PROPOSED PLAN OF OPERATIONS -

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LISBON VALLEY PROJECT

Prepared for
U.S. Department of Interior, Bureau of Land Management, Moab District, Grande Resource Area

by
Summo USA Corporation

August 8, 1995

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Appendix A - Sentinel East Pit Backfilling Amendment .....

Appendix B – Surface Water Diversion Design.....

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LISBON VALLEY MINING CO

Mr. Lynn Jackson
US Bureau of Land Management
82 East Dogwood
Moab Utah 84532

April 6, 2010

Mr. Tom Munsen
Utah Division of Oil, Gas, & Mining
1594 West North Temple Suite 1210
Salt Lake City, UT 84114-5801

Re: Adjustment to Approved Mine Plan Amendment. Drainage Detail Sentinel East Backfilling. Lisbon Valley Mining Company LLC. 920 South County Road 313, La Sal, Utah, 84530.

Dear Lynn and Tom:

The Lisbon Valley Mining Co LLC (LVMC) has attached additional detail pertaining to diversion design around the toe of Waste Dump C. The embedded site plan on the following page shows the location of Diversion Channels C1 and C4.

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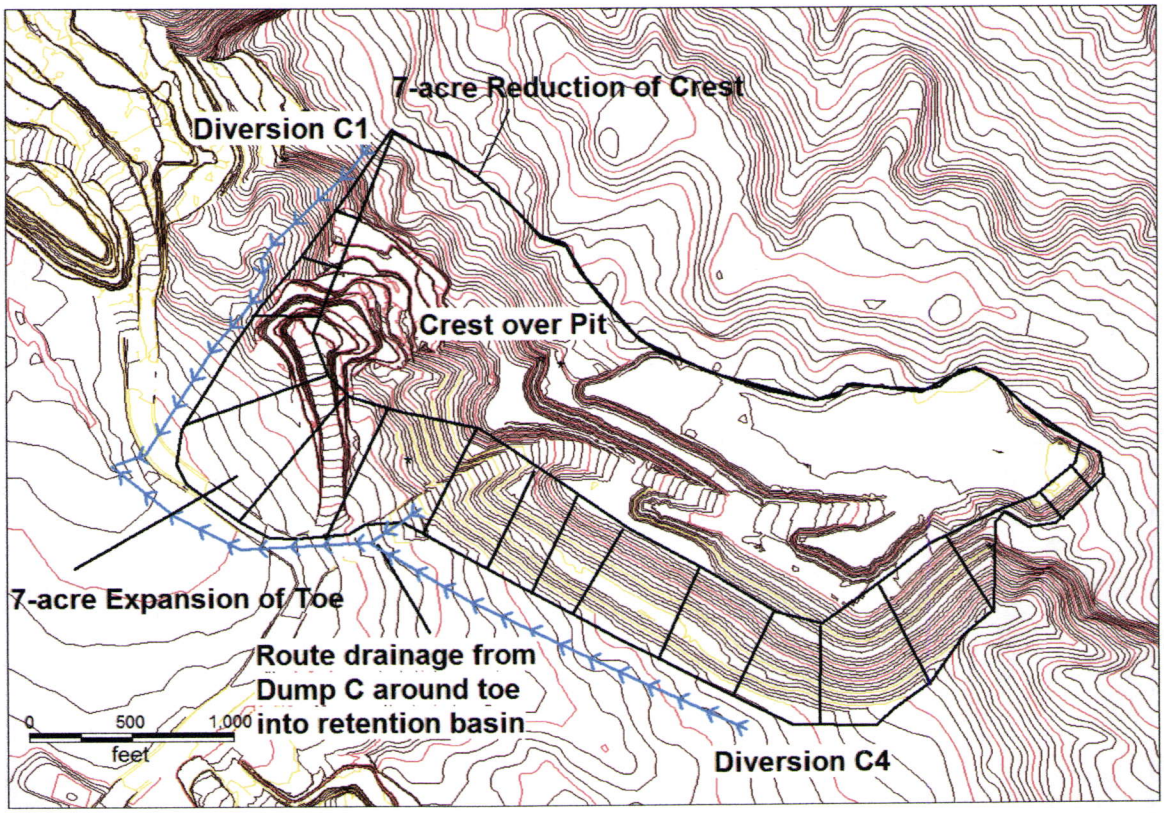

Rock check structures will be installed in the diversion channels to control erosion and sediment. Diversion channel dimensions, rock size, and flow depths are attached.

The LVMC appreciates the agencies' ongoing guidance and support as we continue the restart. We look forward to your review, approval, and written request to proceed.

Please call Lantz Indergard at (435) 686 9950 #106 or email Lindergard@lisbonmine.com if additional information is needed.

Sincerely,

Lantz Indergard PG
Environmental Manager
Lisbon Valley Mining Co LLC

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HEC Model and Diversion Channel Design

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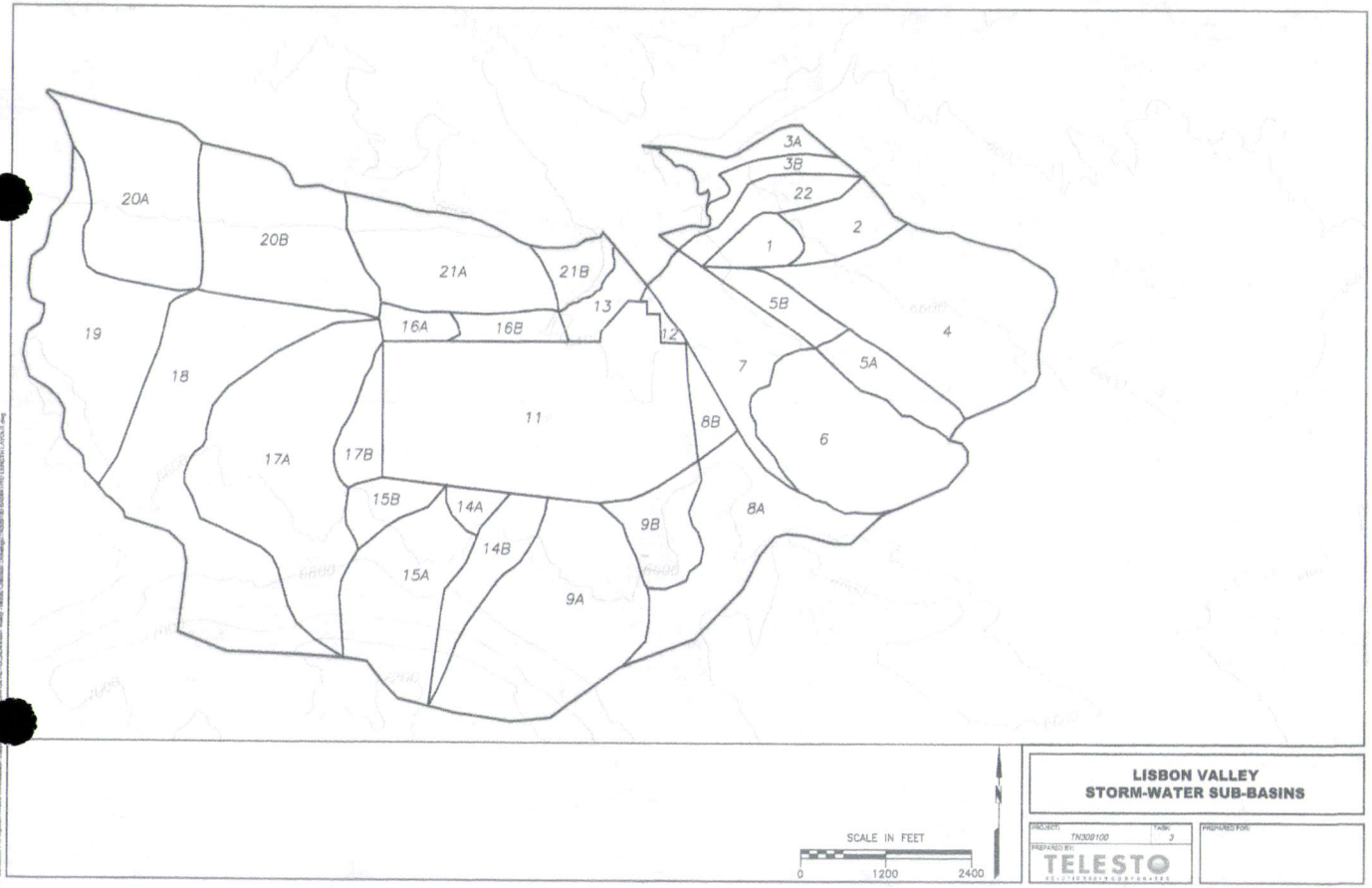

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Constellation Copper
Lisbon Valley Project
8/23/2005

100-Year, 24 Hour Precip Depth = 2.94 in.

HEC-HMS RESULTS

HYDROLOGIC SUB BASIN	DISCHARGE PEAK (CFS)	TIME OF PEAK	TOTAL VOLUME (AC-FT)	DISCHARGE AREA (MI^2)
B-1	7.52	01 Jan 04 1204	0.649	0.0280
B-2	35.74	01 Jan 04 1205	1.657	0.0450
B-3A	18.59	01 Jan 04 1208	0.907	0.0309
B-3B	18.71	01 Jan 04 1207	0.872	0.0297
B-4	76.74	01 Jan 04 1208	4.901	0.2430
B-5A	28.60	01 Jan 04 1217	2.062	0.0460
B-5B	21.85	01 Jan 04 1215	1.471	0.0330
B-6	101.44	01 Jan 04 1215	5.411	0.1690
B-7	50.06	01 Jan 04 1221	3.278	0.1020
B-8A	55.96	01 Jan 04 1214	4.442	0.1420
B-8B	5.25	01 Jan 04 1208	0.522	0.0220
B-9A	79.85	01 Jan 04 1206	7.407	0.2360
B-9B	21.16	01 Jan 04 1204	1.759	0.0560
B-11	NA	NA	NA	NA
B-12	1.48	01 Jan 04 1222	0.114	0.0070
B-13	6.16	01 Jan 04 1220	0.448	0.0270
B-14A	1.41	01 Jan 04 1203	0.113	0.0140
B-14B	5.05	01 Jan 04 1205	0.452	0.0580
B-15A	51.77	01 Jan 04 1203	4.140	0.1320
B-15B	13.22	01 Jan 04 1201	0.978	0.0310
B-16A	5.57	01 Jan 04 1213	0.312	0.0190
B-16B	6.85	01 Jan 04 1215	0.416	0.0250
B-17A	85.91	01 Jan 04 1208	8.546	0.2730
B-17B	22.06	01 Jan 04 1205	1.286	0.0330
B-18	46.81	01 Jan 04 1219	6.548	0.2780
B-19	63.63	01 Jan 04 1217	5.783	0.1850
B-20A	18.25	01 Jan 04 1218	2.492	0.1590
B-20B	22.84	01 Jan 04 1212	2.660	0.1700
B-21A	18.28	01 Jan 04 1212	2.130	0.1360
B-21B	4.52	01 Jan 04 1207	0.434	0.0280
B-22	23.44	01 Jan 04 1209	1.177	0.0400

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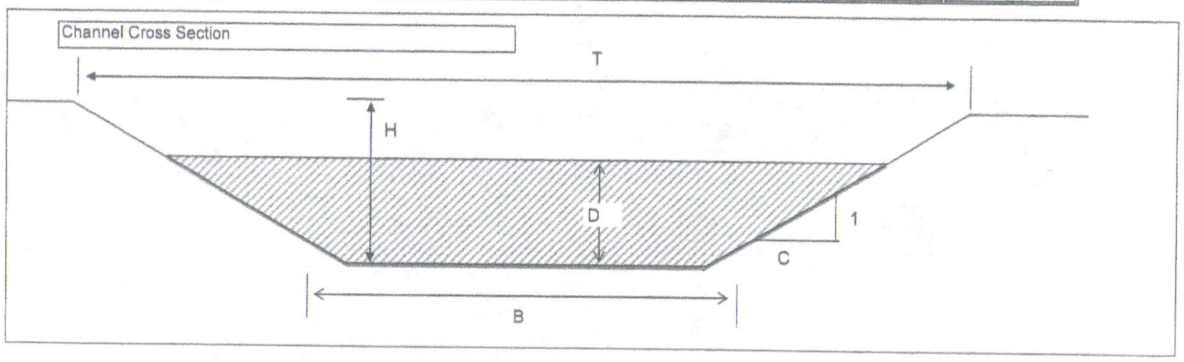
Conceptual Channel Design
Constellation Copper
Lisbon Valley
8/23/2005

CHANNEL SUMMMARY

Channel Name	Average Channel Slope	Estimated Channel Length	100-Year, 24-Hour Design Flow (Peak Discharge)	Flow Depth (D)	Average Flow Velocity	Base Width (B)	Right Sideslope (C)	Left SideSlope (C)	Freeboard	Design Depth (H)	Design Top Width (T)	Estimated RipRap D_{50} Size
	(ft/ft)	(ft.)	(cfs)	(ft)	(ft/s)	(ft)			(ft)	(ft.)	(ft.)	(in.)
C-1	0.100	1159	35.73	0.68	7.19	6.0	2	2	1.0	1.7	12.7	8.0
C-2	0.100	611	119.97	0.84	8.53	15.0	2	2	1.0	1.8	22.4	10.0
C-3A	0.030	2472	28.60	0.86	5.81	4.0	2	2	1.0	1.9	11.4	4.0
C-3B	0.030	2066	50.45	1.20	6.59	4.0	2	2	1.0	2.2	12.8	5.5
C-4	0.020	4049	76.74	1.59	6.69	4.0	2	2	1.0	2.6	14.4	5.5
C-5A	0.028	2900	55.96	1.29	6.61	4.0	2	2	1.0	2.3	13.2	6.0
C-5B	0.053	1000	61.21	1.03	7.39	6.0	2	2	1.0	2.0	14.1	7.5
C-6	0.017	986	235.14	1.81	19.66	3.0	2	2	1.0	2.8	14.2	HDPE LINED
C-7	0.017	718	215.14	2.59	7.42	6.0	2	2	1.0	3.6	20.4	7.5
C-8A	0.023	1170	172.46	2.10	8.08	6.0	2	2	1.0	3.1	18.4	8.0
C-8B	0.023	1910	172.46	1.45	20.24	3.0	2	2	1.0	2.4	12.8	HDPE LINED
C-9	0.013	1087	151.30	2.57	6.46	4.0	2	2	1.0	3.6	18.3	5.5
C-10	0.014	2120	66.40	1.64	5.55	4.0	2	2	1.0	2.6	14.6	4.0
C-11	0.017	2343	22.06	0.85	4.52	4.0	2	2	1.0	1.9	11.4	3.0
C-15	0.039	433	161.15	1.34	8.23	12.0	2	2	1.0	2.3	21.3	8.0



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Rock Check Structure Design

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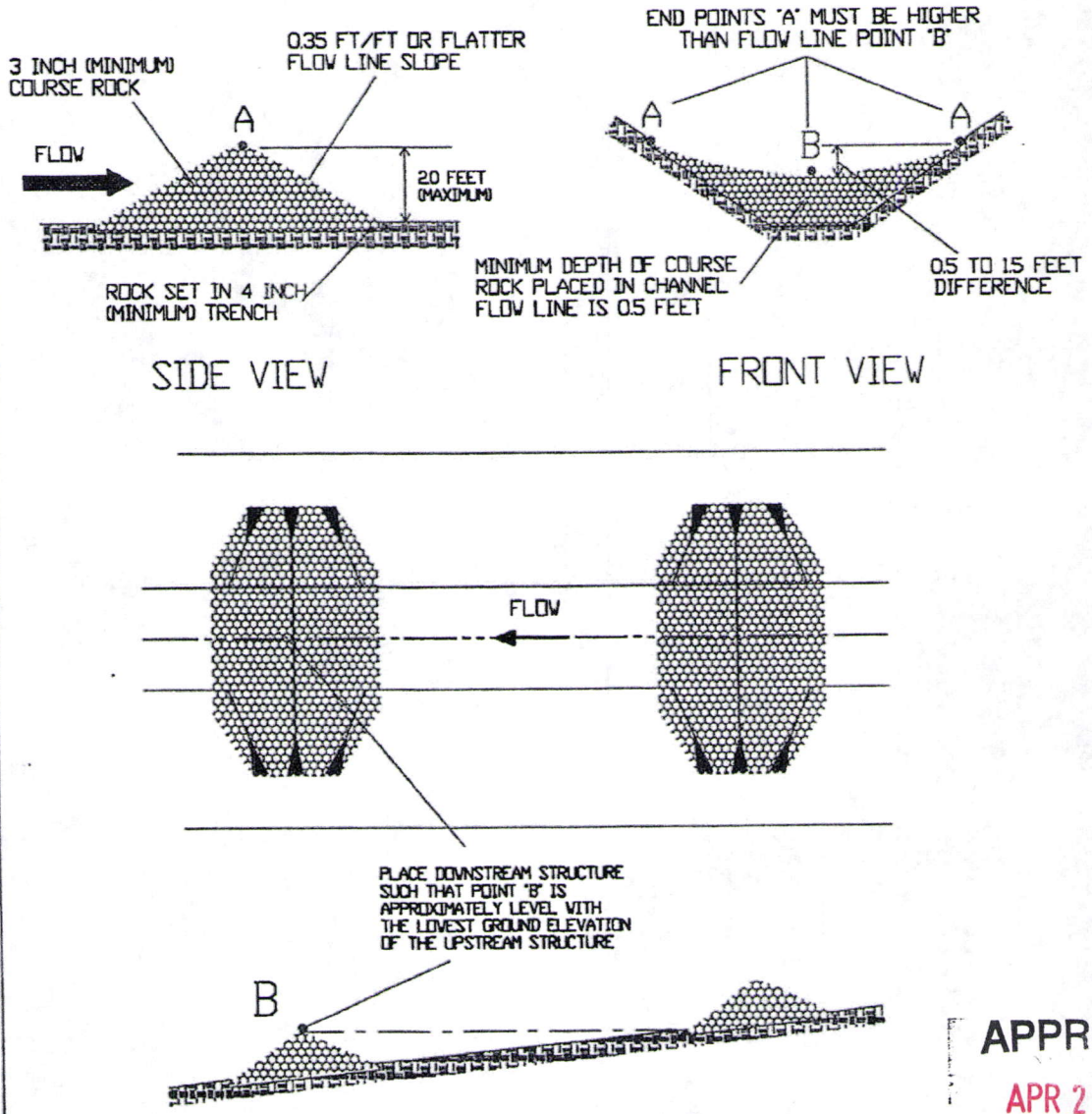
D-50 OF ROCK (INCHES)	DOWNSTREAM FLOWLINE SLOPE OF STRUCTURE (FT/FT) 0.35	0.30	0.25	0.20	0.15	0.10
	MAXIMUM WATER DEPTH OVER ROCK (INCHES)					
3	0.6	0.7	0.8	1.0	1.3	1.9
6	1.2	1.4	1.6	2.0	2.6	3.9

RECOMMENDED ROCK SIZE & FLOW DEPTHS



SMALL ROCK CHECK STRUCTURE FOR WIDE OR NARROW DRAINAGE CHANNELS 4/93

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Figure 22: Illustration of How Rock Check Structures are to be Installed.

1.0 GENERAL INTRODUCTION

Summo USA Corporation (Summo) a subsidiary of Summo Minerals Corporation, is proposing to conduct an open pit mining, heap leach copper operation at its Lisbon Valley Project. Open pit mining will occur at four pits over the life of the operation. These pits are called the Centennial, Sentinel #1, Sentinel #2, and GTO. Mining has occurred in these areas in the past. The project is located approximately 18 miles southeast of La Sal, Utah, in San Juan County (Figure 1-1).

The proposed project is located on private (fee) land, state leases, and unpatented mining claims. A land map of the area is provided for in Figure 1-2. The unpatented mining claims are administered by the Bureau of Land Management (BLM), Moab District, Grand Resource Area. Because unpatented mining claims on BLM lands are a part of this proposed project, Summo must comply with the requirements of 43 CFR 3809 by submitting a detailed Plan of Operations (POO) to the BLM for review and consideration. Summo will comply with the BLM regulations governing surface mining under these general mining laws.

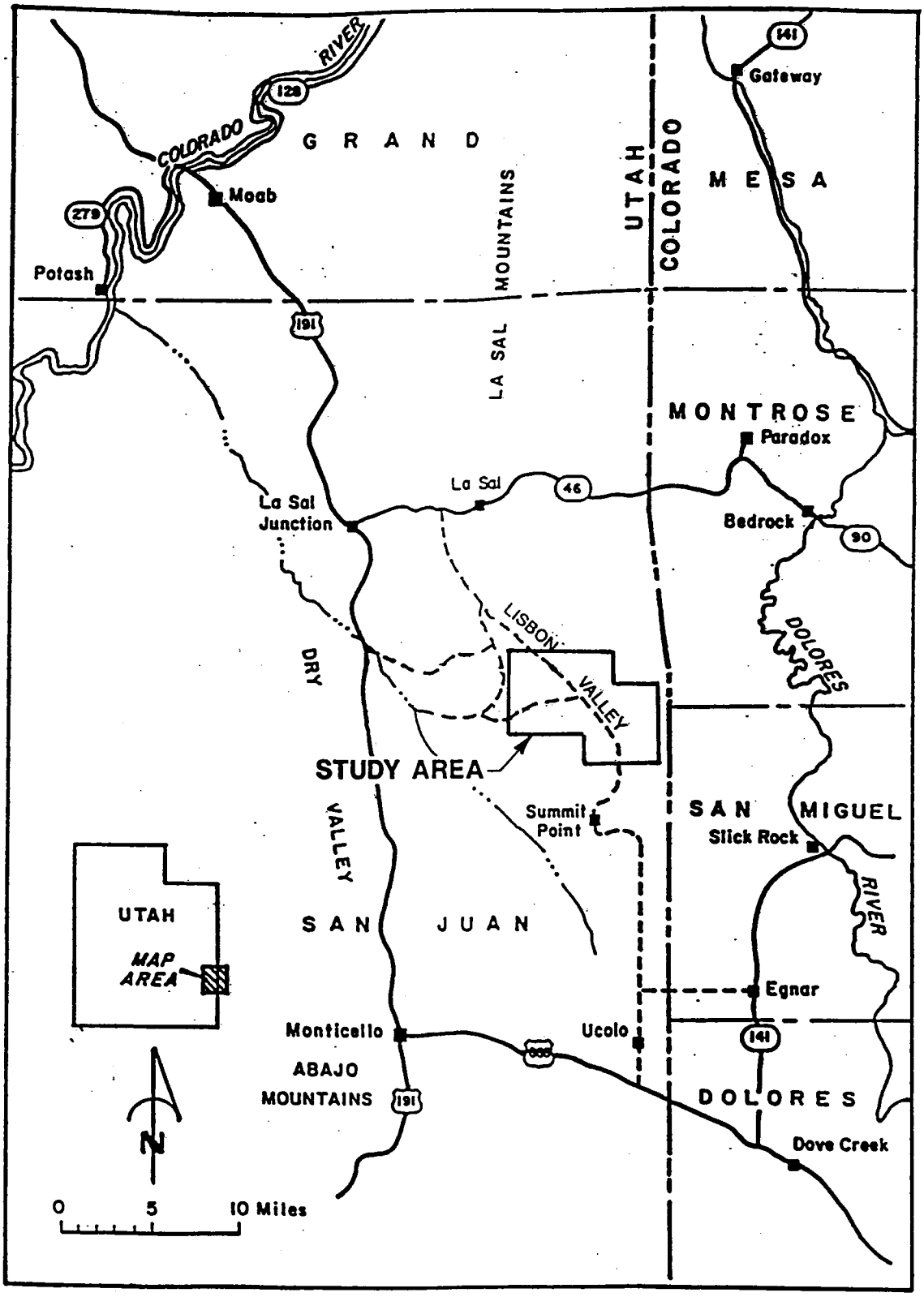
The Lisbon Valley Project area (boundary)will encompass all or parts of :

Sections 22, 23, 24, 25, 26, 27, 34, 35, 36; Township 30 South, Range 25 East
Sections 1, 2; Township 31 South, Range 25 East
Sections 30, 31; Township 30 South, Range 26 East

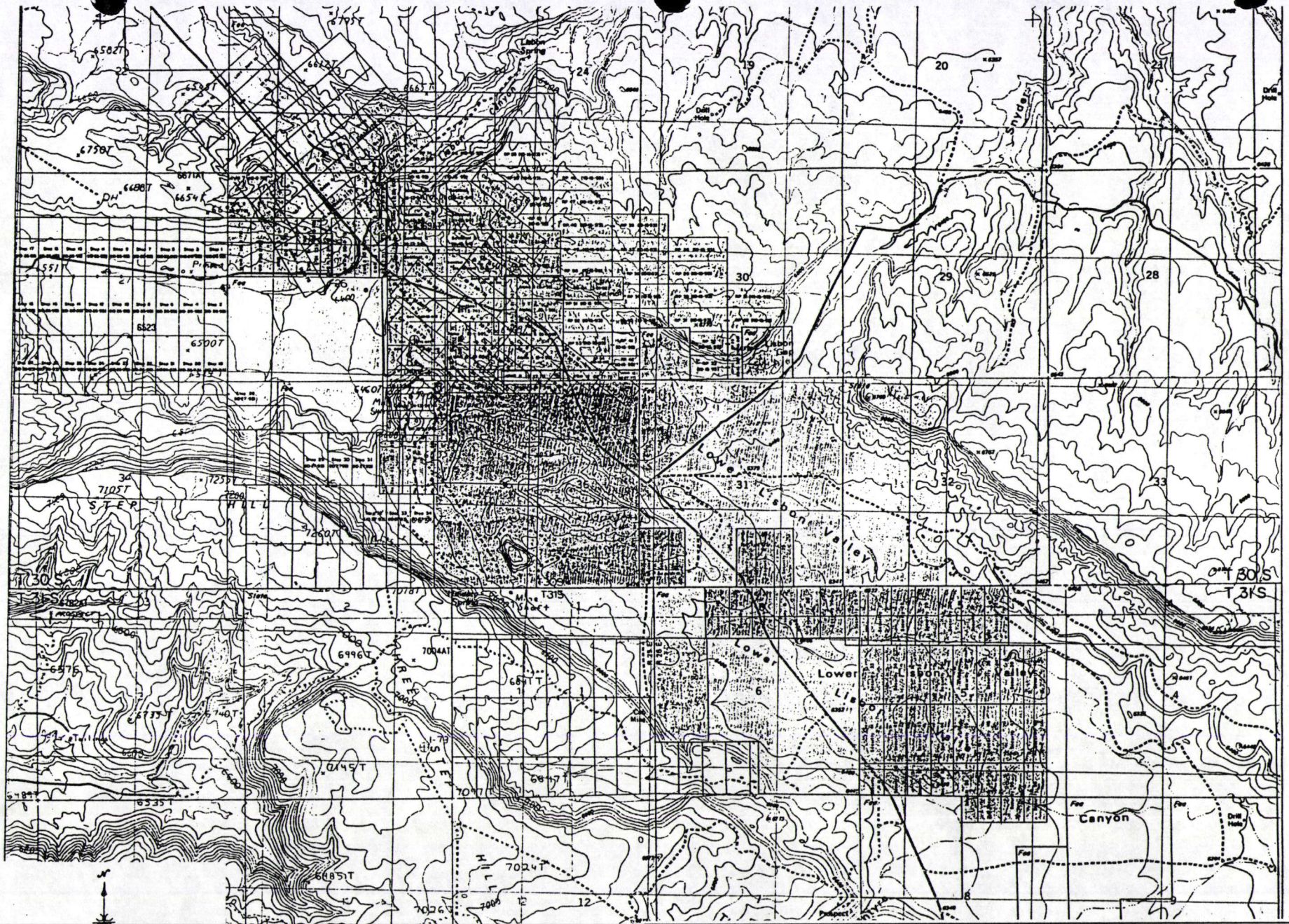
The proposed project facilities are sited in:

Sections 23, 24, 25, 26, 27, 35, 36; Township 30 South, Range 25 East
Section 1; Township 31 South, Range 25 East

The project boundary and proposed facilities are shown on Figure 1-3. Access and powerline corridors extend off of the property.



Job No. : 373-07	**Figure 1-1** **LOCATION MAP** **LISBON VALLEY AREA** **SAN JUAN COUNTY, UTAH**
Prepared By: P.G.	
Date: 8/95	



Job No. : 373-07	**Figure 1-2** **CLAIM MAP** **LISBON VALLEY AREA** **SAN JUAN COUNTY, UTAH**
Prepared By: P.G.	
Date: 8/95	

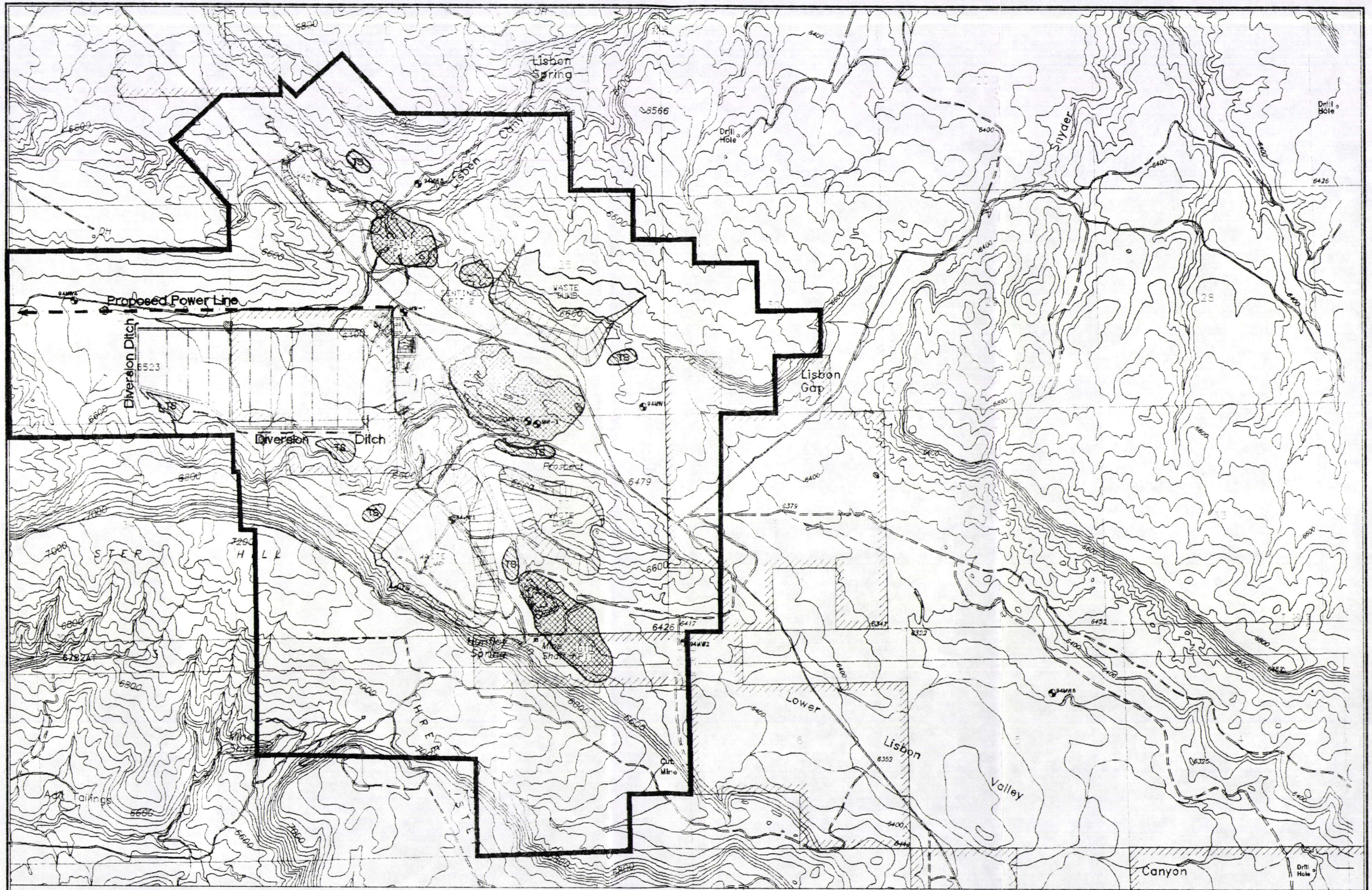


Figure 1-3
SITE MAP
Lisbon Valley Copper Project

SUMMO USA Corporation

Summo is proposing to construct, develop, operate and reclaim the necessary facilities for mining an average of 16,500 tons of ore per day over a currently projected 10 year mine life.

Summo desires to complete permitting by the 4th quarter of 1996 and begin development in the 1st quarter of 1997. The estimated time necessary to complete construction of all facilities is approx. 10 months. Full scale operations are projected for November of 1997. This schedule assumes the prior review and approval of all appropriate federal, state and local agencies.

Preliminary discussions with the BLM have revealed that a Memorandum Of Understanding (MOU) will be developed between the BLM and Summo. This document will highlight roles and responsibilities of each party. It is also understood that a third party environmental contractor will be required to perform the necessary analysis to satisfy the requirements of the National Environmental Policy Act (NEPA).

Permitting requirements of other federal, state, and local authorities will occur concurrently with NEPA to the extent possible.

2.0 PROJECT OVERVIEW

The district has a long history of mining activity. Copper was discovered in the late 1800's. Intermittent exploration and small scale mining activities from open pit and underground operations occurred until the mid 1970's. Visible evidence of this is evident today in the form of abandoned pits, stockpiles and overburden dumps that have not been reclaimed. Incomplete records for this period indicate that approximately 2.5 million pounds of copper was produced from at least five oxide deposits in the Lisbon Valley. In 1993, Summo picked up the property and exploration drilling and testing continued.

In 1995, Summo began a feasibility study that included an evaluation of such things as project size, economics, metallurgy, mine planning, processing (leaching), permitting, and closure. This POO represents the findings of that feasibility report and presents them for BLM review.

This POO also would allow for the reclamation of those facilities that are currently at the site which have not been reclaimed. There is currently over 85 acres of open pits and overburden dumps at the project which fall within the proposed operation.

Summo will employ up to 105 people at one time over the life of the project. The construction workforce will be approximately 80 people. Once the place is up and running, the 105 people needed for operations will be employed. Summo will make every attempt to hire a local skilled (mining) workforce.

2.1 Description of Land Holdings

The Lisbon Valley Project is comprised of approximately 258 unpatented lode mining claims, state leases, and private land. The unpatented lode claims are administered by the BLM. Summo presently holds, or will obtain, all necessary rights to surface use and access of affected lands. Specific claim names and corresponding UMC numbers are provided in Attachment 1. These claims are depicted on Figure 1-2.

2.2 Description of Project Area

The Lisbon Valley Project is located geographically in the far eastern area or near the border of the state, approximately 40 miles southeast of Moab and 18 miles southeast of La Sal, in San Juan County. The project area is commonly referred to as Lower Lisbon Valley (Figure 1-3).

The project, which lies within the Canyonlands division of the Colorado Plateau physiographic province, is a broad northwesterly trending flat-bottomed valley about one mile wide and four miles long. It is bordered on both sides by steep walled mesas and ridges which rise to elevations of 500-700 feet above the valley floor. Maximum relief on the property is about 650 feet.

A more detailed environmental setting (by discipline) for the project is provided in Chapter 5 of this POO.

2.3 Description of Geology of the Project Area

Regional Geology

The geology of the Lisbon Valley region is dominated by structural and stratigraphic features related to the Paradox Basin, a thick succession of sediments and salt deposits that occupies most of southwestern Colorado and southeastern Utah. Lisbon Valley is one of several northwesterly trending valleys formed along salt anticlines in the basin. The Lisbon Valley was formed as a result of regional folding during Permian through Tertiery time. It is a 15 mile long, doubly plunging structure which is faulted along its longitudinal axis by the Lisbon Valley Fault, a normal fault which strikes N40°W and dips 50°-85° northeast with vertical displacement exceeding 3,800 feet. At the ends of the Lisbon Valley Fault the structure tends to horsetail into a number of smaller branching fault strands.

