximately eight (8) inches larger than the butt diameter of the pole, and shall be at least as large at the bottom as at the top.

H. All poles shall be set in alignment, except on line angles, and plumb. At line angles, where suspension construction is used, poles shall be offset on the bisector of the angle so that conductors will hang directly over the point of intersection or in line with the tangent in both directions. All poles shall be plumb after conductors are strung.

6. POLES (Continued)

I. In backfilling, holes shall be thoroughly tamped in layers of six inches or less for the full depth. Earth shall be banked up around each pole. After completion of the job, holes shall be inspected and any settlement refilled.

Frozen earth or any material subject to decay shall not be used in backfilling. Holes shall be dewatered before any backfilling is attempted. Gravel shall be used in backfilling holes under muddy conditions.

J. The tops of full length treated poles shall not be cut except under very exceptional conditions and upon the approval of the Owner. If cutting is deemed necessary, the pole top shall be painted with creosote compound and covered completely with a copper or aluminum cap plate or other approved method.

K. Under no circumstances shall the butt on any pole be cut.

L. All unused holes in poles shall be plugged prior to line completion using treated cedar wood dowel pins.

7. TIMBERS AND ARMS

A. All timbers are to be high-grade structural timbers conforming to the specifications of the Timber Manufacturer's Associations.

B. All arms are to be treated Douglas fir conforming to structural specifications and EEI specifications TD-90 and TD-92.

C. The maximum crushing strength of each timber and arm shall not be less than that set forth by ASTM specifications.

D. All timbers and arms shall be new and free of splits, splinters, and other signs of visible defects.

E. Any field bored holes which are not used shall be plugged with tight-fitting treated cedar plugs.

F. Any timber or arm shall only be cut upon approval of Owner, and when cut shall receive at least two applications of preservative.

G. Timbers and arms shall be installed level to horizontal and perpendicular to the center line except as noted for certain structure types. Timbers or arms used on angle structures shall be set on the bisection of the angle.

8. CONDUCTORS AND OVERHEAD GROUND WIRE

A. Care shall be exercised to avoid kinking, twisting, or abrading the conductor or overhead ground wire in any manner. Conductors or overhead ground wires shall not be tramped on, run over by vehicles, or dragged over sharp rocks. The wire on each reel shall be inspected for cuts, kinks, or other injuries. Injured portions or crooked or imperfect splices in either the conductor or overhead ground wire shall be cut out and the wire respliced. Badly nicked conductors shall not be acceptable.

B. Conductors and overhead ground wires shall be pulled over suitable rollers or stringing blocks properly mounted on the pole or crossarm, to prevent binding while stringing.

C. Installation of conductors and accessories shall be done in accordance with manufacturers' recommendations.

D. Phase conductors shall be 266.8 MCM ACSR (Partridge) throughout. The ground conductors (static) shall be 3/8" EHS Grade B 7 strand galvanized steel.

E. The conductor SAG design shall be set at 40 percent of ultimate (4520 pounds maximum design tension) and for medium loading. Stock bridge dampers shall be installed on the 266.8 MCM ACSR so that they hang directly under the phase conductors. Dampers shall be carefully attached to the conductor in accordance with the wire manufacturers recommendations with regards to the damper spacing, weights, and quantity. Contractor shall ascertain that drain holes in weights are open after dampers are installed.

Included with these specifications are the ALCOA SAG-tension data for 266.8 MCM ACSR based on 40 percent of ultimate. This data lists the final and initial SAGS for 50 foot increments from 100 to 900 foot spans. Also included is ALCOA's recommendations for the damper applications.

This information from ALCOA is intended as a guide for the contractor to follow in determining the damper cost. The actual application shall depend on the specific recommendations by the manufacturer of the cable. It shall be the responsibility of the Contractor to obtain and follow these recommendations based on the brand of conductor purchased.

F. The sag of all conductors after stringing shall be in accordance with the Manufacturers' recommendations, except that a maximum increase of three (3) inches of the specified

8. CONDUCTORS AND OVERHEAD GROUND WIRES (Continued)

sag in any span will be acceptable. Under no circumstances will a decrease in the specified sag be allowed. Sagging by sighting between targets is recommended.

The minimum allowable ground clearance should be no less than twenty-five (25) feet at any point along the line.

The air temperature at the time and place of stringing shall be determined by a certified etched-glass thermometer. The temperature at which the conductor is sagged in and the spans in which sags are measured shall be recorded and the information given to the Owner.

G. There shall not be more than one splice per conductor in any span, and no splice shall be located within fifteen (15) feet of the conductor support. There shall be no splices in spans over 1200 feet. Splices shall be limited to not more than one every 2,000 feet. Where splices are necessary, they shall be made with high quality, compression-type sleeves suitable for the application and they shall be approved by the Owner.

All splicing sleeves shall be carefully installed so that the completed splice is as straight as possible and presents no undue twisting or kinks to the conductor.

After the compression sleeve has been installed, it shall be finished in a workmanlike manner with all the corners and sharp projections tapered or rounded.

H. Utmost care shall be exercised in installing parallel groove clamps. The contact surface of the clamp and the wire shall be clean and bright. A steel brush shall be the principal cleaning medium. These same precautions for cleaning shall apply to the conductor before splicing.

9. INSULATORS

A. Care shall be exercised in handling and erecting insulators and in assembling suspension units to insure that all cotter keys are in place.

B. String and suspension insulators shall be ball and socket type, 5 3/4" x 10", 15,000 pound M&E, ANSI Class 52-3, Light Gray Glaze.

C. Dead end strings will be made up of six (6) insulators having an overall length of $34\frac{1}{2} \pm$.

9. INSULATORS (Continued)

D. Angle string will be made up of five (5) insulators for an overall length of 28 3/4" ±.

E. Tangent strings will be made up of four (4) insulators for an overall length of 23" ±.

F. Post insulators shall be clamp type, Lapp No. 4766.

G. Any insulation type with broken or chipped glass shall not be acceptable.

10. GUYS AND ANCHORS

A. Guys shall be installed in locations specified by the Engineer. Points of attachment to poles shall be via Pole Bands as shown on construction drawings. Guys shall be installed before conductors or overhead ground wires are strung. Down Guys shall be installed at a 1 to 1 slope.

B. Holes for anchors shall be dug in locations staked by the Engineer. Anchor rods shall be in line with the strain and so installed that approximately eight (8) inches of the rod shall remain out of the ground. Under no circumstances shall the eye of the rod be covered. Holes shall be backfilled and tamped in the same manner as for pole holes. The setting of each anchor, in regards to depth and position, shall be inspected by the Engineer and his approval given before the anchor hole is backfilled.

C. Anchors are to be set against undisturbed earth with the rod trenched upward at an angle equal to the guy wire.

D. All guy wire shall be one common size of 1/2" Grade B galvanized extra high strength steel throughout.

E. All guy attachments shall be as near as possible to the conductor they are supporting.

F. All guys shall be of the insulated type with fiberglass strains used where insulation from energized conductors is required.

G. All anchors shall be rated in the 20,000 pound class.

H. Colored fiberglass guy guards shall be installed on all down guys.

I. Adjustable grip deadends shall be installed for down guy tension adjustments.

11. LINE ACCESSORIES AND HARDWARE

- A. All hardware shall be hot dipped galvanized.
- B. All hardware shall be new equipment.
- C. All bolts, angle brackets, etc., shall be at least 3/4" in diameter unless specified otherwise.
- D. All accessories and hardware shall conform to pole structure specifications or accepted standard requirements.
- E. Where practical, locknuts shall be used on all bolts.

12. GROUNDS

- A. Pole grounds shall be run on every pole with a 12" "Bayonet" brought above the pole.
- B. All ground wire shall be #6 AWG Copper Weld.
- C. Copper butt plates shall be used on all poles.
- D. In addition to the butt plates, 3/4" x 8' ground rods shall be driven between poles on the three (3) pole "H" structures and tied to the pole grounds.
- E. On two (2) and three (3) pole structures, where more than one static wire is pulled, the static shall be tied together.
- F. The #6 AWG pole ground conductor shall be stapled to the pole approximately every two (2) feet using ground wire clips.
- G. The pole ground conductor and the overhead static conductor shall be tied together at every pole using compatible connectors.
- H. All pole grounds shall be meggered for ground resistance. If the ground resistance of any structure measures greater than 20 ohms ground rods will be driven, but not to exceed two (2) rods per structure. Contractor will notify Owner if less than 20 ohms cannot be achieved.

13. MISCELLANEOUS

These specifications are intended as minimum acceptable standards. The following pole data sheets, comprised of the specific pole type and material list, along with the reference drawings, are intended to pinpoint the construction as much as

13. MISCELLANEOUS (Continued)

practical. However, the material lists are in no way conclusive. The responsibility for the correct quantities will fall on the successful Contractor who is solely responsible for providing a complete 46 KV transmission line ready to be energized. The quality of the material shall be no less than that specified. For particular items showing no manufacturer, the material selected shall be of comparable grade to the specified components. In such cases, the Owner reserves the right to refuse certain materials considered below grade or inferior.

POLE DATA SHEETS

<u>Pole Number</u>	<u>Constr. type</u>	<u>Pole Size Height/Class</u>	<u>Span (from Preceding Pole)</u>
0.	SPECIAL	50ft/3 40ft/3	Disconnect-Meter Structure (Str.)
1.	PLTS	55ft/3	256 ft.
2.	PLTS	60ft/3	400 ft.
3.	PLTS	55ft/3	400 ft.
4.	PLTS	60ft/3	400 ft.
5.	PLTS	55ft/3	400 ft.
6.	PLTS	55ft/3	400 ft.
7.	PLTS	60ft/3	400 ft.
8.	PLTS	65ft/3	400 ft.
9.	PLTS	65ft/3	400 ft.
10.	PLTS	65ft/3	400 ft.
11.	PLTS	60ft/3	400 ft.
12.	PLTS	65ft/3	400 ft.
13.	PLDE	60ft/2	400 ft.
14.	PLTS	60ft/3	375 ft.
15.	PLTS	60ft/3	375 ft.
16.	PLTS	55ft/3	375 ft.
17.	PLTS	60ft/3	375 ft.
18.	PLTS	60ft/3	375 ft.
19.	PLTS	55ft/3	375 ft.
20.	PLTS	60ft/3	375 ft.
21.	PLTS	55ft/3	375 ft.
22.	PLTS	55ft/3	400 ft.
23.	PLTS	55ft/3	375 ft.
24.	PLTS	55ft/3	375 ft.
25.	PLTS	55ft/3	375 ft.
26.	PLTS	60ft/3	375 ft.
27.	PLTS	60ft/3	375 ft.
28.	PLDE	60ft/2	390 ft.
29.	PLTS	55ft/3	390 ft.
30.	PLTS	55ft/3	390 ft.

POLE DATA SHEETS

(Page 2)

<u>Pole Number</u>	<u>Constr. type</u>	<u>Pole Size Height/Class</u>	<u>Span (from Preceding Pole)</u>
31.	PLTS	55ft/3	390 ft.
32.	PLTS	60ft/3	390 ft.
33.	PLTS	55ft/3	390 ft.
34.	PIMA	60ft/2	400 ft.
35.	PLTS	55ft/3	400 ft.
36.	PLTS	55ft/3	400 ft.
37.	PLTS	55ft/3	400 ft.
38.	PLTS	55ft/3	400 ft.
39.	PLTS	60ft/3	400 ft.
40.	PLTS	55ft/3	400 ft.
41.	PLTS	60ft/3	400 ft.
42.	PLDE	65ft/2	400 ft.
43.	PLTS	55ft/3	400 ft.
44.	PLTS	60ft/3	400 ft.
45.	PLTS	55ft/3	400 ft.
46.	PIMA	60ft/2	400 ft.
47.	PLTS	55ft/3	400 ft.
48.	PLTS	60ft/3	400 ft.
49.	PLTS	55ft/3	400 ft.
50.	PLTS	65ft/3	400 ft.
51.	PLTS	55ft/3	400 ft.
52.	PLTS	55ft/3	400 ft.
53.	PLTS	55ft/3	400 ft.
54.	PLTS	60ft/3	400 ft.
55.	PLTS	55ft/3	400 ft.
56.	H3/LA	55ft/3 55ft/3 55ft/3	400 ft.
57.	H3/LA	55ft/3 55ft/3 55ft/3	705 ft.
58.	PLYS	60ft/3	455 ft.
59.	PLYS	60ft/3	455 ft.
60.	PLYS	60ft/3	455 ft.

