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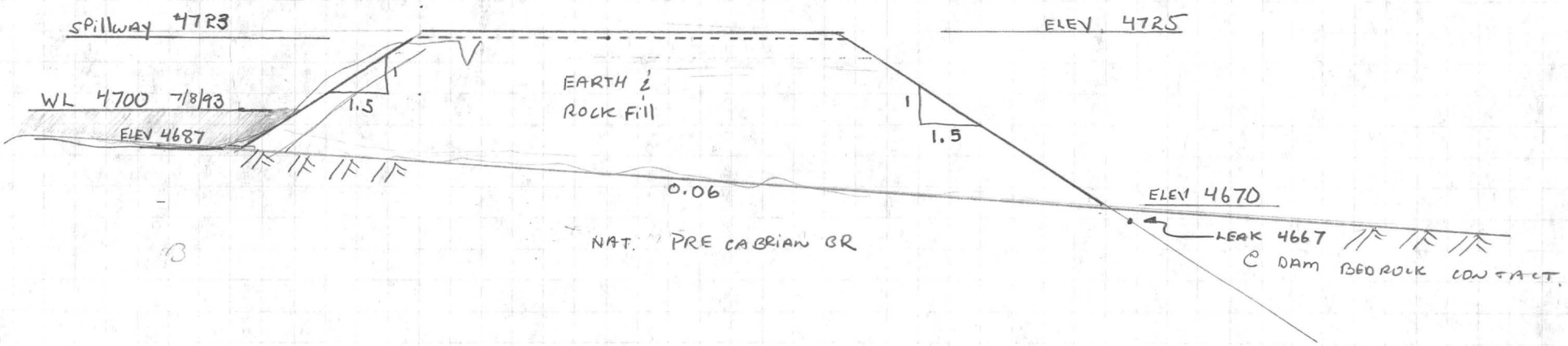
ZONIA MINE

NAT. GND. Slope $\frac{10}{175} = .057 \approx .06$



B

15

OPERATIONAL POND LEVEL: GENERAL REQUIREMENTS

- Avg SOLN. DRAW: 4800 gpm

  STORAGE TIME : 8 hrs

  2,304,000 gallons

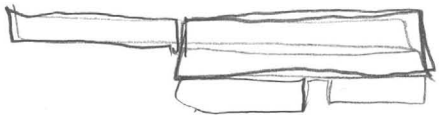
- Soln. EVAP. RATE N/A

- Soln. LOSS N/A

- Soln. INFILTRATION. N/A

- HEAD REQUIREMENTS N/A

REQUIRED Solution Volume (OPERATIONAL)
2,304,000 gallons
307,980 cu. ft.



Zonia Mine
Leach Basin No. 4

Southwest Pond Volume (Sec A)

Elevation	Height	Area	Thickness	Slice	Cummulative Volume Cu. Ft.	Gal.	Acre Ft.
4660	0	34055	2.5	85136.63275	85,137	636,907	2
4665	5	41536	5	207677.755	292,814	2,190,544	7
4670	10	51068	2.5	127670.0898	420,484	3,145,644	10

3,146,000

Southwest Pond Volume (Sec B)

Elevation	Height	Area	Thickness	Slice	Cummulative Volume Cu. Ft.	Gal.	Acre Ft.
4660	0	6618	2.5	16544.2675	16,544	123,768	0
4680	5	10328	5	51638.523	68,183	510,075	2
4670	10	83174	2.5	207935.8758	276,119	2,065,644	6

2,070,000

Southwest Pond Volume (Sec C)

Elevation	Height	Area	Thickness	Slice	Cummulative Volume Cu. Ft.	Gal.	Acre Ft.
4675	0	155825	5	779126.3895	779,126	5,828,645	18
4680	5	177420	5	887100.161	1,666,227	12,465,041	38
4685	10	200963	5	1004812.759	2,671,039	19,982,045	61
4690	15	228949	5	1144745.333	3,815,785	28,545,885	88

Southwest Pond Volume (Sec D)