Propert Geology, Mineralization, and Alteration

The geology underlying the Lisbon Valley claims is directly related to structures, the Lisbon Valley anticline and the Lisbon Valley Fault, and to stratigraphy, the Burro Canyon and Dakota Sandstones. Based upon thousands of feet of drilling in the Centennial area, the largest of the three deposits, it has been found that the best copper mineralization occurs in four or five distinctive beds in the Burro Canyon and Dakota formations.

Copper mineralization consists of both sulphides and oxides that are found disseminated throughout the medium and coarse-grained Dakota and Burro Canyon formations and as lenses and nodules along fractures. Copper minerals include azurite, malachite, and sometimes cuprite in the upper oxidized parts of favorable beds.

Although copper mineralization can occur in several stratigraphic units, the best grades and thickness appear to be spatially related to their close proximity to the Lisbon Valley Fault or to branching and cross faults in the hanging wall block. Because there are no igneous rocks in the

2.4 Project Scope (Page 5)

The scope of the project includes the construction, operation, and reclamation of the ~~1030~~ 1109- acre Lisbon Valley Project Components of this operation are shown on Table 2-1. This table also includes the estimated acreage of each individual facility.

Table 2-1

Facility Pits	Acreage
Centennial	~~116~~ 174 Modelling used 165 A
Sentinel #1	38
Sentinel #2	9
GTO	~~68~~ 33
Waste Dumps	
Waste Dump C	118
Waste Dump B	90
Waste Dump A	~~186~~ 168
Leach Pad Area	~~257~~ 266
Process Area and Facilities	~~21~~ 100
Miscellaneous	
Haul Roads	33
Topsoil Stockpiles	~~39~~ 80
Total Project Related Disturbance	~~1030~~ 1109

Incorporated 1/4/08

2.5 Project Layout

The project facilities will be constructed in the areas shown on Figure 1-3. The project site is intersected at its midpoint by the Lisbon Valley county road which runs from northwest to southeast. Because of the location of ore bodies, and in the interest of conserving space, project facilities have been placed on both sides of the county road. A fence will be constructed around the facility for safety purposes.

2.6 Project Life Expectancy

The project is currently projected to have a 10 year mining life. Processing will continue after mining ceases for an additional year. Final closure and reclamation activities will take approx. 5 years.

During operations, Summo will continue to explore in the surrounding area in an attempt to expand the current ore reserve and increase the projected mine life.

3.0 DESCRIPTION OF PROJECT (DETAILED)

3.1 Mining

Mining at the site will occur 24-hours per day, 7 days a week throughout the project mine life.

3.1.1 Pre-Production Requirements

Pre-production requirements for mining activities are limited due to the fact that the first two pits where mining begins have ore at or near the surface. Requirements will include:

- A clear, level laydown area of sufficient size and/or maintenance shop for assembly and parking of the mine fleet;

- Topsoil removal and stockpiling in the Sentinel and Centennial pit;
- Preparation of the ore stockpile site including topsoil removal and stockpiling, site leveling and compaction.
- Construction of haul roads from the Sentinel and Centennial pits to the appropriate waste dump sites and the crusher site;
- Installation of a water station where the water truck will fill;
- Installation of fueling station for fuel and haul trucks;
- Installation of the ANFO silo for explosives storage (although bagged ANFO may be used initially);
- Establishment of a magazine site for trailer storage of initiators and det cord in accordance with regulations.

3.1.2 Pits

The four pits: Sentinel #1, Sentinel #2, Centennial, and GTO are shown in their ultimate configuration in Figure 1.

3.1.2.1 Sentinel #1 and Sentinel #2

The Sentinel Pits have ore outcropping on surface, and a low stripping ratio. The Sentinel pits are scheduled for production at the start of the project. The Sentinel pits will be mined at an average of 1,600,000 tons of ore per year over the first 6 years with the final year 7 production totaling 274,000 tons. The average stripping ratio is 0.93 to 1; however, the annual stripping ratio varies

3.1.2.2 Centennial Pit (Page 8)

Ore in the Centennial pit outcrops, eliminating pre-production stripping for Phase I. Production begins in the Centennial pit at the start of operations and continues for six to nine years. An average annual production of 4,800,000 tons of ore is mined from the pit. The average stripping ratio is 1.71 to 1, however during years 3 and 4 the stripping ratio is 3.22 to 1 as pre-stripping of overlying Phase III ore begins. A total of ~~74,271,000~~ 94,383,940 tons of material are mined from the Centennial pit, of which ~~27,409,000~~ 29,307,450 tons are ore and ~~46,862,000~~ 65,076,490 tons are waste.

The Centennial production is divided into three separate phases according to three ore bodies having different leach characteristics. Phase I ore is less oxidized but of higher grade. The first year pit is limited to the Phase I ore to deliver high grade ore to the pad. Most of Phase I is mined in the first year. The second year production finishes Phase I and targets higher grade material in Phase II. Phase II ore is more oxidized but has a lower average grade than Phase I ore. Phase II production continues into year 4. Phase III ore is less oxidized and underlies a thick sequence of waste. Pre-stripping of Phase III is planned for Years 3 and 4.

Phase III will require re-routing County Road 313 and an adjacent gas line. The required encroachment permits and associated agreements will be acquired in year 3.

Haul roads in the Centennial pit are designed with maximum grades of 10% and with road widths of 80 feet (including berms).

Incorporated 1/4/07

3.1.2.3 GTO Pit (Page 9)

The GTO pit has the highest strip ratio of the three pits. Ore is covered by a minimum of 100 feet of overburden. Mining is delayed until year ~~6~~ 3due to high overburden stripping requirements. ~~Contractor stripping~~ Stripping with scrapers will begin in year ~~6~~ 3 to expose the ore. A total of 13,556,000 tons of overburden are proposed to be mined ~~by contractors~~ in year 3 of the project. Overburden stripping will be performed by ripping with D-9L dozers and removing material with scrapers. The average strip ratio for GTO is ~~6.95~~ 5.67:1. The total material mined from GTO is ~~42,516,000~~ 24,233,780 tons, of which ~~5,3435,000~~ 3,635,660 tons are ore and ~~37,171,000~~ 20, 598,120 tons are waste.

Haul roads were designed for the GTO pit with a maximum grade of 10% and a road width of 80 feet, except for the bottom 60 feet, which has the same grade but the width is reduced to 50 feet.

3.1.3 Drilling and Blasting Procedures

Drilling will be performed using a 10" rotary drill, with ANFO as the explosive. Blasting will occur approximately every other day, and will only occur during daylight hours.

3.1.4 Waste Stripping

Drilling and blasting will be used to break all of the waste in the pits. ~~Sentinel pit and Phase I and II of the Centennial pit.~~ Substantial waste from Phase III of the Centennial Pit and the GTO Pit has been estimated based on ripping it with a Komatsu D-375-5 ~~D-9~~ dozer rather than drilling and blasting. Waste will be loaded into ~~150~~ 205 ton trucks with a 26.5 cubic yard loader. ~~either a 14 cubic yard loader beginning in year 1, or a 24 cubic yard loader beginning in year 3~~. The ~~contractor~~ stripping of 13,550,000 tons in the GTO Pit is based on ripping with a Komatsu D-375-5 ~~Cat D9~~ dozer and hauling to the dumps with 44 yard scrapers.

Incorporated 1/4/08

3.1.5 Ore Stripping (Page 10)

All ore in all pits is scheduled to be broken by drilling and blasting. Komatsu 730E 205 Ton trucks or equal will be loaded with Komatsu B375-A5 front end loader. The trucks will haul the ore from the pits to an ore stockpile site at the crusher.

3.1.6 Waste Dumps

Three waste dumps with a total combined capacity of 90,000,000 tons at the best available sites were laid out.
Current design calls for a total of three waste dumps. The dump north of the Centennial Pit (Waste Dump C) is designed to receive 17,356,000 tons, which represents all of the waste from Centennial Phase I and all of the waste from the Sentinel pits. The dump west of the GTO pit (Waste Dump A) is designed to receive 36,212,000 tons, and the dump to the north of the GTO pit (Waste Dump B) is designed to receive 31,818,000 tons. Dumps B and C will accept waste from Centennial and GTO pits. Both dumps can be re-deisgned to provide additional capacity if needed.
Figure 1-3 shows final dump configuration. Dumps were designed with a 2.5 to 1 slope.

3.1.7 Ore Stockpiles

An area capable of holding 100,000 tons of ore (roughly one week's production) is needed for the ore stockpile. All ore will be direct-dumped into the crusher from trucks.

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3.1.8 Haul Roads

Haulage ways were designed to access the pits, dumps and the crusher site on an annual basis. The total length of haul roads as currently designed is 15,000 feet. Of this length, 6,500 feet are associated with Sentinel mining, 800 with Centennial mining and 5,350 with GTO mining. A total of 2,350 feet are common to several or all of the pits.

3.1.9 Major Equipment

Major equipment required for mining are:

1 IR TB5 blast hole drill;

1 D-9 dozer;

1 Tradestar ANFO truck;

1 Cat 992 14 cu yd front end loader;

1 Cat 994 24 cu yd front end loader;

7 Cat 785B 150T haul trucks for ore and waste;

1 Cat 14G grader for ramp maintenance;

1 Cat D9N dozer for waste placement on dumps;

1 15000 gal. Capacity off-road water truck for dust suppression on ramps and dumps;

1 Cat 992 front end loader 14 cu yd capacity at the primary crusher stockpile;

1 Cat D-7 dozer at stockpile;

3 light plants;

4 pickup trucks;

1 maintenance truck;

1 fuel and lube truck.

3.1.10 Explosives

Drilling will be done using a 10" rotary drill. ANFO will be used as the explosive. ANFO will be stored in a silo supplied by the ANFO supplier and delivered to the blast patterns with a Tradestar ANFO truck. Separate storage facilities for blast initiators and det cord will be required in accordance with any applicable regulations. The magazine will be sited in a drilling condemned site with a lockable trailer for storage.

3.2 CRUSHING

3.2.1 Crushing facility description

The Ore Receiving and Crushing area is shown on Roberts & Schaefer flowsheet drawing 6326-FS01 located in Attachment 2.

The ore receiving hopper and crushers are located near the Centennial ore body. Ore from the Centennial pit, Sentinel pits and GTO pits will be transferred with 150 ton capacity haul trucks to the Run of Mine (ROM) stockpile located adjacent to the ore receiving hopper. The ore will be stockpiled close to the ore receiving hopper. Ore from this stockpile will be recovered by front-end loader and deposited in the hopper.

The hopper will be fitted with a stationary grizzly with 24 inch openings. Undersize material will fall into a surge hopper, while oversize rocks are removed by a front-end loader and stockpiled. The oversize material can be crushed down by other methods and returned to the circuit for processing if the grade and quantity justify further treatment.

The crushing plant will operate two or three shifts per day as required to meet the needs of the Heap Leach Area and SX-EW plant. A vibrating grizzly feeder will feed material from the ore receiving hopper at an average rate of 478 dry tons per hour. The grizzly oversize (+6") will report to the primary jaw crusher. The jaw crusher will use a nominal setting of 6 inches.

The jaw crusher discharge and grizzly undersize material will be collected on the 36 inch wide Primary Crusher Collecting Conveyor.

Dust will be controlled in the primary crushing area by means of a water spray system.

Ore from the primary crusher will be transferred to a double deck vibrating screen. The top deck will have 3 inch screen openings and the bottom deck will have 1-1/2 inch screen openings. Oversize from the top and bottom decks will report to the Secondary Cone Crusher.

The Secondary Cone Crusher will operate with a closed side setting of 1-1/2 to 2 inches. The Cone Crusher product will join the vibrating screen undersize product before being transferred to the heap leach pad area.

Dust control in the secondary crushing plant area will be accomplished with a dust collector system.

3.2.2 Conveying and Stacking

The Conveying and Ore Stacking is shown on flowsheet drawing 6326-FS01 (Attachment 2).

Crushed ore will be transferred from the Secondary Cone Crusher area to the Heap Leach area by a series of conveyors and stacked on an impermeable leach pad with a radial stacker. The pad is approximately 8,300 feet long by 2,400 feet wide and will contain the ore in three 36 foot high lifts when completed.

3.3 PROCESSING SUMMARY

The Lisbon Valley copper project is a conventional sulfuric acid heap leach and solvent extraction-electrowinning operation. The facilities were designed to process an average of 478 tons per hour of ore to produce 17,000 tons per year of copper cathodes.

Raffinate (a low grade sulfuric acid solution) from the raffinite pondwill be pumped to the heap and distributed by a system of headers and sprays or drip irrigation emitters. This raffinate solution will percolate through the heap and dissolve copper in the ore as a copper sulfate solution. This solution will be collected in the Pregnant Leach Solution (PLS) pond before being pumped to the SX circuit.

The PLS solution will then be pumped to the first extraction stage in the SX circuit. Here the PLS solution is mixed with an organic solution containing an extractant which absorbs the copper ions. The copper loaded organic solution flows through a settler tank where the organic and the aqueous solutions disengage. There are two extraction stages in series that remove copper from the PLS solution. With most of the copper transferred to the organic phase, the barren aqueous solution or raffinate is returned to the raffinate pond and resprayed on the heap.

The copper containing loaded organic solution flows to the stripper mixer/settler tank and is mixed with a high strength sulfuric acid solution which forms the electrolyte for the tankhouse. The copper ions transfer to the aqueous phase and are separated from the organic. The pregnant aqueous strip solution (strong electrolyte) is filtered before being directed to the electrowinning circuit (EW). The strong electrolyte solution is pumped to the electrowinning cells where the copper is deposited onto stainless steel cathodes. The EW tankhouse is designed to produce London Metal Exchange LME Grade A 99.99% copper. The copper is then washed, stripped from the steel cathode, sampled, and banded for shipment.

A series of flowsheets have been prepared for the project and are included in Attachment 2.

3.3.1 Heap Leaching Overview

The heap leaching flows are shown on flowsheet drawing 6326-FS02 (Attachment 2).

Crushed ore on the leach pad will be leached with raffinate solution from the raffinate pond which contains dilute sulfuric acid. Sulfuric acid and make up water are added as needed to the pond to maintain the solution and acid strength for the heap leach. Raffinate solution pumps at the raffinate

pond will deliver leach solution to a main header which feeds branch lines at approximately 100 foot spacings. The branch lines connect to a network of pipes with spray or drip irrigation tubing to distribute the solution to the heap. The raffinate solution will percolate through the heap dissolving copper.

To maintain the copper strength in the pregnant leach solution (PLS), an intermediate solution sump will collect leach solution from partially leached ore. This "intermediate" solution will be pumped to fresher ore on the pad to increase the PLS grade. The final PLS solution will flow by gravity to the PLS pond, from which it will be pumped to the solvent extraction plant. The PLS will contain approximately 3.0 grams per liter of copper.

3.3.2 Plant Description SX-EW

3.3.2.1 SX Circuit

Solvent extraction flowsheets are shown on drawings 6326-FS03 and 6326-FS04 (Attachment 2).

The SX area consists of three mixer/settlers and associated storage tanks. Two extraction mixer/settlers in series and one stripping mixer/settler have been designed for this plant. Each mixer/settler is installed outdoors with a pump mix box, an auxiliary mix box, and a settler with covers. The pump mix box contains an impeller designed to mix the aqueous and organic solutions and to provide hydraulic head. Solution from the pump mix box flows through the auxiliary mix box for a total retention time of at least two minutes before entering the settler.

The PLS will be pumped at 3,000 gpm to the E1 extraction mixer. In the mixer, PLS will contact organic solution which will absorb copper from the PLS. The organic solution contains an organic chelating agent (extractant) dissolved in a high flashpoint kerosene (diluent) which preferentially removes copper from the PLS solution. The partially stripped PLS will separate from the organic solution in the settler and flow to the E2 extraction mixer. There, most of the remaining copper will absorb into fresh organic solution, leaving a stripped acid or raffinate solution which separates

from the organic solution in the settler. The raffinate solution flows through a flotation column to remove and recover entrained organic before being pumped back to the raffinate pond for use on the heap leach pads. The raffinate contains approximately 0.3 grams per liter copper. The acid solution used in the leach and SX circuits is in a closed loop system with no losses except through evaporation, entrainment in the heap, or entrainment in the organic solution to the Electrowinning circuit.

The strong electrolyte (strip solution) from the E1 settler, which contains about 46 g/l copper, will flow through a flotation column and filter system to remove entrained organic solution and small particles.

Crud which is collected in the SX settlers and from the flotation column overflow will be decanted into a pair of tanks so that the organic and aqueous solutions can be recovered and recycled.

3.3.2.2 Electrowinning (EW) Circuit

Drawing 6326-FS04, shows the flowsheet for the electrowinning circuit.

The strong electrolyte solution will be heated in a pair of heat exchangers. The first heat exchanger or Electrolyte Interchanger will recover heat from electrolyte solution being pumped back to the SX circuit. The second heat exchanger will use hot water to heat the strong electrolyte solution if cold weather or startup conditions make the extra heat necessary.

The strong electrolyte will flow through the scavenger cells which will use electrolysis to plate out copper on the cathodes. The scavenger cells will also protect the majority of the copper in the other cells if impurities get past the electrolyte filter. In both the scavenger and commercial electrowinning cells, copper will be deposited onto stainless steel blanks. During this process, water will dissociate to generate oxygen at the anodes. Additional sulfuric acid will also be generated. Solution from the scavenger cells will flow to the electrolyte recirculation tank. Guar and cobalt sulfate solutions will be added to both the strong electrolyte solution before it enters the

scavenger cells and the electrolyte recirculation tank. Guar is added to create smoother cathodes and cobalt sulfate is added to reduce the anode corrosion rate.

Electrolyte solution from the electrolyte recirculation tank will be pumped through the commercial cells, where additional copper will be plated out, and will return to the electrolyte recirculation tank. A portion of the recirculation tank's solution will be pumped through the electrolyte interchanger to recover heat before being pumped back to the S1 stripper mix box as lean electrolyte.

Sulfuric acid and water will be added to the electrolyte recirculation tank as needed. The water will come from the reverse osmosis (R.O.) system which will remove impurities including chloride ions. Chloride will pit cathode mother blanks if it becomes too concentrated in the electrolyte. The local well water for the plant contains chloride salts. A small electrolyte bleed stream will be used to control chloride and iron concentrations which can build up in the electrowinning circuit over time.

A rectifier will supply direct current to the electrowinning cells.

3.3.2.3 Cathode Handling

Cathodes from the electrowinning cells will be removed and transferred to the cathode handling system with a bridge crane. A semi-automatic cathode handling system from Wenmec will be used. The cathode handling system washes the cathodes with hot water, flexes and separates the copper plates from the mother blanks, weighs and samples the copper plates, and bands the plates for shipping. The final copper plates will meet LME Grade A copper requirements.

3.3.3 Heap Leach Pad Considerations

The heap leach facilities consist of a leach pad, a raffinate pond (barren solution), a pregnant leach solution (PLS) pond, as well as the necessary ditch systems for solution collection and runoff diversion. The facilities are designed to contain all solutions (process waters and direct precipitation) within the system without discharge to the environment.

The layout of the facilities: 1) minimizes the ore transport distance to the heap leach pad, 2) takes advantage of the natural topography to minimize earthwork requirements and allow gravity drainage of the solutions from the pad, and 3) protects the environment by containing all solutions and precipitation. Design criteria include the following:

* Provide adequate capacity for the ore to be stacked and leached without interfering with daily operations;

* Design a layout to accommodate staged construction to minimize liner exposure and reduce initial capital costs;

* Provide adequate pond capacity for operating conditions, drain-down of the heap, and containment of runoff from the pad due to the design storm event; and

* Design the leach pad and pond liner systems to protect the environment and meet the intent of the design requirements set forth by the State of Utah in their draft rule R317-11 Extraction of Metal Values by Heap Leach Mining Methods, dated November 10, 1994.

A general overview of the individual components of the heap leach facilities are discussed in the following sections.

3.3.4 Heap Leach Pad Design

The leach pad is designed to contain up to 45 million tons of ore and to route solution drainage to the solution ponds via gravity drainage. The pad layout is such that it may be constructed in four stages to accommodate ore production schedules and may be expanded to contain additional tonnages without having to reconstruct a whole new heap leach system.

The proposed pad covers about 11.6 million square feet in total. It will be graded to follow the natural topography of the valley. Therefore, drainage will be in a northern and easterly direction

with the solution ponds located at the northeast corner of the pad as shown in Figure 1-3. An access road and conveyor corridor will be constructed along the south side of the pad. The access road will be about 20 feet wide and extend the full perimeter of the pad. The solution collection ditch will be constructed along the north edge of the pad and drain by gravity to the solution ponds.

The ore will be stacked on the pad in three lifts, each being 36 ft in vertical height. The first lift will be offset from the edge of the pad a minimum of 10 ft to provide a buffer zone between the toe of the lift and the edge of the lined pad. Subsequent lifts will be set back from the crest of the previous lift to create an over all slope of 2H:1V (Horizontal:Vertical). The face of each lift will be sloped at the angle of repose of the crushed ore. This will result in a slope grade of about 1.5H:1V.

The pad will be constructed in stages as mentioned above beginning with the eastern section and progressing westerly in an up gradient direction. The first stage is about 2.45 million square feet and will contain up to 22 months of production in the first two lifts. Stage two of the leach pad will be about 2.45 million square feet and increase the pad capacity to 42 months of production in the first two lifts. Stage 3 will also be about 2.45 million square feet and increase the capacity to about 62 months of production in the first two lifts. At this time the third lift will be placed over the existing pad space prior to constructing Stage 4. This will increase the operating time of the first three stages to about 88 months. Stage 4 will be about 3.82 million square feet and provide the required capacity for the remainder of the project .

The heap leach pad liner system will consist of one foot of compacted low permeability soil overlain by 80-mil thick high density polyethylene (HDPE) plastic. The plastic sheets will be welded together to form a continuous impermeable synthetic liner. The conveyor corridor along the south side of the pad will be lined in a similar manner and constructed to drain onto the leach pad as described below. The leach pad liner system will also be continuous with the solution ditch liner system in order to provide complete containment of the solutions within a lined system during leaching and solution routing to the ponds.

A grid of solution collection pipes spaced approximately 20 to 30 feet apart will be installed over the synthetic liner to enhance drainage of the solution from the ore and reduce the depth of solution over the liner. The pipes are spaced to control the head to about one foot. This reduction will reduce seepage potential through the liner system and enhance the stability of the stacked ore. The pipe will be covered with a protective layer of material which will likely be a layer of ore spread over the pad prior to stacking operations. Details for placement of the protective layer will be determined as part of final design and will be consistent with current practices for protecting synthetic liners.

The conveyor corridor will be about 20 ft wide and separated from the access road by a berm. The conveyor corridor will be lined with a 60-mil thick HDPE liner that will overlap the 80-mil heap leach pad liner by a minimum of 3 feet. The conveyor corridor liner will not be welded to the heap leach pad to allow for movement and repairs of the conveyor corridor liner.

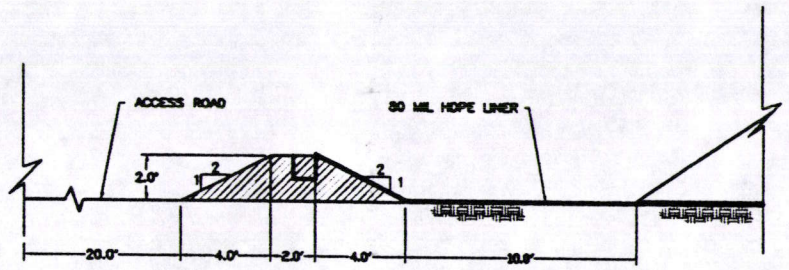
Figures 3-1 and 3-2 show liner detail for Pad and Pond construction.

3.3.5 Solution Management

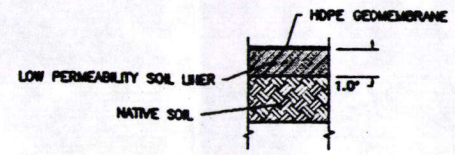
The management of the process solutions will be accomplished by constructing lined solution ponds to contain and store solutions drained from the leach pad. Other components include the solution collection pipes installed over the liner (as described above), the distribution pipelines and drip system, and the drainage ditch along the north side of the leach pad. Below are summary descriptions of the different components of the solution management system.

3.3.6 Solution Pond System Layout and Design

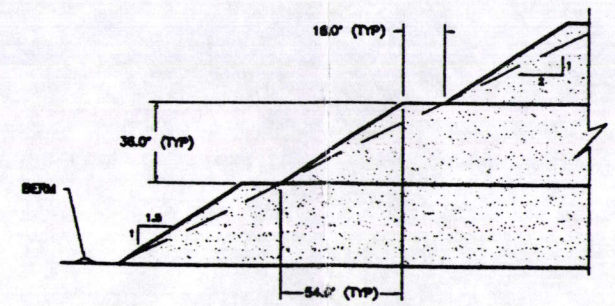
The solution ponds have been designed to separately store the two types of solutions be circulated through the heaps plus excess runoff from the design storm event. One solution is the PLS (Pregnant Leach Solution and the other solution is the Raffinate solution (barren and intermediate



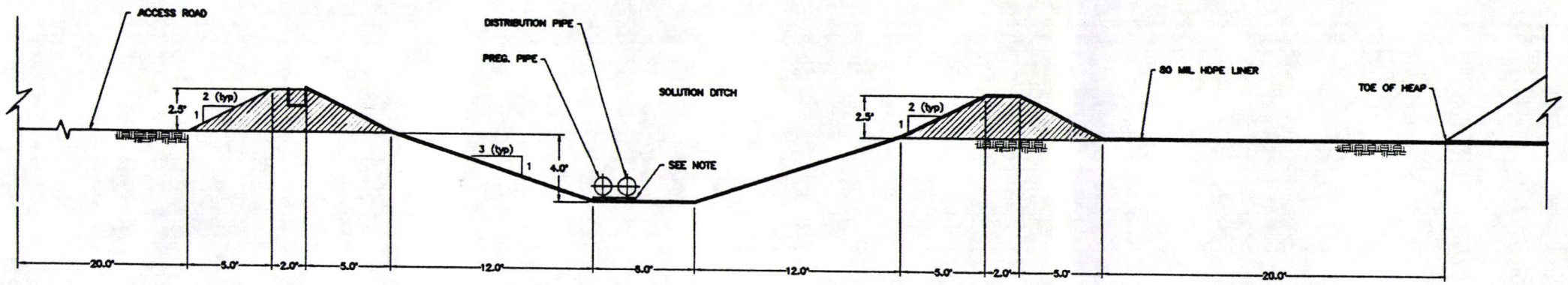
PAD PERIMETER SECTION nts (A)



TYPICAL PAD LINER DETAIL nts

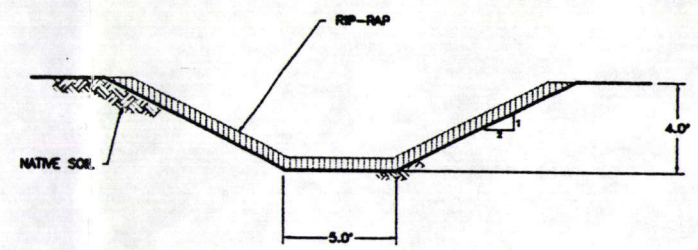


TYPICAL HEAP CONFIGURATION DETAIL nts

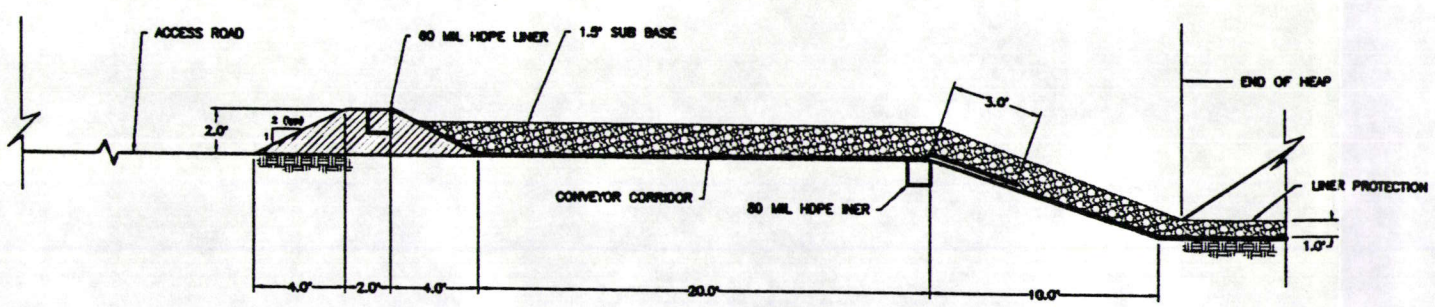


NOTE: PIPES TO REST ON A RUB SHEET (I.E. EXCESS LINER OR CONVEYOR BELT MATERIAL) AND/OR SUPPORT BLOCKS. TO BE DETAILED IN FINAL DESIGN.

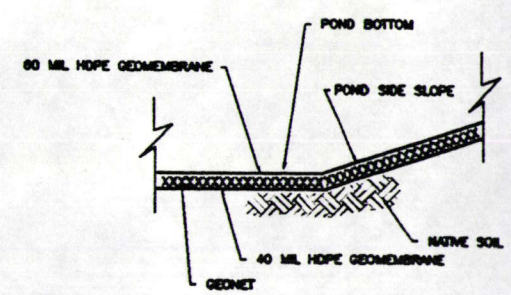
SOLUTION CHANNEL SECTION nts (B)



DIVERSION DITCH DETAIL nts (E)



CONVEYOR CORRIDOR SECTION nts (C)



GEOSYNTHETIC LINING SYSTEM, PONDS DETAIL nts (D)

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App'd					
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Figure 3-1

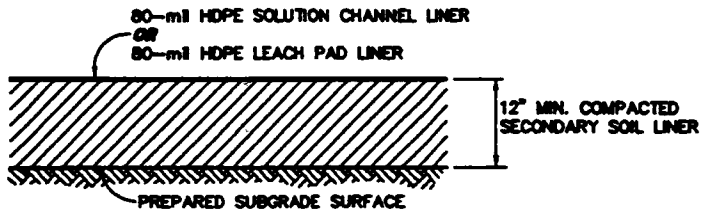
LISBON VALLEY COPPER PROJECT
HEAP LEACH PAD/POND AREA

SUMMO USA CORPORATION

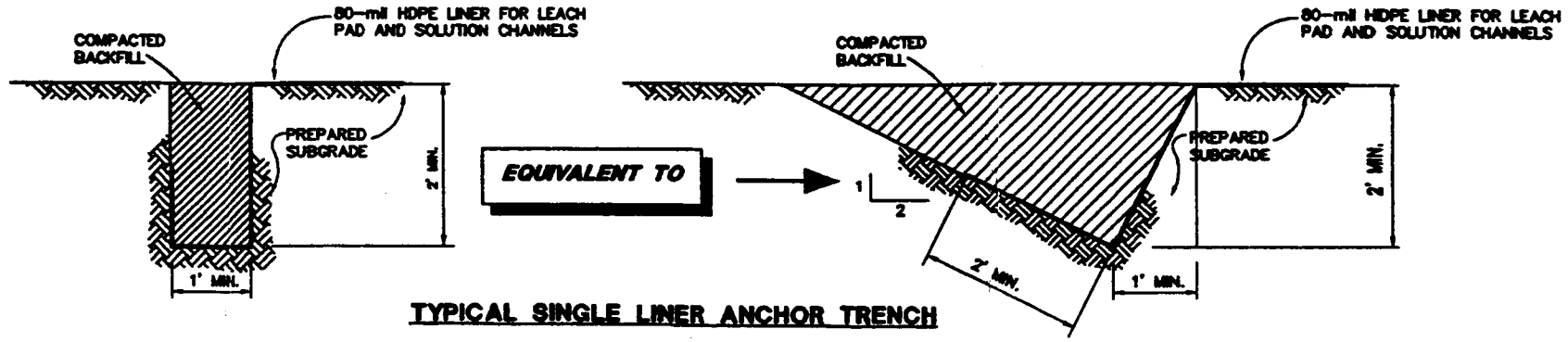
Drawing Name: LEACH PAD DETAILS

Location: SAN JUAN COUNTY, UTAH

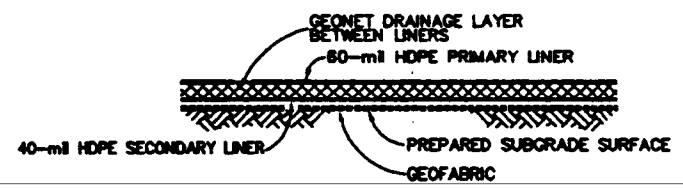
Drawing No. 04301-2 | File Name 04301-2 | Revision 0



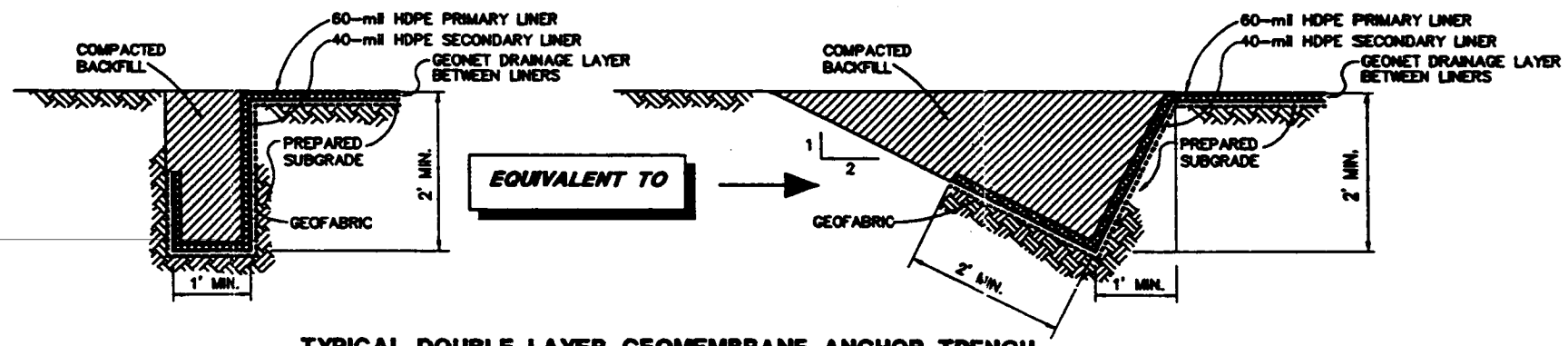
LEACH PAD LINER SYSTEM



TYPICAL SINGLE LINER ANCHOR TRENCH



DOUBLE GEOMEMBRANE LINING WITH DRAINAGE LAYER



TYPICAL DOUBLE LAYER GEOMEMBRANE ANCHOR TRENCH

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Figure 3-2

LISBON VALLEY COPPER PROJECT
HEAP LEACH PAD/POND AREA

SUMMO USA CORPORATION

Drawing Name: LINER DETAILS

Location: SAN JUAN COUNTY, UTAH

Drawing No. 04301-3 | File Name 04301-3 | 0 Revision

grade solutions). The ponds are sized to contain the estimated volumes using the criteria listed below. The pond capacities are listed in Table 3.1.