POLE DATA SHEETS

(Page 3)

<u>Pole Number</u>	<u>Constr. type</u>	<u>Pole Size Height/Class</u>	<u>Span (from Preceding Pole)</u>
61.	PLYS	60ft/3	442 ft.
62.	PLYS	60ft/3	438 ft.
63.	PLDE	55ft/2	525 ft.
64.	PIMA	55ft/2	400 ft.
65.	PLTS	55ft/3	350 ft.
66.	PLTS	55ft/3	350 ft.
67.	PLDE	60ft/2	350 ft.
68.	PLTS	55ft/3	383 ft.
69.	PLTS	65ft/3	275 ft.
70.	PLTS	60ft/3	385 ft.
71.	PIMA	55ft/2	385 ft.
72.	PLTS	60ft/3	341 ft.
73.	H3/LA	60ft/3 60ft/3 60ft/3	331 ft.
74.	H2TS	60ft/2 65ft/2	645 ft.
75.	H3/LA	55ft/3 55ft/3 60ft/3	694 ft.

ANDALEX RESOURCES, INC.

ELECTRICAL SPECIFICATION NO. TR-2
DEADMAN CANYON MINE SUBSTATION

I. General

This specification is for the construction of an outdoor permanent substation. This substation will be used to step-down the incoming 46 KV, 3-phase, 60 Hertz power supply from Utah Power and Light Company to a distribution voltage of 4160 volts, 3-phase, 60 Hertz for supplying power to Andalex Resources, Inc.'s Pinnacle Coal Mine and surface facilities at the present time. However, the entire substation secondary and mine power distribution system shall be designed, installed, and insulated in accordance with 8 KV specifications to facilitate the future conversion to a 7200 volt mine power distribution system. The substation will also contain a section that will step-down the mine primary distribution voltage (4160 or 7200 volts) to 480 volts, 3-phase, 60 Hertz power for surface power distribution purposes.

All work shall be done in strict adherence to the latest National Electrical Code; Part 77, Code of

Federal Regulations; and all applicable local, state, and federal laws, regulations, and codes. In addition, all applicable spacings and clearances shall conform to the recommendations given in Utah Power and Light Company's Drawing C1501, "Outdoor Substation Clearances", which is attached. The general layout is to be as shown on the conceptual drawing TR-2-1.

II. Definitions

- A. The term "purchase" shall refer to Andalex Resources, Inc.
- B. The term "contractor" shall refer to the successful bidder who is constructing the substation.

III. Work By Purchaser

The purchaser will grade and drain substation site; and survey and locate foundations, footers, and pads for the substation structure, power transformers, ground resistor, control transformer, and distribution boxes.

IV. Material Supplied By Purchaser

The purchaser shall supply all major substation components such as power transformers; switchgear; control transformer; grounding resistor; 46 KV load

break switch; 39 KV intermediate type lightning arrestors; 46 KV deadend insulators; S & C SMD-1A, 46 KV fused disconnects and fuse units; 4.5 KV intermediate type lightning arrestors, and 8 KV solid disconnect switches.

V. Material Supplied By Contractor

The contractor shall supply all conduit, conduit fittings, wire and cable, stress cones, terminals, fencing material, steel, and concrete necessary to complete the construction of the substation as specified.

VI. Work By Contractor

A. Grounding

1. A ground field (grid) not exceeding 3 ohms shall be established within the station by means of interconnected driven ground rods. The ground rods shall be copper-clad steel electrodes, 3/4 inch diameter x 12 feet long. A main ground loop shall be constructed by interconnecting the ground rods with stranded, soft-drawn, bare copper wire, size 500 MCM. The main ground loop should follow the fence line as closely as possible with the tops of the ground rods at least 24 inches below finished grade.

2. The main tap from the ground loop to the neutral grounding resistor shall also be stranded, soft-drawn, bare copper wire, size 500 MCM.
3. Taps from the ground loop are to be connected to all columns of the substation metallic structure, to all metallic cases and enclosures within the substation and switchgear house, and to the operating mechanisms and operating handles of all air-break switches within the substation. All of these shall be stranded, soft-drawn, bare copper wire, size 250 MCM.
4. A dual-path ground will be provided for 46 KV and 4.16 KV lightning arrestors, size 2/0 AWG minimum.
5. The fence shall be grounded in accordance with the following specifications and Utah Power and Light Company's Drawing UC-57923-C "Grounding Steel Fence Details" which is attached for reference.
 - a. All corner posts and all gate posts shall be grounded.
 - b. Ground taps at intervals not exceeding 50 feet in length will be placed between corner posts and between gate posts and corner posts.

- c. Gate panels and removable panels will be bonded to ground with flexible straps (shunts).
 - d. All grounds will be extended up the fabric and bonded to each strand of fence.
 - e. All ground taps shall be stranded, soft-drawn, bare copper wire, size 250 MCM minimum.
6. A ground tap shall be provided for the grounded mat located at each grounded operating handle of airbreak switches. Each ground tap shall be stranded, soft-drawn, bare copper wire, size 250 MCM minimum.
7. Ground wire connections to the main ground loop, to the electrodes and to the substation structure shall be by thermit weld. Bolted ground clamps shall be used on all electrical equipment within the substation and switch-gear house.
8. All conduits shall be bonded to panel boards, wire troughs or other metallic enclosures by means of grounding bushings or ground clamps. Bonding is to be provided across all conduit connections that are not fully threaded.
- B. Substation Structure Construction
- 1. The contractor shall supply all materials, fabricate, and erect the heavy gauge steel

structure. Outline drawings and instructions pertaining to the construction of the substation structure shall be furnished by purchaser. Note that the drawings are to be used as guidelines only and are not detailed enough to be used as fabrication specifications. The contractor shall be responsible for design, layout, fabrication, and erection of the substation structure. The structure shall be designed on the basis of 1500 lbs. tension per wire $\pm 15^\circ$ from straight and 80 MPH wind. The contractor shall be responsible for locating all necessary anchors and/or fasteners within the concrete footers and pads in order to erect the structure. The contractor shall also be responsible for all concrete work associated with the substation construction.

2. The incoming 46 KV, 3-phase, 60 Hertz power line will dead-end on the incoming end of the substation structure with a slack span from the 2-pole terminal structure that will be centered on the substation. The incoming conductors, which are three, single, bare 266.8 MCM ACSR conductors, shall terminate on the line side of the substation incoming-line, air-break

switch. In addition, 1 3/8" EHS Grade B, 7-strand, galvanized steel static wire carried along the overhead power line shall be solidly grounded to the substation structure. The contractor shall be responsible for terminating the incoming line on strain insulators provided by the purchaser and mounted by the contractor. The contractor shall be responsible for providing a means to solidly ground the static wire to the substation structure and to make the connection. The contractor shall supply and install the jumper wires required between the strain insulators and the line-side of the incoming-line, air-brak switch.

3. The purchaser shall supply and the contractor shall install the incoming line switch on the substation structure. This switch shall be a three-pole, gang operated, air-break, load-break, manually operated switch rated at 46 KV and 600 amperes. The switch operating mechanism will be arranged so that the operating handle is located near ground level enabling the switch to be opened and closed from the ground. The switch operating handle shall be grounded as specified previously. A metal mat, grounded as previously specified, shall be provided by

purchaser and installed by contractor. The switch shall be arranged so that it will automatically ground all three phases on the load-side of the switch when fully in "open" position. The contractor shall install this switch and make all necessary connections; including grounds, bus work and wires. The busing will be supplied by the contractor.

4. Lightning arrestors shall be supplied by the purchaser and installed and connected by the contractor on the load-side of the 46 KV incoming line switch. These lightning arrestors shall be rated for at least 40 KV to ground and one shall be provided for each phase (3). All bus work, wiring and grounding shall be installed by the contractor. The contractor will supply the busing. A dual-path ground shall be provided.
5. Three single-pole fused cut-outs shall be provided for transformer protection on the primary (46 KV) side. These fuse cut-outs shall be S & C Electric Company type SMD-1A or equivalent. They shall be rated for at least 46 KV and 200 amperes. Each fused cut-out will be equipped with a 46 KV, 20 ampere current-limiting fuse. These fuse cut-outs will be supplied by the purchaser.

6. The purchaser shall supply and the contractor shall install the 46 KV insulators that are required.
7. The contractor shall furnish and install all 46 KV bus work that is required. All bus work will be copper and all terminations will be for copper-to-copper connections. All terminations will also be furnished by and installed by contractor. Busing shall be copper tubing (IPS).
8. All clearances and spacings in the substation and on the substation structure shall comply with the 1978 National Electrical Code, AIEE standards, and Utah Power & Light Company's Drawing CI501 "Outdoor Substation Clearances" shall be used as a reference. All energized 46 KV parts are to be at least 120 inches above finished ground level. All energized 4160 volt parts are to be at least 111 inches above finished ground level.
9. All 4160 volt bus work within the substation will be copper and will be furnished by and installed by the contractor. All terminations are to be for copper-to-copper connections and will be furnished by and installed by the contractor.

10. Lightning arrestors will be supplied by the purchaser and installed and connected by the contractor as closely as practical to the load-side (4160 volt) of the main transformer. These lightning arrestors will be rated for at least 4160 volts to ground and one shall be provided for each phase (3). A dual-path ground shall be provided. All bus work, wiring and grounding shall be installed by the contractor. The purchaser will supply all bus work that is required.
11. The purchaser shall supply and the contractor shall install all insulators on the 4160 volt side of the substation. All 4160-volt side insulators will be rated for at least 7.5 KV to ground.
12. The purchaser will supply and the contractor will install a 25 KVA, 4160 volt, 120/240 volt, single-phase control power transformer on the 4160-volt end of the substation. All necessary terminals, mounting brackets and associated hardware required for this installation will also be provided by the purchaser. The contractor shall furnish and install enclosed fuse cut-outs on the primary side (4160 volt) of this control transformer. The

fuse cut-outs shall be rated for at least 8 KV and 100 amperes, with fuse links rated at 8 KV and 9.0 amperes.

13. The contractor shall furnish and install an outdoor, NEMA 3R (raintight), 8 pole-space, 100 ampere rated circuit breaker panel. This circuit breaker panel shall be equipped with circuit breakers with the following ratings:

1 - 30 ampere, 2 - pole

2 - 20 ampere, 1 - pole

14. The contractor shall furnish all parts and install a service drop from the 25 KVA control transformer to the circuit breaker panel. This service drop shall consist of a 1½ inch weatherhead; 1½ inch rigid conduit; a 1½ inch weather-tight hub; and the enclosed service conductors which shall be 2 - #2 AWG, type THW, black phase conductors; 1 - #2 AWG, type THW white neutral conductor; and 1 - #6 AWG, bare copper ground wire. Note that the center-tapped neutral shall be grounded to the substation structure ground field.

15. The contractor shall furnish all parts and install a 120 volt, single-phase, auxiliary power outlet on the substation structure column beneath the circuit breaker panel. This

power outlet shall consist of a 20 ampere, 1-pole circuit breaker in the circuit breaker panel; a ½ inch rigid galvanized conduit offset nipple, locknuts, and plastic bushings; the enclosed conductors which shall be 1 - #12 AWG, type THW, black phase conductor; 1 - #12, type THW white neutral conductor; and 1 - #12 AWG, bare copper ground wire; a weather-proof outlet box; a 20-ampere-rated duplex receptacle; a weather-proof cover; and the necessary mounting accessories.