Elevation	Height	Area	Thickness	Slice	Cummulative Volume Cu. Ft.	Gal.	Acre Ft.
4680	0	74861	3	224583	224,583	1,680,105	5
4685	10	143552	5	717760	942,343	7,049,668	22
4690	15	234744	5	1173719.6	2,116,063	15,830,264	49

Total Pond Volume	6,628,450	49,587,437	152

OPERATIONAL REQUIREMENTS

(4800)(60)(8) = 2,304,000 gallons

SOLN ELEV (SEC A)

4667.5 2,190,544
x 2,304,000 x = 4667.8
4670 3,145,644

VOLUME CALCULATIONS

SEC ABOVE INT. BERM TO TOP OF FILL

4675 5828 645
4677 x x = 8,483,203
4680 12,465,041

~~up to spillway~~ incld. internal temp storage

4685 19982045 4685 7049668
4689 26833117 + 4689 19674144.8
4690 28545885 4690 15831264

Prepared by Arimetco, Inc. 6/9/95

MAX SURFACE AREA @ 4689

4685 200963
4689 x x = 223,352
4690 228949

OPER. SURFACE AREA @ 4668

4665 41536
4668 x x = 47255.2
4670 51068

+ 3145644 + 2065644 = 46,185498
46,120,000

Zonia Mine

Leach Basin No. 4

Southwest Pond Volume (Sec A)

Elevation	Height	Area	Thickness	Slice	Cummulative Volume Cu. Ft.	Gal.	Acre Ft.
4660	0	34055	2.5	85136.63275	85,137	636,907	2
4665	5	41536	5	207677.755	292,814	2,190,544	7
4670	10	51068	2.5	127670.0898	420,484	3,145,644	10

Southwest Pond Volume (Sec B)

Elevation	Height	Area	Thickness	Slice	Cummulative Volume Cu. Ft.	Gal.	Acre Ft.
4660	0	6618	2.5	16544.2675	16,544	123,768	0
4680	5	10328	5	51638.523	68,183	510,075	2
4670	10	83174	2.5	207935.8758	276,119	2,065,644	6

Southwest Pond Volume (Sec C)

Elevation	Height	Area	Thickness	Slice	Cummulative Volume Cu. Ft.	Gal.	Acre Ft.
4675	0	155825	5	779126.3895	779,126	5,828,645	18
4680	5	177420	5	887100.161	1,666,227	12,465,041	38
4685	10	200963	5	1004812.759	2,671,039	19,982,045	61

Southwest Pond Volume (Sec D)

Elevation	Height	Area	Thickness	Slice	Cummulative Volume Cu. Ft.	Gal.	Acre Ft.
4680	0	74861	3	224582.9109	224,583	1,680,105	5
4685	10	143552	5	717757.8625	942,341	7,049,651	22

Total Pond Volume	4,309,983	32,242,985	99

5 { 4665 41536 ; 2 { 4668 Ax ; 4670 51068 } x } 9532

$\frac{2}{5} = \frac{x}{9532}$ $x = 3812$

$Ax = 51,068 - 3812 = 47,255$

STORM REQ TO OVERFLOW SPILLWAY @ LB #4

SEC A	3,146,000
B	2,070,000
C	13,700,000
to spillway	47,000,000

$$47{,}000{,}000 \text{ gallons} \left(\frac{1 \text{ cu ft}}{7.481 \text{ gallons}} \right)$$

6,282,583 cu. ft. TOTAL CONTAINMENT

− 308,000 cu. ft. OPER SOLN.

5,975,000 cu ft.

$$5{,}444{,}815 \times X \times 0.9 = 5{,}975{,}000 \text{ cu. ft}$$

$$X = 1.0973 \text{ ft}$$

LEACH BASIN NO 4

(4800)(60)(8)

3.68 in 100yr

} IN POND BEHIND FILL

SPILLWAY TO CONTAIN

MAX

47,000,000
- (4800)(60)(8)
- 3.68 100yr

} CONTAINED IN HEAD

~~5.8 100yr~~ ~~ADDITIONAL CASE~~
~~4800 (60)(8)~~

MINIMUM

5.5 100yr - 3.68 in 100yr in HEAD
7 million from #3 in HEAD

JUST BRING BOTTOM UP.