Pond Design Criteria

* 24 hours of operation at 3000 gpm;
* 8 hours of drain down due to pump failure or power outage
* Stormwater runoff from minor storm events to avoid solution intermixing
  - 2-yr., 24-hr. storm event (1.4 inches) for the PLS pond
  - 10-yr., 24-hr. storm event (2.2 inches) for the raffinate pond
* Storm water runoff from the 100-yr., 24-hr. design storm event (3.4 inches)
* Minimum 2 feet of freeboard above maximum capacity

The stormwater ponds were sized to contain 100% of the runoff from the design storm event based on worst case conditions. This assumes that no ore has been placed on the stage of leach pad under consideration. Preliminary estimates found the two worst conditions were at the completion of Stage 1 construction and again at the end of Stage 4 construction. Based on these findings, two storm ponds are proposed to be constructed in phases. Initially a pond will be constructed to contain the storm water runoff from the Stage 1 leach pad area. As part of Stage 4 construction a second pond will be constructed to contain the increase in runoff over and above the capacity of the existing pond.

Table 3.1 - Solution Pond Capacity Estimates

Criteria	PLS Pond ($x10^4$ gal)	Raff. Pond ($x10^4$ gal)	Storm Pond 1 ($x10^4$ gal)	Storm Pond 2 ($x10^4$ gal)
24 hrs. @ 3000 gpm	432	432	N/A	N/A
8 hrs. @ 3000 gpm	144	144	N/A	N/A
Minor Storm Event	2390	4045	N/A	N/A
100 yr. Storm Event	N/A	N/A	6252	2055
Total Capacity Estimate	2986	4641	6252	2055

It is currently anticipated that an average irrigation rate of ~~0.005~~ 0.0027 gallons per minute per square foot will be used during heap leach operations. The solution will be applied with drip emitters to minimize evaporation losses to the system. This will be beneficial in reducing fresh water make-up requirements.

The pond layout is such as to minimize the mixing of solutions during storm events to protect the grade of solution in the PLS pond. In summary, the PLS pond will spill into the raffinate pond once full. The raffinate pond will then flow into the storm pond 1 which will flow into storm pond 2. Spillway elevations will be set such that the raffinate and storm ponds can flow from one to another. The PLS pond spillway into the raffinate pond, however, will be such that the raffinate pond cannot flow back into the PLS pond.

3.3.7 Pond Design and Lining System

The ponds required for solution management are listed below. The depth of each pond includes 2 feet of freeboard above the solution level.

PLS Pond
ILS Pond
Raffinate Pond
Storm Pond 1
Storm Pond 2

The lining system for the solution ponds will consist of two synthetic liners with a leak detection system between the liners. The outer liner will be placed over a compacted subgrade with a prepared surface suitable for liner placement. The liners will be 60 mil thick HDPE with panels welded together to create continuous impermeable liners. A geodrain material will be placed between the two liners to act as a drainage pathway for the leak detection system. A gravel sump will be installed in the low corner of the pond floor to collect seepage in the geodrain material. A riser pipe will extend up between the liners to the crest of the pond to serve as the monitoring well of the leak detection system. The riser pipe will be a 4-inch diameter pipe so that a sump pump may be installed for solution removal in the event a leak occurs in the primary liner.

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two liners to act as a drainage pathway for the leak detection system. A gravel sump will be installed in the low corner of the pond floor to collect seepage in the geodrain material. A riser pipe will extend up between the liners to the crest of the pond to serve as the monitoring well of the leak detection system. The riser pipe will be a 4-inch diameter pipe so that a sump pump may be installed for solution removal in the event a leak occurs in the primary liner.

3.3.8 Surface Water Diversion

A series of diversion channels have been designed to route runoff around the active mining areas. The diversion channels are designed to pass the peak flow resulting from the 100-yr., 24-hr. design storm event. Based on data presented by NOAA for this region, this event produces 3.4 inches of precipitation. Based on the topography and upgradient drainage areas, the typical channel cross section to carry the estimated peak flows will be a trapezoidal section with a 5-ft bottom width, side slopes excavated at 2H:1V and to maximum depth of four feet. Rock check structures will be installed in the diversion channels to control erosion and sediment. Diversion channel dimensions, rock size, and flow depths are included in Appendix B.

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3.4 SUPPORT FACILITIES

well of the leak detection system. The riser pipe will be a 4-inch diameter pipe so that a sump pump may be installed for solution removal in the event a leak occurs in the primary liner.

3.3.8 Surface Water Diversion

SUPERCEDED 4/26/2010

A diversion channel has been designed to route runoff from areas upgradient of the property around the heap leach facilities. The primary routing of the ditch is along the south side of the pad and to the east beyond the process facilities. The diversion ditch will merge into the natural drainage which exits the property in a northerly direction. Runoff from the west side of the pad will be diverted into the natural drainage channel along the north side of the pad. This channel will also intercept the runoff from the north side of the valley. The natural drainage channel is adequate except in an area near the west end of the stage 1 leach pad. A diversion ditch will have to be constructed along the shoulder of the access road in order to route the flow back into the natural channel. The flow from this area will receive the flow from the south side of the project as it exits the project area.

The diversion ditches around the project site are designed to pass the peak flow resulting from the 100-yr., 24-hr. design storm event. Based on data presented by NOAA for this region, this event produces 3.4 inches of precipitation. Based on the topography and upgradient drainage areas, the typical ditch cross section to carry the estimated peak flows will be a trapezoidal section with a 5-ft bottom width, side slopes excavated at 2H:1V and to maximum depth of four feet. The slope of the ditch will not exceed 1%.

p. 2-6 of EIS says 6' bottom width & 2' deep.

3.4 SUPPORT FACILITIES

3.4.1 Shop

A truckshop repair building will be included with the ancillary facilities for the project. Items installed in this shop include; Oil storage and dispensing tanks & equipment, overhead crane, antifreeze storage tank and dispensing equipment, waste oil storage tank & evacuation equipment,

and drainage sump to contain any spill in the truckshop area. The sump will contain an oil separation tank and storage tank for collection and proper disposal.

3.4.2 Warehouse

A warehouse will be housed within the same building as the truckshop. The warehouse and truckshop will be separated by offices which house the warehouse personnel, operating personnel and the truckshop personnel.

The warehouse will store the necessary spare parts and supplies required to maintain operations.

3.4.3 Laboratory

A laboratory will be required for the proposed project. This laboratory will be used to perform the necessary tests to maintain correct ore grade in the mine and to enable the process plant to maintain high copper quality.

The solution discharge from the laboratory will flow into the raffinate pond. Sewage will be directed into a septic tank and drain field.

3.4.4 Administration Building.

An administration building will be included with this project to house all of the administrative personnel required for the mine. This building will include a separate locker room facility with showers for both the male and female mine personnel. Also included is a First Aid room for emergency medical situations, a lunchroom, conference/training room and line-up room.

3.4.5 Electrical Power

The existing power line at the site does not have the capacity required to meet the demand for the project. Power is available from either a 69 kV power line or a 138 kV power line which are located approximately 6.5 miles from the site. A transformer would be required to step the power down from the 138 kV line to a new 69 kV power line feeding the plant. Power requirements for the plant are approximately 8 megawatts. Summo and Utah Power and Light (UPL) are working together on the permitting, design, and construction of the power supply facilities.

3.4.6 Water Source and Supply

Water for the project will come from wells developed near the project site. A number of test holes have been drilled at the site which identify an aquifer at 250 to 300 feet deep. This aquifer should provide the process water requirements for the project (up to 1000 gpm). Potable water for the facilities will be provided in the form of bottled water. The well water will service the showers, lavatories and emergency eye washes etc.

3.4.7 Access Roads

The primary access road to the Mine will be the Lisbon Valley Road, which is a well maintained County road. Access roads for the plant site are minimal and will require very little work to install. This is due to flat topography in the area where the plant site will be built. Summo will work closely with the county (San Juan) in developing any upgrading and/or maintenance requirements.

3.4.8 Sanitary and Solid Waste Disposal

No sewage systems for the plant are currently in place. A system of septic tanks and leach fields will be installed. It is anticipated that separate systems will need to be installed for the truck shop

and warehouse area, administration and laboratory area and the SX-EW plant. There will be a separate system for the laboratory sink drains which will drain to the raffinate pond.

3.4.9 Fuel Storage and Supply Needs

A fuel storage and dispensing station will be built on site for diesel fuel and unleaded gas. This will be used to operate the mine fleet and small vehicle fleet at the mine site. The diesel fuel storage tanks will consist of two (2) 15,000 gallon horizontal above ground storage tanks and the unleaded gas storage tank will consist of one (1) 5,000 gallon above ground storage tank.

3.4.10 Chemical Storage and Supply

The reagent storage flowsheet is shown on drawing 6326-FS07 (Attachment 2). The reagent storage area will contain the sulfuric acid storage tanks and pumping system. Acid will be added both to the raffinate solution in the raffinate pond and occasionally to the electrolyte solution in the electrolyte recirculation tank. Some acid will also be applied to the ore on the conveyor belt system to agglomente the ore. The reagent area and SX area will also provide space for storing additional reagents. These include diluent (high flash point kerosene), extractant, guar and cobalt sulfate. Diluent will be stored in a tank. Extractant will be stored in barrels as received from the manufacturer. Guar and cobalt sulfate will be stored in bags as received from the manufacturer.

Ferrous Sulfate will also be stored near the Raffinate pond for addition to the Raffinate solution. This will be stored in supersacks as received from the manufacturer and added to a tank where it will be mixed and pumped into the pond or the piping to the heap.

4.0 EMISSION-POLLUTION CONTROL AND MONITORING

All equipment at the site will be well maintained. Each vehicle will be equipped with standard vehicle emission control devices. In addition, Summo will attempt to purchase low sulphur diesel fuel for the heavy equipment at the site.

4.1 Dust Control From Roads and Disturbed Areas

As stated earlier in the mining section of this proposed plan, dust control will be handled by the spraying of water from a water truck. This will be done in all active mining areas. If this practice becomes too time and water consuming, Summo will look into the application of other dust suppressants such as magnesium chloride or other commercially available products.

Dust suppression in other disturbed areas will involve the prompt revegetation of the disturbed area with a species of grasses, forbs, and shrubs. This will done in conjunction with seasonal planting schedules.

4.2 Particulate and Gas Emissions Controls

Particulate and gas emissions will be controlled at the mine. These activities will fall under the regulatory purview of the Utah air program. As stated in Section 3.3 the crushing system will have spraybars and dry dust collectors. Emission levels and concentrations will meet the stipulations of the regulatory air program.

4.3 Spill Prevention Plan

There are regulations on the federal and state level that are designed to prevent and mitigate spills of fuels and chemicals. This plan must be developed in conjunction with discussions with federal, state, and local officials.

The plan will address at a minimum, the following:

1) Name of the facility
2) Location
3) Date and year facility began operation
4) Hazardous material list
5) Maximum-storage capacity

6) Description of facility, including storage and handling procedures

7) Spill event action program (which outlines roles and responsibilities)

8) Medical emergency procedures

The objectives of this plan are to:

1) Reduce the potential for accidental spills and environmental contamination through a well-defined materials management program;

2) Provide the operating facility with the necessary information to properly respond to a hazardous material spill event;

3) Clearly define line of function responsibilities for a spill situation; and

4) Provide a response and clean-up program which minimizes environmental impacts.

5.0 ENVIRONMENTAL BASELINE

In order to permit and develop the proposed Lisbon Valley Project, it will be necessary to establish an environmental baseline. Recognizing that this will be required by the regulatory agencies, Summo began collecting the long lead time items that will be critical to the review of the operations.

The baselines that will have to be characterized for permitting, operational, and closure purposes are:

Vegetation
Wildlife
Soils
Hydrology (surface and groundwater)
Cultural, Historical and Archaeological
Geotechnical
Air and Meteorological
Socioeconomics

In April of 1994, Summo hired Woodward Clyde, an internationally recognized environmental firm, to begin establishing critical environmental baseline studies. To date, Woodward Clyde has initiated the following baselines. These were initiated because of their long lead times and to assist in project planning:

Vegetation
Wildlife
Soils Geochemistry
Hydrology (surface and groundwater)

Recently, other environmental baselines were initiated. Summo chose to hire individual specialists with local and site specific experience to initiate these studies. The individual studies and the contractor performing them included:

Cultural, Historical and Archaeological - (Metcalf Archaeological)
Geotechnical - (D.P. Engineering)
Air and Meteorological - (Air Sciences)

The remaining socioeconomic baseline will be completed and incorporated into the permitting requirements of the NEPA document.

5.1 Vegetation

Vegetation studies are conducted for a variety of reasons. The primary reason is to develop an initial characterization of the resources that exist. Additionally, these studies are performed to determine the potential occurrence of threatened, endangered, or sensitive species that may occur within the proposed project area. Finally they are used to see what will grow in a particular area for reclamation and closure planning.

An initial inventory of vegetation communities that occur at the proposed project site highlight two different vegetation zones. These included the Pinyon-Juniper and Sagebrush zones. Both are amenable to excellent reclamation success if the reclamation plan is well conceived.

The field investigation did not reveal any riparian habitat. There were however, small isolated occurrences of standing or flowing water. These included the Lisbon Valley Spring, the Cenennial pit, the GTO pit and small isolated stock ponds.

A review of the literature and consultation with regulatory officials indicates that there are 5 species considered sensitive, that can occur within the Lisbon Valley area. These include; Depauperate daisy (*Erigeron mancus*), Alcove bog-orchid (*Habernaria zothecina*), Broad-leafed biscuitroot (*Lomatium latilobum*), Alcove rock-daisy (*Perityle specuicola*) and *Pediomelum aromaticum* var.*tuhyi* (no common name). None of these species were observed and only two appear to have proper habitat.

5.2 Wildlife

As with vegetation, wildlife inventories were performed to assist with the development of reclamation plans that are targeted for species that will utilize the area once the mine has closed. A preliminary reconnaissance for threatened, endangered, and sensitive species was also performed.

Overall, the presence of wildlife in the Lisbon Valley area was characterized as "limited" due to the lack of potential food and water sources.

There are 5 species of birds, 2 fish, 1 mammal, and 1 insect, that are listed as sensitive, which <u>may</u> occur within the project area according to consultations with federal and state agencies. These include:

American Peregrine Falcon

Bald Eagle

Mexican Spotted Owl

Ferruginous Hawk

Loggerhead Shrike

Black-footed Ferret

Great Basin Silverspot

5.3 Soils and Geochemistry

The soils of the project area were evaluated for availability as well as quality. The majority of the topsoils and subsoils have a good to fair rating for use as reclamation growth medium.

Because of the relatively good quality, it is recommended that at least 12 inches of topsoil be stockpiled for reclamation purposes. This material will have to be protected from erosion when stockpiled. In addition, micro nutrient levels should be maintained. This can be done by cover seeding the stockpiles while they are not in use.

The generation of acid is a concern that plagues many copper operations. Summo has carried out extensive studies to assess the potential for the waste rock to generate acid. Based upon this testing, the majority of the material demonstrates a high net neutralization potential. In addition, the waste rock demonstrates a high pH (paste) generally above 8.0, supporting the basic characteristic of the mine waste material.

5.4 Hydrology (Surface and Groundwater)

Surface Water - The project area receives approximately 12 inches of precipitation a year, with most of it occurring in the fall and winter months. For this reason, there is limited surface water in Lisbon Valley. There are no perennial streams that run through the proposed project area. The drainages are usually dry and only carry water as a result of extreme storm events. Water was

observed and sampled in two isolated springs, two stock watering ponds, the Centennial Pit, and from the GTO Pit.

Surface water quality samples were taken to compare the results with Utah drinking water standards. Primary drinking water standards are established for the protection of human health. Secondary standards provide guidance in evaluating the aesthetic qualities of drinking water. Dissolved antimony, sulfate, and gross alpha exceeded the primary standards.

Groundwater - Groundwater occurs beneath the project site as discontinuous aquifers and appears to be structurally controlled. This is evidenced by the erratic water elevations encountered, and the wide range of apparent saturated thicknesses that are present. Three water bearing units were established; the valley fill near the Sentinel Pit, the Burro Canyon/Brushy Basin aquifer, and the Mancos Shale aquifer in the Lower Lisbon Valley.

Pump testing of existing wells and analysis by Woodward-Clyde Consultants indicate that dewatering of the ore deposits to facilitate mining will provide a substantial portion of the water needed for dust control and ore processing. Additional water is available on the property, if needed.

Groundwater quality was established for the three water bearing units in and around the project area. These units are; the valley fill unit near the Sentinel Pit, the Burro Canyon/Brushy Basin aquifer in the Centennial/GTO Pit areas, and the Mancos Shale in Lower Lisbon Valley. An excellent baseline for permitting purposes has been initiated.

The valley fill aquifer analysis shows that gross alpha and gross beta exceed state primary drinking water standards, and dissolved manganese and TDS exceed secondary standards.

Analytical results from the Burro Canyon/Brushy Basin aquifer reveal that standards for gross alpha, gross beta, sulfate, TDS, antimony, dissolved zinc, and dissolved manganese exceed primary and secondary standards.

Results from the Mancos Shale show that the groundwater exceeds primary standards for sulfate, TDS, gross alpha, and gross beta.

Summo will continue monitoring to establish an acceptable baseline for permitting purposes. This will be utilized for comparison in determining compliance once the facility is permitted, constructed and in operation.

5.5 Cultural, Historical and Archaeological

Cultural, historical, and archaeological surveys were initiated in the spring of 1995. These inventories are being performed by Metcalf Archaeological Consultants (MAC) who has performed numerous inventories and studies on public lands (BLM) in Utah.

The surveys have been designed to review the existing literature and perform a preliminary inventory to highlight potential fatal flaws which could inhibit the permitting of the project. This activity is complete.

The second phase of work is the detailed field investigation of the proposed project facilities. This phase calls for very labor intensive walking and recording of sites that may have potential to be significant enough for follow-up investigation and documentation. MAC is approximately three quarters of the way complete with this exercise. To date, field investigations have discovered 68 individual sites throughout the project area. Of these, 45 have been designated as "nonsignificant," while 5 have been designated as clearly important, or "significant." The remaining 23 sites fall within a grey area and will have to be looked into in more detail.

Sites, which are considered to be significant, will be handled in one of two ways. The first will be through avoidance, which can be accomplished by relocating a portion of the facility that may be impacted. The second way will be by mitigating the potential impact, by information data gathering or a detailed site study.

5.6 Geotechnical

The geotechnical investigation is currently being performed by D.P. Engineering of Englewood CO. The purpose of these studies is to determine the geotechnical characteristics of the leach pad area, the waste dump areas, and the proposed process areas (including the crusher site). In addition, the information will be used for backup and design calculation and will be provided to support permitting efforts on the federal (BLM) and state (Dept. of Environmental Quality) levels.

5.7 Air and Meteorological

Detailed air and meteorological baselines have not been established for the Lisbon Valley Project. There are existing data bases from the surrounding area, that can and have been utilized. However, the quality of this information is questionable. For this reason, Summo has hired an independent contractor (Air Sciences) to begin collecting data.

Air Services will assist with the development of baseline information that will satisfy requirements on the federal and state level.

5.8 Socioeconomics

One remaining baseline that will need to be established for permitting and project planning purposes is the socioeconomic baseline. The purpose of this baseline is to determine whether or not there are adequate resources for schooling, housing, sewage treatment, water availability, etc., to handle a new mine and workforce needs. This baseline will be established during the NEPA process.

6.0 RECLAMATION AND CLOSURE

Reclamation and closure of mining facilities has gone beyond the art and landscaping stage that was in practice in the 1980's. Today, operations are incorporating existing land uses and

developing reclamation plans that begin before ground is ever disturbed.

The primary goals of the Lisbon Valley reclamation plan will be to ensure long term protection of the environment and to return disturbed areas to the suitable post mining land uses that currently exist at the project area. Existing land uses that are currently emphasized are; wildlife habitat, livestock grazing, and mineral development. Related to this, the reclamation will minimize public safety hazards and, to the extent practicable, diminish the appearance of man made structures.

Reclamation of the facility will also mitigate the adverse effects of modern day mining activities that have been left unreclaimed. As mentioned earlier, there is currently approximately 85 acres of unreclaimed mining activities at the project site.

Reclamation at Lisbon Valley will be divided into two major categories: concurrent/interim reclamation practices (those activities that are conducted during active mining) and final reclamation (closure).

6.1 Concurrent/Interim Reclamation

The activities associated with concurrent reclamation include the following measures

- During site preparation, disturbed areas will be contoured to minimize erosion and provide adequate drainage. Sediment traps will be installed down gradient from disturbed areas. Erosion control structures, such as rock check dams, straw bales and silt fences will be installed to prevent the accelerated erosion and sedimentation of surface drainages.

- Salvageable growth medium will be removed from the areas to be developed or disturbed. The soils investigation confirms that more than enough material is available for reclamation purposes

- During the life of the mine, areas no longer needed will be reclaimed and revegetated with plant species that meet the proposed post mining land use. This will eliminate and/or minimize the requirement for all disturbed areas to remain disturbed during the entire mine life.

- The development of a test plot revegetation program is perhaps one of the most beneficial interim reclamation tools a company can utilize. Any company can propose a revegetation plan that spells out preferred species. However, it is important to determine whether or not these species will in fact grow in these specific conditions. It is imperative that a series of test plots be developed that will simulate various conditions of the mine site at closure. Typical conditions assessed include; species composition, fertilizer requirements, topsoil requirements, slope and aspect, etc. It is better to know success capability prior to large expenditures, rather than after the fact.

6.2 Final Reclamation

As stated earlier, the intent of reclamation at the Lisbon Valley Project will be to return the land to similar land uses that exist currently. Through proper planning and site management, the opportunity to improve certain conditions exist. Rubble habitat at the base of waste dumps offer cover sites for small mammals. Cliff habitat associated with pit walls offer an excellent habitat base for raptors.

The site specific reclamation activities at Lisbon Valley, can be broken down by distinct facilities, ie. pits, roads, overburden dumps, etc. The specific reclamation at these facilities is described in further detail below.

6.2.1 Open Pits

To begin with, it is imperative that public access to open pits be blocked. This will be done by placing rock berms and/or fences. These fences and berms be marked to provide adequate notice to the public. Summo will design these structures in cooperation with the BLM and MSHA.

No revegetation of bench walls is proposed. Once mining is complete pit walls and benches will be allowed to fill with rubble. Haul roads, which access the bottom of the pit, will be scarified, topsoiled, seeded, and if necessary fertilized to promote healthy vegetation stands.

Dewatering of the pits will stop. Ponds may form in the lower levels of some of the pits, depending upon whether the inflow of groundwater and precipitation exceed the high evaporation rates experienced in the area.

Besides berming and fencing, the pit entrances will be planted with indigenous tree species (Pinyon Juniper) in order to screen the visible impacts of the open pit.

6.2.2 Overburden Disposal Areas

Uneconomical material is usually referred to as waste rock or overburden. The Lisbon Valley Project as currently designed, calls for four (4) individual disposal sites which are designed to minimize haul distance and cost.

The intent with the construction of the dumps is to build them such that the side slope with intermediate benches is constructed at an angle of 2.5:1. With this design, the requirement of grading these slopes will be relatively easier than if the dumps were designed at angle of repose and they had to be graded from top to bottom.

The flattened top surfaces of the dumps will be ripped to a depth of ~4 ft. Scarified to form a roughened seedbed. The surface would be contoured to encourage infiltration rather than ponding. Undulations will serve to enhance revegetation efforts.

Following grading, growth medium will be applied at optimum thicknesses. The areas will then be seeded with an approved grass, forb and shrub mix.

6.2.3 Heap Leach Pads

The closure of the leach pad is designed to minimize leachate discharge by preventing water from entering the leach pad from surface percolation and groundwater infiltration. In addition, special reclamation techniques will enhance runoff and evapotranspiration of the heap surface.

At the end of ore loading of the pad, the final economic copper will be recovered. Following this, the pad will be allowed to drain down. Full scale testing of the remaining material will then begin. While this is going on, the solution inventory will gradually be reduced by the use of high evaporation sprinklers.

Once the heap closure chemical parameters are met, the pad will be recontoured. The slopes of the pad will then be reduced to a slope of 2.5:1. The surface of the pad will be prepped to minimize infiltration. This will either be done by the placement of compacted soils, or the use of lime or other commercially available products. On top of this prepared layer, overburden/waste rock will be placed to provide for an adequate root zone. Growth medium will be applied on top of this.

The area will then be revegetated with a seed mix of grasses, forbs, and shallow root shrubs. Trees will be eliminated from this revegetation effort, so that the integrity of the surface of the heap is not jeopardized.

Other components of the heap leach pad closure include the removal of piping and the final design of the facility to allow for rain and run off to bypass the leach pad area.

6.2.4 Solution and Stormwater Ponds

The solution and stormwater ponds will be some of the last facilities reclaimed at the site, in order to allow for solution containment while reclamation occurs at other facilities. Reclamation of the pond will involve evaporation and, if necessary, treatment of process and stormwater solutions. Following this the liners will be folded in. Overburden will hauled in and placed over the liner system and the area will be graded and revegetated.

6.2.5 Structures

All equipment will be removed. No chemical or electrical hazards will remain after closure. All buildings and other facilities will be dismantled and removed from the site or buried.

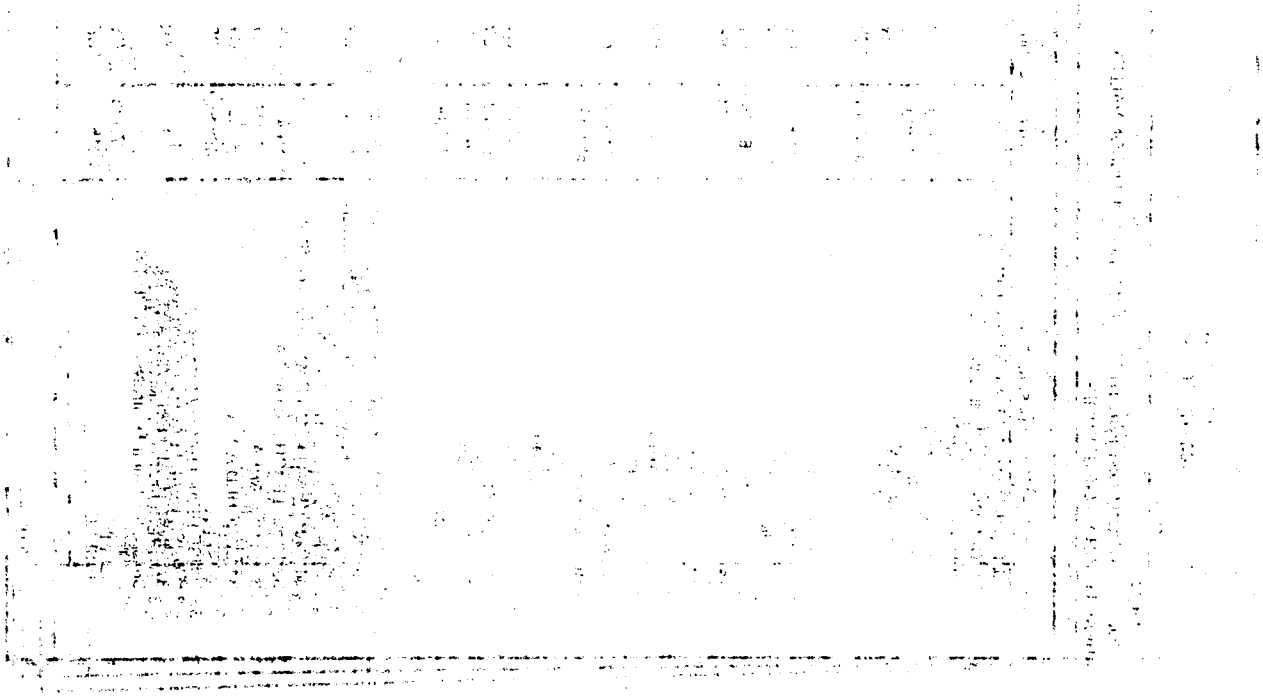
Foundations will either be removed and buried elsewhere on the site or buried in place. Facility areas will be contoured to create a natural appearance and to prevent erosion. Growth medium will be applied, and seeding will then take place. Fertilizer will be applied at a rate that is dependent upon site specific soil conditions.

6.2.6 Roads, Conveyor Routes, and other Ancillary Facilities

Roads and other facilities not deemed essential by the BLM will also be reclaimed in a manor that is consistent with what has been proposed for other facilities at the Lisbon Valley Project. Compacted areas will be ripped, then graded to conform to the surrounding terrain. Growth medium will then be applied. The area will then be seeded with an approved grass, forb, and shrub mixture, and fertilized with an appropriate mixture and rate.

6.3 Post Closure Monitoring and Care

Summo is committed to ensuring that reclamation is successful at the project site. Permits issued from the various agencies will require monitoring to ensure compliance with permit standards. This monitoring will also serve as a tool for determining successful reclamation. At a minimum, Summo is committed to monitoring site conditions for at least two years following site reclamation.



FILENAME: RECC1.XLS
PROJECT: LISBON VALLEY COPPER
DESCRIPTION: RECLAMATION COSTS
DATE: 13-Aug-96

SUMMO USA CORPORATION
LISBON VALLEY PROJECT

Remarks	UNIT LABOR US $/HR	LABOR HOURS THIS PAGE		EXTENDED COSTS MATERIAL	LABOR	RENTAL	SUBCONT	TOTAL
CONSTRUCTION COST FOR THE RECLAMATION OF LISBON VALLEY HEAP LEACH & WASTE DUMPS	$		SUBTOTALS	0	0		1,223,352	1,223,352

	DESCRIPTION	QTY	UNIT	LABOR H PER UNIT	UNIT COSTS MAT'L	HOURS LABOR	RENTAL EQUIPMENT	SUB/CONT	EXTENDED COSTS MATERIAL	LABOR	RENTAL	SUBCONT	TOTAL
1	MOBILIZATION /DEMOBILIZATION	1.00	LOT					35,000				35,000	35,000
2	CAP WASTE DUMPS W/12.6" TOPSOIL:												
3	WASTE DUMP D												
4	SCARIFY AREA	5,760	CY					0.25				1,440	1,440
5	DUMP AREA	5,760	CY					2.10				12,095	12,095
6	SLOPE AREA	8,698	CY					2.10				18,266	18,266
7	SEED AREA	371,771	SF					0.025				9,294	9,294
8													
9	WASTE DUMP C												
10	SCARIFY AREA	11,539	CY					0.25				2,885	2,885
11	DUMP AREA	11,539	CY					2.10				24,231	24,231
12	SLOPE AREA	18,866	CY					2.10				39,619	39,619
13	SEED AREA	781,844	SF					0.025				19,546	19,546
14													
15	WASTE DUMP B												
16	SCARIFY AREA	6,642	CY					0.25				1,660	1,660
17	DUMP AREA	6,642	CY					2.10				13,948	13,948
18	SLOPE AREA	14,807	CY					2.10				31,096	31,096
19	SEED AREA	551,558	SF					0.025				13,789	13,789
20													
21	WASTE DUMP A												
22	SCARIFY AREA	15,770	CY					0.25				3,943	3,943
23	DUMP AREA	15,770	CY					2.10				33,118	33,118
24	SLOPE AREA	30,260	CY					2.10				63,547	63,547
25	SEED AREA	1,183,647	SF					0.025				29,591	29,591
26													
27													
28	CAP HEAP LEACH PAD W/12" CLAY LINER	42,343	CY					5.00				211,715	211,715
29	CAP HEAP LEACH PAD W/12" CRUSHED	42,343	CY					3.40				143,966	143,966
30	ROCK												
31	CAP HEAP LEACH PAD W/12" TOPSOIL												
32	HEAP LEACH PAD AREA	5,643	CY					2.10				11,851	11,851
33	SLOPE AREA	31,231	CY					2.10				65,585	65,585
34	BENCHED AREA	5,469	CY					2.10				11,485	11,485
35	SEED	1,088,819	SF					0.025				27,220	27,220
36													
37	RINSE HEAP LEACH AREA/YEAR	1	YR					20,095				20,095	20,095
38	UNRECLAIMED MINING ACTIVITIES												
39	AREA	137,133	CY					2.10				287,980	287,980
40	SEED	3,615,480	SF					0.025				90,387	90,387
	TOTAL											1,223,352	1,223,352

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

FILENAME: RECC1.XLS
PROJECT: LISBON VALLEY COPPER
DESCRIPTION: RECLAMATION COSTS
DATE: 13-Aug-96

SUMMO USA CORPORATION
LISBON VALLEY PROJECT

Remarks	UNIT LABOR US $/HR	LABOR HOURS THIS PAGE		EXTENDED COSTS MATERIAL	LABOR	RENTAL	SUBCONT	TOTAL
CONSTRUCTION COST FOR THE RECLAMATION OF LISBON VALLEY SURFACE AREAS	$		SUBTOTALS	0	0		1,092,043	1,092,043

	DESCRIPTION	QTY	UNIT	LABOR H PER UNIT	UNIT COSTS MAT'L	HOURS LABOR	RENTAL EQUIPMENT	SUB/CONT	EXTENDED COSTS MATERIAL	LABOR	RENTAL	SUBCONT	TOTAL
1													
2	POND AREA RECLAIM W/12" TOPSOIL												
3	RAFFINATE POND	396	CY					2.10				832	832
4	PLS POND	395	CY					2.10				830	830
5	WATER RUNOFF POND	698	CY					2.10				1,466	1,466
6	SEED	38,299	SF					0.025				957	957
7													
8	PLANT AREA RECLAIM W/12" TOPSOIL												
9	TOPSOIL	2,531	CY					2.01				5,087	5,087
10	SEED	65,075	SF					0.025				1,627	1,627
11	CRUSHER AREA RECLAIM W/12" TOPSOIL												
12	TOPSOIL	397	CY					2.01				797	797
13	SEED	10,200	SF					0.025				255	255
14	RECLAIM SURFACE ROADS												
15	SCARIFY	44,444	CY					3.50				155,556	155,556
16	CONTOUR	44,444	CY					1.50				66,667	66,667
17	TOPSOIL	46,667	CY					2.01				93,800	93,800
18	SEED	1,200,000	SF					0.025				30,000	30,000
19	RECLAIM PIT HAUL ROADS												
20	SCARIFY	64,296	CY					3.50				225,037	225,037
21	CONTOUR	64,296	CY					1.50				96,444	96,444
22	TOPSOIL	67,511	CY					2.01				135,697	135,697
23	SEED	1,736,000	SF					0.025				43,400	43,400
24	FENCE AROUND OPEN PITS												
25	SENTINEL PIT 1	1,806	LF					20.00				36,120	36,120
26	SENTINEL PIT 2	630	LF					20.00				12,600	12,600
27	CENTENNIAL PIT	2,705	LF					20.00				54,100	54,100
28	GTO PIT	2,243	LF					20.00				44,860	44,860
29													
30													
31	SURFACE DRAINAGE DIVERSION DITCHES												
32	LEACH PAD AREA	7,473	CY					3.50				26,154	26,154
33	PLANT AREA	1,595	CY					3.50				5,581	5,581
34	CRUSHER AREAS	1,810	CY					3.50				6,336	6,336
35		13,668	CY					3.500				47,839	47,839
36													
37													
38													
39													
40													
	TOTAL											1,092,043	1,092,043

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

FILENAME: RECC1.XLS
PROJECT: LISBON VALLEY COPPER
DESCRIPTION: RECLAMATION COSTS
DATE: 13-Aug-96

SUMMO USA CORPORATION
LISBON VALLEY PROJECT

Remarks	UNIT LABOR US $/HR	LABOR HOURS THIS PAGE	SUBTOTALS	EXTENDED COSTS MATERIAL	LABOR	RENTAL	SUBCONT	TOTAL
SUMMARY OF RECLAMATION COSTS FOR LISBON VALLEY	$			0	0	0	0	3,367,742