16. The contractor shall supply and install two 200 watt mercury vapor street lights and the power circuits for these lights. The lights shall be mounted on both sides of the 46 KV end of the structure as shown on the attached diagrams. The lights shall be equipped with photocells. The lighting circuit shall consist of a 20 ampere, 1-pole circuit breaker in the circuit breaker panel; ½ inch rigid galvanized conduit; ½ inch weather-proof boxes; and the enclosed conductors which shall be 1 - #12 AWG, type THW, black phase conductor; 1 - #12 AWG, type THW, white neutral conductor; and 1 - #12 AWG, bare copper ground wire.

17. All 120/240 volt control and power circuits, and all 480 volt distribution circuits on the substation structure and located within the substation area shall be enclosed in galvanized rigid conduit and all conductors shall be 600 volt, type THW, copper. All buried conduits shall be coated and sealed with black mastic compound.
18. All 46 KV busing, complete with fittings and terminals, shall be supplied and installed by the contractor. This busing shall be electrical tubing-type copper (IPS) rated at 600 amperes continuous, and braced to withstand the mechanical forces associated with currents up to 10,000 amperes instantaneously. See the attached diagrams.
19. All 8 KV busing, complete with fittings and terminals, shall be supplied and installed by the contractor. This busing shall be 4/0 bare copper, stranded, single-conductor cable suspended from one end of the substation secondary to the other by means of 8 KV strain insulators. See the attached diagrams.
20. The purchaser shall supply and the contractor shall install three (one per phase) non-fused (solid blade) disconnect switches on the

substation structure on the line-side of the mine oil circuit breaker. The contractor shall connect the line-side of these disconnect switches to the secondary busing on the substation and the load-side of the mine oil circuit breaker.

21. The purchaser shall supply and the contractor shall install three (one per phase) fused cut-outs on the substation structure to provide protection and disconnect functions for the surface power transformer bank. The line-side of these fused cut-outs shall be connected to the substation secondary bus work (4160 volts), and the load-side shall be connected to the surface transformer bank. The surface power transformer bank shall provide 480 volt, 3-phase, 60 Hertz power for surface loads. The connections shall be made with 4/0, bare, stranded copper wire. All wire and connectors shall be supplied by the contractor. The voltage rating of the fused cut-outs, insulators, and fuse links shall be at least 8 KV. The current rating of the fused cut-outs shall be 200 amperes and the current rating of the fuse links shall be sized to protect the surface transformer bank and will be specified at a later date.

22. The contractor shall provide mounting brackets at the location shown on the attached diagrams for the installation of the utility company metering cabinet. The contractor shall also provide a beam or other mounting arrangement on the substation structure for installation of the utility company secondary (4160 volt) metering transformers.

23. The contractor shall provide and install a fence that shall completely enclose the substation. The fence shall be in accordance with Utah Power and Light Company specifications, which are attached (page 2 of the attached Utah Power and Light Company "Specifications and Requirements for Customer-Owned Substations- 69,000 Volts and Below"). The most important items of these specifications and additional instructions are listed below.

- a. The fence is to be of galvanized chain link 7 feet in height with 1 foot extension of barbed wire above for an overall height of 8 feet.
- b. The fence shall be grounded in accordance with the specifications

for fence grounding previously described in the section of this specification headed "Grounding".

- c. At no point shall the bottom of the fence fabric and bottom of fabric on gates and removable panels be more than 2" above finished grade.
- d. The substation fencing shall not be connected or in contact with any other fencing.
- e. "Danger-High Voltage" signs shall be prominently displayed on all sides of the fence facing outside.
- f. One man gate (3 feet wide) and one equipment gate (10 feet wide overall, consisting of 2 - 5 foot wide gates) shall be provided. The man gate shall be located on the end opposite the high-voltage end of the substation opposite the hillside and near the high-voltage end. These gates shall be constructed of galvanized steel pipe and chain link, and shall be 8 feet high overall. All gates shall be provided with locking provisions to prevent unauthorized entrances.

C. The purchaser shall supply and the contractor shall install the main substation distribution transformer or transformer bank. The substation structure has been outlined to provide the required spacings and clearances for a capacity of up to 5,000 KVA. However, the initial transformers will probably be a bank of three 333 KVA, single-phase transformers (1,000 KVA total capacity). Therefore, the contractor will likely need to provide transformer stands to achieve the required vertical clearance for 46 KV lowest line parts of 120 inches. All transformers shall be equipped with primary and secondary top-mounted bushings for connection to the substation structure equipment and bus work. The contractor shall provide a 4/0 bare copper wire bus extended between 46 KV strain insulators on the substation primary end for connection of the transformer bank primary (46 KV). The contractor shall make all transformer power connections and supply all material except transformer bushing terminals needed to make the connections. The contractor shall install and connect substation ground field taps for each power transformer.

D. The purchaser shall supply and the contractor shall install and wire a neutral current-limiting grounding resistor. The purchaser shall supply and the contractor shall install and wire a neutral current transformer. The neutral current transformer shall be mounted inside the grounding resistor shall be completely enclosed in a galvanized expanded metal enclosure, complete with top-mounted bushings. The contractor shall supply and install a galvanized steel stand that will elevate the grounding resistor such that the height to the exposed terminals above the bushings is at least 111 inches. A ½ inch galvanized rigid conduit shall be provided and installed by the contractor which will initiate at the neutral grounding resistor and terminate at the mine oil circuit breaker. This conduit shall enclose two #12 AWG, type THW conductors that connect to the neutral current transformer and the ground fault relay at the mine oil circuit breaker control panel. The contractor shall connect the line-side of the neutral grounding resistor to the main transformer neutral and the load-side to the mine ground field and mine neutral ground conductor. Refer to the attached diagrams for clarification. The contractor shall also ground the neutral

grounding resistor enclosure to the substation ground field.

- E. The purchaser shall supply and the contractor shall install a mine oil circuit breaker complete with control panel and stand. The vertical clearance to the lowest live part above the finished grade on this oil circuit breaker must be at least 111 inches. This oil circuit breaker shall be equipped with line-side and load-side, top-mounted bushings. The line-side of the circuit breaker shall be connected to the disconnect switches provided on the substation structure. The load-side of the oil circuit breaker shall be connected to an overhead power line extending to the mine portal via the appropriate stand-off and strain insulators mounted on the substation structure. For the purposes of this bid, the contractor shall make the line-side connections as described above. In addition, the contractor shall extend a conductor on each phase from the load-side of the circuit breaker to the stand-off insulators and strain insulator provided on the substation structure, leaving an 18 inch pig-tail for connection to the overhead lines. All interconnecting conductors used to make the connections described above shall be 4/0 AWG, stranded,

bare copper. The contractor shall furnish all parts and materials and install a control power circuit for the oil circuit breaker. This control power circuit shall consist of a 30 ampere, 2-pole circuit breaker in the circuit breaker panel (240 volt, 1-phase, 60 Hertz); ½ inch galvanized rigid conduit, fittings, and mounting accessories; and the enclosed conductors which shall be 2 - #10 AWG, type THW, black phase conductors; and 1 - #10 AWG, bare copper ground wire. The contractor shall solidly ground the mine oil circuit breaker frame to the substation ground field. A neutral ground current transformer circuit to be installed by the contractor has already been specified. A mine power feeder ground monitor circuit must also be installed by the contractor. The contractor shall supply all parts and materials to install this circuit as specified. Note that the ground monitor unit shall be equipped by the purchaser and contained in the mine oil circuit breaker control panel. The ground monitor circuit shall originate at the mine oil circuit breaker control panel and terminate at the mine power feeder ground and pilot wires as described below. This ground monitor circuit shall consist of a ½ inch galvanized rigid conduit, fittings, and mounting accessories; and the

enclosed conductors which are 1 - #10 AWG, type THW, yellow pilot wire, and 1 - #10 AWG, type THW, green ground wire. The yellow wire shall be connected to the mine feeder circuit pilot wire at the point where it leaves the substation structure via a strain insulator accessing it to the overhead power line to the mine. The green wire shall be connected to the mine neutral ground wire on the load-side of the neutral grounding resistor. The contractor shall test, calibrate, and set the oil circuit breaker protective relays and current transformers as specified by the purchaser.

- F. The purchaser shall supply and the contractor shall install a surface power transformer bank. All transformers shall be equipped with top-mounted bushings. The contractor shall make all transformer connections and shall solidly ground the transformer cases to the substation ground field. The transformer bank will very likely consist of three 150 to 200 KVA, single-phase transformers (450 to 600 KVA total capacity). The contractor shall be responsible for achieving the required vertical clearance of 111 inches to live parts on this transformer bank primary (4.15 or 7.2 KV). The contractor shall supply all material

needed to install and connect the surface power transformer bank. The surface power transformer bank shall supply 480 volts, 3-phase, 60 Hertz power to a distribution box located in the substation enclosure. The specifications for this power feeder circuit and the distribution box are given below.

- G. The contractor shall supply all parts, material, and labor to install a 480 volt, 3-phase, 60 Hertz power feeder circuit from the surface power transformer to a 480 volt distribution box that will be specified later. This power feeder circuit shall consist of a 4-inch weather-head, 4-inch rigid galvanized conduit, necessary 4-inch rigid galvanized conduit fittings, and the enclosed conductors. The conductors are 2-350 MCM, type THW, copper conductors in parallel per phase. This 4-inch conduit shall be solidly grounded to the substation ground field by means of a grounding bushing. This power feeder circuit shall initiate at the surface power transformer secondary terminals and terminate on the line-side of the 600 ampere main breaker at the 480 volt distribution box. The conduit shall be constructed in accordance with acceptable standards for a weatherproof installation. See the attached diagrams for a clarification of the work described above and to determine the relative locations of the transformer bank and distribution box.
- H. The contractor shall supply all materials for and construct a 480 volt distribution box located as shown in the substation on the attached

diagrams. This distribution box shall be constructed of heavy guage steel, and shall be weatherproof and weathertight. All conduits entering the distribution box shall be equipped with weathertight hubs. The incoming power feeder circuit for the distribution box shall terminate on the line-side of the 600 ampere main circuit breaker. The load-side of this main circuit breaker shall be connected to three copper buses (one per phase) by means of 2-350 MCM, type THW, copper conductors. The buses shall be rated at least 600 amperes continuous and braced to withstand the magnetic forces associated with 10,000 amperes of fault current momentarily. The distribution box shall be equipped with 3-225 ampere circuit breakers and 1-50 ampere circuit breaker to supply and protect the 480 volt branch circuits. The 225 ampere circuit breakers shall be used to supply the "Fan", "Belt Drive", and "Bath House and Office". The 50 ampere circuit breaker shall be used to supply a yard lighting circuit. The line-sides of the 225 ampere circuit breakers shall be connected to the phase buses by means of 4/0, type THW, copper conductors. The line-side of the 50 ampere circuit breaker shall be connected to the phase buses by means of #6,

type THW, copper conductors. The distribution box shall be equipped with a copper ground bus extending across the bottom of the box for the entire length of the box. This copper ground bus shall be rated at 600 amperes continuous and shall be solidly grounded to the distribution box frame and to the substation ground field. All circuit breakers shall be standard molded-case, 3-pole, thermal-magnetic trip, 600 volt rated. The box shall be constructed such that all circuit breakers can be operated external to the box, all circuit breakers have lock-out provisions, and all circuit breakers are easily accessible by means of hinged doors which also have locking provisions. The box shall be constructed to provide for enough length for the possible future addition of a 400 ampere circuit breaker.