19,982,045

Zonia Mine
Leach Basin No. 4
Spec Information

Leach Pad

Surface Area - sq. ft.	5,444,815
Perimeter - ft	10,578
Face Height - ft.	130
Face/Side slopes	2:1 (H:V)
S.F.	
Volume - cu. ft.	460,760,575
Volume - tons	25,597,810
Max. Thickness - ft.	170

Hydrology

Design Storm	100 yr.
Duration	24 hr.
Intensity	5.5 in.
Soil Group Class	B
Ante. Moisture	AMC-II
Init. Abstractions	0.25
Ground Cover	50-75%
SCS Curve # (Calc)	53
SCS Curve # (Design)	60
Direct Runoff	1.6 in.

Runoff - Pad (Rational Method)

Area - sq. ft.	5,444,815
Intensity	5.5 in.
Coefficient	0.90
Runoff (Pad) - gal	16,802,224

Runoff - Watershed (SCS Curves)

Hyrdrologic Area - sq.ft.	5,984,149
Nat. Ground Area - sq.ft.	539,334
Runoff (Nat. Gnd.) - gal	537,967

Ore

T.F.	18 cu.ft./ton
Tonnage	25,597,810
% Cu	0.35
# Cu	179,184,668

Production

Monthly - tons	328,146
Annually - tons	3,937,750
Life - yrs	6.5

Engineering Parameters (Est.)

LL - (Silty Sand/Gravel)	32
PL - (Silty Sand/Gravel)	13
Max. Dry Density (SSG)	123
Peak Strength (-4# Mat.)	3290 psf
Clay Permeability (cm/sec)	1.55E-08

Pond Containment Volumes

Runoff (Total) - gal	17,340,191
Leach Solution * - gal.	4,704,320
Total Containment - gal	22,044,511
Total Contaiment - acre-ft.	68

Primary Pond (SW Pond)

Bottom Elevation - ft. (ASL)	4,670
Surface Area - sq. ft.	320,201
Max. Depth - ft.	42
Max. Soln. Elev - ft.	4,712
Oper. Soln. Elev - ft.	4,696
Volume - gal	45,902,917
Volume - acre-Ft.	140.9

Primary Dam (SW Dam)

Toe Elevation - ft.	4,670
Height - Crest - ft.	50
Width - Crest - ft.	133
Length - ft	144
Height to Spillway - ft.	42
Width of Spillway (bottom) - ft.	20
Spillway depth - ft.	8.0
Upstream Slope - ft.	2:1 (H:V)
Downstream Slope - ft.	2:1 (H:V)
S.F. (Overall)	
G.C.	Earth/Rock
Free Board - ft. (oper.)	24

Secondary Pond

Bottom Elevation - ft. (ASL)	N/A
Surface Area - sq. ft.	N/A
Max. Depth - ft.	N/A
Max. Soln. Elev - ft.	N/A
Oper. Soln. Elev - ft.	N/A
Volume - gal	N/A
Volume - acre-ft.	N/A

Secondary Dam

Toe Elevation - ft.	N/A
Height - Crest - ft.	N/A
Width - Crest - ft.	N/A
Lenght - ft.	N/A
Height to Spillway - ft.	N/A
Width of Spillway (bottom) - ft.	N/A
Spillway depth - ft.	N/A
Upstream Slope - ft.	N/A
Downstream Slope - ft.	N/A
S.F. (Overall)	N/A
G.C.	N/A
Free Board - ft. (oper.)	N/A

Copper Value (70% Rec.)

$0.70 Cu	$87,800,487
$0.80 Cu	$100,343,414
$0.90 Cu	$112,886,341
$1.00 Cu	$125,429,268
$1.10 Cu	$137,972,194
$1.20 Cu	$150,515,121

*** Note: leach solution is applied at 0.003 gal/min/sq.ft. over 60% of the pad for one 8 hour shift**