	DESCRIPTION	QTY	UNIT	LABOR H PER UNIT	UNIT COSTS MAT'L	HOURS LABOR	RENTAL EQUIPMENT	SUB/CONT	EXTENDED COSTS MATERIAL	LABOR	RENTAL	SUBCONT	TOTAL
1													
2													
3	SUMMARY COST-HEAP LEACH & DUMPS	1	LOT						-	-	-	1,223,352	1,223,352
4													
5	SUMMARY COST-MISC SURFACE AREAS	1	LOT						-	-	-	1,092,043	1,092,043
6													
7													
8													
9													
10													
11													
12											TOTAL DIRECT COST		2,315,395
13													
14													
15													
16													
17													
18													
19													
20													
21	CONTRACTORS GROSS RECEIPTS TAX	1	LOT										79,881
22													
23	ENGINEERING	1	LOT										231,539
24													
25	OWNERS COST	1	LOT										138,924
26													
27	CONSTRUCTION MANAGEMENT	1	LOT										463,079
28													
29	CONTINGENCY	1	LOT										
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													
	TOTAL												3,367,742

ATTACHMENT 1

EXHIBIT "A"
Lisbon Valley Project

Unpatented claims situate in San Juan County, Utah
Township 30 South, Ranges 25 and 26 East
and Township 31 South, Range 26 East

Claim Name	Book/Page	Twn/Rge/Sec	BLM Serial No. UMC
Camel	25/453	30S/25E/25,26	129728
Amended	231/261		
Cat	25/454	30S/25E/25,26	129729
Amended	231/262		
Colt	25/455	30S/25E/25,26	129730
Amended	231/263		
Cougar	25/455	30S/25E/25,26,35	129731
Amended	231/263		
Cow	25/454	30S/25E/25,26	129732
Amended	231/262		
Coyote	25/456	30S/25E/35	129733
Amended	231/264		
Cub	25/456	30S/25E/35	129734
Amended	231/264		
Sentinal 1	47/44	30S/25E/25	129718
Amended	231/256		
Sentinal 2	47/45	30S/25E/25	129719
Amended	231/257		
Sentinal 3	47/45	30S/25E/25	129720
Amended	231/257		
Sentinal 4	47/46	30S/25E/25,26	129721
Amended	231/258		
Sentinal 5	47/46	30S/25E/25	129722
Amended	231/258		
Sentinal 6	47/47	30S/25E/25,26	129723
Amended	231/259		
Sentinal 7	47/47	30S/25E/25	129724
Amended	231/259		
Sentinal 8	47/48	30S/25E/25,26	129725
Amended	231/260		
Sentinal 9	47/48	30S/25E/25	129726
Amended	231/260		
Sentinal 10	47/49	30S/25E/25,26	129727
Amended	231/261		
Climax 1	R2/382	30S/25E/25	129763
Amended	41/229		
Amended	487/186		
Climax 2	R2/382	30S/25E/25	129764
Amended	41/230		
Amended	487/186		
Alpha 1	270/83	30S/25E/25	129765
Alpha 2	270/83	30S/25E/25	129766
Alpha 3	270/84	/25E/25	129767
Alpha 4	270/84	30S/25E/25	129768
Alpha 5	270/85	30S/25E/25	129769
Alpha 6	270/85	30S/25E/25	129770
Alpha 7	270/86	30S/25E/25	129771
Alpha 8	270/86	30S/25E/25	129772

Claim Name	Book/Page	Twn/Rge/Sec	BLM Serial No. UMC
CW 1	510/62	30S/25E/25,26,35	129811
CW 2	510/63	30S/25E/25	129812
CW 3	510/64	30S/25E/25,26	129813
CW 4	510/65	30S/25E/25	129814
CW 5	510/66	30S/25E/25	129815
CW 6	510/67	30S/25E/25,26	129816
CW 7	510/68	30S/25E/25	129817
CW 8	510/69	30S/25E/25	129818
CW 9	510/70	30S/25E/25	129819
CW 10	510/71	30S/25E/25	129820
CW 11	510/72	30S/25E/25	129821
CW 12	510/73	30S/25E/25	129822
Amended	521/9		
CW 13	510/74	30S/25E/25	129823
CW 14	510/75	30S/25E/25,26	129824
CW 15	511/596	30S/25E/25	129825
CW 16	511/597	30S/25E/25	129826
CW 19	511/598	30S/25E/25	129827
Amended	521/8		
CW 22	511/599	30S/25E/24,25	129828
KWR 1	487/130	30S/25E/26	129789
KWR 2	487/131	30S/25E/26	129790
KWR 3	487/132	/25E/26	129791
KWR 4	487/133	30S/25E/26	129792
KWR 5	487/134	30S/25E/26	129793
KWR 6	487/135	30S/25E/26	129794
KWR 7	487/136	30S/25E/26	129795
KWR 8	487/137	30S/25E/26	129796
KWR 9 Fractin	501/345	30S/25E/26	129797
KWR 10	501/346	30S/25E/23,26	129798
KWR 11 Fraction	501/347	30S/25E/25	129799
KWR 11 Fraction	521/469	30S/25E/25	129802
KWR 12 Fraction	501/348	30S/25E/25	129800
KWR 13 Fraction	501/349	30S/25E/25	129801
G. M. Wallace	484/636	30S/25E/25	129829
Fraction (Amended)	487/129		
Nu Zuni 45	707/500	30S/25E/35	330150
Nu Zuni 46	707/501	30S/25E/35	330151
Nu Zuni 47	707/502	30S/25E/35	330152
Oxide 1	707/734	30S/25E/23,26	327776
Oxide 2	707/735	30S/25E/23,26	327777
Oxide 3	705/119	30S/25E/23	327778
Oxide 4	705/120	30S/25E/23,26	327779
Oxide 5	705/121	30S/25E/23	327780
Oxide 6	705/122	30S/25E/23,26	327781
Oxide Fraction	708/345	30S/25E/23,26	331632
CWG Fraction	517/275	30S/25E/26	129786
CWG Fraction 1	517/276	30S/25E/26	129787
CWG Fraction 2	517/277	30S/25E/26	129788
CD 1	509/508	30S/25E/25,26	129773
CD 2 Fraction	509/509	30S/25E/25	129774
CD 3 Fraction	509/510	30S/25E/25,36	129775
CD 4 Fraction	509/511	30S/25E/25,36 30S/26E/30,31	129776
CD 5 Fraction	509/512	30S/25E/25	129777
CD 6 Fraction	509/550		129737
CD 7A Amended	724/350	30S/25E/25	349339

Claim Name	Book/Page	Twn/Rge/Sec	BLM Serial No. UMC
CD 8A	722/134	30S/25E/25	349340
CD 9A Amended	724/352	30S/25E/25	349341
CD 10A Amended	724/354	30S/25E/25	349342
Globe 1	486/16	30S/25E/26	129782
Amended	489/392		
Globe 2	486/17	30S/25E/26	129783
Amended	489/393		
Globe 9	486/24	30S/25E/23	129784
Amended	489/400		
Globe 10	486/25	30S/25E/23,26	129785
Amended	489/401		
Security 3	377/402	30S/26E/31	140827
Security 5	377/403	30S/26E/31	140607
Security 7	377/404	30S/26E/31	140608
Security 9	377/405	30S/26E/31	140609
Security 11	377/406	30S/26E/31	140610
Security 14	377/407	31S/26E/6	140611
Security 15	377/408	31S/26E/6	140612
Security 16	377/409	31S/26E/6	140613
Security 18	377/410	31S/26E/6	140614
Security 19	377/411	31S/26E/6	140615
Security 20	377/412	31S/26E/6	140616
Security 25	377/413	31S/26E/6	140617
Security 26	377/414	31S/26E/5,6	140618
Security 27	377/415	30S/26E/31	140619
Security 28	377/416	30S/26E/31	140620
Security 29	377/417	30S/26E/31	140621
Security 30	377/418	30S/26E/31	140622
Security 31	377/419	30S/26E/31	140623
Security 32	377/420	30S/26E/31	140624
Security 33	377/421	30S/26E/31	140625
Security 34	377/422	30S/26E/31	140626
Security 35	377/423	30S/26E/31	140627
Security 36	377/424	30S/26E/31	140628
Security 37	377/425	30S/26E/31	140629
Security 38	377/426	30S/26E/31	140630
Security 39	377/427	30S/26E/31	140631
Security 40	377/428	30S/26E/31	140632
Security 41	377/429	30S/26E/31	140633
Security 42	377/430	30S/26E/31	140634
Security 43	377/431	30S/26E/31	140635
Security 44	377/432	30S/26E/31	140636
Security 45	377/433	30S/26E/31	140637
Security 46	377/434	30S/26E/31	140638
Security 47	377/435	30S/26E/31	140639
Security 48	377/436	30S/26E/31	140640
Security 49	378/341	30S/26E/31	140641
Security 50	378/342	30S/26E/31	140642
Security 51	378/343	30S/26E/31	140643
Security 52	378/344	30S/26E/31	140644
Security 53	378/345	30S/26E/31	140645
Security 54	378/346	30S/26E/31	140646
Security 55	378/347	30S/26E/31	140647
Security 56	378/348	30S/26E/31	140648

EXHIBIT "B"
Lisbon Valley Project

Unpatented claims situate in San Juan County, Utah
Township 30 South, Ranges 25 and 26 East

Claim Name	Book/Page	Twn/Rge/Sec	BLM Serial No. UMC
STEP 1	733 470	30S/25E/27	354577
STEP 2	733 472	30S/25E/27	354578
STEP 3	733 474	30S/25E/27	354579
STEP 4	733 476	30S/25E/27	354580
STEP 5	733 478	30S/25E/27	354581
STEP 6	733 480	30S/25E/27	354582
STEP 7	733 482	30S/25E/27	354583
STEP 8	733 484	30S/25E/27	354584
STEP 9	733 486	30S/25E/27	354585
STEP 10	733 488	30S/25E/27	354586
STEP 11	733 490	30S/25E/27	354587
STEP 12	733 492	30S/25E/27	354588
STEP 13	733 494	30S/25E/27	354589
STEP 14	733 496	30S/25E/27	354590
STEP 15	733 498	30S/25E/27	354591
STEP 16	733 500	30S/25E/27	354592
STEP 17	733 502	30S/25E/27	354593
STEP 18	733 504	30S/25E/27	354594
STEP 19	733 506	30S/25E/27&34	354595
STEP 20	733 508	30S/25E/27&34	354596
STEP 21	733 510	30S/25E/27&34	354597
STEP 22	733 512	30S/25E/27&34	354598
STEP 23	733 514	30S/25E/27&34	354599
STEP 24	733 516	30S/25E/27&34	354600
STEP 25	733 518	30S/25E/27&34	354601
STEP 26	733 520	30S/25E/27&34	354602
STEP 27	733 522	30S/25E/27,28,	354603
33&34			
STEP 28	733 524	30S/25E/35	354604
STEP 29	733 526	30S/25E/35	354605
STEP 30	733 528	30S/25E/35	354606
STEP 31	733 530	30S/25E/35	354607
STEP 32	733 532	30S/25E/35	354608
STEP 33	733 534	30S/25E/35	354609
STEP 34	733 536	30S/25E/35/36	354610
RP 21	733 305	30S/26E/30	354543
RP 22	733 306	30S/26E/30	354544
RP 23	733 307	30S/26E/30	354545
RP 24	733 308	30S/26E/30	354546
RP 28	733 309	30S/26E/30	354547
RP 29	733 310	30S/26E/30	354548
RP 30	733 311	30S/26E/30	354549
RP 31	733 312	30S/26E/30	354550
RP 32	733 313	30S/26E/30	354551
RP 33	733 314	30S/26E/30	354552
RP 36	733 315	30S/26E/30	354553
		30S/25E/25	
RP 37	733 316	30S/26E/30	354554

		30S/25E/25	
RP 38	733 317	30S/26E/30	354555
		30S/25E/25	
RP 39	733 318	30S/26E/30	354556
		30S/25E/25	
RP 40	733 319	30S/26E/30	354557
		30S/25E/25	
RP 41	733 320	30S/26E/30	354558
		30S/25E/25	
RP 42	733 321	30S/26E/30	354559
		30S/25E/25	
RP 46	733 322	30S/25E/24&25	354560
RP 47	733 323	30S/25E/25	354561
RP 48	733 324	30S/25E/25	354562
RP 49	733 325	30S/25E/25	354563
RP 50	733 326	30S/25E/25	354564
RP 51	733 327	30S/25E/25	354565
RP 52	733 328	30S/25E/25	354566
RP 53	733 329	30S/25E/25	354567
RP 54	733 330	30S/25E/25	354568
RP 58	733 331	30S/25E/24	354569
RP 59	733 332	30S/25E/24&25	354570
RP 60	733 333	30S/25E/25	354571
RP 61	733 334	30S/25E/25	354572
RP 66	733 335	30S/25E/24	354573
RP 67	733 336	30S/25E/24&25	354574
RP 74	733 337	30S/25E/23&24	354575
RP 75	733 338	30S/25E/23,24 25,26	354576
Lady Buff 1	743 306	30S/25E/26	356889
Lady Buff 2	743 309	30S/25E/26	356890
Lady Buff 3	743 312	30S/25E/23,26	356891
Lady Buff 4	743 315	30S/25E/23,26	356892
Lady Buff 5	743 318	30S/25E/23	356893
Lady Buff 6	743 321	30S/25E/22,23,26	356894
Lady Buff 7	743 324	30S/25E/23	356895
Lady Buff 8	743 327	30S/25E/22,23	356896
Lady Buff 9	743 330	30S/25E/23	356897
Lady Buff 10	743 333	30S/25E/22,23	356898
Lady Buff 11	743 336	30S/25E/23	356899
Lady Buff 12	743 339	30S/25E/22,23	356900
Lady Buff 13	743 342	30S/25E/22,23	356901
GKS 1			
GKS 2			
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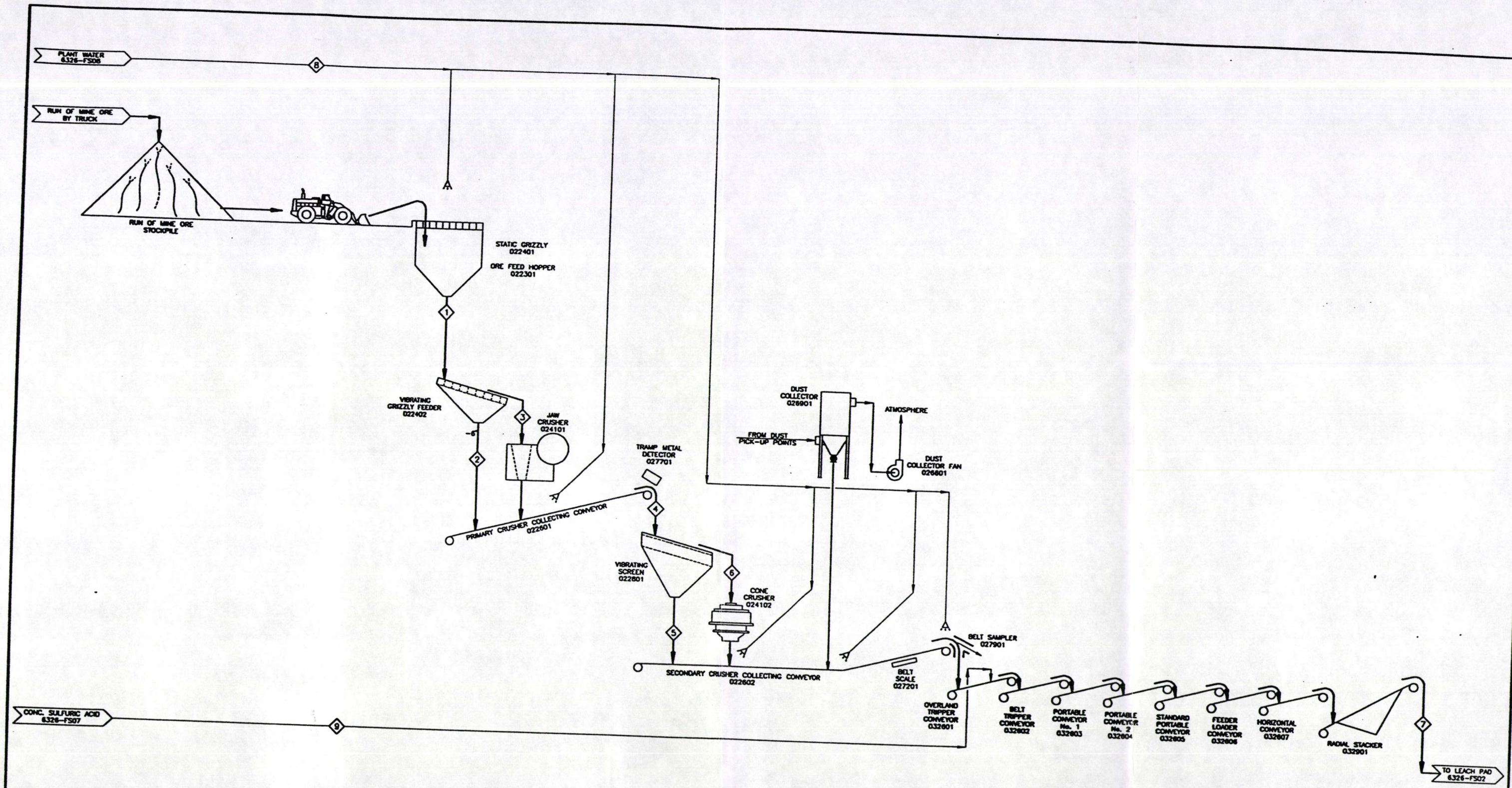
GKS 47

ATTACHMENT 2



STREAM No.		1	2	3	4	5	6	7	8	9
DESCRIPTION		VIBRTG GRIZZ FEED	GRIZZ U'SIZE	GRIZZ O'SIZE	VIBRTG SCREEN FEED	SCREEN U'SIZE	SCREEN O'SIZE	LEACH PAD FEED	PLANT WATER	SULFRIC ACID
MEDIUM		ORE	ORE	ORE	ORE	ORE	ORE	ORE	WATER	ACID
DESIGN	SOLIDS, DRY TPH	700.0	280.0	420.0	700.0	182.0	518.0	700.0	-	-
	LIQUID, GPM	-	-	-	-	-	-	- 4	26.3	8.2
	LIQUID, SPG	-	-	-	-	-	-	-	1.0	1.8
AVERAGE	SOLIDS, DRY TPH	478.0	191.2	286.8	478.0	124.3	353.7	478.0	-	-
	LIQUID, GPM	-	-	-	-	-	-	-	17.9	0.0
	LIQUID, SPG	-	-	-	-	-	-	-	1.0	-

NOTE:

1. OPERATING SCHEDULE: 16HR/DAY, 7DAYS/WEEK

REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION

REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
D	5/3/95	TRB		ADD CONVEYOR SYSTEM
C	4/19/95	JAP		GENERAL REVISION
A	3/2/95	BR	TE	PRELIMINARY

ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY

SUMMO U.S.A. CORPORATION

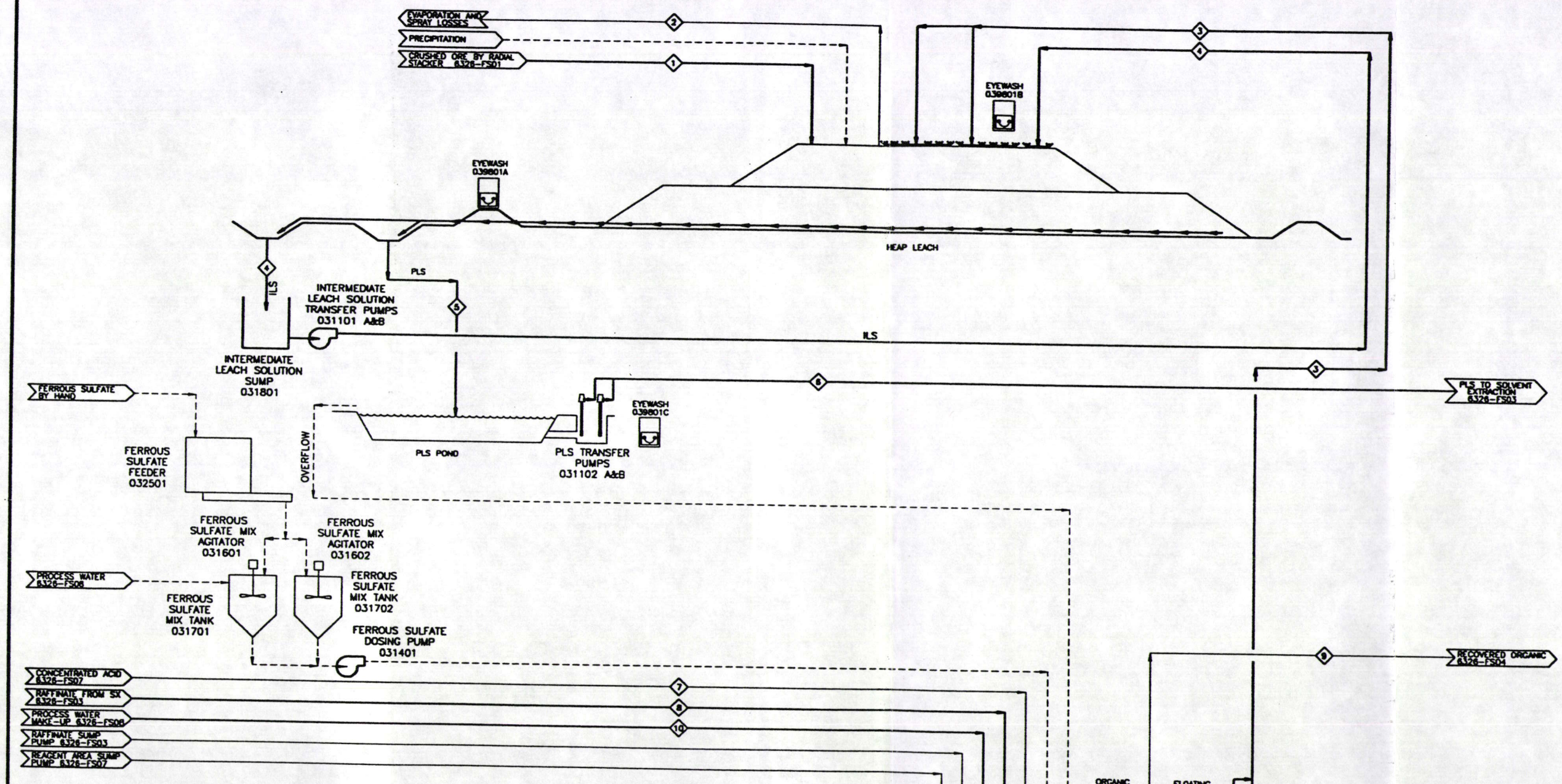
DRAWN BY JAP
DESIGNED BY RBA
CHECKED BY
APPROVED BY

PROCESS FLOW DIAGRAM
AREA 02 & 03 CRUSHING AND SCREENING
LISBON VALLEY COPPER PROJECT
SAN JUAN CO., UTAH

SCALE NONE
DATE 2/15/95
DRAWING NO. 6326-FS01
REV. C

ACADNOTE:

6326 K:\6326\RELEASED\6326FS01 05/26/95 12:13 ALANO



STREAM No.		1	2	3	4	5	6	7	8	9	10
DESCRIPTION		ORE TO LEACH PAD	EVAP AND SPRAY LOSSES	RAFF TO HEAP	INTER LEACH SOLN	PREG LEACH SOLN	PLS TO SX	CONC ACID TO RAFF POND	RAFF FROM SX	RECOV ORGANIC	PROCESS MAKE-UP WATER
MEDIUM		ORE	WATER	SOLN	SOLN	SOLN	SOLN	ACID	SOLN	ORGANIC	WATER
DESIGN	SOLIDS, DRY TPH	553.8	---	---	---	---	---	---	---	---	---
	LIQUID, GPM	---	324.1	3324.1	3157.9	3000.0	3000.0	12.3	3000.0	15.0	311.8
	LIQUID, SPG	---	1.0	1.0	1.0	1.0	1.0	1.8	1.0	0.8	1.0
	Cu CONTENT, g/l	---	0	0.22	0.77	3.08	3.08	0	0.25	---	0
AVERAGE	SOLIDS, DRY TPH	478.0	---	---	---	---	---	---	---	---	---
	LIQUID, GPM	---	295.2	3028.1	2876.7	2732.9	2732.9	11.2	2732.9	0.0	284.0
	LIQUID, SPG	---	1.0	1.0	1.0	1.0	1.0	1.8	1.0	---	1.0
	Cu CONTENT, g/l	---	0.0	0.2	0.8	3.1	3.1	0.0	0.3	---	0.0

REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
B	5/30/95	BR		UPDATE
A	05/26/95			PRELIMINARY

ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

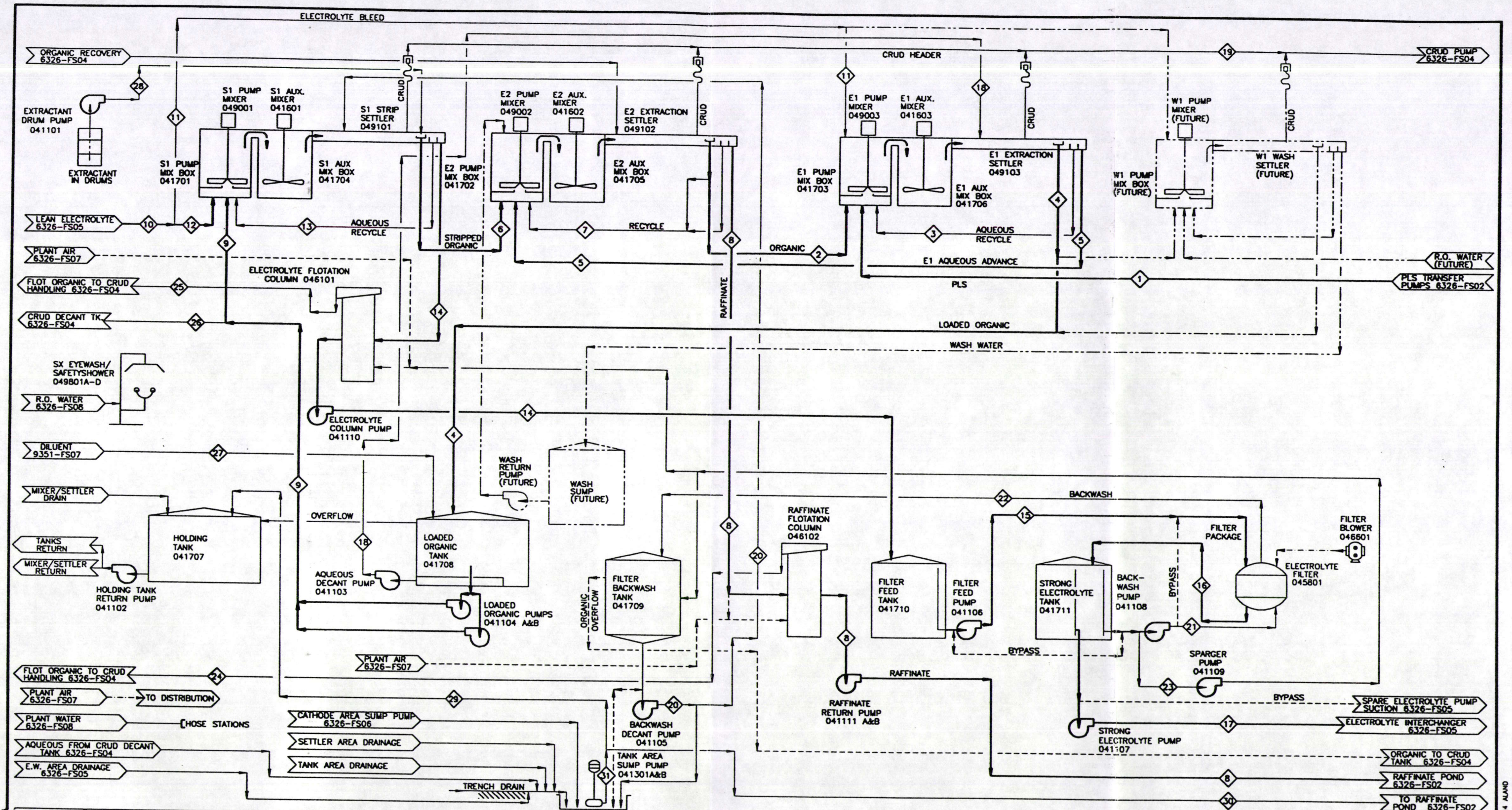
DRAWN BY BR
ENGINEERED BY RBA

PRECESS FLOW DIAGRAM
AREA 03 HEAP LEACHING
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

SCALE NONE
DATE 4/21/95
6326-FS02
REV. B

ACRONOTE:

6326 K:\6326\RELEASED\6326FS02 06/07/95 08:23 ALAND



STREAM No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
DESCRIPTION		PLS FROM PLS POND	E2 ORG	E1 AQ RECYCL	E1 LOADED ORG	E1 AQ ADVANCE	S1 STRIP ORG	E2 AQ/ORG RECYCL	RAFF	LOADED ORG FROM TANK	LEAN ELECT-ROLYTE	ELECT-ROLYTE BLEED	LEAN ELECT-ROLYTE S1	S1 RECYCLE	STRONG ELECT-ROLYTE	ELECT-ROLYTE FILTER FEED	STRONG ELECT-ROLYTE TANK	STRONG ELECT-ROLYTE PUMP	AQ BECKWASH PUMP	CRUD MIXER	BACK-WASH BECKWASH PUMP	BACK-WASH PUMP	BACK-WASH	SPARGE PUMP	FLOT ORG RAFF COLUMN	FLOT ORG ELECT COLUMN	LOADED ORG CRUD TANK
MEDIUM		AQ	ORG	AQ	ORG	AQ	ORG	AQ/ORG	AQ	ORG	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	ORG	AQ	AQ	AQ	AQ	ORG	ORG	ORG
DESIGN	LIQUID, gpm	3000	3000	0	3000	3000	3000	0	3000	3000	609.3	20	609.3	2390.7	609.3	633.1	633.1	609.3	25	30	47.8	571.3	571.3	609.3	250	250	100
	LIQUID, SPG	1.05	0.82	----	0.82	1.03	0.82	----	1.05	0.82	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.03	0.82	1.03	1.03	1.03	1.05	0.35	0.35	0.82
	Cu CONTENT, gm/l	3.00	----	----	----	----	----	----	0.25	----	32	32	32	----	45.97	45.97	45.97	45.97	----	----	----	----	----	----	----	----	----
		----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
AVERAGE	LIQUID, gpm	3000	3000	0	3000	3000	3000	0	3000	3000	609.3	20	609.3	2390.7	609.3	609.3	609.3	609.3	0	0.5	23.8	23.8	23.8	0	0	0	0
	LIQUID, SPG	1.05	0.82	----	0.82	1.03	0.82	----	1.05	0.82	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	----	0.82	1.03	1.03	1.03	----	----	----	----
	Cu CONTENT, gm/l	2.01	----	----	----	----	----	----	0.22	----	32	32	32	----	45.77	45.77	45.77	45.77	----	----	----	----	----	----	----	----	----
		----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
B	5/30/95	BR		UPDATE & MASS BALANCE
A	5/26/95			PRELIMINARY

ROBERTS & SCHAEFFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

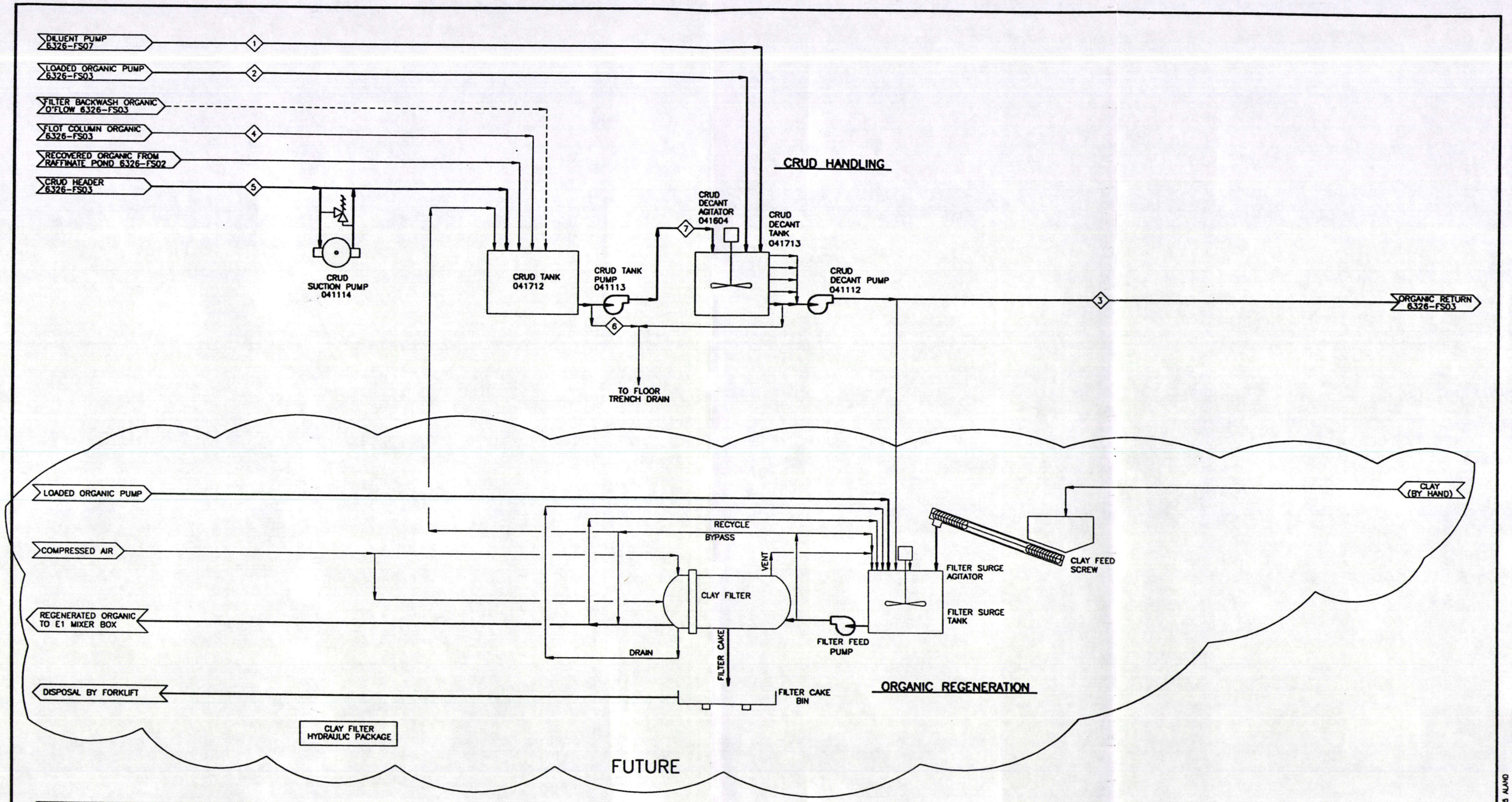
DRAWN BY: HLN
DESIGNED BY: SGA

PROCESS FLOW DIAGRAM
AREA 04 SOLVENT EXTRACTION
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

SCALE: NONE
DATE: 4/7/95
DRAWING NO.: 6326-FS03
REV.: B

ACADNOTE:

6326 K:\6326\RELEASED\6326FS03 06/07/95 09:24 ALANO



STREAM No.		1	2	3	4	5	6	7
DESCRIPTION		DILUENT PUMP	LOADED ORG PUMP	CRUD DCANT PUMP	FLOT ORG FROM COLUMN	CRUD SUCTN PUMP	AQ TO DRAIN	CRUD TANK PUMP
MEDIUM		DILUENT	ORG	ORG	ORG	CRUD	AQ	CRUD
DESIGN	LIQUID, GPM	65.0	65.0	40.0	0.5	25.0	40.0	40.0
	SPG	0.80	0.82	0.82	0.55	0.94	1.03	1.03
		---	---	---	---	---	---	---