- I. The contractor shall supply all parts, material, and labor to install the branch distribution circuits, conduit risers, and initial pole (pole C on attached diagrams) for the 480 volt distribution circuits. Rigid galvanized conduits equipped with weathertight hubs shall originate at the distribution box, extend underground to pole C, and extend up pole C by means of rigid galvanized conduit risers and

weatherheads. All buried conduits shall be coated with black mastic compound. Pole C shall be a 40 ft., butt-treated, Class 2 or 3 pole. The contractor shall supply, set, install all necessary hardware on, and supply all hardware on this pole. The branch distribution circuits for the "Fan", "Belt Drive", and "Bath House and Office" shall be protected by 225 ampere circuit breakers at the distribution box; shall be enclosed by 2½-inch rigid galvanized conduits; and shall be fed by 3 - 4/0, type THW, copper phase conductors, and 1 - 4/0, type THW copper ground conductor for each distribution circuit. The 50 ampere lighting circuit shall consist of 2 - #6, type THW, copper phase conductors; and 1 - #6, type THW, copper ground conductor enclosed in 1 inch rigid galvanized conduit. All ground conductors shall originate and be solidly connected to the distribution box ground bus. The conduit risers on the poles shall all terminate with weatherheads and 18-inch pigtaills for all conductors shall extend from the weatherheads for connection to future overhead powerlines. The contractor shall supply and install stand-offs, unistrut, and unistrut clamps for attaching the conduit risers to the pole.

J. The contractor shall supply all parts, material, and labor to install the necessary hardware and insulators to facilitate the connection of the future mine 4160 volt overhead powerline drop into the substation. The contractor shall extend 4/0, bare, copper conductors for each phase from the mine oil circuit breaker to stand-off insulators provided on the substation structure. A 24-inch pigtail for each phase shall extend from these stand-off insulators for connection to the power drop. Strain insulators shall also be provided on the substation structure for each phase for termination of the future overhead powerline at the substation. A splice shall be made between the stand-off insulator and strain insulator for each phase for final connection of the overhead power line to the mine oil circuit breaker. Similarly, the necessary strain and stand-off insulators shall be provided on the substation structure to facilitate the transition from the substation to the overhead power line for the mine ground conductor and ground monitor (pilot) conductor.

X. The contractor shall supply all parts, material, and labor to install a mine neutral ground field. This ground field shall at no point be

located less than 25 feet from the substation ground field or structure. In addition, the neutral ground conductor connected to this ground field shall be insulated from the substation structure, substation ground field, and all lightning arrestor grounds. The ground field shall be constructed in accordance with the following guidelines.

1. The mine neutral ground field (grid) shall not exceed 3 ohms and shall be established by means of interconnected driven ground rods. The ground rods shall be copper-clad steel electrodes, 3/4-inch diameter x 12 feet long.
2. A main ground loop shall be constructed by interconnecting the ground rods with stranded, soft-drawn, bare copper wire, size 500 MCM. This main ground loop shall be connected to the tops of the ground rods which shall be located at least 24 inches below finished grade.
3. The main tap from the ground loop shall also be stranded, soft-drawn, bare copper wire, size 500 MCM. This main tap shall extend up a 30 ft. pole provided to extend the neutral ground field conductor into the substation. A 4/0 ACSR

conductor shall extend from this pole to the substation. The necessary strain and stand-off insulators shall be provided on the substation structure to facilitate the connection of this conductor to the mine neutral ground bus in the substation. Note that approved copper-to-aluminum connectors shall be used to make all copper-to-aluminum connections. The contractor shall make all connections required to connect the mine neutral ground field to the substation neutral ground bus. The contractor shall supply all necessary parts, materials, connectors, conductors, insulators, pole, and labor to complete this phase of the project.

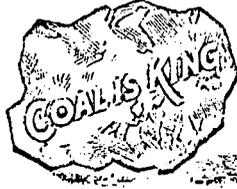
4. The initial ground field construction shall consist of digging a 24-inch deep, square trench that is centered on a 30 ft. square. A total of 12 - 3/4-inch x 12 ft. ground rods shall be driven around the square trench on 10 ft. centers. The ground rods shall then be interconnected with wire as previously specified to establish the main ground loop. The connections between the ground rods and wire shall be by thermit

weld. The main tap from the ground loop as previously specified, shall be connected to the ground loop by means of thermit weld. The contractor shall measure the resistance of the ground field upon completion of the above steps. If the resistance of the ground field is 3 ohms or less, the construction is complete and the trenches may be filled and the ground wire connections to the substation completed. However, if the resistance is greater than 3 ohms, additional ground rods must be driven until a measured resistance not exceeding 3 ohms is obtained. Refer to Drawing No. TR-2-2 for a layout of the initial ground field construction and the location of additional ground rods if necessary.

- L. The contractor shall furnish and spread gravel throughout the entire area enclosed by the substation to an average depth of at least 6 inches.

Appendix J

OTHER APPROVALS



CARBON COUNTY

PRICE, UTAH

January 16, 1978

AMCA Coal Leasing, Inc.
P. O. Box 1027
Price, Utah 84501

Attn. Mr. Sam Quigley

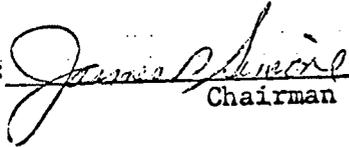
Gentlemen:

The Carbon County Board of Commissioners hereby grants AMCA Coal Leasing, Inc., permission to upgrade County Road No. 299 north to Dead Man.

If you plan on making any radical changes to the re-alignment of said County road, permission must be obtained from Carbon County. Before actual work is done on this road, we would appreciate your contacting our County Road Supervisor, Mr. Burke Johnstun. It is mutually agreed that there will be no restrictions on this road as far as traffic is concerned.

Sincerely yours,

BOARD OF CARBON COUNTY COMMISSIONERS

By: 

Chairman

JPS:JW





SCOTT M. MATHESON
Governor

GORDON E. HARMSTON
Executive Director,
NATURAL RESOURCES

CLEON B. FEIGHT
Director

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS, AND MINING
1588 West North Temple
Salt Lake City, Utah 84116
(801) 533-5771

OIL, GAS, AND MINING BOARD

CHARLES R. HENDERSON
Chairman

JOHN L. BELL
C. RAY JUVELIN
THADIS W. BOX
CONSTANCE K. LUNDBERG
EDWARD T. BECK
E. STEELE McINTYRE

September 5, 1980



Mr. Sam Quigley
Tower Resources, Inc.
P.O. Box 1027
Price, Utah 84501

RE: Final Approval
Pinnacle Mine
ACT/007/019
Carbon County, Utah

Dear Mr. Quigley:

The Board of Oil, Gas and Mining, at its May, 1980 Executive Session, fully executed the Mined Lands Reclamation Escrow Agreement submitted by Tower Resources, Inc. for the Pinnacle Mine. A copy of this agreement is enclosed for your records.

Tower Resources, Inc. has now fulfilled all of the requirements under the Utah Mined Land Reclamation Act as well as the Interim Program Regulations for Coal Mining and Reclamation Operations for the Pinnacle Mine. Further, during the 30 day public comment period subsequent to publication of the Division's tentative approval of the Mining and Reclamation Plan for this operation, no adverse comments were received.

The Division therefore issues Final Approval to Tower Resources, Inc. for the Pinnacle Mine and operations may now lawfully commence. Please note however, that this approval is issued under the Interim Program Regulations only and that a Permanent Program Mining and Reclamation Plan will be required for the Pinnacle Mine within two months of the State's regulatory program approval.

Please notify the Division within 30 days of commencement of operations as required under Rule 40-8-15 of the Utah Mined Land Reclamation Act. Also under this Rule it is required that an annual Operations and Progress Report be submitted at the end of each calendar year for all active operations.

Mr. Sam Quigley
September 5, 1980
Page Two

Also, please be reminded that any modifications in Tower Resources, Inc.'s mining and reclamation plan as presently approved, must be submitted to the Division for approval prior to initiating the modification.

Should you have any questions relative to this Final Approval, please feel free to contact the Division.

Sincerely,

A handwritten signature in cursive script, appearing to read "James W. Smith, Jr.", written in dark ink.

JAMES W. SMITH, JR.
COORDINATOR OF MINED LAND DEVELOPMENT

JWS/te
cc: Don Crane, O.S.M.



DEPARTMENT OF HEALTH

DIVISION OF ENVIRONMENTAL HEALTH

150 West North Temple, P.O. Box 2500, Salt Lake City, Utah 84110



Alvin E. Rickars, Acting Director
Room 426 801-533-6121

533-6108
June 13, 1980

James O. Mason, M.D., Dr.P.H.
Executive Director
801-533-6111

Michael W. Glasson
Tower Resources, Inc.
P.O. Box 1027
Price, UT 84501

DIVISIONS

Community Health Services
Environmental Health
Family Health Services
Health Care Financing
and Standards

OFFICES

Administrative Services
Health Planning and
Policy Development
Medical Examiner
State Health Laboratory

Re: Air Quality Approval Order
for Construction and Operation
of the Centennial Coal Mine
and Loadout Operation near
Price, Carbon County

Dear Mr. Glasson:

On May 6, 1980 the Executive Secretary published a notice of intent to approve your proposed coal mine and loadout operation. The 30-day public comment period expired June 5, 1980 and no comments were received.

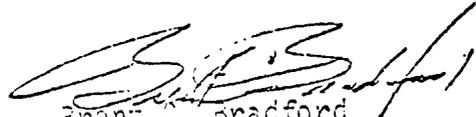
This air quality approval order authorizes the construction and operation of the Centennial Coal Mine and loadout operation in Carbon County as proposed in your notice of intent dated 2/15/80 and 4/22/80, with the following conditions:

1. Production shall be limited to 960,000 tons/year. Production proposed above this limit shall require a notice of intent, per Utah Air Conservation Regulations, Section 3, be submitted by the owner/operator.
2. All air pollution control facilities shall be installed and operated as proposed.
3. Primary crushing operation shall be enclosed underground with spraying (water and wetting agent) required on material entering the crusher and on exiting the crusher via the exit conveyor.
4. Storage piles shall be chemically stabilized to minimize fugitive dust emissions.
5. Conveyors shall be covered to minimize fugitive emissions.
6. Railroad car loadout area shall be sprayed to minimize fugitive dusts.
7. Visible emissions from all controlled process and fugitive emission sources shall not exceed 20% opacity.

8. Haul roads: 5.82 miles section from mine to paved Coal Creek Road and 2.69 miles section from U.S. 6/50 to loadout at Farnham Siding shall be chemically stabilized upon initial operation and be re-treated routinely as required by dry weather conditions or as determined necessary by the Executive Secretary to minimize fugitive dusts. Speed on these sections of road shall be limited to 35 mph.
9. Commuter road: 7 miles from Price to Mine site shall be chemically stabilized upon initial operation and be re-treated routinely as required by dry weather conditions or as determined necessary by the Executive Secretary to minimize fugitive dusts. Speed on this section of road shall be limited to 35 mph.
10. A record shall be kept of the spraying/stabilizing done on storage areas, loadout area, and haul/commuter roads, i.e., dates, time, type, amount and locations, and be available to the Executive Secretary.

An initial compliance inspection will be required. Please notify us when your construction is completed and you are operational, so an inspection can be performed.

Sincerely,

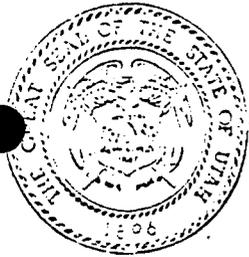


Brent C. Bradford
Executive Secretary
Utah Air Conservation Committee

MRK:js

cc: Southeastern District Health Dept.
EPA/Region VIII (Norman Huey)

DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
150 West North Temple, P.O. Box 2500, Salt Lake City, Utah 84110



Arvin E. Rickars, Acting Director
Room 426 801-533-6121

533-6746
May 14, 1980

James O. Mason, M.D., Dr.P.H.
Executive Director
801-533-6111

DIVISIONS

Community Health Services
Environmental Health
Family Health Services
Health Care Financing
and Standards

OFFICES

Administration Services
Health Planning and
Policy Development
Medical Examiner
State Health Laboratory

Samuel C. Quigley
Western Project Manager
Tower Resources, Inc.
P.O. Box 1027
Price, UT 84501

RE: Sediment ponds

Dear Mr. Quigley:

We have reviewed the April 3, 1980 sedimentation and drainage control plan and supporting information for the Pinnacle Mine of Tower Resources. These two ponds are to provide for the runoff from a ten year 24 hour 1.8 inch rainfall on the mine disturbed area.

As a result of our review, the plans for the Tower Resources Pinnacle mine sedimentation control ponds are approved and a construction permit as constituted by this letter is hereby issued provided:

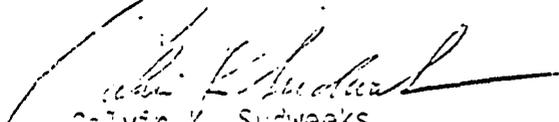
1. Sufficient riprap is provided on the outside toe of the pond dike to protect against erosion by the stream.
2. The sediment level is maintained at least 3 feet below the outlet.

The two ponds are to have a design capacity of 1 and 0.2 acre feet of sediment and runoff storage. The dikes are to have a top width of 10 feet with a side slope of 2 horizontal to 1 vertical. The outlet pipes are to have an inverted inlet one foot below the water level.

Additional treatment must be provided if the discharge from these ponds fails to meet state or federal discharge requirements.

Sincerely,

UTAH WATER POLLUTION COMMITTEE


Calvin K. Sudweeks
Executive Secretary

cc: Off, Gas & Mining
EPA Salt Lake
Southeast 208
Southeastern District Health Dept.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII
1860 LINCOLN STREET
DENVER, COLORADO 80295

Ref: 8E-WE

June 20, 1980

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Samuel C. Quigley
Manager, AMCA Coal Leasing, Inc.
P. O. Box 1027
Price, Utah 84501

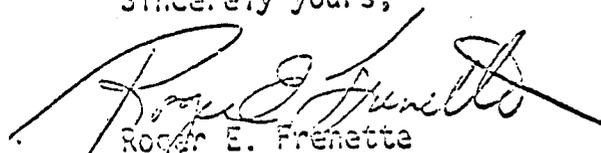
Dear Mr. Quigley:

Herewith enclosed is the NPDES permit for AMCA Coal Leasing, Inc.,
UT-0023507. This permit shall become effective
and issued thirty (30) days following your receipt of this letter, unless
within thirty (30) days following the date of receipt you submit a request
for an evidentiary hearing in accordance with the provisions of 40 CFR
Section 124.74. Such request must be addressed to:

Roger L. Williams (8E-WE)
Regional Administrator
U.S. Environmental Protection Agency
Region VIII, Suite 103
1860 Lincoln Street
Denver, Colorado 80295

If you have any legal questions with regard to this matter, please
contact Mr. John J. Lepley of this Agency at (303) 837-4812. Questions
regarding monitoring requirements should be directed to Mr. Doug Skie of
this office at (303) 837-4835.

Sincerely yours,


Roger E. Frenette
Acting Director
Enforcement Division

Enclosures

- (1) NPDES Discharge Permit
- (2) EPA Form 3320-1 for reporting of self-monitoring

MI

Permit No.: UT-0023507

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et. seq.) (hereinafter referred to as "the Act"),

AMCA Coal Leasing, Inc.,

is authorized to discharge from a facility located at Section 7, Township 13 South, Range 11 East, Carbon County, Utah,

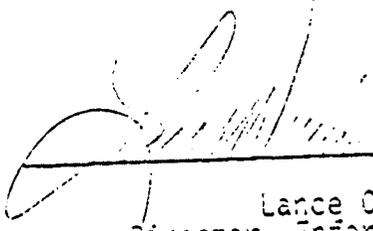
to receiving waters named Deadman Creek which is a tributary to the Price River,

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III hereof.

This permit shall become effective on the date of issuance.*

This permit and the authorization to discharge shall expire at midnight, December 31, 1980.

Signed this 30th day of May, 1980.


Lance C. Vinson
Director, Enforcement Division

*Thirty (30) days after the date of receipt of this permit by the Applicant.

Permit is stamped



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

1860 LINCOLN STREET
DENVER, COLORADO 80295

DEC 1 1980

Ref: 8E-WE

Mr. Samuel C. Quigley
AMAC Coal Leasing, Inc.
P. O. Box 1027
Price, Utah 84501

Re: NPDES No. UT-0023507

Dear Mr. Quigley:

As you are aware, the NPDES permit previously issued to you by EPA expires by its own terms on December 31, 1980. Although you have applied for permit renewal, we will be unable to reissue the permit by that date. Consequently, there is an interim period between the expiration date contained in the previous permit and the time any renewal permit will be issued. Because you made a timely and sufficient application for permit renewal, under the provisions of EPA's May 19, 1980, Consolidated Permit Regulations (45 FR 33425, 40 CFR 122.5), there is an automatic continuation of the permit during the interim between expiration and renewal. You should be aware that, under the terms of this regulation, all of the requirements and conditions of your current permit will remain fully effective until the renewal permit is issued.

Any violations of the permit during the interim period are subject to enforcement action by the Agency. Additionally, at the discretion of the permit issuing official, your request for permit renewal can be denied on the basis of any failure to comply during the interim period. The denial would terminate the permit continuation and subject you to an enforcement action for discharge without a permit.

After we have completed an evaluation of the necessary information, including application Form 20 where applicable, a permit will be drafted and we will publish notice of our intent to reissue the permit. The draft permit will contain effluent limitations and other provisions reflecting the various requirements of the Clean Water Act. The public notice and related information will summarize the proposed permit and will allow thirty (30) days for public comments. A final permit will be issued sometime after the close of the public comment period.

The permit continuation, provided under the terms of 5 U.S.C. 558(c) and 40 CFR 122.5, will terminate upon issuance of the renewal permit.

Sincerely yours,



Lance C. Vinson
Director
Enforcement Division

cc: Utah Dept. of Health
EPA, Utah State Engineer



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

1 1980

REGION VIII
1860 LINCOLN STREET
DENVER, COLORADO 80295

RECEIVED
3-24-80

REF: 8AH-A

Mr. Michael Glasson
Geologist
Tower Resources, Inc.
Post Office Box 1027
Price, Utah 84501

Dear Mr. Glasson:

This office has received your February 13, 1980, PSD emission inventory of the proposed Pinnacle Mine near Price, Utah.

Because of the recent court decision in the case of Alabama Power Co. vs. Douglas M. Costle (D. C. Circuit 78-1006 and consolidated cases), EPA implemented a partial stay of its regulations (February 5, 1980, Federal Register, 45 FR 7800). In light of this stay, we have determined that your proposed mine does not need a PSD air quality permit. We believe your proposed mine is not now subject to the PSD regulations because of the new definition of a major source and the accompanying exclusion of fugitive emissions (including fugitive dust) as announced in the proposed PSD regulations of September 5, 1979 (44 FR 51924).

Nevertheless, you are advised that the decision in Alabama Power will have further significant impacts on EPA's PSD regulations and may affect permit actions taken under existing regulations.

It is our intent to work with OSM and the State to incorporate in their programs measures to control particulate emissions at mines. I have forwarded copies of your emission inventory to the Denver OSM office and the Utah Bureau of Air Quality. I have also included a copy of the Region VIII guideline document on air quality review of surface mining operations. This document was the basis for our determinations as to what constitutes acceptable control measures.

If you have any questions, please contact David Joseph of my staff at (303) 837-3763.

Sincerely yours,

Robert L. Duprey, Director
Air and Hazardous Materials Division

Enclosures

cc: F. Johnson, OSM, with enclosures
B. Bradford, Utah Bureau of Air Quality, with enclosures

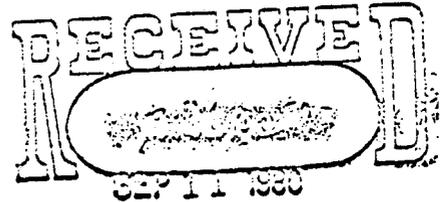


United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Moab District
P. O. Box 970
Moab, Utah 84532

IN REPLY REFER TO

2810
U-45966
(U-060)



CERTIFIED MAIL--RETURN RECEIPT REQUESTED
Certification No. 661144

DECISION

Tower Resources Incorporated : Right-of-Way U-45966
P. O. Box 1027 :
Price, Utah 84501 :

Right-of-Way Granted

Details of Grant

Serial number of grant:	U-45966
Name of Grantee:	Tower Resources Incorporated P. O. Box 1027 Price, Utah 84501
Map showing the location and dimensions of grant	
Map designations:	Right-of-way location map Tower Resources Incorporated access road.
Date filed:	June 13, 1980
Right-of-way width:	50 feet
Permitted use:	Construction, use and maintenance of access road.
Authority:	Section 501 (a)(6) of the Federal Land Policy and Management Act of 1976, (90 Stat. 2776; 43 USC 1761).
Effective Date:	Effective the date of this decision
Termination Date:	30 years from the date of this decision



United States Department of the Interior

2800
F017
U-36739
(U-942)

BUREAU OF LAND MANAGEMENT
UTAH STATE OFFICE
University Club Building
136 East South Temple
Salt Lake City, Utah 84111

DECISION

NOV 20 1978

Right-of-Way Granted

Details of Grant

Serial number of grant: Utah 36739

Name of Grantee: AMCA Coal Leasing, Inc.
Post Office Box 1027
Price, Utah 84501

Map showing the location and dimensions of grant

Map designations: Meiji Resource Consultants
Telephone Line Survey S.N. U-36739
AMCA Coal Leasing, Inc.

Date filed: March 31, 1978

Permitted use by grantee: Buried Telephone Cable
15 Feet in width

Authority for grant: Title V of the Federal Land Policy and
Management Act of October 21, 1976 (90
Stat. 2776; 43 U.S.C. 1761)

Date of grant: NOV 20, 1978

Expiration date of grant: NOV 19, 2008

Rental

Amount: \$25.00

When payable by grantee: At the beginning of each 5-year rental
period

Terms and conditions of the grant are set forth on the following pages.





BUREAU OF LAND MANAGEMENT
UTAH STATE OFFICE
University Club Building
136 East South Temple
Salt Lake City, Utah 84111

DECISION

NOV 20 1978

Right-of-Way Granted

Details of Grant

Serial number of grant: Utah 36741

Name of Grantee: AMCA Coal Leasing, Inc.
Post Office Box 1027
Price, Utah 84501

Map showing the location and dimensions of grant

Map designations: A & W Surveying
Powerline Survey S.N. U-36741
AMCA Coal Leasing, Inc.

Date filed: August 15, 1978

Permitted use by grantee: 46 KV Electric Power Transmission
Line 100 feet in width

Authority for grant: Title V of the Federal Land Policy and
Management Act of October 21, 1976 (90
Stat. 2776; 43 U.S.C. 1761)

Date of grant: NOV 20 , 1978

Expiration date of grant: NOV 19 , 2008

Rental

Amount: \$100.00 rental deposit

When payable by grantee: Rental amount not yet determined

Terms and conditions of the grant are set forth on the following pages.



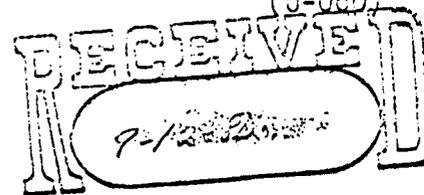


United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Moab District
P. O. Box 970
Moab, Utah 84532

IN REPLY REFER TO

2890
U-45965
(U-060)



SEP 11 1980

CERTIFIED MAIL--RETURN RECEIPT REQUESTED
Certification No. 661143

DECISION

Tower Resources Incorporated : Right-of-Way U-45965
P. O. Box 1027 :
Price, Utan 84501 :

Right-of-Way Granted

Details of Grant

Serial number of grant:	U-45965
Name of Grantee:	Tower Resources Incorporated P. O. Box 1027 Price, Utah 84501
Map showing the location and dimensions of grant	
Map designations:	Right-of-Way location map Tower Resources Incorporated Material Storage Site
Right-of-way area:	10 acres
Date filed:	June 13, 1980
Permitted use:	Material Storage
Authority:	Section 501 (a)(7) of the Federal Land Policy and Management Act of 1976, (90 Stat. 2776; 43 USC 1761).
Effective Date:	Effective the date of this decision
Termination Date:	30 years from the date of this decision

2890
U-45965
(U-601)

United States Department of the Interior



BUREAU OF LAND MANAGEMENT

Moab District

Price River Resource Area

P. O. Drawer AB

Price, Utah 84501

RECEIVED
8-27-80

August 27, 1980

Mr. Mike Glasson
Tower Resources Incorporated
P. O. Box 1027
Price, Utah 84501

Dear Mr. Glasson:

We have made the necessary changes in your right-of-way (U-45965), authorizing you to construct an office, shop or warehouse on the site should the need arise. We were able to make the adjustment without any additional information from you since the right-of-way had not been issued.