REV	DATE	BY	CHECK	DESCRIPTION OF REVISION

REV	DATE	BY	CHECK	DESCRIPTION OF REVISION
B	5/30/95	BR		UPDATE
A	05/26/95			PRELIMINARY

ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

DRAWN BY BR
DESIGNED BY RBA
CHECKED BY
APPROVED BY

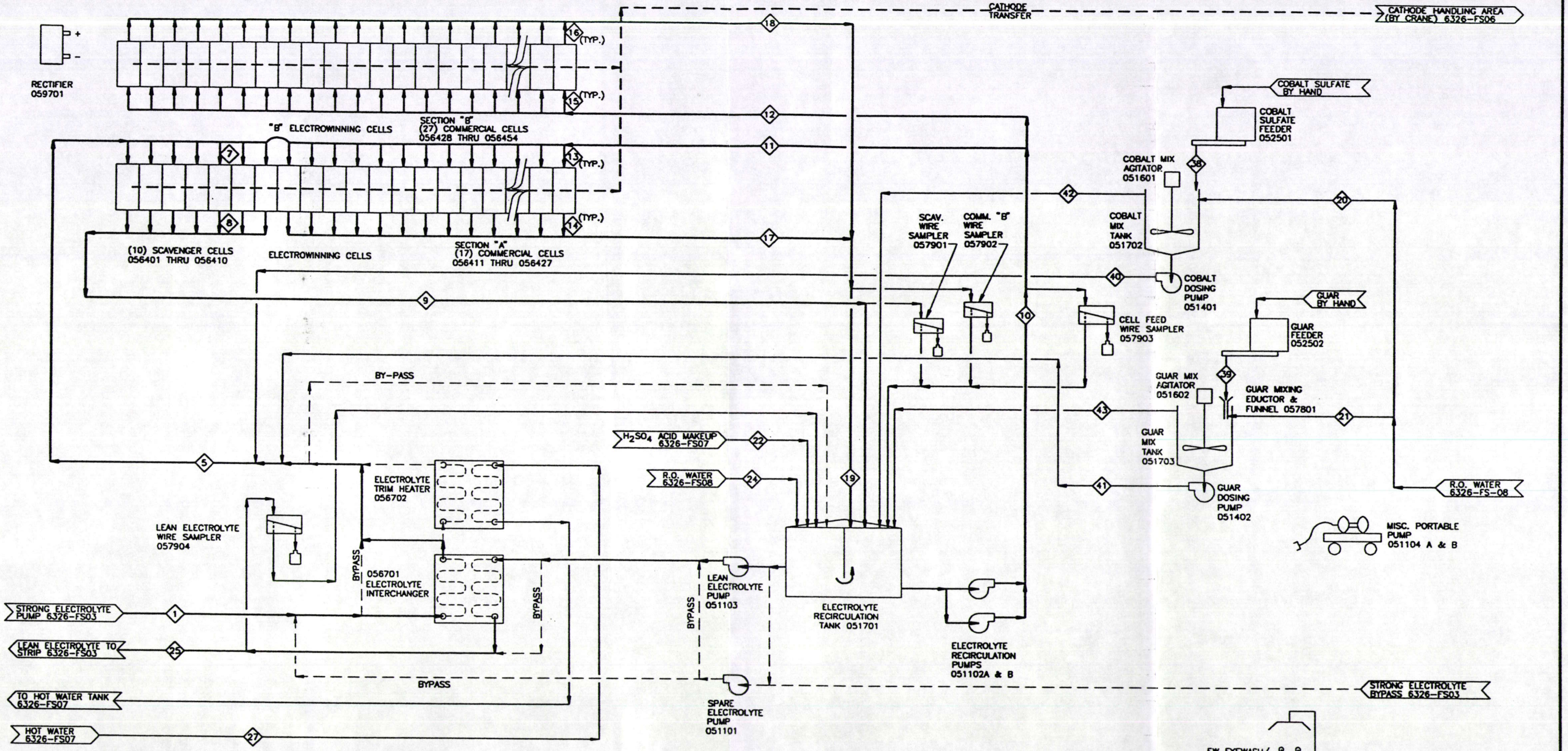
PROCESS FLOW DIAGRAM
(AREA 04) CRUD AND ORGANIC HANDLING
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

SCALE NONE
DATE 4/20/95
DRAWING NO. 6326-FS04
REV. B

ACADNOTE:

6326 K:\6326\RELEASED\6326FS04 08/07/95 09:25 ALAND

THIS DRAWING IS DESIGN AND DETAIL IS OUR PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH



STREAM No.		1	5	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	24	25	27	38	39	40	41	42	43
DESCRIPTION		STRONG ELECT FROM SX	STRONG ELECT TO SCAV CELLS	STRONG ELECT TO SCAV /CELL	ELECT FROM SCAV /CELL	ELECT FROM SCAV CELLS	RECIRC. FLOW	RECIRC TO "A" COMM CELLS	RECIRC TO "B" COMM CELLS	RECIRC TO "A" COMM /CELL	"A" COMM RETURN /CELL	RECIRC TO "B" COMM /CELL	"B" COMM RETURN /CELL	"A" COMM RETURN	"B" COMM RETURN	COMM CELLS RETURN	COBOH MAKEUP WATER	COBOH MAKEUP WATER	H2SO4 ADDITN	WATER MAKEUP	LEAN ELECT TO SX	HOT WATER TO TRIM HEX	COBOH MAKEUP	GUAR MAKEUP	COBOH MAKEUP TO SCAVG CELLS	GUAR MAKEUP TO SCAVG CELLS	COBOH TO COMM CELLS	GUAR TO COMM CELLS
MEDIUM		AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	ACID	WATER	AQ	WATER	COBOH	GUAR	COBOH	GUAR	COBOH	GUAR
DESIGN	LIQUID, GPM	608.3	616.8	68.9	68.8	616.8	2688	700	1268	47	47	47	47	700	1268	2688	2	4	10.5	83.5	628.3	0	23.68	0.84	0.5	1	1.5	3
	LIQUID, SPG	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1	1	1.83	1	1.16	1	----	----	1	1	1	1
	Cu CONTENT, g/l	51.2	51.2	51.2	48.7	48.7	37	37	37	37	33.6	37	33.6	33.6	33.6	33.6	0	0	0	0	32	0	----	----	0	0	0	0
		----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
AVERAGE	LIQUID, GPM	608.3	616.8	68.9	68.8	616.8	610.8	700	1268	47	47	47	47	700	1268	2688	2	4	2.06	11.8	628.3	32	4.76	0.86	0.5	1	1.5	3
	LIQUID, SPG	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1	1	1.83	1	1.16	1	----	----	1	1	1	1
	Cu CONTENT, g/l	45.8	45.8	45.8	43.4	43.4	35.4	35.4	35.4	35.4	32.3	35.4	32.3	32.3	32.3	32.3	0	0	0	0	32	0	----	----	0	0	0	0
		----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
B	5/30/95	BR		UPDATE & MASS BALANCE
A	05/26/95	BR		PRELIMINARY

ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

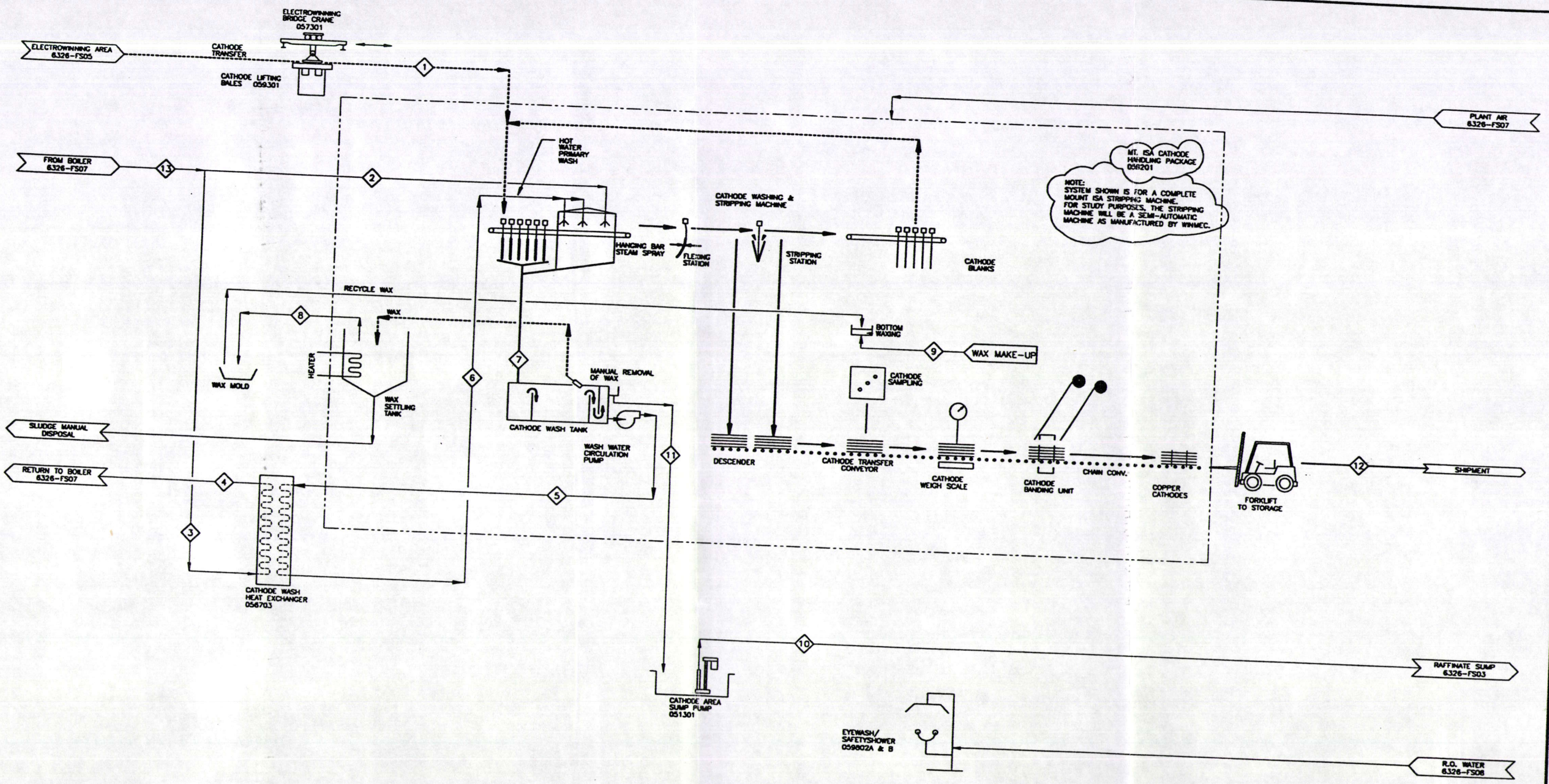
SUMMO U.S.A. CORPORATION

DRAWN BY HLN
CHECKED BY SGA

PROCESS FLOW DIAGRAM
(AREA 05) ELECTROWINNING
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

SCALE NONE
DATE 4/7/95
6326-FS05
REV. B

ACADNOTE:
6326 K:\6326\RELEASED\6326FS05 08/07/95 09:28 ALAND



STREAM No.		1	2	3	4	5	6	7	8	9	10	11	12	13
DESCRIPTION		CATHODE FROM EW	CATHODE RINSE	HOT H2O TO WASH HEAT EXCHNG	RETURN WATER	CATHODE WASH RECIRC	HOT WATER WASH	WASH TANK U'FLOW	WAX RECYCL (lb/hr)	WAX MAKE-UP (lb/hr)	SUMP PUMP DISCHRG	WASH TANK O'FLOW	BUNDLE CATHODE	HOT WATER TO CATH WASH
MEDIUM		COPPER	WATER	WATER	WATER	WATER	WATER	WATER	WAX	WAX	WATER	WATER	COPPER	WATER
DESIGN	COPPER, TPD	54.8	---	---	---	---	---	---	---	---	---	---	54.8	---
	COPPER, TPY	19000	---	---	---	---	---	---	---	---	---	---	19000	---
	FLOW, gpm	---	21.0	400.0	400.0	400.0	400.0	400.0	5.23	1.38	100.0	21.0	---	421.0
	SPG	---	1.00	1.00	1.00	1.00	1.00	1.00	---	---	1.00	1.00	---	1.00
AVERAGE	COPPER, TPD	49.0	---	---	---	---	---	---	---	---	---	---	49.0	---
	COPPER, TPY	17000	---	---	---	---	---	---	---	---	---	---	17000	---
	FLOW, gpm	---	4.0	344.0	344.0	400.0	400.0	400.0	4.41	1.10	0.0	4.0	---	348.0
	SPG	---	1.00	1.00	1.00	1.00	1.00	1.00	---	---	---	1.00	---	1.00

REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
B	05/26/95	BR		UPDATE & MASS BALANCE
A	05/26/95			PRELIMINARY

ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY

SUMMO U.S.A. CORPORATION

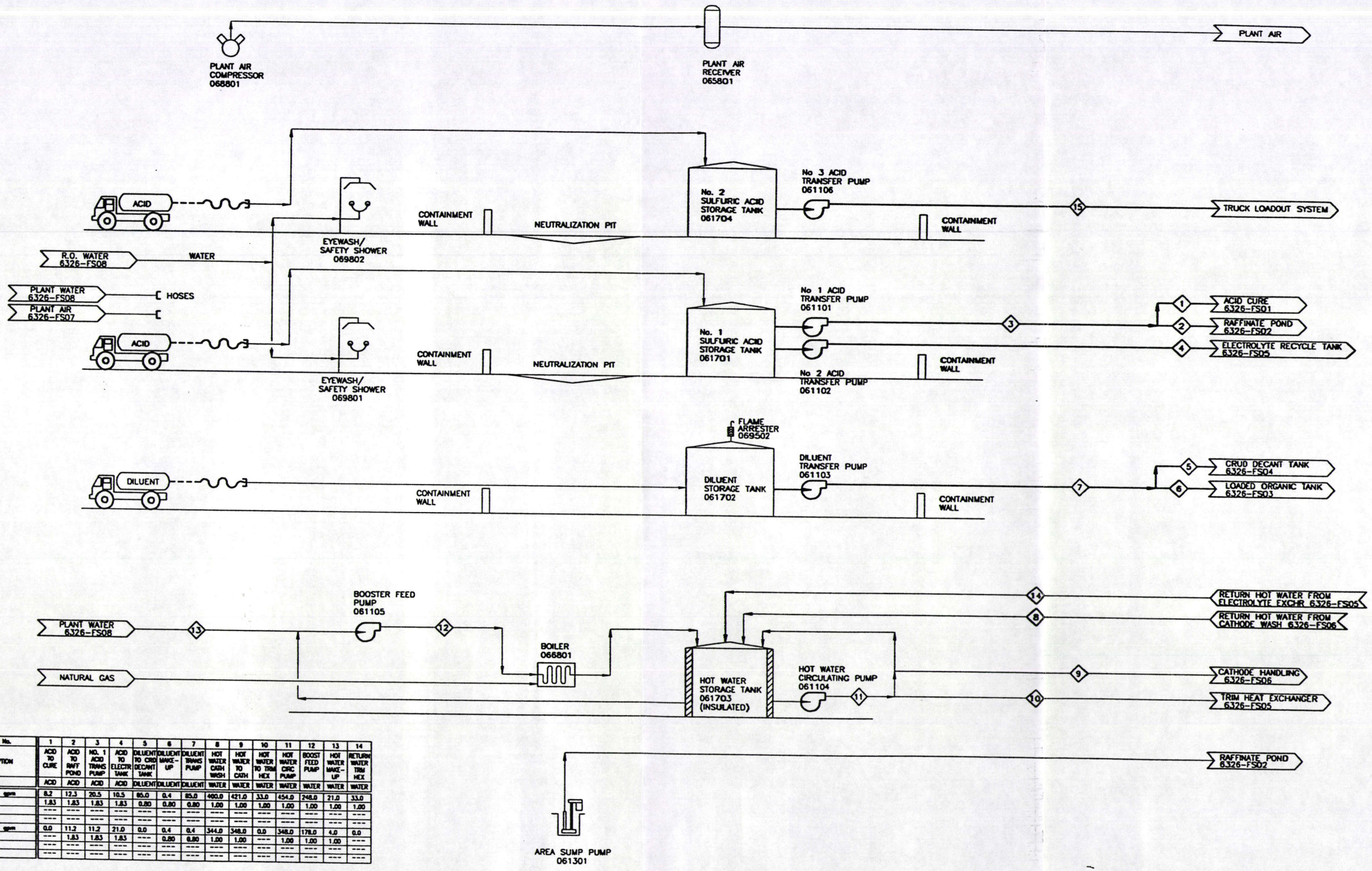
DRAWN BY: JAP
DESIGNED BY: RBL

PROCESS FLOW DIAGRAM
(AREA 5) CATHODE HANDLING
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

SCALE: NONE
DATE: 2/17/95
DRAWING NO.: 6326-FS06
REV. B

ACADNOTE:

6326 K:\6326\RELEASED\6326FS06 06/07/95 09:27 ALANO



STREAM No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14
DESCRIPTION		ACID TO CURE	ACID TO RAFF POND	NO. 1 ACID TRANS PUMP	ACID TO ELECTR TANK	DILUENT TO CRD DECANT TANK	DILUENT MAKE-UP	DILUENT TRANS PUMP	HOT WATER CATH WASH	HOT WATER TO CATH	HOT WATER TO TRIM HEX	HOT WATER CIRC PUMP	BOOST FEED PUMP	HOT WATER MAKE-UP	RETURN WATER TRIM HEX
MEDIUM		ACID	ACID	ACID	ACID	DILUENT	DILUENT	DILUENT	WATER	WATER	WATER	WATER	WATER	WATER	WATER
DESIGN	LIQUID, gpm	8.2	17.3	20.5	10.5	85.0	0.4	85.0	400.0	421.0	33.0	454.0	248.0	21.0	33.0
	SPG	1.83	1.83	1.83	1.83	0.80	0.80	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		---	---	---	---	---	---	---	---	---	---	---	---	---	---
		---	---	---	---	---	---	---	---	---	---	---	---	---	---
AVERAGE	LIQUID, gpm	0.0	11.2	11.2	21.0	0.0	0.4	0.4	344.0	348.0	0.0	348.0	178.0	4.0	0.0
	SPG	---	1.83	1.83	1.83	---	0.80	0.80	1.00	1.00	---	1.00	1.00	1.00	---
		---	---	---	---	---	---	---	---	---	---	---	---	---	---
		---	---	---	---	---	---	---	---	---	---	---	---	---	---

REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
B	5/30/95	BR		UPDATE & MASS BALANCE
A	05/26/95			PRELIMINARY

ROBERTS & SCHAEFFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

DRAWN BY BR
CHECKED BY RBA

PROCESS FLOW DIAGRAM
(AREA 6) REAGENT STORAGE AND PREP
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

SCALE NONE
DATE 4/20/95
6326-FS07
REV. B

ACADNOTE:
6326 K:\6326\RELEASED\6326FS07 08/07/95 09:28 ALAND

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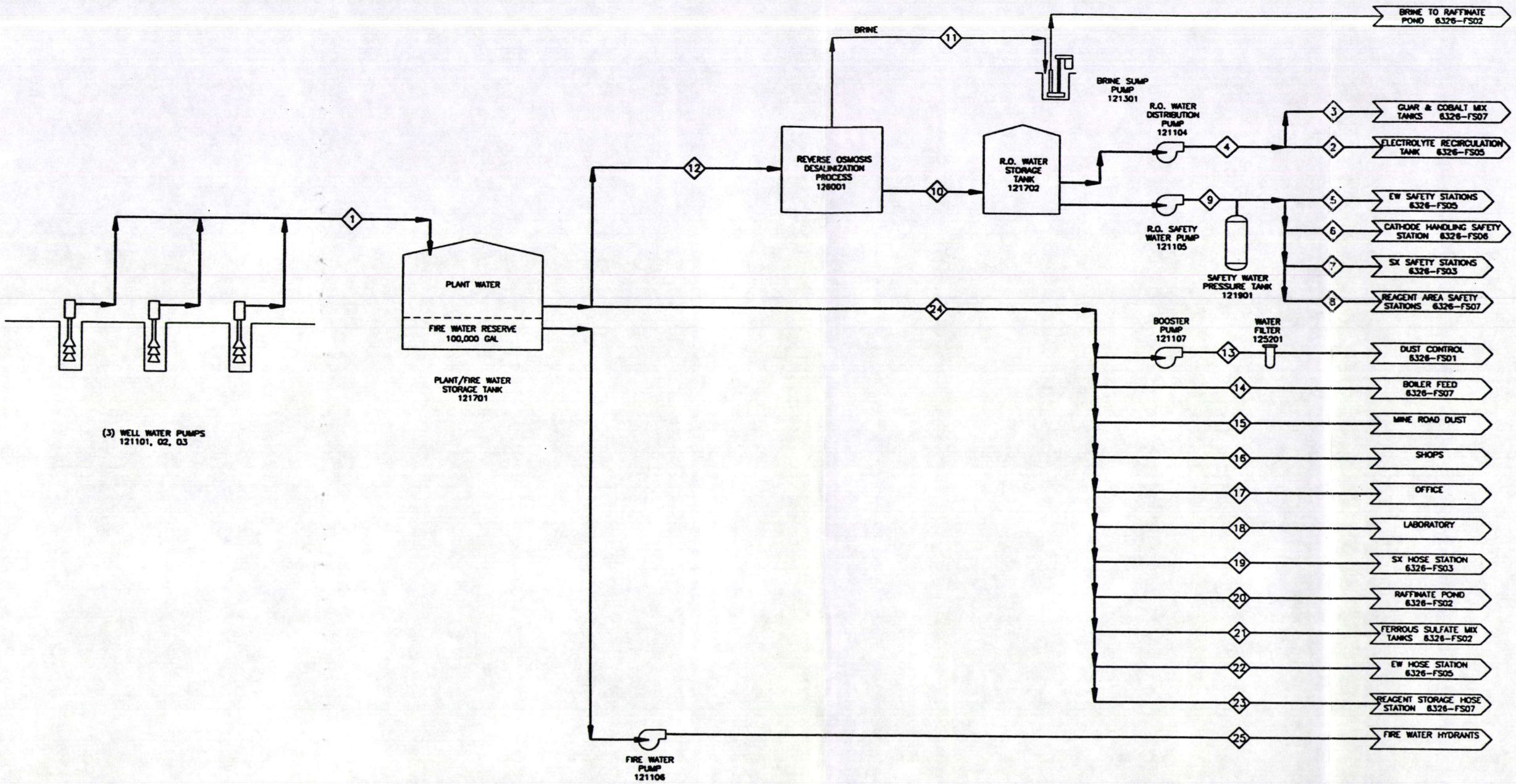

STREAM No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
DESCRIPTION		WELL WATER PUMPS	TO ELECTR RECIRC TANK	GUAR & COBALT TANKS	R.O. DIST PUMP	EW SAFETY STATION	CATHODE HANDLING SAFETY STATION	SX SAFETY STATION	REAGENT SAFETY STATION	R.O. SAFETY WATER PUMP	R.O. STORAGE TANK	BRINE	R.O. BOIL FEED	DUST CONTROL WATER	BOILER FEED WATER	MINE ROAD DUST WATER	SHOPS	OFFICE WATER	LAB WATER	SX HOSES	RAFT POND MAKE-UP	FERROUS SULFATE WATER	EW HOSES	REAGENT STORAGE AREA HOSES	PLANT WATER DISTRIB	FIRE WATER PUMP
MEDIUM		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
DESIGN	LIQUID, gpm	591.0	20.0	5.0	100.0	30.0	80.0	50.0	30.0	150.0	170.0	33.3	133.3	26.3	71.0	100.0	60.0	45.0	45.0	20.0	311.5	100.0	20.0	20.0	535.0	1500.0
	SPG	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
AVERAGE	LIQUID, gpm	300.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	334.0
	SPG	1.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.0
		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
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REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
B	5/30/95	BR		UPDATE & MASS BALANCE
A	05/26/95			PRELIMINARY

ROBERTS & SCHAEFFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY

SUMMO U.S.A. CORPORATION

DRAWN BY: BR
DESIGNED BY: RBA
CHECKED BY:
APPROVED BY:

PROCESS FLOW DIAGRAM
(AREA 12) PLANT WATER DISTRIBUTION
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

SCALE: NONE
DATE: 4/22/95
DRAWING NO.: 6326-FS08
REV.: B

ACADNOTE:

6326 K:\6326\RELEASED\6326FS08 06/07/95 09:20 ALAND

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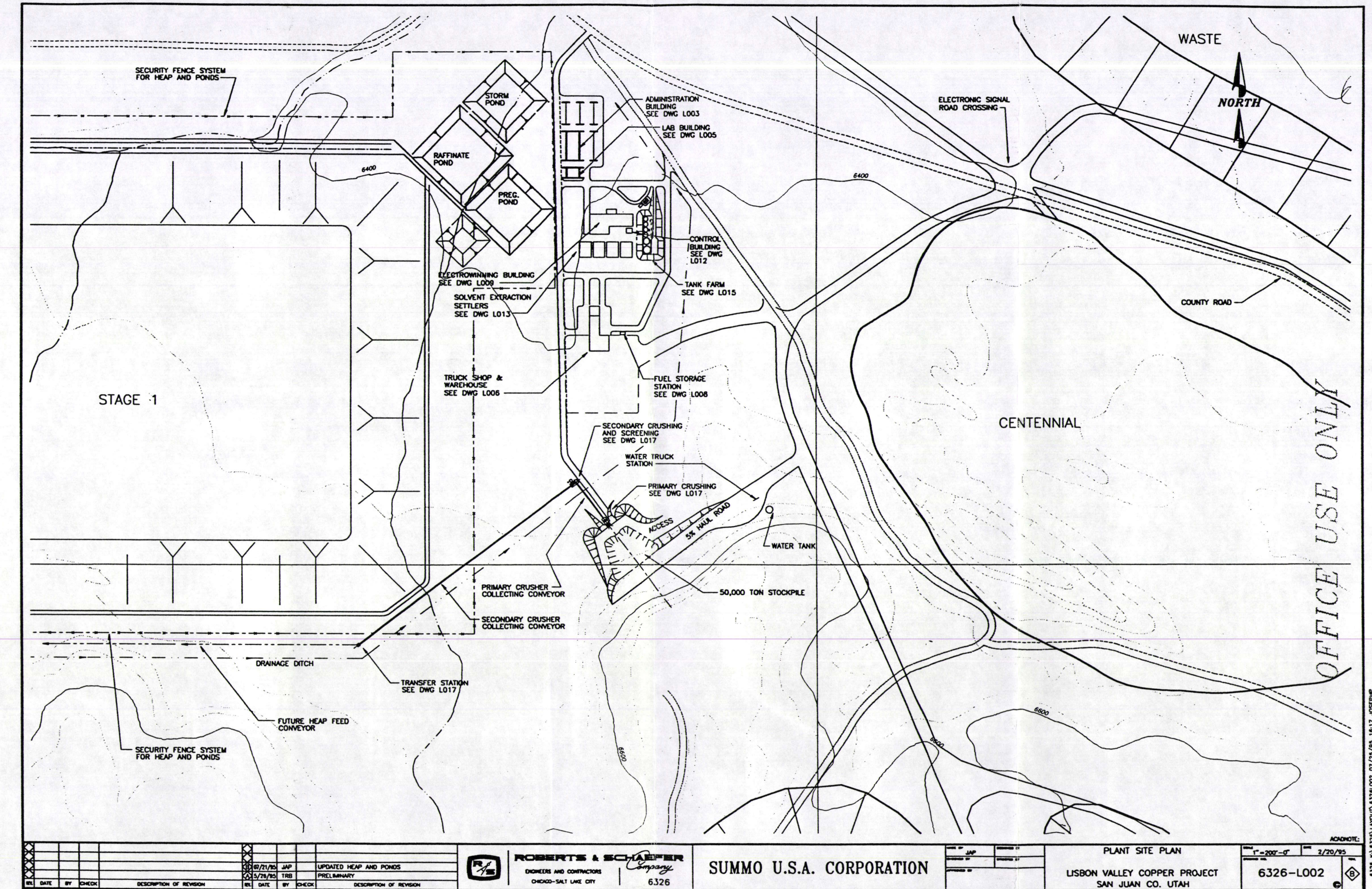


REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
B	07/21/95	JAP		UPDATED HEAP AND PONDS
A	5/26/95	TRB		PRELIMINARY

ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

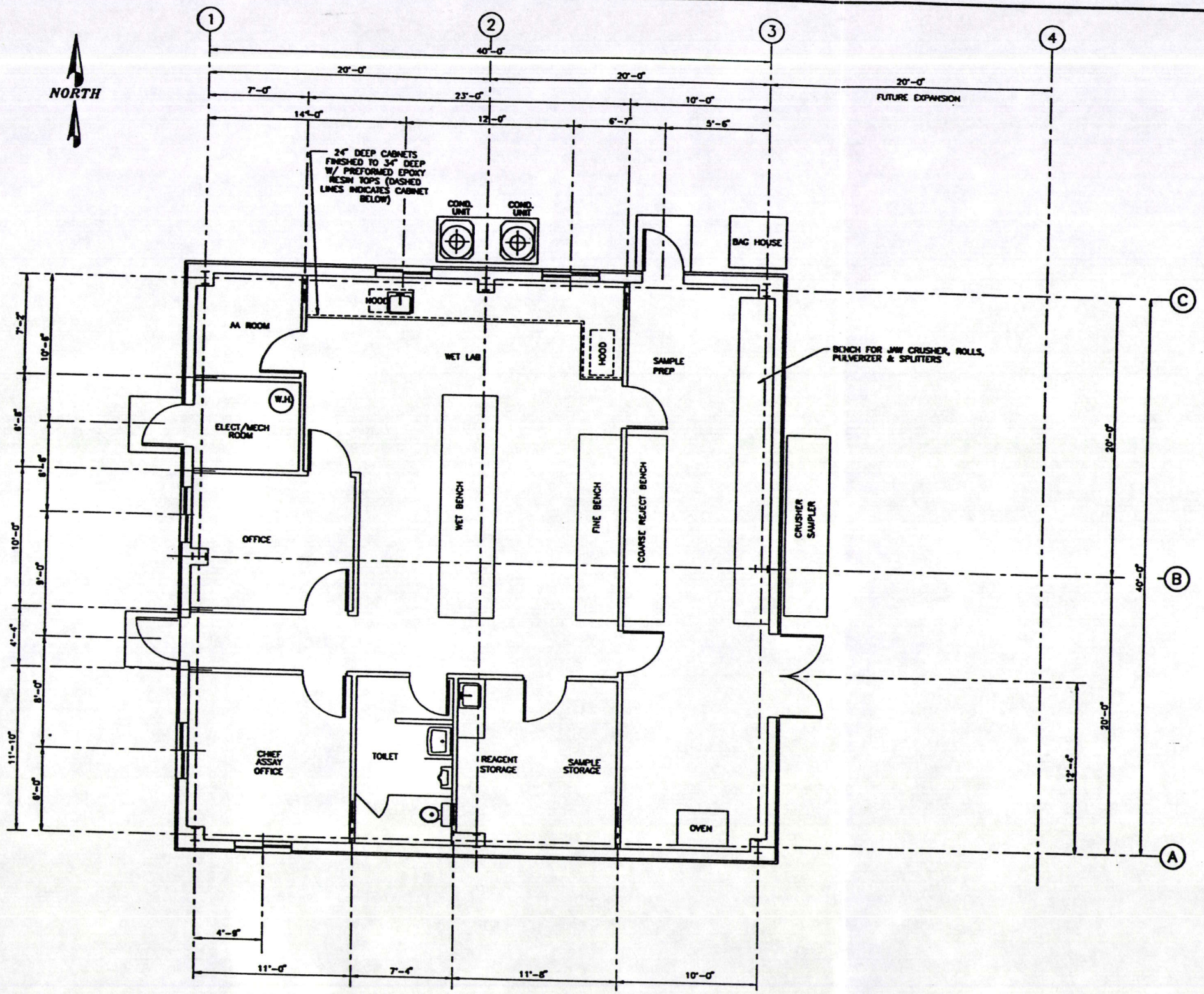
JAP

PLANT SITE PLAN
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

1"=200'-0" 2/20/95
6326-L002 B

ACADNOTE:

6326 K:\6326\LAYOUT\6326L002 07/25/95 16:17 JOSEPHP



LABORATORY BUILDING

NOTE:

1. DIMENSIONS SHOWN FOR INTERIOR FRAMING ARE TO CENTER OF STUDS UNLESS OTHERWISE NOTED

REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
A	5/26/95	TRB		PRELIMINARY

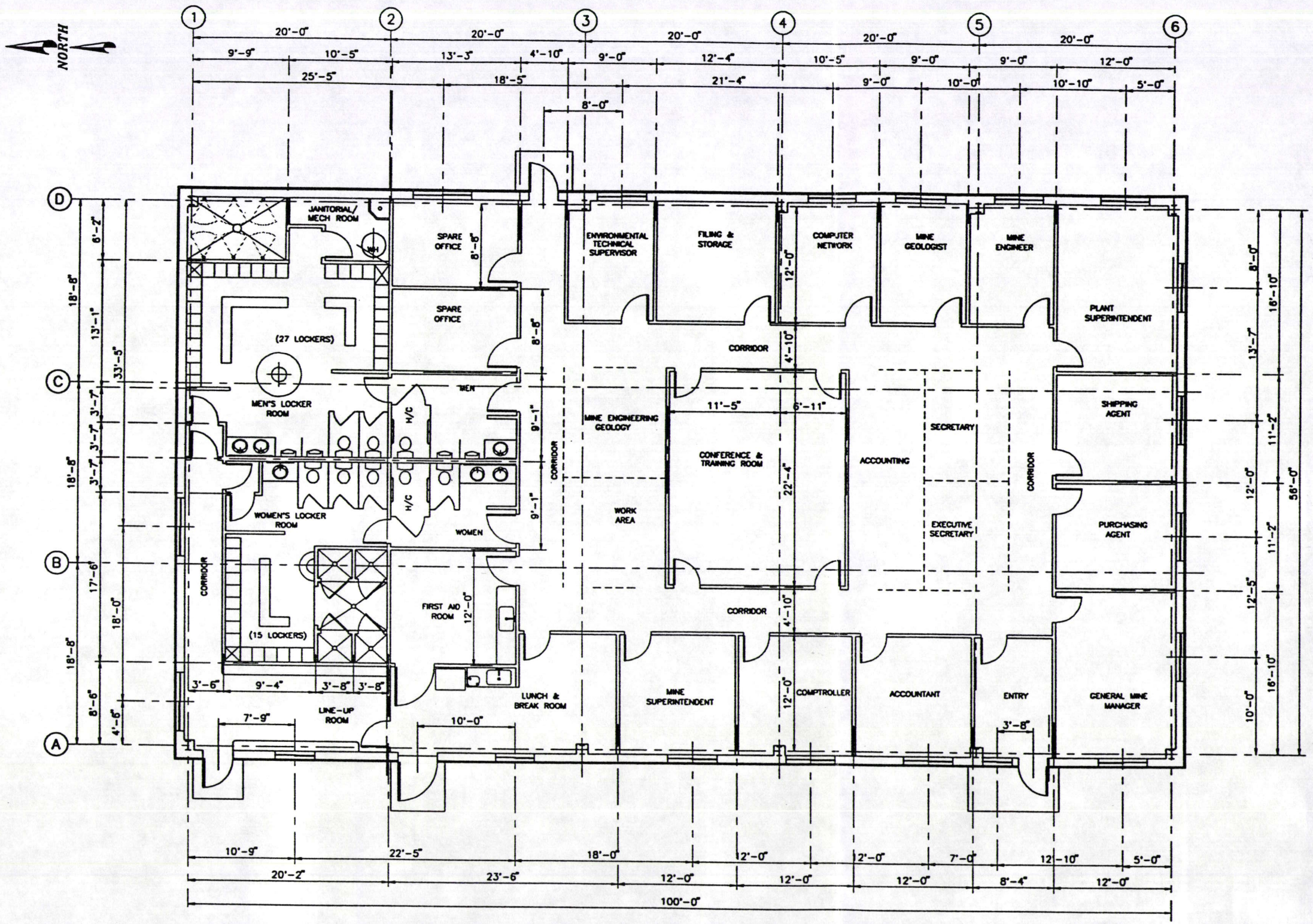
ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

LABRATORY PLAN
AT SX / EW AREA
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

SCALE 1/4"=1'-0" DATE 2/24/95
DRAWING NO. 6326-L005 REV. A

6326 K:\6326\RELEASED\6326L005 05/26/95 15:28 ALAND



ADMINISTRATION BUILDING

NOTE:

1. DIMENSIONS SHOWN FOR INTERIOR FRAMING ARE TO CENTER OF STUDS UNLESS OTHERWISE NOTED

REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
A	5/26/95	TRB		PRELIMINARY

ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

DRAWN BY TB
DESIGNED BY CBM
APPROVED BY RJB

ADMINISTRATION BUILDING
PLAN
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

SCALE 3/16"=1'-0" DATE 2/21/95
DRAWING NO. 6326-L003 REV. A

ACADNOTE:

6326 K:\6326\RELEASED\6326L003 05/26/95 15:25 ALAND

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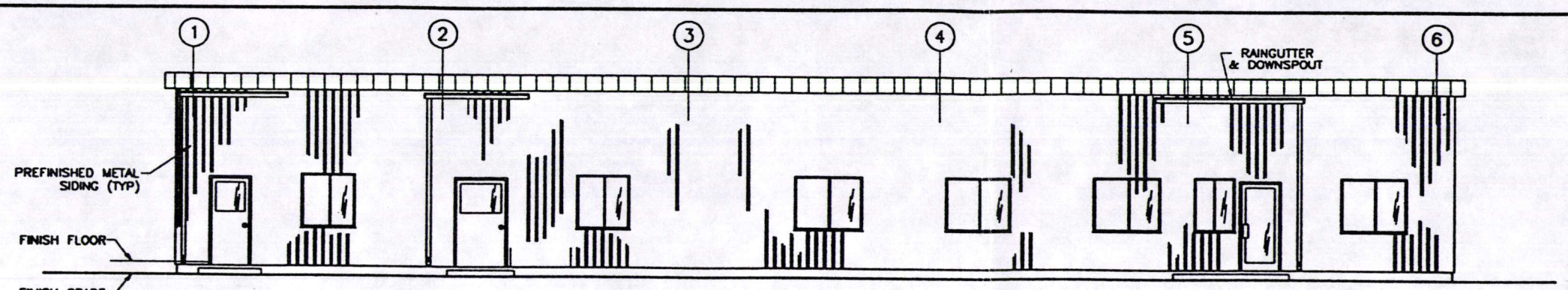
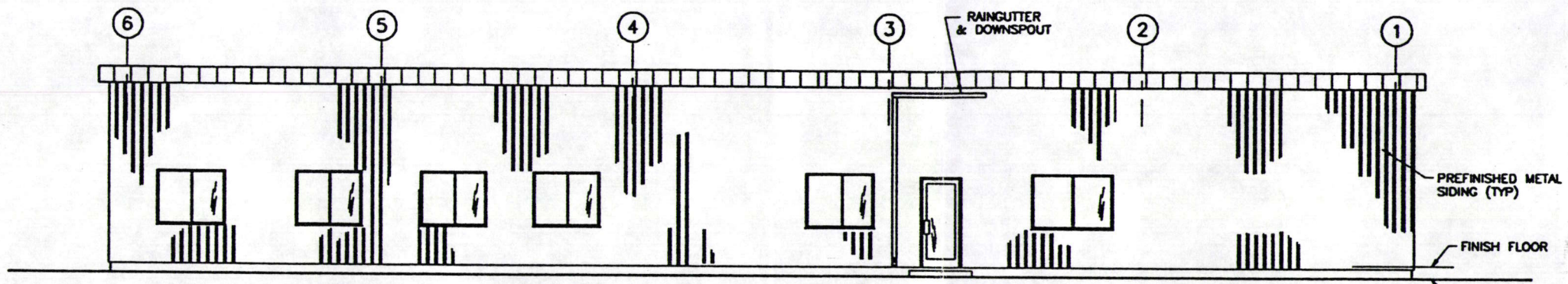
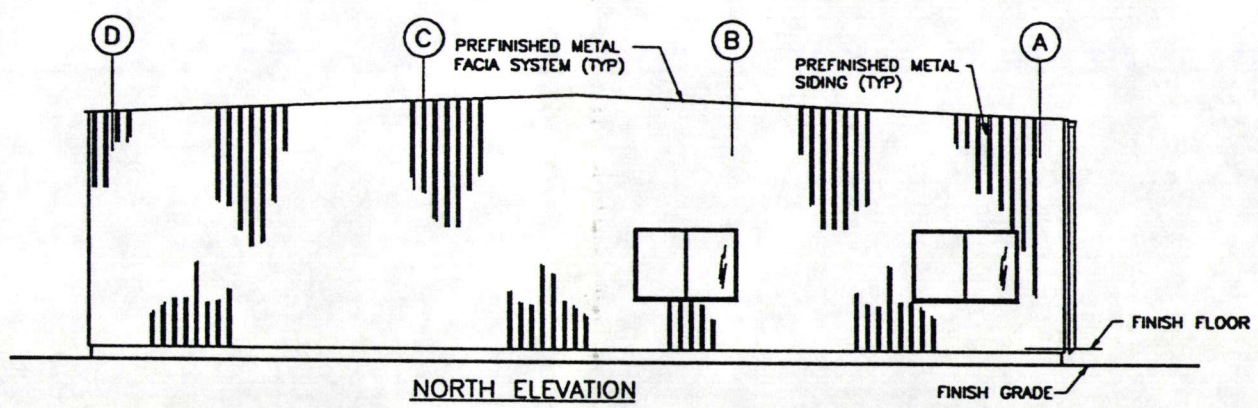


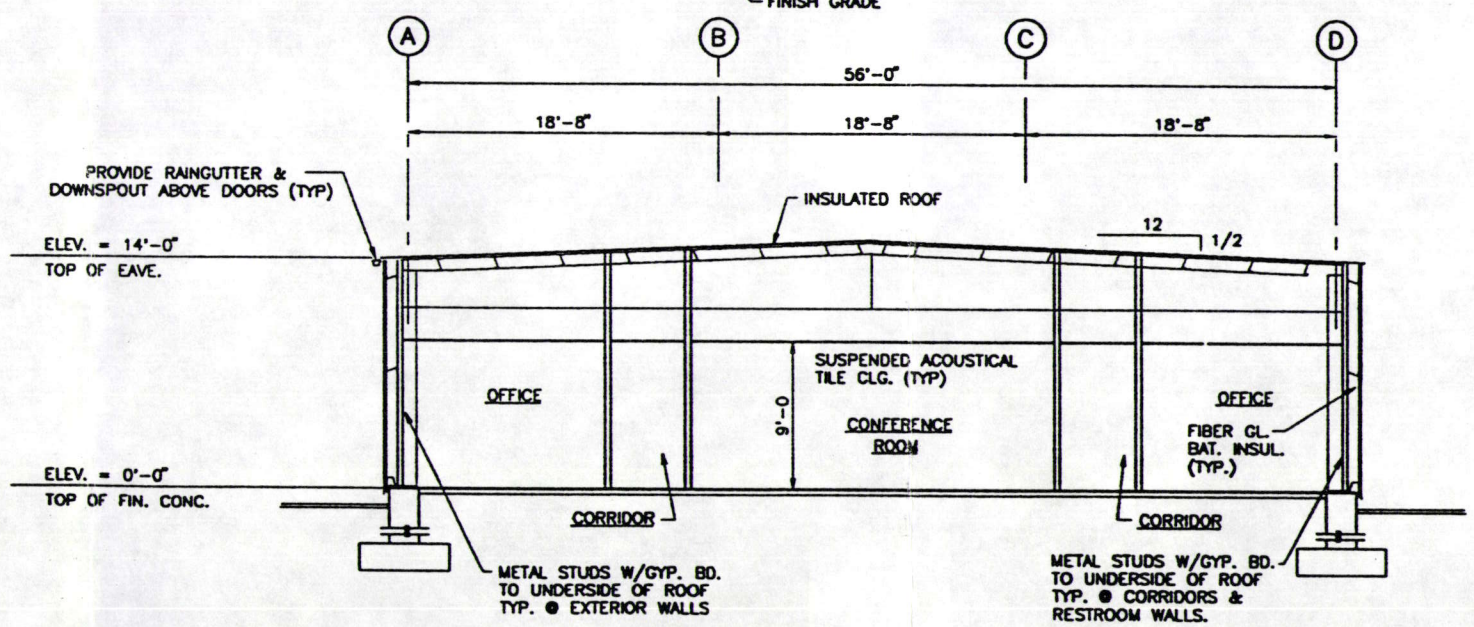
WEST ELEVATION



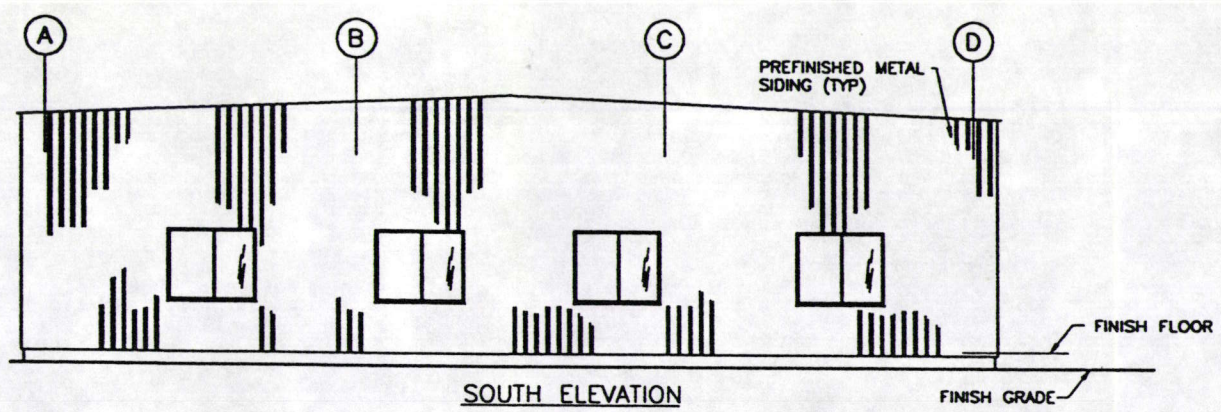
EAST ELEVATION



NORTH ELEVATION



TYPICAL BUILDING SECTION



SOUTH ELEVATION

NOTE:

1. DIMENSIONS SHOWN FOR INTERIOR FRAMING ARE TO CENTER OF STUDS UNLESS OTHERWISE NOTED

REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
A	5/26/95	TRB		PRELIMINARY

ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

DRAWN BY: B
DESIGNED BY: CEM
CHECKED BY: RJB
APPROVED BY:

ADMINISTRATION BUILDING
ELEVATIONS
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

SCALE: 3/16"=1'-0" DATE: 2/23/95
DRAWING NO. 6326-L004 REV. A

ACADNOTE:

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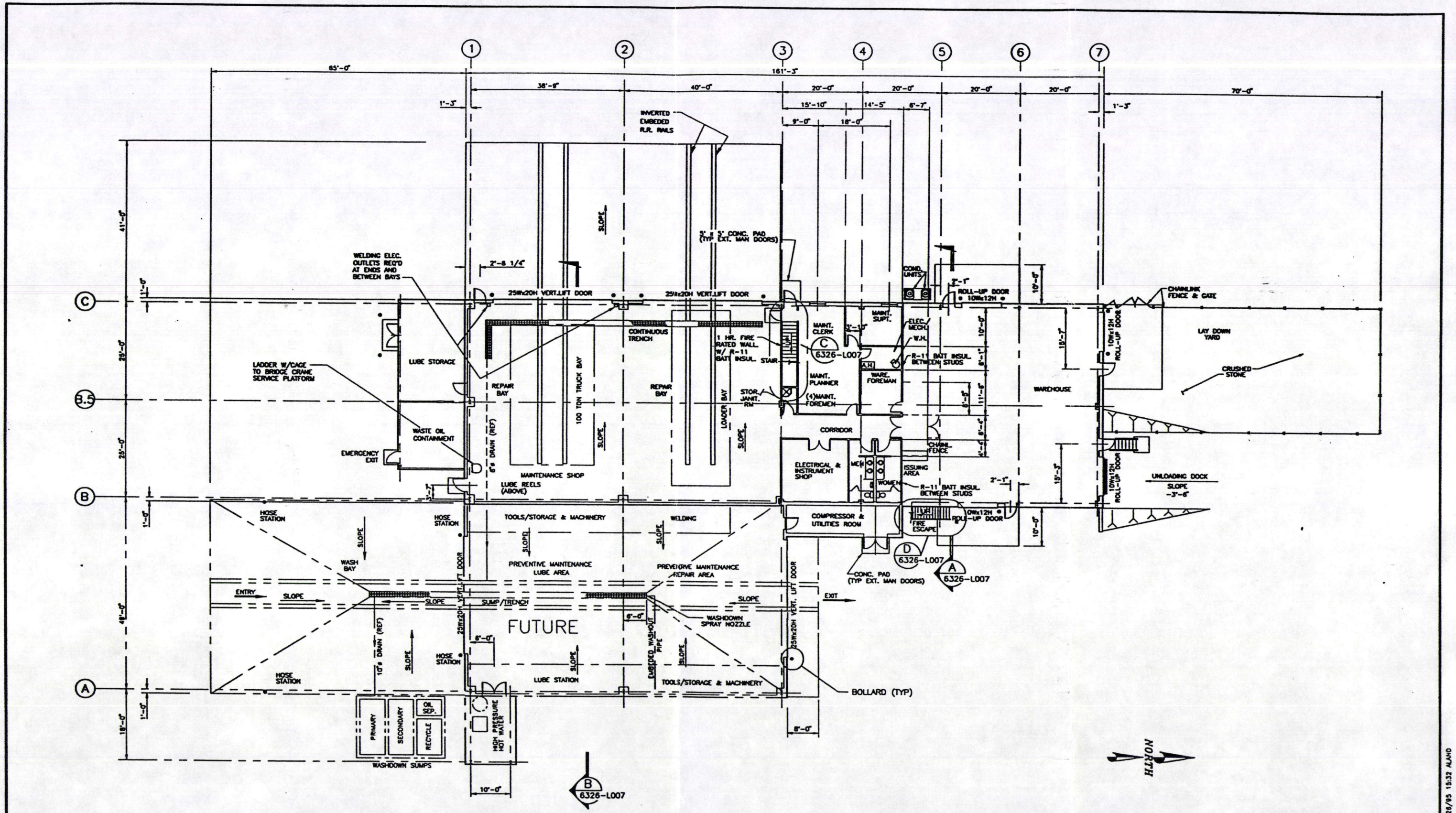

TRUCK SHOP - GRADE PLAN

REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION	REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
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ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

DRAWN BY MLN
DESIGNED BY CBM
APPROVED BY RJB

TRUCK SHOP & MINE WAREHOUSE
BUILDING PLAN
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

SCALE 3/32"=1'-0" DATE 2/23/95
DRAWING NO. 6326-L006 REV. A

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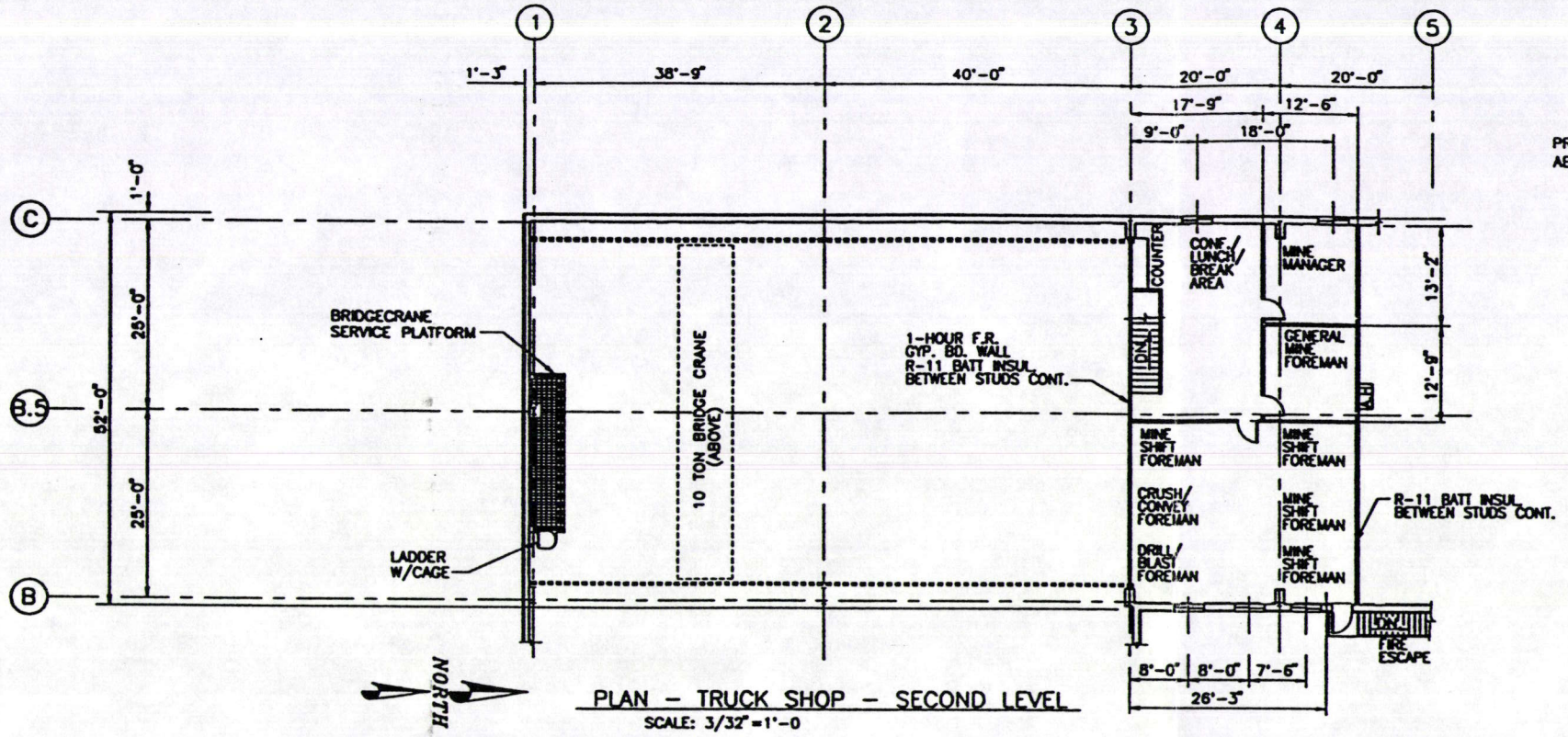
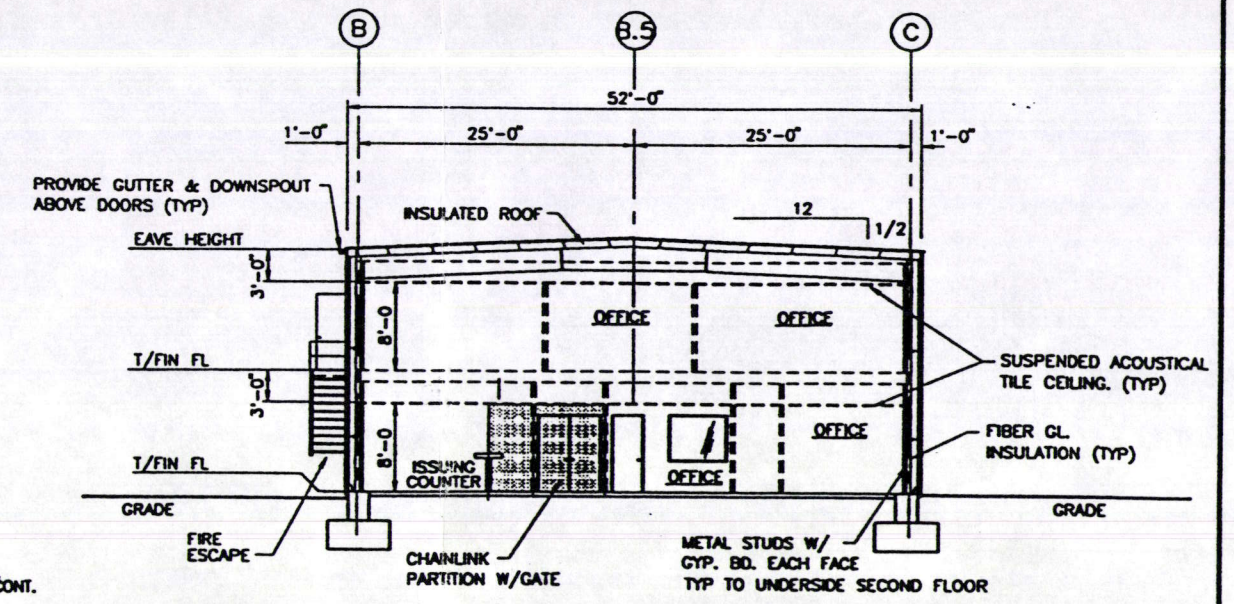
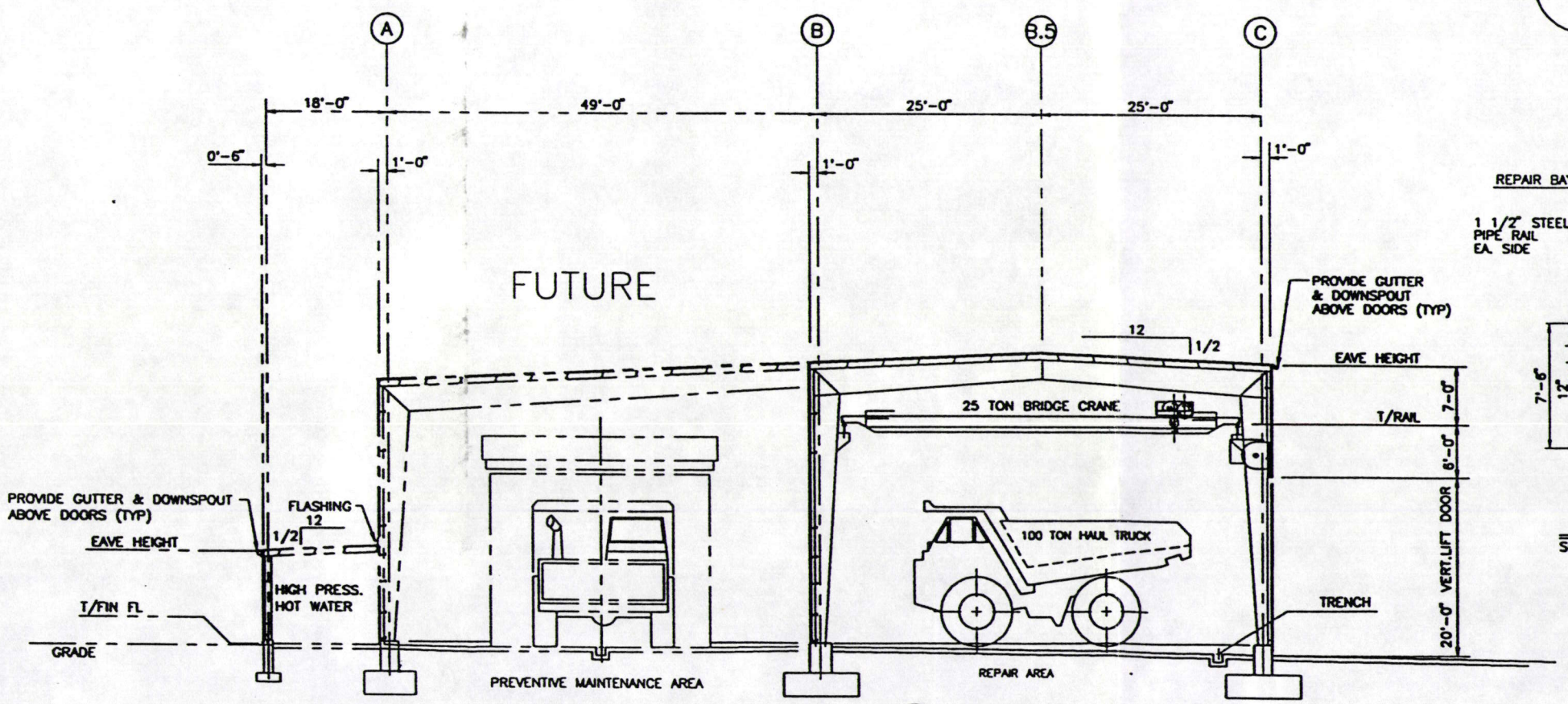


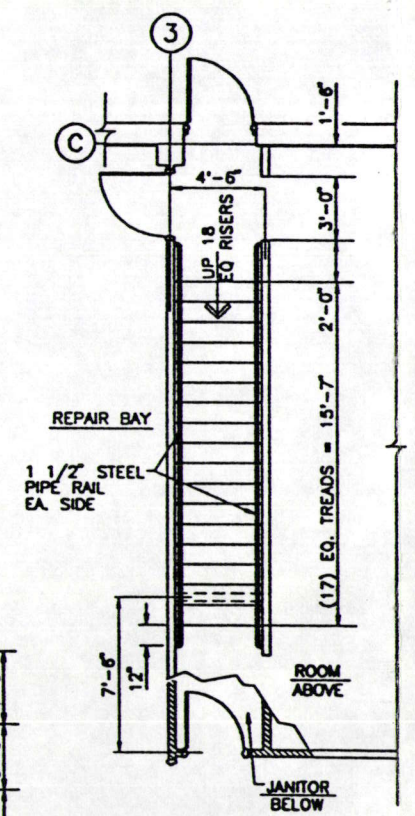
PLAN – TRUCK SHOP – SECOND LEVEL
SCALE: 3/32"=1'-0



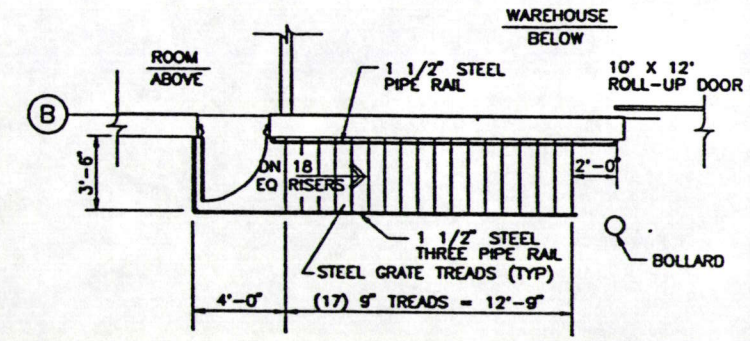
SECTION A
SCALE: 1/8"=1'-0 6326-L006



SECTION B
SCALE: 1/8"=1'-0 6326-L006



STAIR PLAN C
SCALE: 1/4"=1'-0 6326-L006



FIRE ESCAPE STAIR PLAN D
SCALE: 1/4"=1'-0 6326-L006

REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION	REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
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ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

DRAWN BY MLN | DESIGNED BY GDM | CHECKED BY RJB

TRUCK SHOP & MINE WAREHOUSE
PLAN & SECTIONS
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

3/32"=1'-0" U.O. | DATE 2/23/95 | DRAWING NO. 6326-L007 | REV. A

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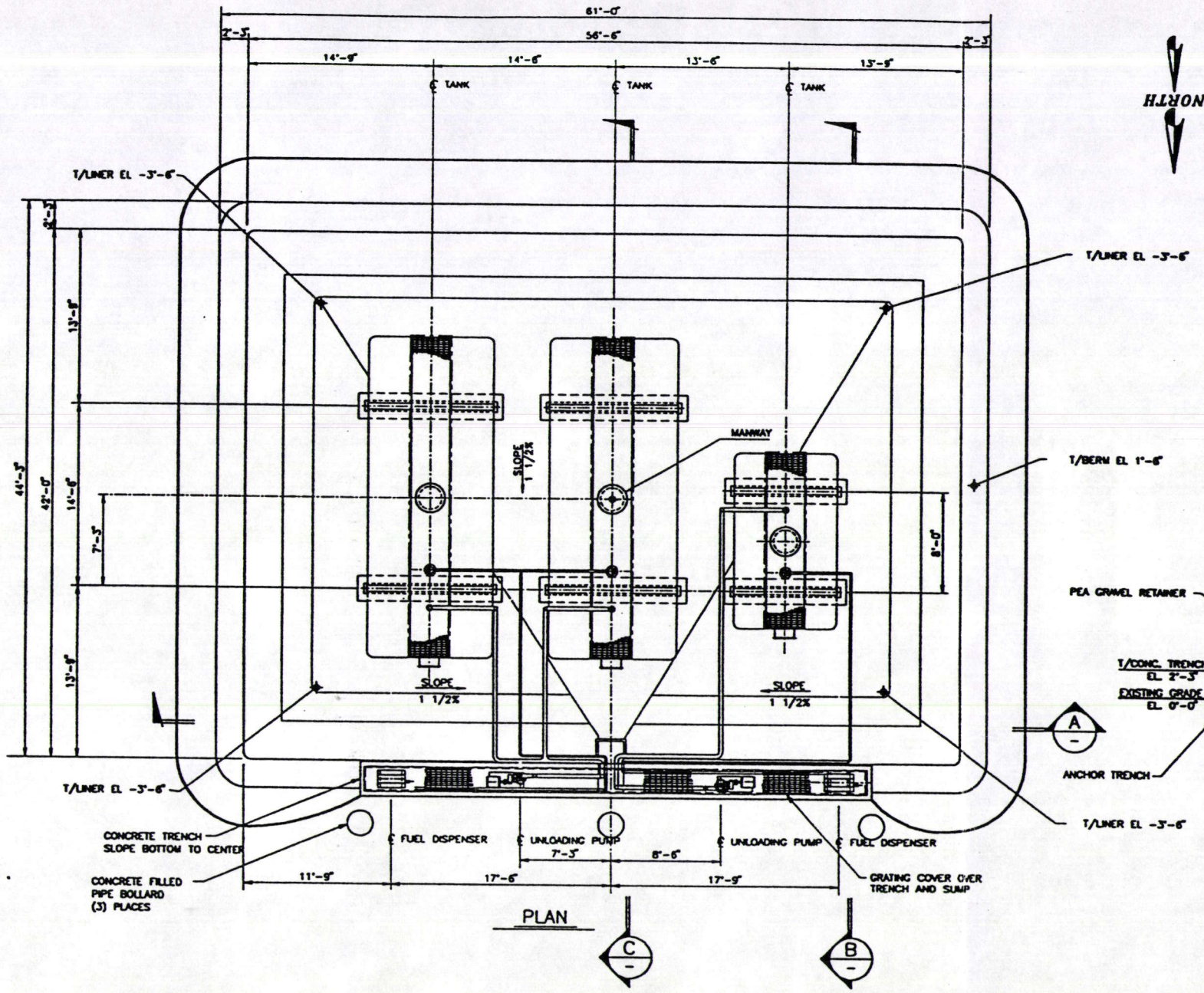
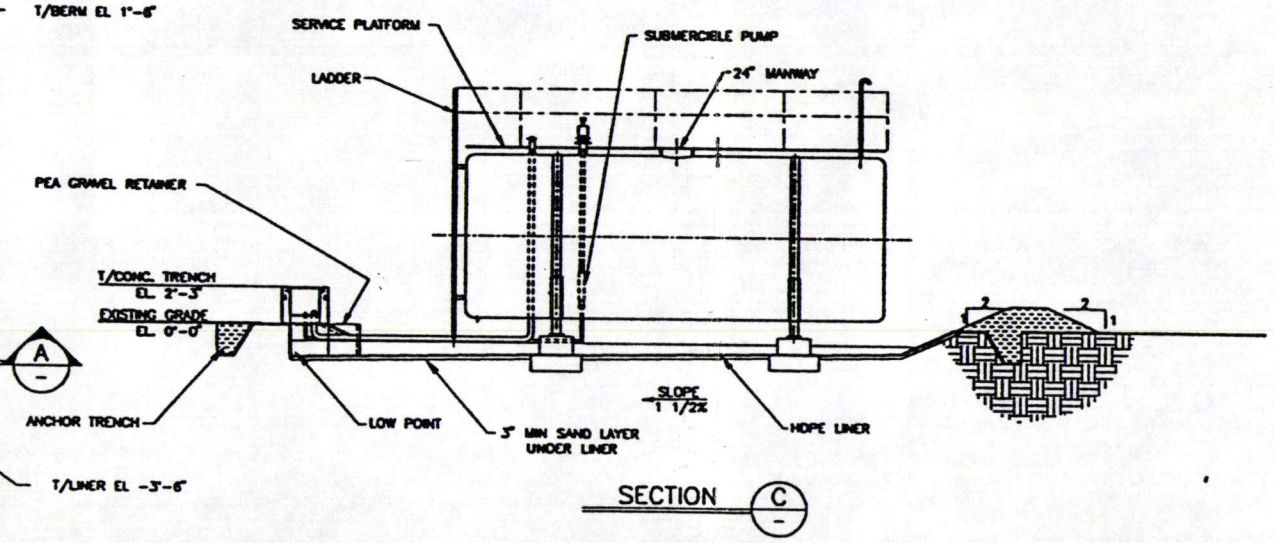
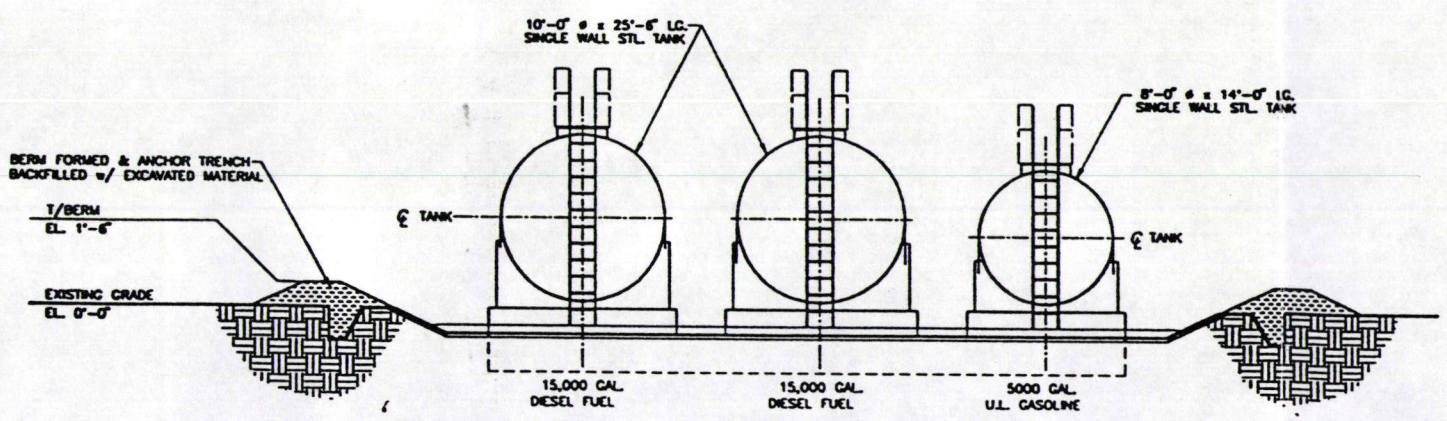
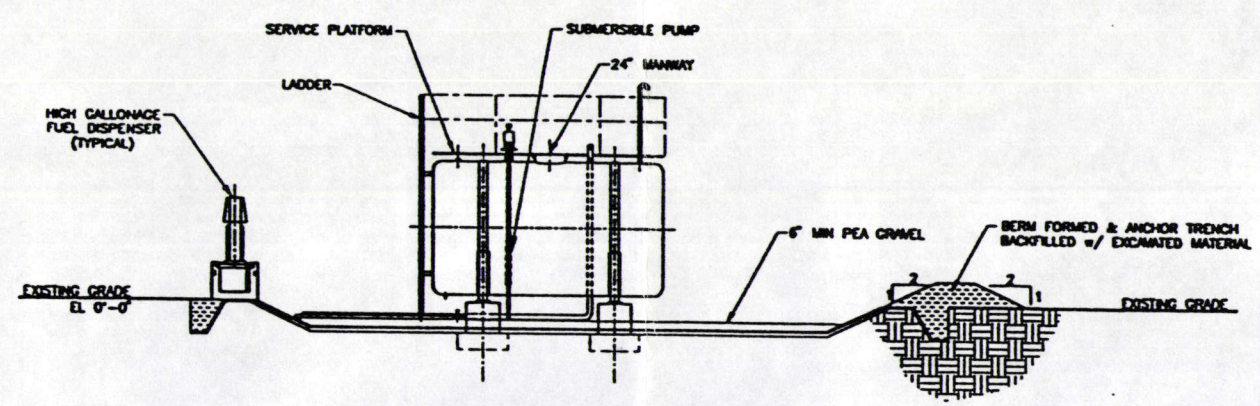
6326 K:\6326\RELEASED\6326L007 05/26/95 13:31 ALAND