If you have any questions, please feel free to call.

Sincerely yours,

A handwritten signature in cursive script that reads "Leon E. Berggren".

Leon E. Berggren
Area Manager



December 24, 1980

Mr. Samuel C. Quigley
Western Project Manager
Tower Resources, Inc.
P.O. Box 1027
Price, UT 84501

Re: Roof Control Plan
Pinnacle Mine
I.D. No. 42-01474

Dear Mr. Quigley:

The roof control plan consisting of 18 pages, received at this office on December 22, 1980, has been reviewed and is approved. This is a minimum roof control plan and will supercede all previously approved plans, supplements and addendums. As required by 30 CFR, 75.200, the plan must be reviewed by MSHA every six months.

Sincerely,

John W. Barton
John W. Barton
District Manager

Enclosure

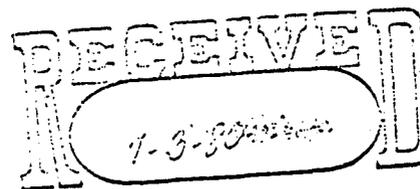
U. S. Department of Labor

Mine Safety and Health Administration
P O Box 25367
Denver, Colorado 80225



Coal Mine Safety and Health
District 9

June 30, 1980



Samuel C. Quigley
Western Project Manager
Tower Resources, Incorporated
P. O. Box 1027
Price, Utah 84501

Re: Pinnacle Mine
I. D. No. 42-01474
Roof Control Plan

Dear Mr. Quigley:

The roof control plan for the subject mine, dated June 24, 1980, has been reviewed and is approved. This plan supercedes all previously approved plans, supplements and addendums. As required by 30 CFR, 75.200, the plan must be reviewed by MSHA every six months.

Sincerely,

John W. Barton
John W. Barton
District Manager

Enclosures

P O Box 25367
Denver, Colorado 80225
Coal Mine Safety and Health
District 9



July 9, 1980

RECEIVED
7-14-80

Samuel C. Quigley
Manager
Tower Resources, Inc.
PO Box 1027
Price UT 84501

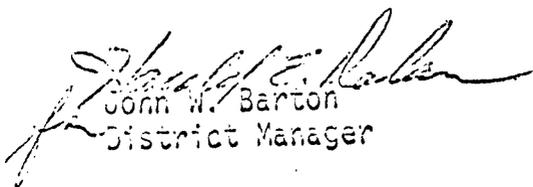
Re: Pinnacle Mine
I.D. No. 42-01474
Ventilation System and Methane
and Dust Control Plan -

Dear Mr. Quigley:

The ventilation system and methane and dust control plan dated June 26, 1980, for the subject mine has been approved in accordance with Section 75.316, 30 CFR 75. The plan is subject to revision at any time and shall be reviewed by the operator and MSHA at least once every six months. Before any changes are made in the approved ventilation system, they shall be submitted to and approved by MSHA prior to implementation.

This plan supersedes any previously approved plans and a copy of this plan shall be made available to the miners.

Sincerely yours,


John W. Barton
District Manager

Enclosure

U.S. DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

Mailing Address:
P.O. Box 25367, DFC
Denver, Colorado 80225

Street Address:
730 Simms
Lakewood, Colorado



Coal Mine Health and Safety
District 9

September 21, 1978

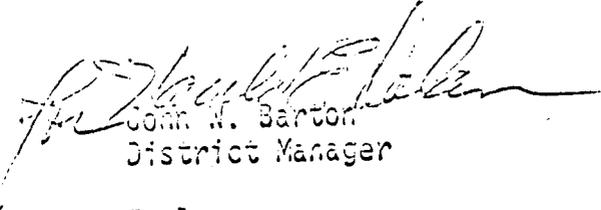
Samuel C. Quigley
Manager
A.M.C.A. Coal Leasing, Inc.
PO Box 1027
Price, Utah 84501

Re: Pinnacle Mine
I.D. No. 42-01474
Fan Stoppage Plan

Dear Mr. Quigley:

This is to acknowledge receipt of the Fan Stoppage Plan for the subject mine. It has been reviewed for compliance with Section 75.321, 30 CFR 75, and has been found adequate. Approval is hereby given.

Sincerely yours,


John W. Barton
District Manager

Enclosure

U.S. DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

Mailing Address:
P.O. Box 25367, DFC
Denver, Colorado 80225

Street Address:
730 Simms
Lakewood, Colorado

Coal Mine Health and Safety
District 9



September 21, 1978

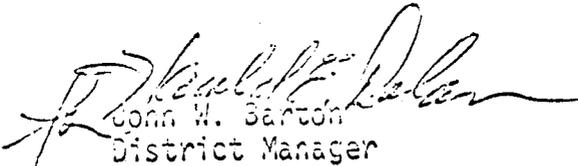
Samuel C. Quigley
Manager
A.Y.C.A. Coal Leasing, Inc.
PO Box 1027
Price, Utah 84501

Re: Pinnacle Mine
I.D. No. 42-01474
Smoking Prohibition Plan

Dear Mr. Quigley:

This is to acknowledge receipt of the Smoking Prohibition Plan for the subject mine. It has been reviewed for compliance with Section 75.1702, 30 CFR 75, and is hereby approved.

Sincerely yours,


Donn W. Barton
District Manager

Enclosure



EDUCATION AND TRAINING
DENVER TRAINING CENTER

RECEIVED
8.25.80

August 19, 1980.

S. C. Quigley
Manager
Tower Resources, Inc.
P.O. Box 1027
Price, UT 84501

RE: 42-01474 Pinnacle
UNDERGROUND

Dear Mr. Quigley:

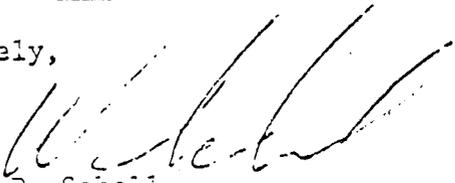
Your training plan submitted under the requirements of CFR Title 30, Part 48 is approved as of the date of this letter.

Any proposed revisions or changes to your approved plan must be submitted to the miner's representative and approved by the Training Center Chief.

Included is an initial supply of the 5000-23 form on which training must be recorded. A copy of this record must be given the employee at the completion of the training received (i.e. New Miner Training, Refresher Training, etc.) The other copy must be retained at the mine site. A copy of the 5000-23 should not be sent to this or any other MSHA office. Additional 5000-23 forms may be obtained from this office as needed.

Please do not record Part 48 training on the 5000-1 forms.

Sincerely,


Walter R. Schell
Chief, Denver Training Center

cc: Representative of Miners

U. S. Department of Labor

Mine Safety and Health Administration
P O Box 25367
Denver, Colorado 80225
Coal Mine Safety and Health
District 9



November 5, 1980

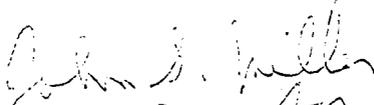
Thomas R. May
Safety Director
Tower Resources, Inc.
PO Box 1027
Price, UT 84501

Re: Pinnacle Mine
I.D. No. 42-01474
Firefighting & Evacuation Plan

Dear Mr. May:

The firefighting and evacuation plan for the subject mine has been approved in accordance with Section 75.1101-23, 30 CFR 75. The plan is subject to review and possible revision at any time and any changes proposed to the plan shall be approved by MSHA prior to implementation.

Sincerely yours,


John W. Barton
District Manager

Enclosure

U.S. DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION
Mailing Address: P.O. Box 25007, 19701
Denver, Colorado 80225
Direct Address: 700 Simms
Denver, Colorado



Coal Mine Health & Safety
District 9

September 6, 1978

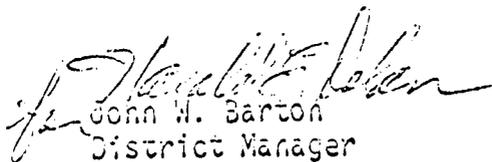
Mr. Samuel C. Quigley
AMCA Coal Leasing, Inc.
P.O. Box 1027
Price, Utah 84501

Re: Pinnacle Mine
I.D. #42-01474
Emergency Medical

Dear Mr. Quigley:

The information submitted to this office, required by Section 75.1713-1 of the Regulations, CFR 30, has been placed on file at the District Office.

Sincerely,


John W. Barton
District Manager

Enclosure

U.S. DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

Mailing Address:
P.O. Box 25367, DFC
Denver, Colorado 80225

Street Address:
730 Simms
Lakewood, Colorado



Coal Mine Health & Safety
District 9

September 6, 1978

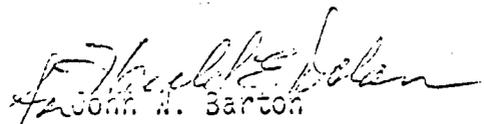
Mr. Samuel C. Quigley
AMCA Coal Leasing, Inc.
P.O. Box 1027
Price, Utah 84501

Re: Pinnacle Mine
I.D. #42-01474
Section 109(d)

Dear Mr. Quigley:

The information submitted to this office, required by Section
109(d) of the Act, has been placed on file at the District Office.

Sincerely,


John A. Barton
District Manager

Enclosure

Appendix K

RESPONSE TO COMPLETENESS REVIEW
September, 21, 1987

(Excluding Hydrology Section)

770.12

- a) There is no equipment located within our permit area which contain any of the substances listed by the Toxic Substances and Control Act, particularly PCB's. All transformers and OCB's are relatively new and are PCB free.
- a)2. This change has been made to reflect the Utah Mining Code.
- a)3. The storage of petroleum products on site is done in such a manner that hazards from spillage do not exist. Andalex operates with an SPCC plan approved by a registered professional engineer.

771.23

See Appendix L.

776.23

This submittal specifically refers to the August 19th review document on a regulation by regulation basis. This should make the Divisions review much easier. Specific comments will be addressed regarding conflicts as necessary.

- a)6) The telephone number for the resident agent is (801) 364-1228
- e) The correct address for the Division of State Lands is now shown.

Sophia Critchlows' address is 144 South 1650 East, Price, Utah 84501. This is now shown under surface owners.

Sunedco is now listed under surface owners.

It is unclear where the erroneous legal description appears, but if it pertains to the location of Franklin Real Estate Property, then the correct legal should be 10 east.

782.14

- c) The following violations were received at the Centennial project in the preceding 3 years. See following page.

782.19

All other permits listed in the MRP are up to date and current. The NPDES permit for the Centennial project has not yet been renewed, however, the Bureau of Water Quality has instructed us to operate under the old one in the interim. This is based on our timely request to EPA to have the permit renewed.

782.21

The newspaper advertisement originally announcing our approval of intent to conduct mining is included on page 17 of the MRP.

Violations in Preceding 3 Years

1. 84-6-1-1 (Paid)
2. 86-9-4-2 (Paid)
3. 87-9-8-2 (Pending)

783.12

A request has been made of the State Historical Preservation Officer for the emergency lease to sign off on the lease. It should be noted that the emergency lease contained significantly less coal than anticipated and it has been mined out. We expect to relinquish this lease in the next year to avoid any further rental payments.

783.13-16

The aberdeen sandstone in our vicinity is 80 to 100 feet thick. Its lateral extent is from Castlegate to well east of the Centennial property. It is a very well known geologic marker in the Book Cliffs coal field. It is a medium grained, tightly cemented, cross bedded sandstone which contains very little or no water. It has been drilled into in every exploration hole on our leases. All other aquifers or water tables within our leases are perched.