REV	DATE	BY	CHECK	DESCRIPTION OF REVISION
A	3/28/95	TRB		PRELIMINARY

ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

DRAWN BY HUN | DESIGNED BY CBM | APPROVED BY FUB

FUEL STORAGE STATION
PLANS & SECTIONS
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

SCALE 3/16" = 1'-0" | DATE 2/23/95

6326-L008

A

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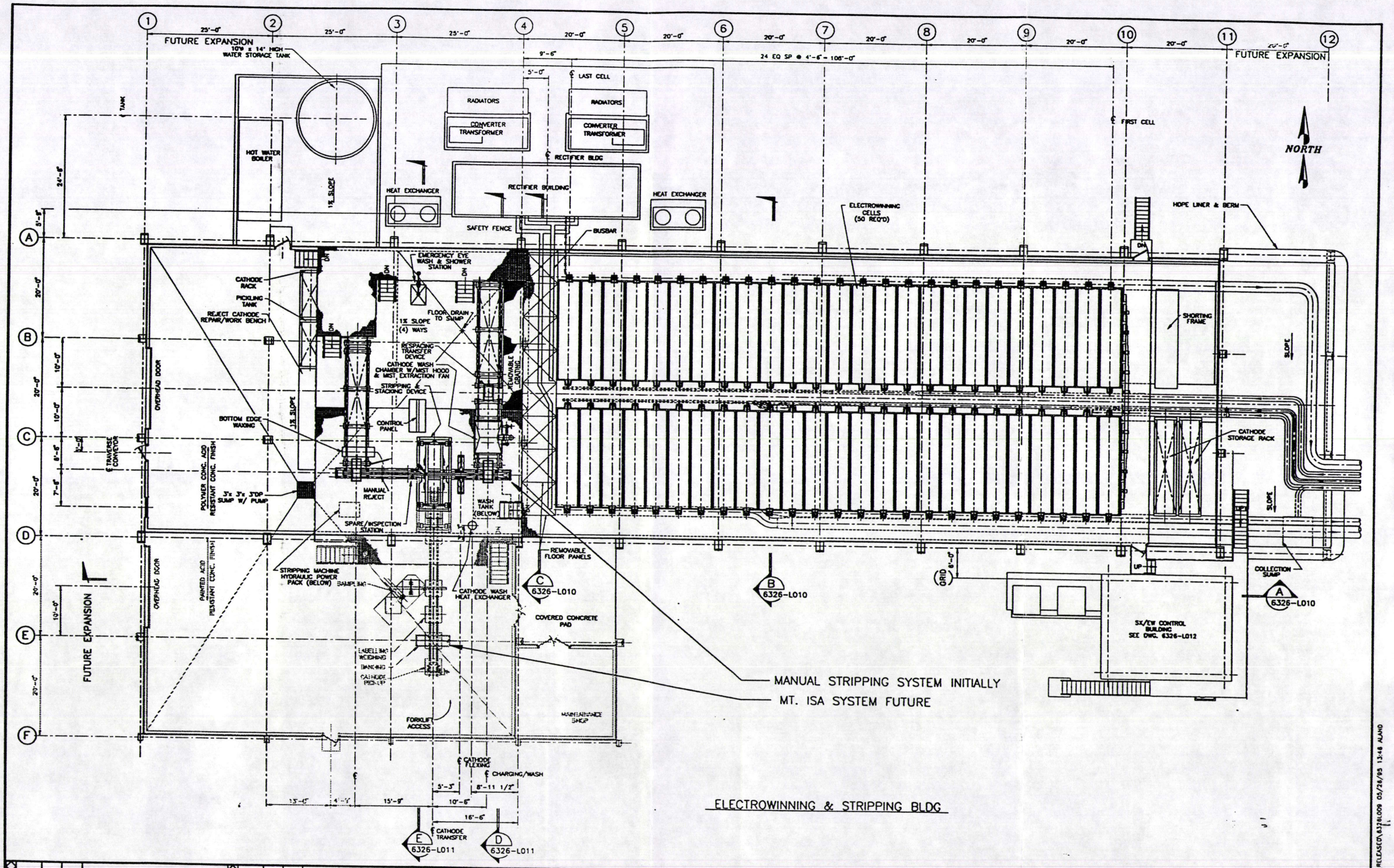

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					A	5/26/95	TRB		PRELIMINARY

ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO - SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

ELECTROWINNING & STRIPPING BLDG
PLAN
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

1/8" = 1'-0" | 2/28/95 | 6326-L009 | A

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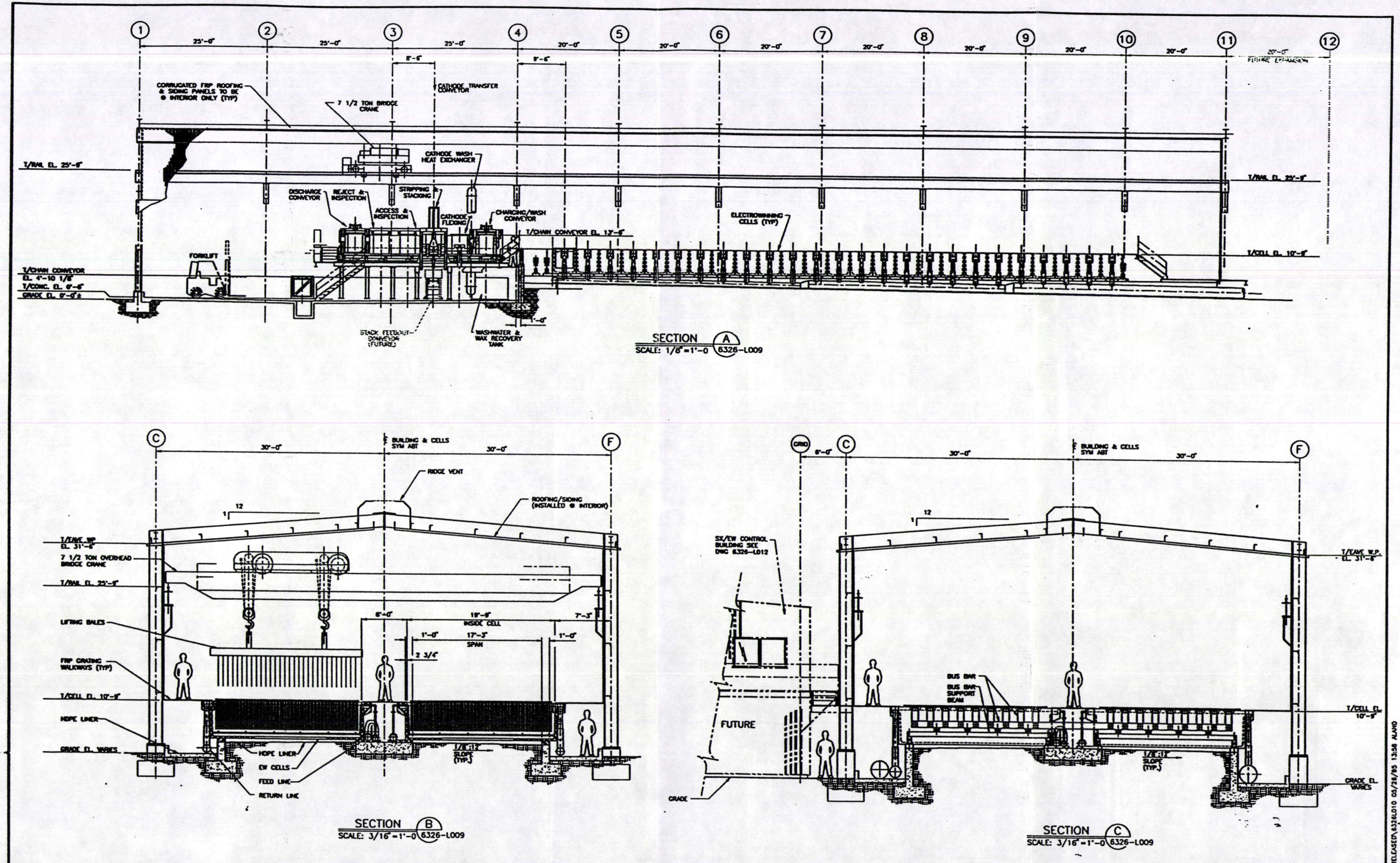

REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
A	5/26/95	TRB		PRELIMINARY

ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

ELECTROWINNING & STRIPPING BLDG.
SECTIONS
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

1/8"=1'-0" UN | 3/1/95
6326-L010 | A

ACADNOTE:

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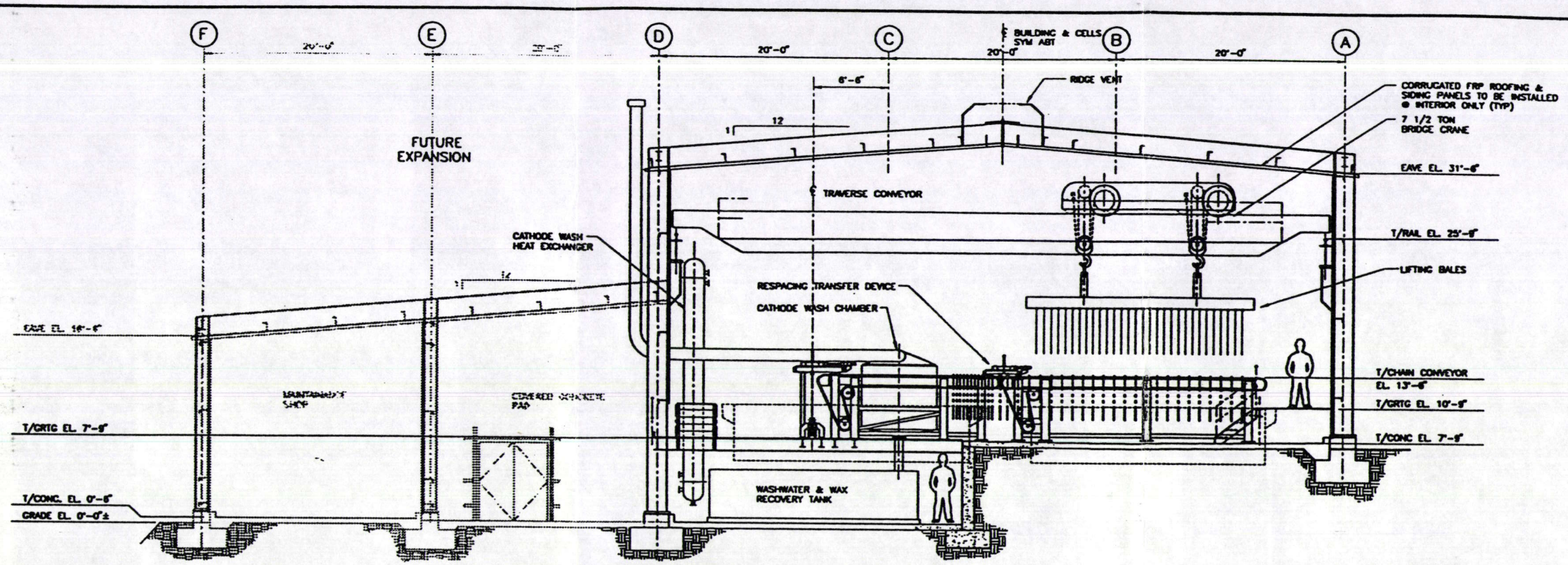
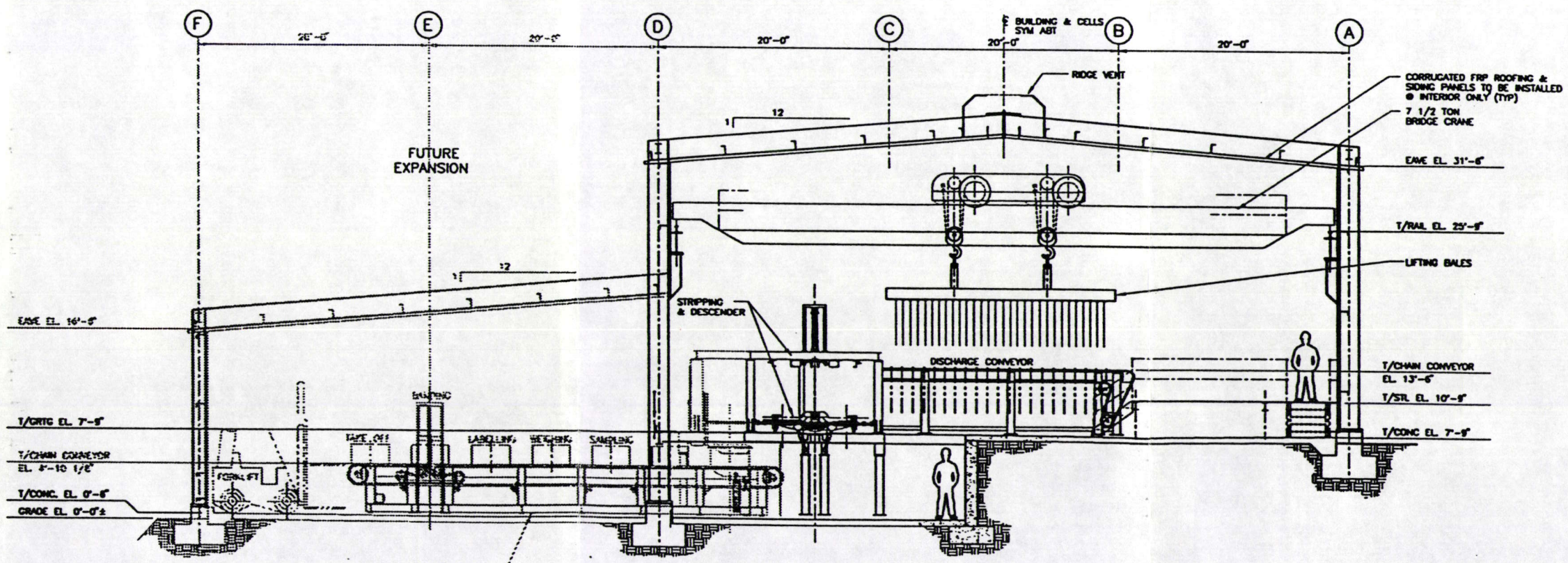


SECTION D
6326-L009



SECTION E
6326-L009

REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION	REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
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ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
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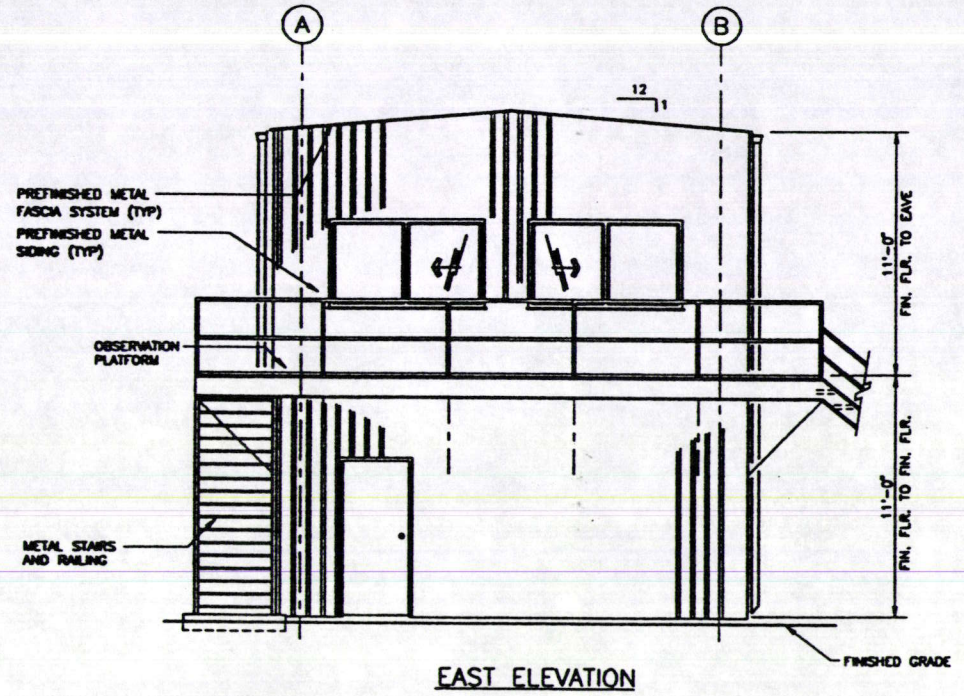
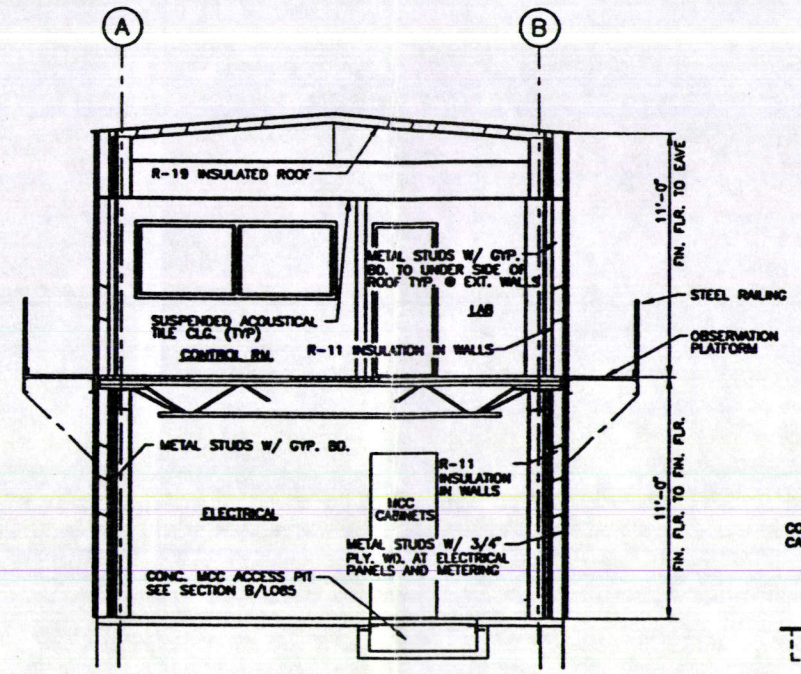
SUMMO U.S.A. CORPORATION

ELECTROWINNING & STRIPPING BLDG.
SECTIONS
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

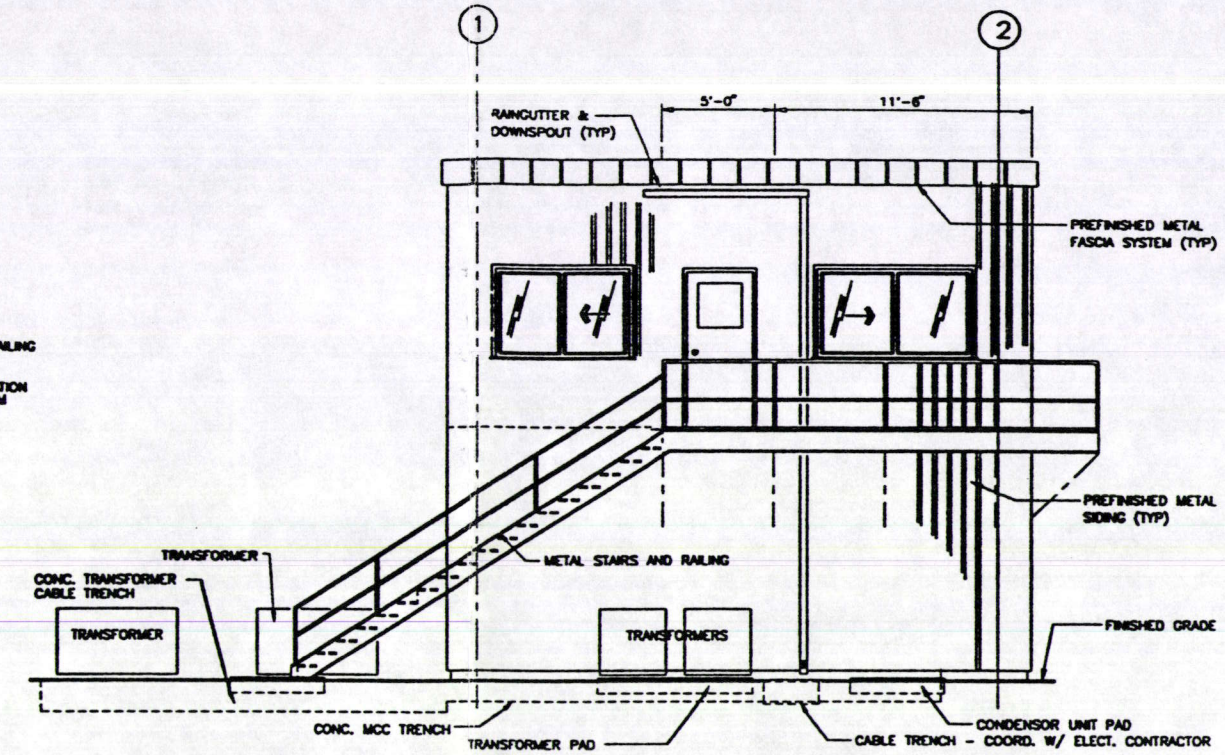
3/16"=1'-0" 3/1/95
6326-L011



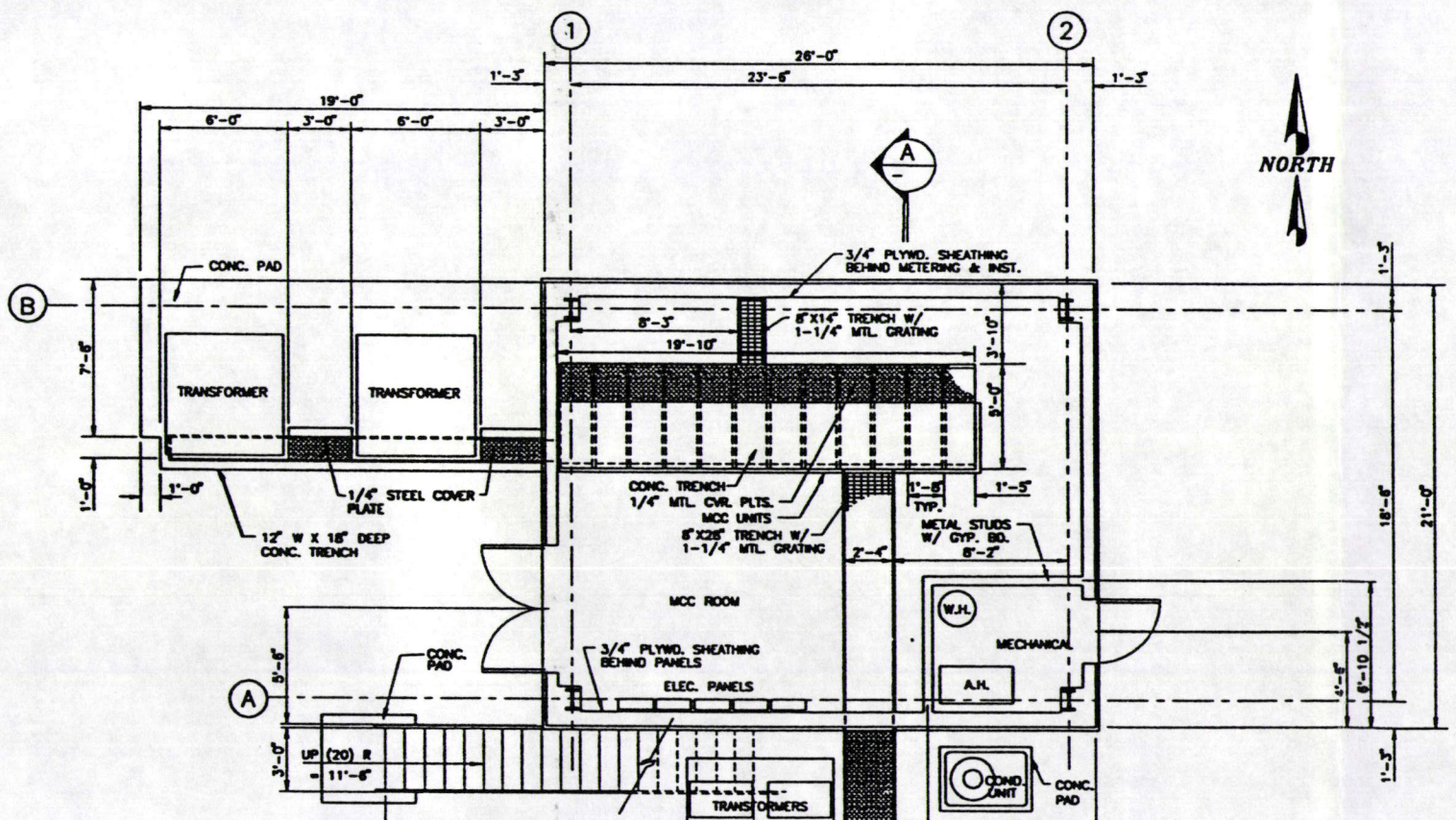
EAST ELEVATION



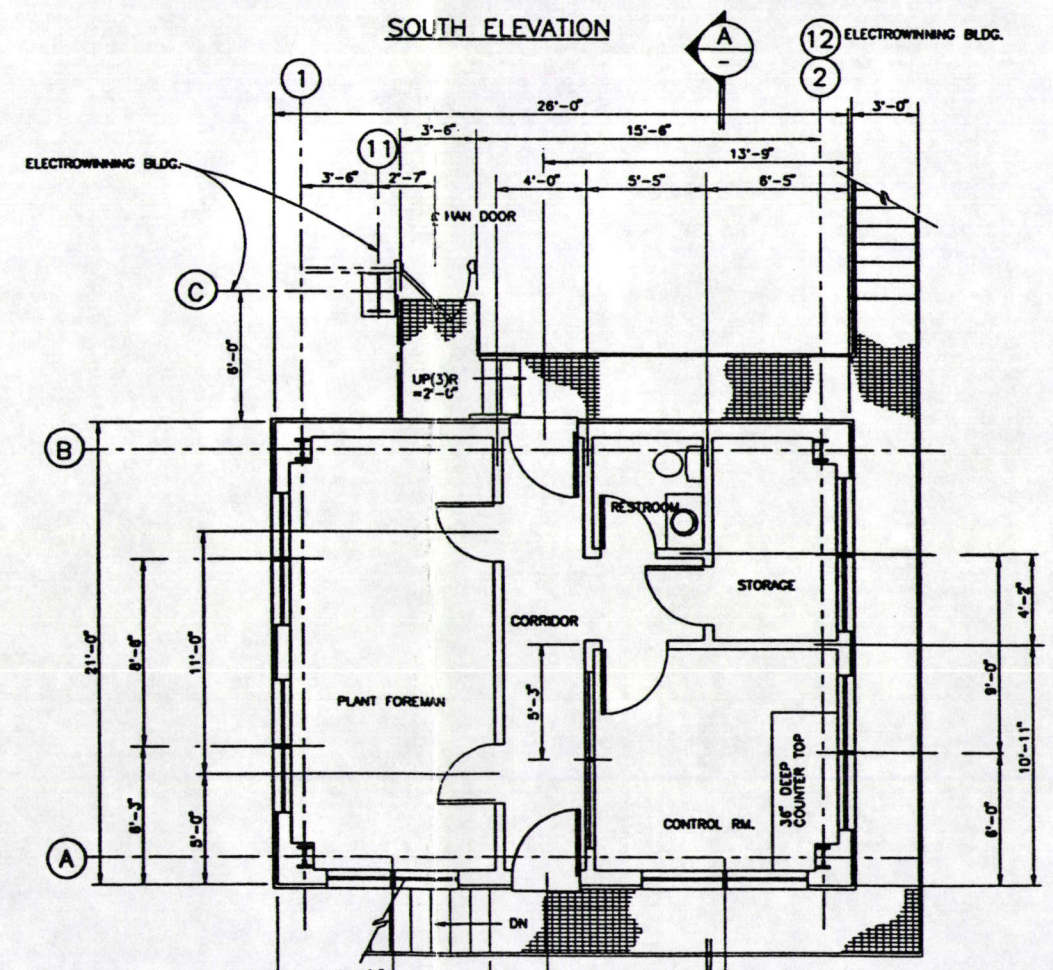
SECTION A



SOUTH ELEVATION



SX/EW CONTROL BUILDING - GRADE PLAN



SX/EW CONTROL BUILDING - UPPER PLAN

REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION	REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
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ROBERTS & SCHAEFER Company
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CHICAGO - SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

DRAWN BY HLN | DESIGNED BY GSM | APPROVED BY RJB

CONTROL BUILDING PLANS & SECTIONS
AT SX / EW AREA
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

SCALE 1/4" = 1'-0" | DATE 2/23/95
DRAWING NO. 6326-L012 | REV. A

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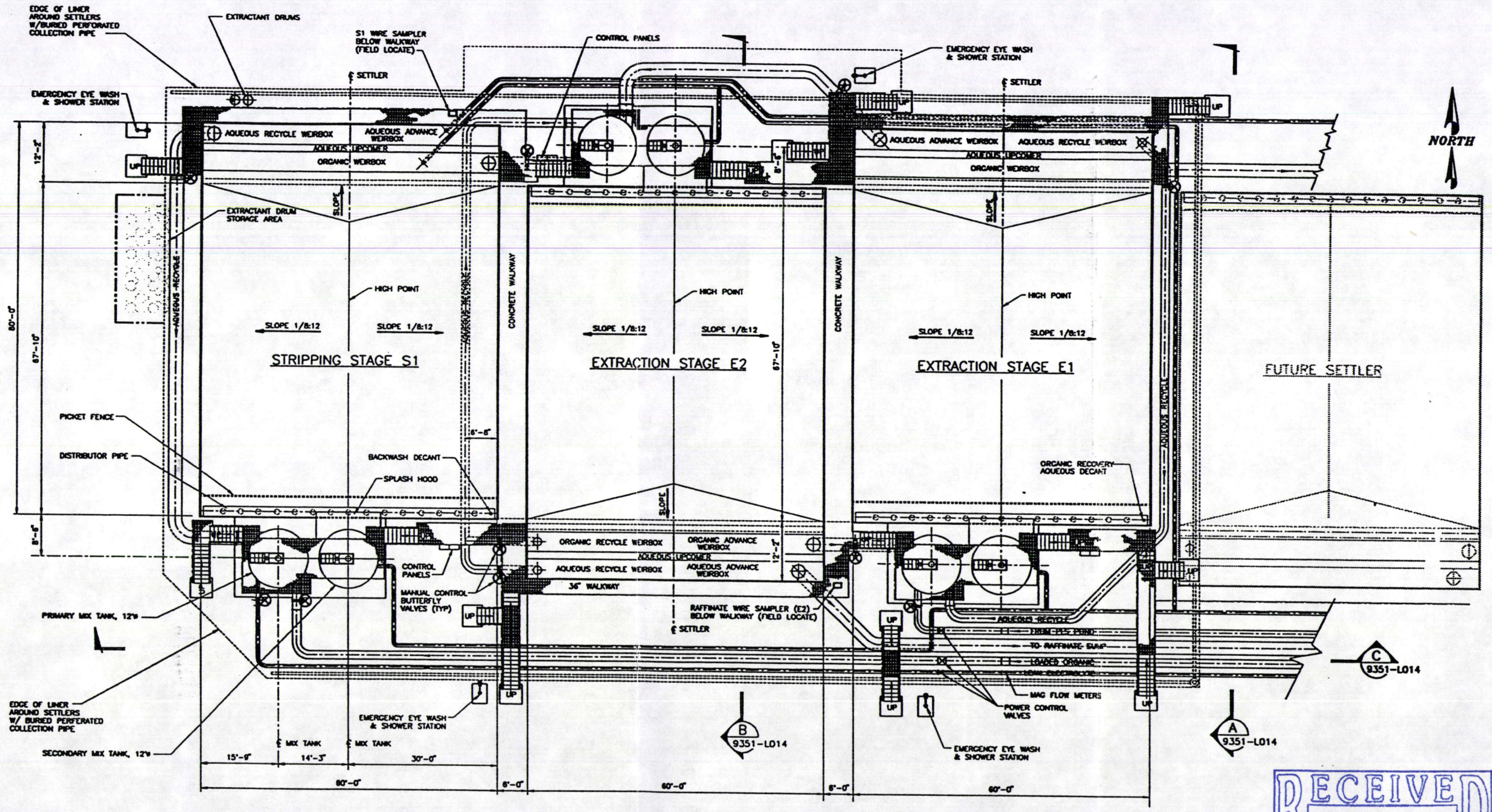

PLAN @ GRADE

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DIV. OF OIL, GAS & MINING

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ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

HLN | CBM | RJB

(SX) SOLVENT EXTRACTION SETTLERS
PLAN
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