See Appendix L for additional responses

783.17

See Appendix L

783.19

Andalex will select and mark reference areas in the field for vegetation. Areas will be chosen to include all types of vegetation conditions such as drainage areas, shallow slopes and steep slopes. Andalex will contact the SCS to help evaluate the condition of these sites. It should be noted that Andalex does have the benefit of a revegetation test plot located on one of the topsoil piles.

The important vegetation types in the vicinity of the minesite appears on page 212 of this submittal.

The revegetation map now shows the acreages for the three range types. Shrub clumps make up 2.17 acres, drainage areas make up 14.57 acres and steep slopes make up 15.78 acres. Total disturbed area, including the as yet built Aberdeen mine totals 32.52 acres.

783.21

The soils map, shown as plate 18 in Volume II is a combination of the information provided by both EEC and SCS. EEC performed the work on the north and south one-thirds of the disturbed area and the SCS performed the work on the one-third in the middle. This was for the original Pinnacle Mine approval on the Zions fee area.

The acreages given by EEC in the soils report does not include the entire disturbed area since we know that the SCS surveyed roughly one-third of the disturbed or "to be" disturbed area. The correct

acreage as planimetered by Andalex staff is 32.52 acres. This of course includes the area where the Aberdeen mine is to be developed. The area of disturbed Brycan is approximately 8 acres and the Datino is 4 acres within the SCS survey.

783.22

No grazing land has been impacted by Andalex's minesite or permit area as none exists within the disturbed area. As far as wildlife habitat is concerned, two things should be pointed out. First, Andalex has successfully provided new vegetation and food sources through revegetation within the deer winter range in acreages greatly exceeding the disturbed or "impacted" area. Second, and perhaps more importantly, on Andalex's minesite, wildlife abounds. There are large numbers of small mammals of many varieties including, but not limited to, squirrels, chipmonks, mice and rabbits. There are large numbers of all types of birds, including large and small raptors hunting in the area. The DWR has indicated that our powerline has provided important hunting opportunities for large raptors. Deer are commonly observed within our disturbed area feeding on revegetated slopes. Revegetation within our disturbed area is mitigation in itself to the so called impacted area.

783.24

- d) The facilities map, included in Volume II, Plate 6, as constructed very accurately depicts the location and size of all buildings and structures within the affected area. The disturbed acreages are now shown on the facilities map as well as the revegetation map, plate 20. All maps required to contain the mark of a registered P.E. now do.

783.25

- 1) Refer to response for 783.24

783.25

- a) See Appendix L

784.11

The MRP has been retyped, the pages have all been renumbered, the appendix section reorganized and labeled, and the table of contents redone. Hopefully this will assist the Division in their review.

Originally it was anticipated that all buildings and structures were to be completed during the 1st 5 year permit term. Obviously this is not the case since the Aberdeen mine has not been developed yet although it has been bonded all along. This is why there are two surface facilities maps included as plates 6 and 7, 6 being the current as built and 7 being the as proposed which shows the Aberdeen facility.

The coal is currently loaded into 40 ton coal haulers via automatic truck loaders at both the Pinnacle and Apex sites.

784.12

See comments on 784.11. Also, the cross reference chapter has been renumbered.

784.13

b)5) Information regarding vegetation and revegetation is found in Chapter IV of the MRP beginning on page 210. This section specifically addresses a revegetation plan and includes information on soil preparation, seeding methods, and monitoring. Additional specific information regarding seed mixtures and locations for revegetation group types can be found on page 215 and Plate 20.

Sections 5.1 and 5.5 on pages 213 and 214 indicate the first normal planting season will be used for revegetation following the removal of all structures and regarding the season for normal planting of seed mixtures is the fall, prior to snow-fall or after October 1st. The normal season for shrub plantings is the spring after freezing while moisture is available.

Andalex would plan on using organic mulch. It will be used wherever seeds are planted. These areas are shown on Plate 20 and constitute 29.35 acres. The rate of application will be $\frac{1}{2}$ ton per acre.

Revegetation monitoring is discussed on page 214 of the MRP. Parameters to be measured are growth rate, plant density and percent cover. We would expect to monitor or supervise monitoring at least monthly during the first two growing seasons. From experience with interim revegetation at the minesite we have learned that two growing seasons are needed to establish any success. After this we would know whether reclamation was progressing successfully.

In previous submittals, Andalex provided detailed and accurate estimates for reclamation costs for instance as shown on page 70 of the MRP. This information was never utilized by the Division in the determination of reclamation bond amounts as evidenced by Andalex's \$66,000.00 estimate and the Divisions \$381,000.00 bond. Regardless, a new estimate is provided on Page 70.

Re-establishment of drainages is shown on Plates 15 and 16 which are reclamation contours and cross sections. The cross sections show cut and fill which has occurred on site versus the original contours and reclaimed contours. As no material has been removed from the site and none brought in, logically sufficient material is available to return the site to its approximate original contour and pre-mining land use.

b)1) See Appendix L

784.14

See Appendix L

784.16

See Appendix L.

784.19

Andalex has submitted a plan to the Division via correspondence in September of 1987 indicating a desired area within the Permit area. Andalex is sure the Division understands the lack of available space within the disturbed area and that available storage areas are very limited. Currently sediment pond waste is being temporarily stored in what was previously sedimentation Pond A. The material is also being tested to determine if there is any reason it cannot be removed from the site, as originally approved by the Division.

784.21

Please refer to comments on 783.22. To further address additional specific questions, first of all there are no unpaved sections of the haul road and swareflex reflectors are not being used. Andalex has demonstrated mitigation of impacted habitat through revegetation efforts on areas in and outside the permit area. We have had employee wildlife education sessions in the past and may perhaps in the future. The powerline was constructed under strict guidelines and has been thoroughly checked by both the Utah DWR and the U.S. Fish and Wildlife Service. Both agencies are pleased with the design and the as-built facilities. Andalex is willing to adhere to reasonable and practical recommendations given by any agency and has for the most part taken the advice of the DWR on most all occasions as outlined in the Wildlife Resources Appendix. Special condition #7 was answered by posting 40 mph speed limits, year round.

784.22

See Appendix L.

784.23

Maps and plans pertaining to surface facilities have been updated and corrected accordingly. Disturbed area boundaries are shown on Plates 5, 6, 7, 8, 9, 15, 18, 19 and 20. Registered P.E. stamps have been provided as needed.

784.23

b)6) See Appendix L

784.24

Transportation facilities are discussed in Chapter III, B.6 and 7. Also, it should be noted that the haulroad up through the Pinnacle mine truck loadout and to the administrative offices has been

paved according to UDOT specifications. Plate 35 shows a typical road cross section.

800

An estimate is provided on Page 70 of the MRP. It is the same material submitted in 1981 with some exceptions. Notably is the addition of the shop/warehouse complex the removal of which will have to be added to the reclamation cost. The original estimate has also been revised to reflect current prices and wage schedules. Andalex has provided, as Plate 16, accurate as built versus reclaimed cross sections which show the mass balance for earth work. The approximate original contours will be achieved using the material cut out to create the fill areas. No material will be hauled in. Maps depicting accurately the surface facilities including topsoil areas, structures and facilities are included in Volume II and also specific topsoil maps and cross sections are included. Andalex expects to return topsoil to a depth of 6" around the surface area of 32.52 acres. It should be noted that topsoil has not been gathered yet for the Aberdeen minesite.

Phase I of the reclamation will include structure removal, portal sealing, well sealing, regrading, recontouring, distribution of topsoil and revegetation. Once Phase I is adequately achieved Phase II will commence which includes the removal of sediment structures (this recontouring) and revegetation of these areas. This is followed by monitoring, noting that monitoring had begun during Phase I.

817.14

- b) Temporary closing of underground workings will be accomplished with chain link fence material as recommended by MSHA. This prevents access by unauthorized individuals during idling periods. It is not anticipated that once Andalex reaches its peak production that this will occur.

817.15

See Appendix L.

817.22

Surveys conducted on the topsoil piles which were drawn into plans and profiles are now included in the plan in Volume II, Plates 40, 37 and 36. This shows volumes stored currently.

The proposed future disturbance is roughly 8 acres. Enough topsoil material will be gathered and stored to replace this 8 acres with at least 6" of topsoil. Areas designated for topsoil removal will be flagged prior to future mine development, specifically at the Aberdeen minesite.

The new substitute topsoil pile plan and profile along with the volumes is included in Volume II also.

817.23

This topsoil will be protected by the use of straw dikes and earthen berms.

817.24

- A) Andalex will rip the subsurface material to 6" using most likely a toothed motor grader or a discor, prior to soil redistribution.
- B) Andalex will mix one ton of alfalfa per acre with its topsoil material to aid in aeration, Microbiological community development and water holding capacity.
- C) Andalex will distribute topsoil to a minimum depth of 6" as previously stated.

817.25

- A) Andalex has already committed to testing of redistributed soil and fill material and has committed to use proper additives if it is discovered necessary. Specifically, Andalex will test for organic matter, phosphorous, potassium, pH, conductivity and texture. The samples will be taken at 0-6 inches, 6-12 inches and 12-24 inches at least 90 days prior to final reclamation.
- B) See 817.24 B

817.42

See Appendix L

817.43

See Appendix L

817.44

See Appendix L

817.46

See Appendix L

817.47

See Appendix L

817.48

See Appendix L

817.49

See Appendix L

817.52

See Appendix L

817.55

See Appendix L

817.59

The reserves referred to are unleased federally owned coal reserves. Assuming that the Bureau of Land Management were willing to lease this coal to Andalex, Andalex would access these reserves from this existing underground workings. If the leases were not made available then Andalex could not maintain access as it would completely pull pillars up to our 50' barrier zone within our existing leases.

At such time as these additional leases became available to Andalex, they will be made a part of the MRP such as what was done with our Emergency lease. Andalex does not feel these potential reserves belong as part of the MRP at this time.

817.71-74

See response to 784.19

817.89

Please see response to 784.19 and 770.12 a) and a)3). There are no toxic or hazardous materials generated on Andalex's minesite. In a letter dated August 19, 1981 in Appendix B of the MRP, Andalex is granted permission from Carbon County to dispose of various material at the County Landfill.

817.95

Prior to mining in excess of 960,000 tons per year from Andalex's 3 mines, Andalex will obtain an approval order from the Department of Environmental Health.

817.99

Andalex will notify the Division in the event of any slides or other damage.

817.103

Andalex will act in accordance of the requirements of this section including the covering of acid or toxic forming materials if any are encountered.

817.106

Andalex will fill, regrade and stabilize rills and gullies over 9 inches in depth. Further, Andalex has agreed to interim stabilization of all slopes and embankments within the disturbed area and has done so. Our slope located at the bottom of the office, driveway has been attempted through hydroseeding, fertilizing and mulching techniques on three separate occasions. Andalex feels that a more than reasonable effort has been made to vegetate this small area, and in light of no significant erosion problems suggests that the requirement on this small area be waived.

817.131

Andalex will advise the Division in the event of a temporary shutdown, such as a letter sent the Division when Andalex's Apex Mine was temporarily closed. See also the response 817.14 b). Also refer to revised cross reference table in Chapter VII.

817.151-156; .161-.166; .171-.176

All criterior set forth in this section have been accounted for. Design and construction of the Class I (paved) road within our permit area has been doen according to performance standards on Location, Design (UDOT), Drainage (UDOT), surfacing (asphalt) maintenance (Carbon County) and Restoration. As this is a County Road it is doubtful that it will be removed upon cessation of mining.

Andalex has also taken into account all criteria set forth in UMC for Class II roads. These roads within Andalex's permit area are used for material haulage and access to mines, materials and facilities.

There are no Class III roads within the Centennial mine are.

817.180

The conveyor structures at the minesite are very standard cross member, bent designs. The Pinnacle conveyor is 180 feet in length and uses a 42" conveyer belt. It is covered with galvanized corrugated sheeting. The Pinnacle truck loadout is an under pile gravity feed reclaim system in 8 foot diameter sectioned steel tunnel for 90 feet and surfaces on the typical bent, steel structure for an additional 110 feet. The Apex truck loadout is identical to Pinnacle. The mine conveyor is also the same bent/cross member design with a 42" conveyor, however, it is 250 feet in length. It is anticipated that the Aberdeen facility will be equipped with conveyor facilities similar to that of Pinnacle with only slight variations in exact length anticipated or possible.

Other transportation facilities such as roads are addressed in 817.151-176 responses. The roads, Class II and I are to be removed upon cessation of mining by simple regrading and re-establishment of contours, unless surface owners request access through the mine area might remain.

Protection of the environment through the use of these facilities is achieved by speed controls (20 mph minesite). The conveyor structures as such do not impose environmental problems. Public safety obviously is a requirement of law including MSHA but also public safety is a requirement of Andalex Resources. Also the minesite is not frequented by any public outside of normal, weekly business hours.

817.181

It is unclear what is meant by accounting for ancillary facilities. The facilities exist, they have been approved by our previous MRP and its amendments and they are included in the reclamation cost estimates as outlined in Appendix K and starting on page 70. All facilities on site are accurately shown on Plates 6 and (proposed) on Plate 7.

The mine permit area has no utilities or services through it other than those which are accurately depicted on Plate 6. All utilities have been and will be constructed under the close scrutiny of the Utah DWR and the U.S. Fish and Wildlife Service.

Salt Lake and Intermountain Area Obituaries

Lois R. Frederick

Lois R. Frederick, 67, of Salt Lake City died December 18, 1978...

Phyllis Jane Parks Clouner Campbell

Phyllis Jane Parks Clouner Campbell, 64, of Salt Lake City died December 18, 1978...

Elizabeth Medley Stevenson

Elizabeth Medley Stevenson, 82, of North Ogden, Utah died December 18, 1978...

Raymond Lewis Smith

Raymond Lewis Smith, 69, of Salt Lake City died December 18, 1978...

Joseph Henry (Joe) Danie

Joseph Henry (Joe) Danie, 73, of Salt Lake City died December 18, 1978...

Mathew J. Harris

Mathew J. Harris, 79, of Princeton, Utah died December 18, 1978...

Eva Harriet Massey Harper

Eva Harriet Massey Harper, 92, of Murray, Utah died December 18, 1978...

Richard Dean Christensen

Richard Dean Christensen, 60, of Taylorsville, Utah died December 18, 1978...

Margaret (Marnie) Cross

Margaret Frances Goodman Cross, 75, of Salt Lake City died December 18, 1978...

Martha Ellen Cornejo Wade

Martha Ellen Cornejo Wade, 68, of Salt Lake City died December 18, 1978...

Urvain Gee

Urvain Gee, 70, of Salt Lake City died December 18, 1978...

William L. Peltol

William L. Peltol, 70, of Salt Lake City died December 18, 1978...

Legal Notices

ORDER TO SEIZE CAUSE No. 82-007-001 BEFORE THE BOARD OF OIL GAS AND MINING...

Legal Notices

NOTICE OF HEARING Case No. 19-43-01 BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

FUNERAL NOTICES

MOYLE - Funeral services for Helen Rich Moyle will be held Thursday, 2 p.m. in the Larkin Mortuary...

LEGAL NOTICES

ADVERTISMENT FOR BIDS Granger-Hunter Improvement District, 3144 West 3500 South, Salt Lake City, Utah

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CLASSIFIED INFORMATION and INDEX

237-2000

1-800-662-9186

CLASSIFIED INFORMATION and INDEX 237-2000. An excellent service for those who need to find classified information...

PUBLIC MEETING

PUBLIC MEETING Pursuant to Public Law 93-411, notice is herewith made that the Copper Mountain Mental Health Center is proposing to apply for Federal Funds...

SALT LAKE COUNTY INVITATION TO BID

SALT LAKE COUNTY INVITATION TO BID Bids will be received by the Purchasing Director of Salt Lake County...

NOTICE OF APPLICATIONS

NOTICE OF APPLICATIONS Notice is hereby given that applications for the position of Public Health Officer are being accepted...

650-Leaf and Found

650-Leaf and Found. A collection of various items for sale or found.

Appendix L

RESPONSE TO COMPLETENESS REVIEW

~~October 5, 1987~~
~~Submitted~~

submitted Oct 8, 1987

HYDROLOGY SECTION

[Signature]

Comment UMC 784.14 (d)
Reclamation Plan: Protection of Hydrologic Balance - JRH

Response:

See response to Comment UMC 784.14 on p.63 of previous submittal.

RECEIVED
OCT 8 1987
DIVISION OF OIL
GAS & MINING

Comment UMC 784.14 (3)
Reclamation Plan: Protection of Hydrologic Balance - DC

Response:

See Section 2.7 (p. 132) and 3.7 (p.150), and Table 2 - "Water Quality Analytical Schedule", p.133.

See also response to comment UMC 784.13 (b)(1) - "Post-Mining Hydrology".

Comment UMC 784.16
Reclamation Plan: Ponds, Impoundments, Banks, Dams and Embankments - JRH

Response:

See response to Comment UMC 784.13 (b)(1) - "Post-Mining Hydrology".

Comment UMC 784.22
Diversions - KRW

Response:

See revised Plate 8 showing contour details of the disturbed area.

Diversion designs are detailed on p.187 - "Diversion Design". Erosion protection is discussed on p.191 "Erosion Protection".

Erosive velocities for this area are estimated to be those greater than 6.5 fps., based on the following:

- (1) Erosion Protection Charts in Section IV, B, 5 (Exhibit 1), indicate allowable velocities of 5-7 fps for soils classified as "gravelly loam" or "gravelly clay", and velocities ranging from 6-8 fps for gravel;
- (2) The soil survey for this area is described in Section IV, F, 2 of the plan. The soils in the disturbed area are primarily Brycan "bouldery loam" in the flatter (8-20 percent slope) areas, and Datino "very stoney loam" in the 15-30 percent slope areas. The soil is classified as being moderately erosive in the barren area, and the Datino is classified having low erodibility. As shown on the "Soil Map", p.273, the entire disturbed area is comprised of these 2 soil types. The diversions and culvert outlets all fall into this area, and are therefore considered to be non-erosive up to a velocity of 6.5 fps as previously determined.

Comment 784.23

Operation Plan: Maps and Plans - JRH

Response:

All drawings and maps required to bear the mark of a registered professional engineer have now been certified.

Disturbed area boundaries are clearly marked on Plates 5 and 6.

Comment UMC 784.23 (b)(6)
Operation Plan: Maps and Plans - KRW

Response:

- 1) Diversion ditches as they exist are shown on Revised Plate 6. Topographic detail has been added to this plate to allow determination of watershed slopes.
- 2) Proposed diversions and other hydrologic controls are shown on Plates 7 and 13, for the Aberdeen Mine expansion. Topographic detail has been added to Plate 7 to allow determination of watershed slopes.
- 3) Plate 16 has been revised to show drainage during the reclamation period (before and after removal of sediment ponds).
- 4) See Revised Plate 16 for final drainage details.
- 5) Plate 9 has been revised to show corrected delineations of watershed areas.
- 6) The culvert will be removed entirely during the reclamation/earthwork phase. Pond "E" will be enlarged, and the entire drainage area above will flow into the restored channel RC-1 and through Pond "E". Once revegetation is deemed adequate, Pond "E" will be removed and reclaimed.

Casing and Sealing of Exposed Underground Openings: Temporary - JRH

Temporary Cessation

Response:

Whenever it is known that operations are to be temporarily ceased for more than 30 days, Andalex Resources will submit to the Division a notice of intention to cease or abandon the operations, in accordance with UMC 817.131 and to MSHA standards.

This notice will describe mitigation measures to be employed in accordance with the terms and conditions of the permit approval, such as a statement of the number of surface areas involved in the cessation, extent of sub-surface strata, prior reclamation efforts accomplished on the property, and identification of all backfilling, regrading, revegetation, environmental monitoring, underground opening closures and water treatment activities that will continue during the temporary cessation.

If underground openings are to remain inactive for a period greater than 90 days, such openings will be temporarily closed off from access. Such closures will consist of a chain link or other substantial wire mesh fabric fence placed over the portals to prevent public access while allowing for air flow. Locked gates may be installed in the portal to allow for mine inspection.

Sediment Control for Office Facilities:

Response:

The office facilities area is approved as a small area exemption; therefore, runoff from this area does not report to the sediment ponds. Natural runoff from above the office area is diverted to the south of the pad, and flows in an open ditch down to the lower (road) level where it enters an 18" culvert going into the 42" culvert carrying undisturbed drainage off site. Straw bales are maintained in the open ditch to minimize sediment in the undisturbed flow.

The office pad and access road are paved. Runoff from the pad and road flow down a grouted ditch along the north side of the road, through a culvert and then down the east side of the main paved road. Sediment contributions from the office facilities area are minimal (if any) due to the pavement and concrete grouted ditch. Straw bales are also maintained along the main haul road to minimize sediment loading from this area.

An effort will be made to establish vegetation along the road embankments. A sample of the runoff water from the office facilities area will be taken and analyzed for compliance with effluent standards.

Sediment Control for Powder Magazine Area:

Response:

The powder magazine area is not used, and does not flow into the undisturbed drainage. There is a basin located below the area, which is approximately 20'L x 20'w x 3'd. The magazine area is approximately 30'L x 30'w. The runoff from a 10 yr. - 24 hr. event on this area would be slightly over 500 gallons of water, the water level in the basin would be less than 2 inches deep. Sediment yield of 0.1 ac.ft./acre would be approximately 90 cu.ft. or less than 3 inches in the basin. The basin is more than adequate to contain the runoff from this area; however, if it should ever discharge, the company will sample such a discharge for compliance with effluent standards.

NPDES Permits:

Response:

Both point sources are included under the same NPDES Permit. The permit is under review for renewal. Timely application has been made, and the company is currently operating under an extension of the original permit. Refer to Page 9 of Appendix L for a copy of the letter of extension.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
DENVER PLACE — 999 18TH STREET — SUITE 500
DENVER, COLORADO 80202-2465

DEC 4 1986

cc: Holland Shepherd
DOGM

Ref: 8WM-C

Mr. Michael W. Glasson
Senior Geologist - Pinnacle Mine,
Andalex Resources - Tower Division
P.O. Box 902
Price, Utah 84501

Re: NPDES No. UT-0023507

Dear Mr. Glasson:

As you are aware, the NPDES permit previously issued to you by EPA expires by its own terms on December 31, 1986. Although you have applied for permit renewal, we will be unable to reissue the permit by that date. Consequently, there is an interim period between the expiration date contained in the previous permit and the time any renewal permit will be issued. Because you made a timely and sufficient application for permit renewal, under the provisions of EPA's April 1, 1983 Permit Regulations (48 FR 14158, 40 CFR 122.6), there is an automatic continuation of the permit during the interim between expiration and renewal. You should be aware that, under the terms of this regulation, all of the requirements and conditions of your current permit will remain fully effective until the renewal permit is issued.

Any violations of the permit during the interim period are subject to enforcement action by the Agency. Additionally, at the discretion of the permit issuing official, your request for permit renewal can be denied on the basis of any failure to comply during the interim period. The denial would terminate the permit continuation and subject you to an enforcement action for discharge without a permit.

After we have completed an evaluation of the necessary information, including application Form 2C where applicable, a permit will be drafted and we will publish notice of our intent to reissue the permit. The draft permit will contain effluent limitations and other provisions reflecting the various requirements of the Clean Water Act. The public notice and related information will summarize the proposed permit and will allow thirty (30) days for public comments. A final permit will be issued sometime after the close of the public comment period.

- 2 -

The permit continuation, provided under the terms of 5 U.S.C. 558(c) and 40 CFR 122.6, will terminate upon issuance of the renewal permit.

Sincerely yours,



Max H. Dodson
Director
Water Management Division

cc: Utah Department of Health