1" = 10' | 2/27/95
6326-L013 | A

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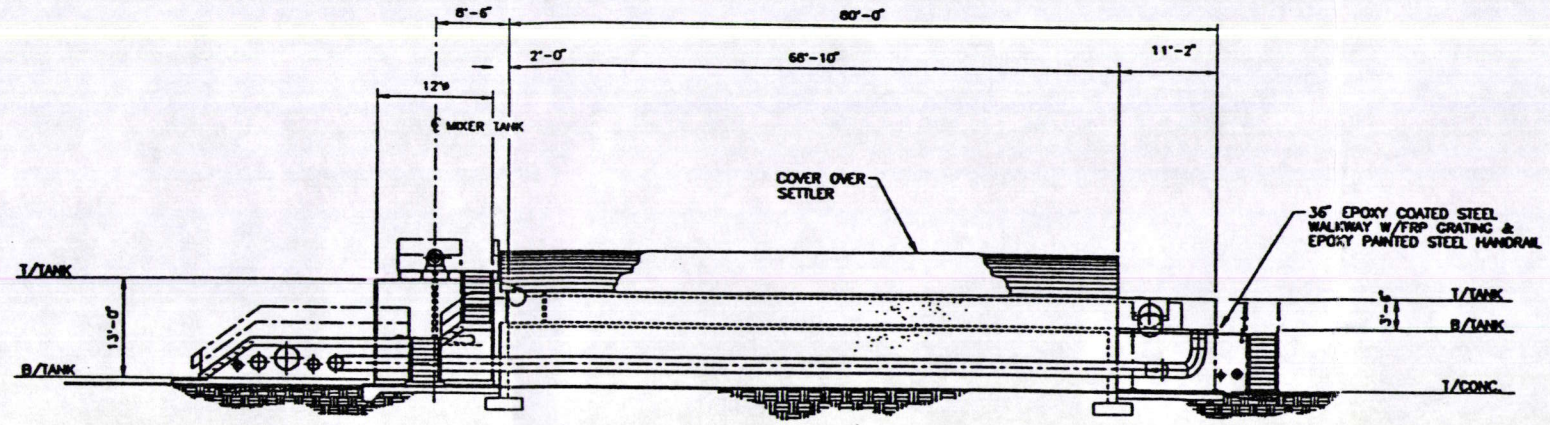
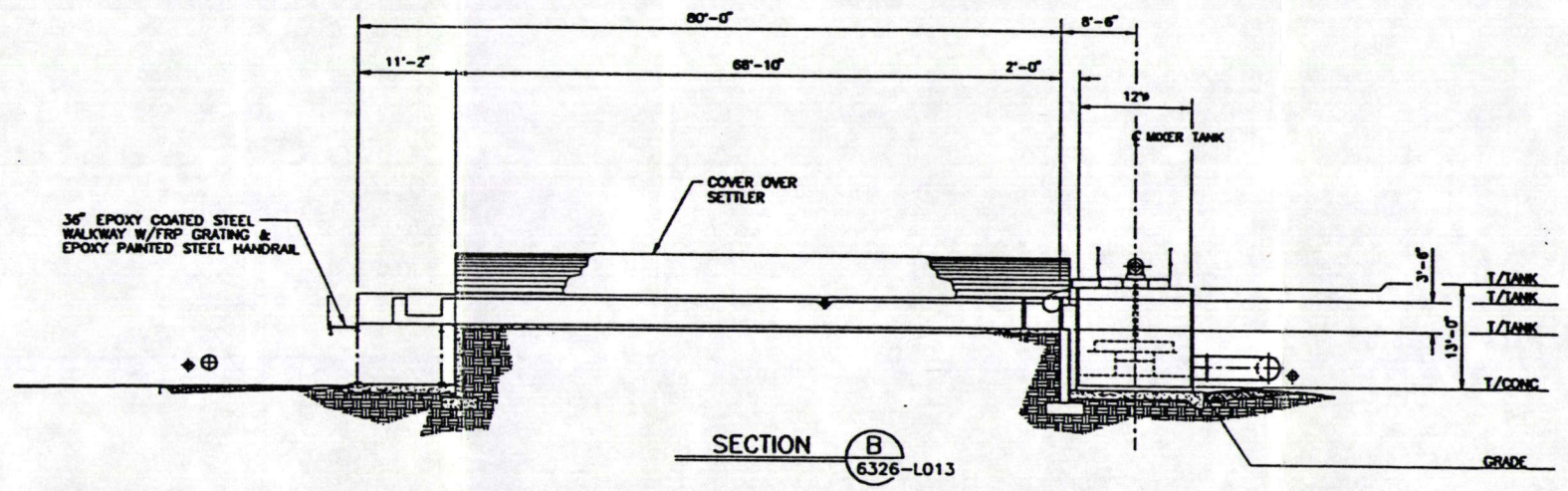
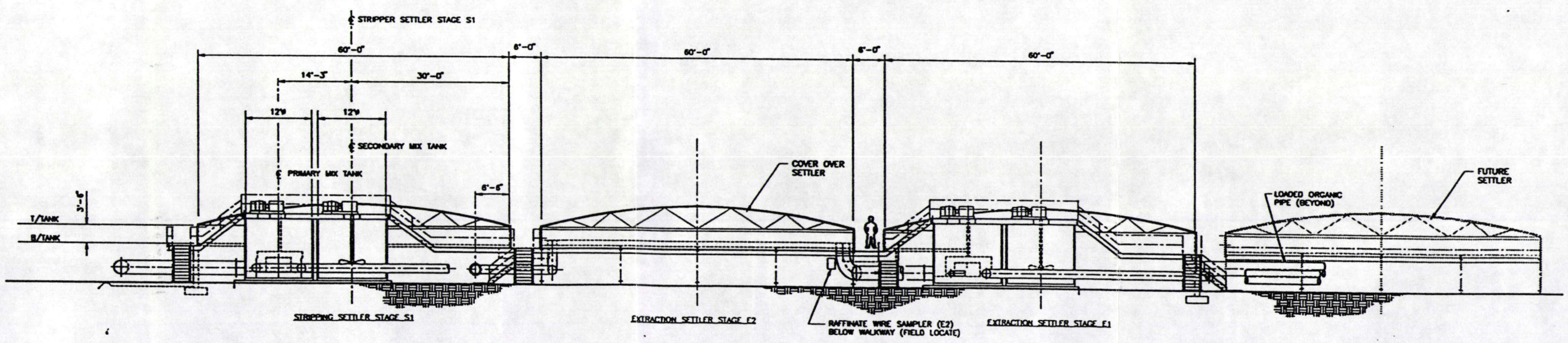


SECTION A 6326-L013



SECTION B 6326-L013



SECTION C 6326-L013

REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION	REV.	DATE	BY	CHECK	DESCRIPTION OF REVISION
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ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

HLN | GBM | RJB

(SX) SOLVENT EXTRACTION SETTLERS
SECTIONS
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

1" = 10' | 2/27/95

6326-L014 | A

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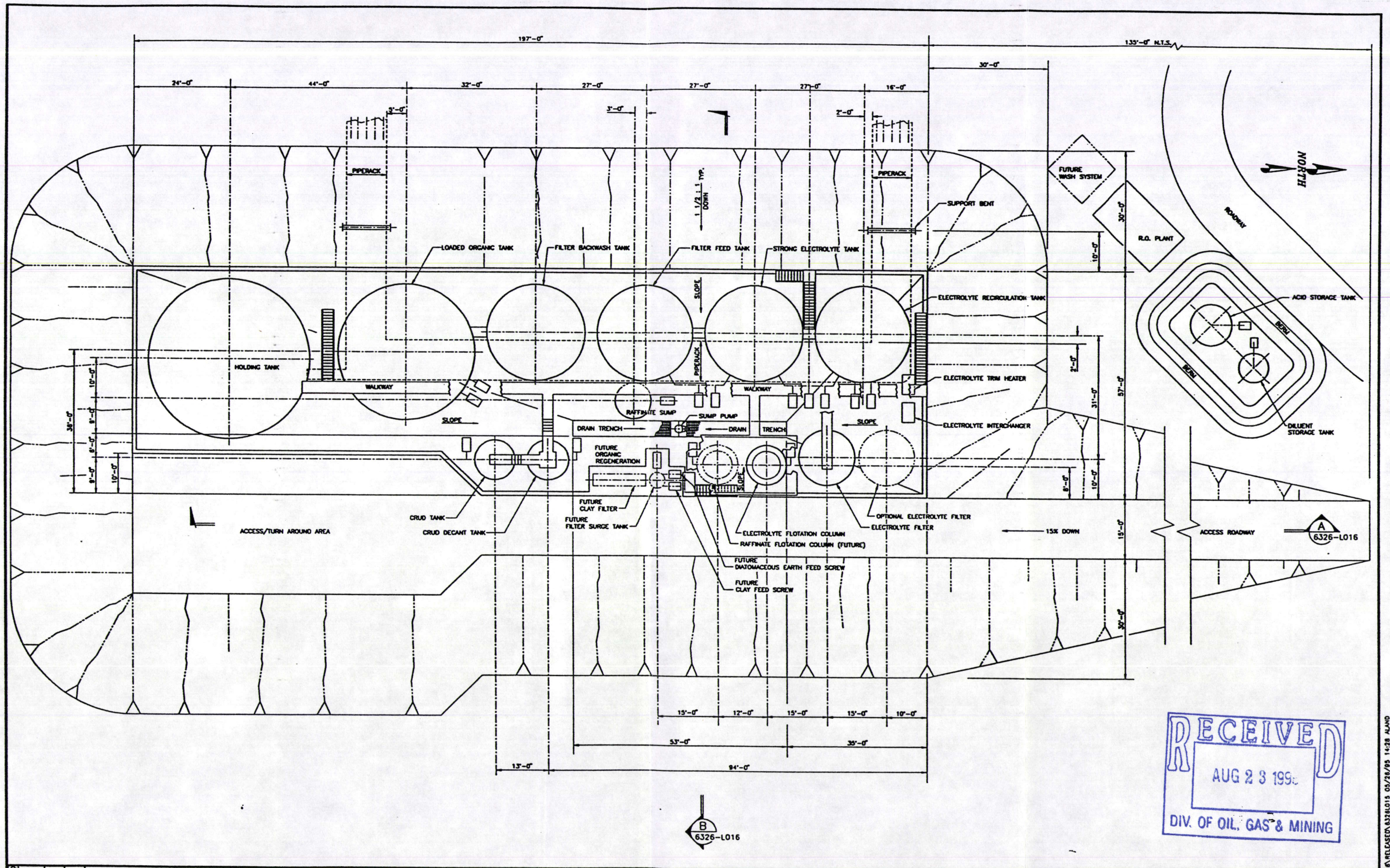

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DIV. OF OIL, GAS & MINING

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CHICAGO-SALT LAKE CITY
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DRAWN BY MLN | DESIGNED BY GBM | CHECKED BY RJB

TANK FARM
PLAN
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

SCALE 1" = 10' | DATE 2/28/95
DRAWING NO. 6326-L015 | REV. A

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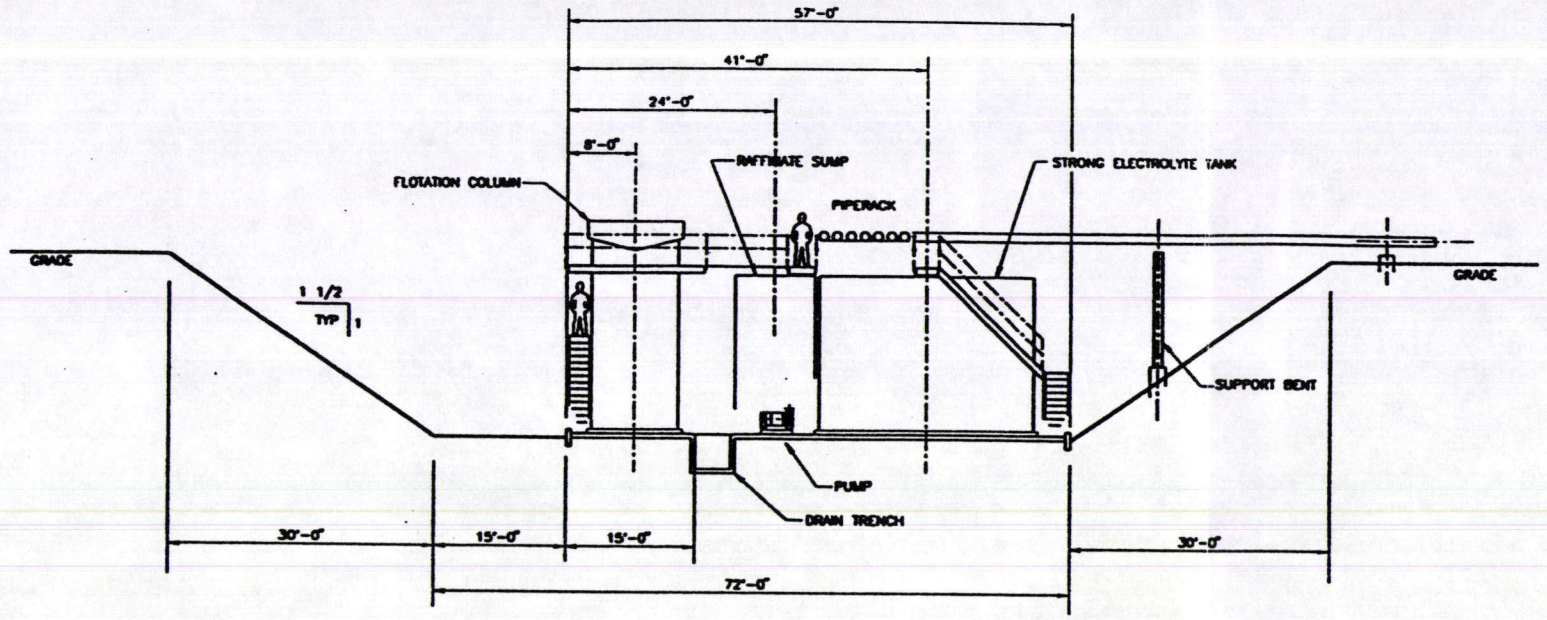
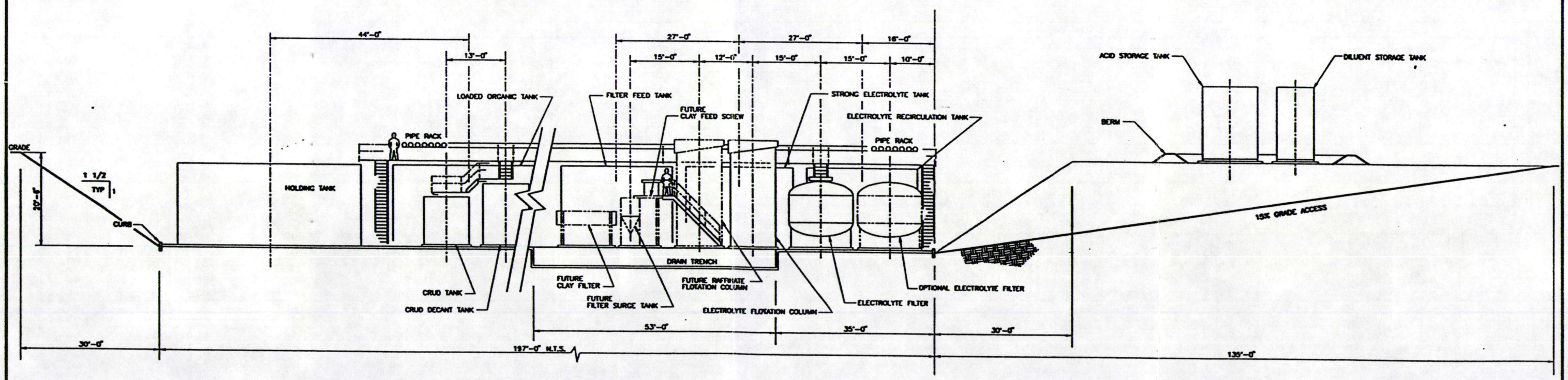


SECTION B
6326-L015



SECTION A
6326-L015

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AUG 23 1995
DIV. OF OIL, GAS & MINING

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CHICAGO-SALT LAKE CITY
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SUMMO U.S.A. CORPORATION

HLN | CBM | JUB

TANK FARM
SECTION VIEWS
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

1" = 10' | 2/26/95

6326-L016 | A

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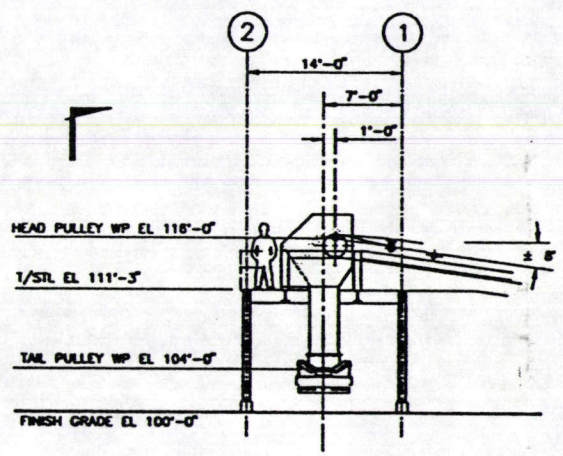
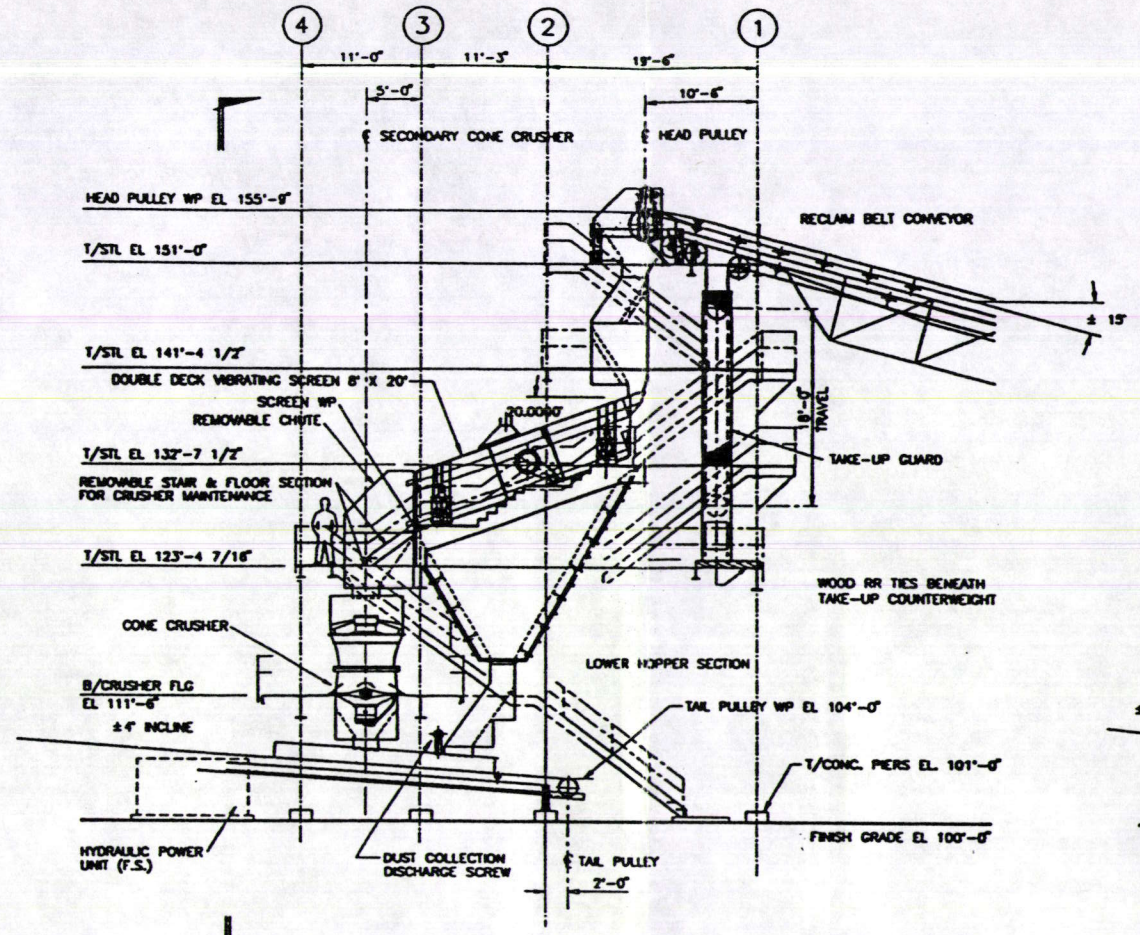


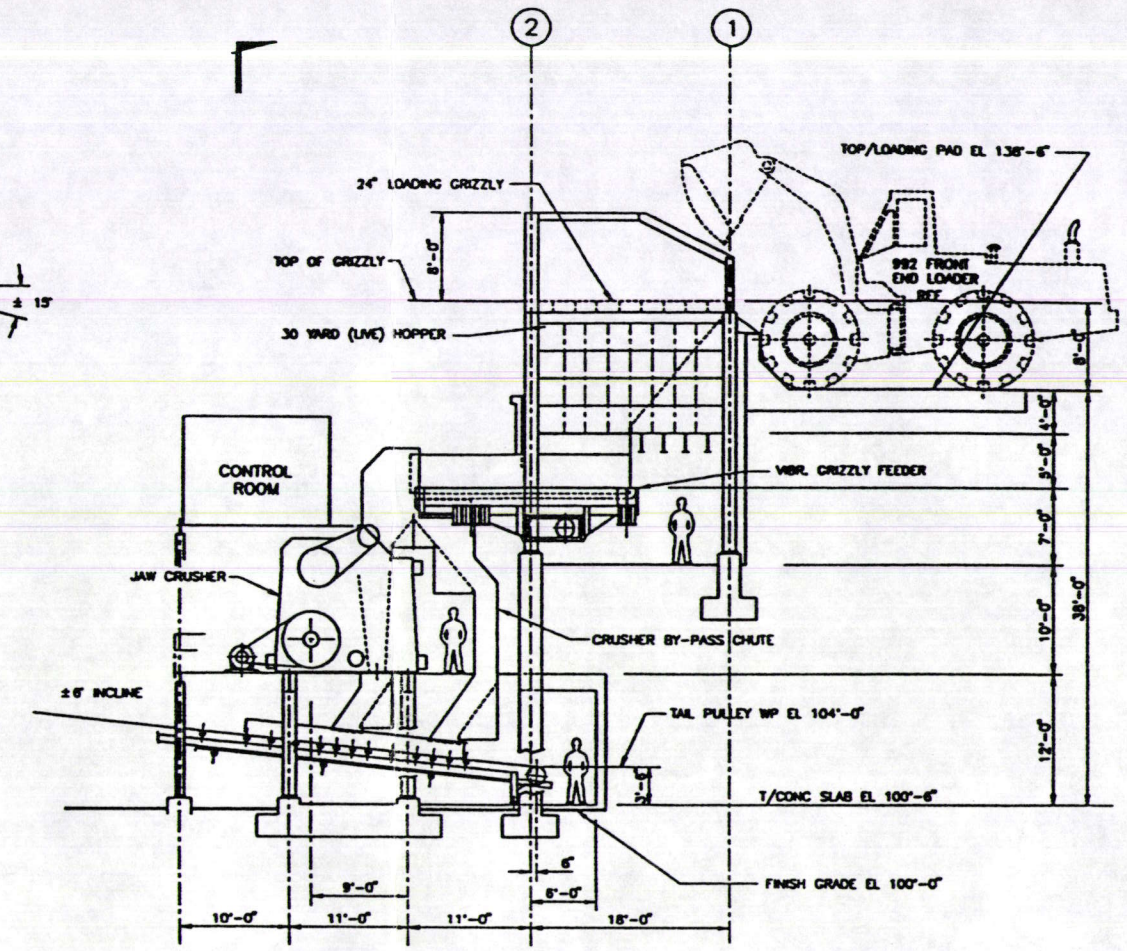
TRANSFER STATION

C 6326-L018



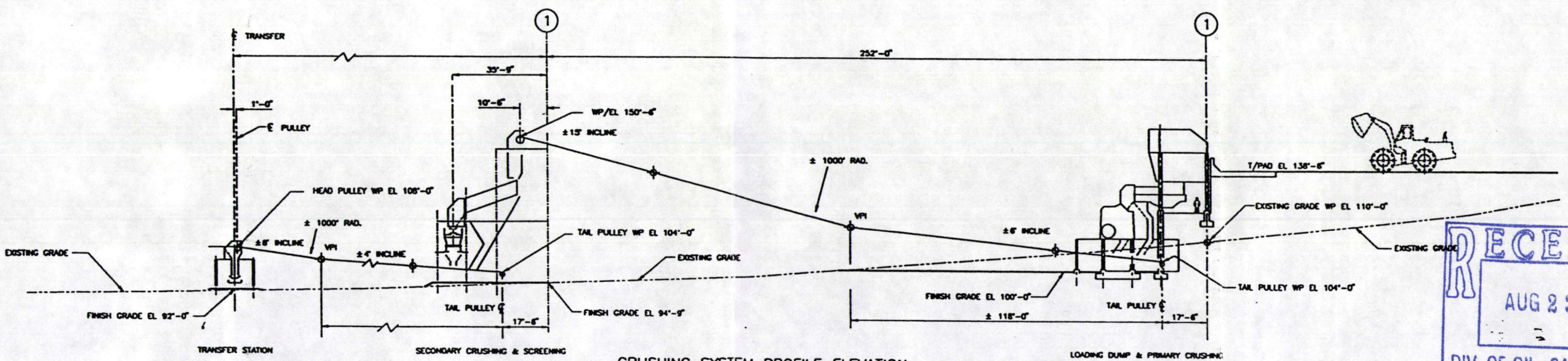
SECONDARY CRUSHING & SCREENING

B 6326-L018



LOADING DUMP & PRIMARY CRUSHING

A 6326-L018



CRUSHING SYSTEM PROFILE ELEVATION

SCALE: 1" = 20'

RECEIVED
AUG 23 1995
DIV. OF OIL, GAS & MINING

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ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

HLN | CEM | R/8

PRIMARY & SECONDARY CRUSHING
PROFILE & ELEVATION VIEWS
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

1/8" = 1'-0" | 3/3/95

6326-L017 | A

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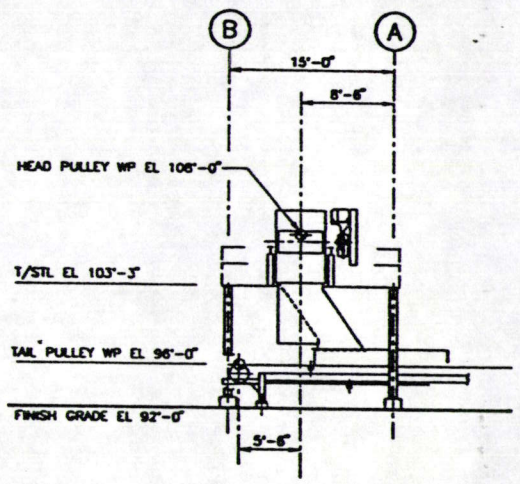
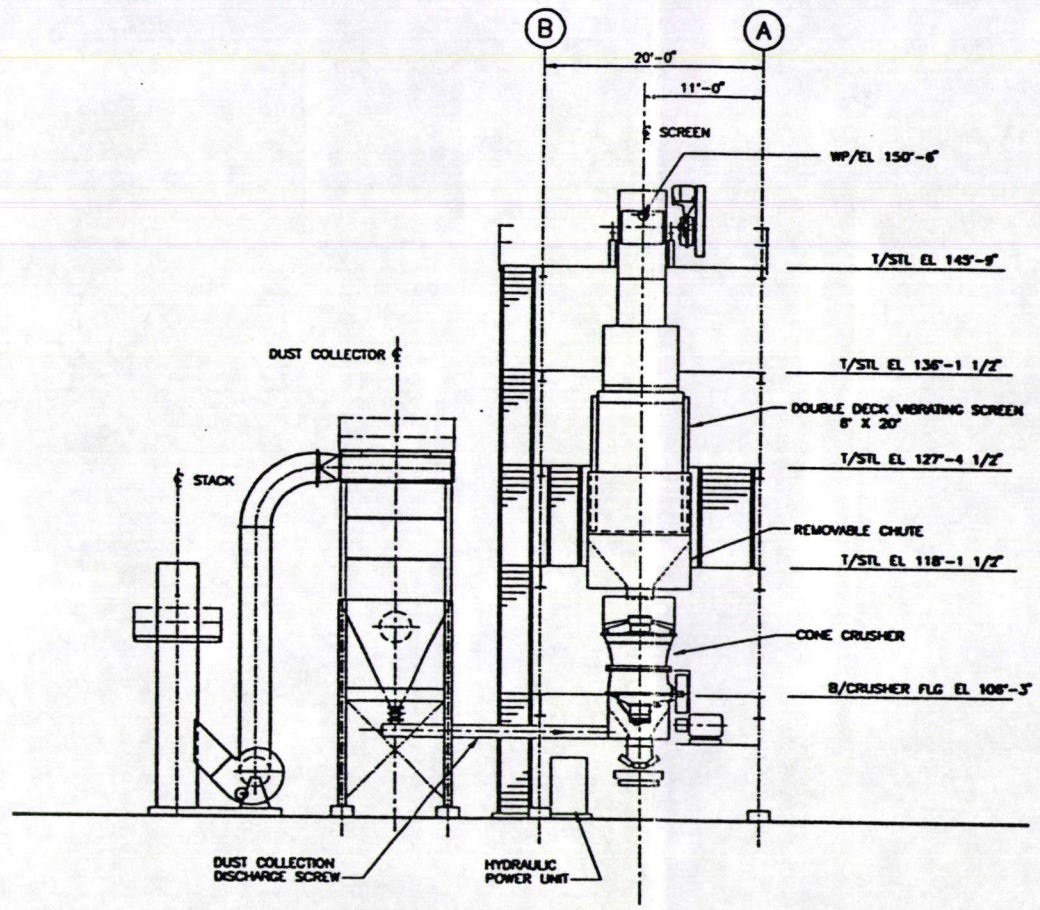


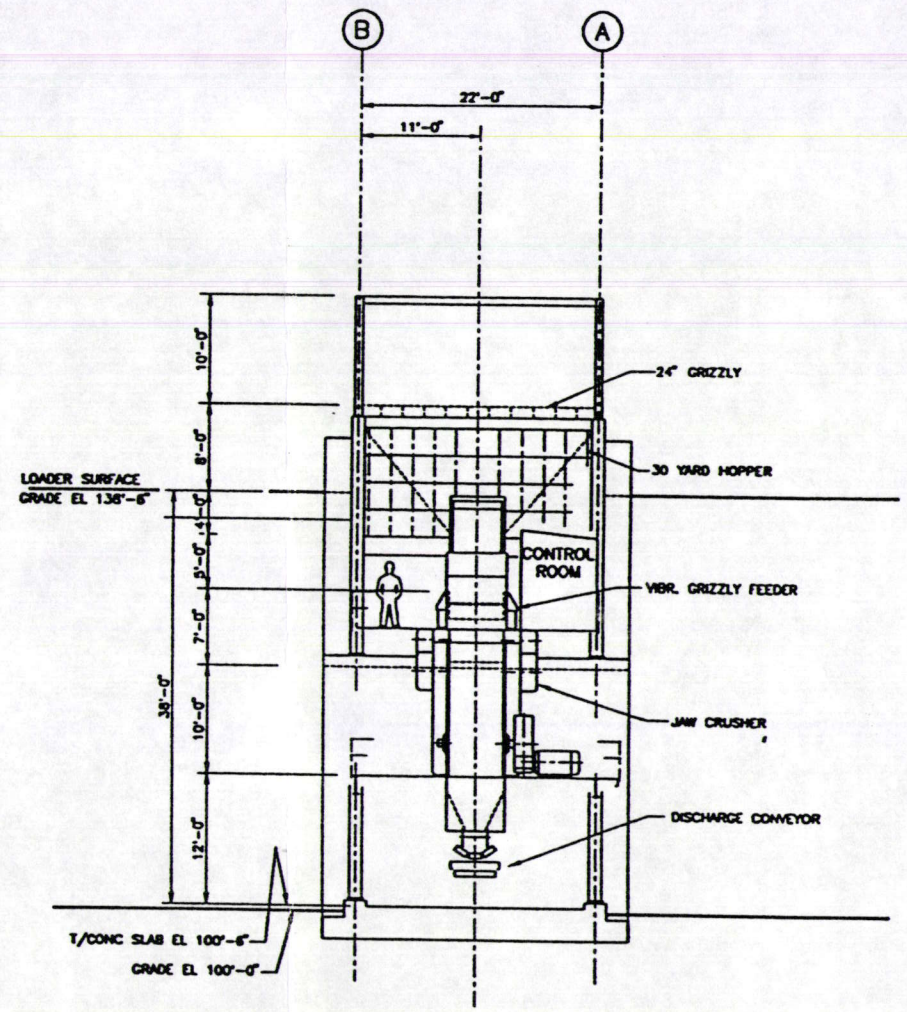
TRANSFER STATION

SECTION C 6326-L017



SECONDARY CRUSHING & SCREENING

SECTION B 6326-L017



LOADING DUMP & PRIMARY CRUSHING

SECTION A 6326-L017

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AUG 23 1995
DIV. OF OIL, GAS & MINING

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ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

DRAWN BY HLN | DESIGNED BY CBM | CHECKED BY RJB

PRIMARY & SECONDARY CRUSHING
SECTION VIEWS
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

SCALE 1/8" = 1'-0" | DATE 3/9/95

DRAWING NO. 6326-L018 | REV. A

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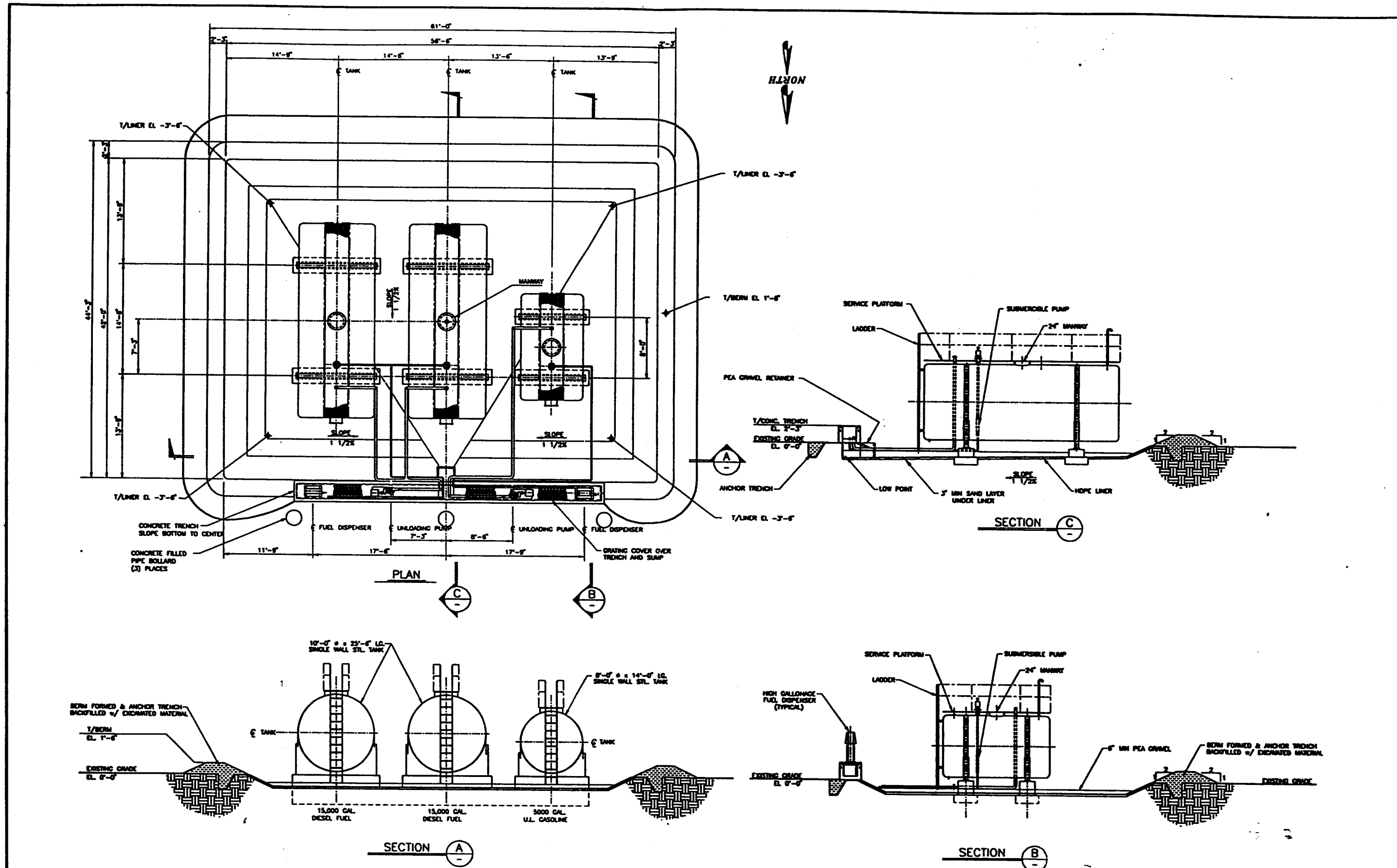

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ROBERTS & SCHAEFER Company
ENGINEERS AND CONTRACTORS
CHICAGO-SALT LAKE CITY
6326

SUMMO U.S.A. CORPORATION

HLN | CBM | FUB

FUEL STORAGE STATION
PLANS & SECTIONS
LISBON VALLEY COPPER PROJECT
SAN JUAN CO. UTAH

3/16" = 1'-0" | 2/23/95

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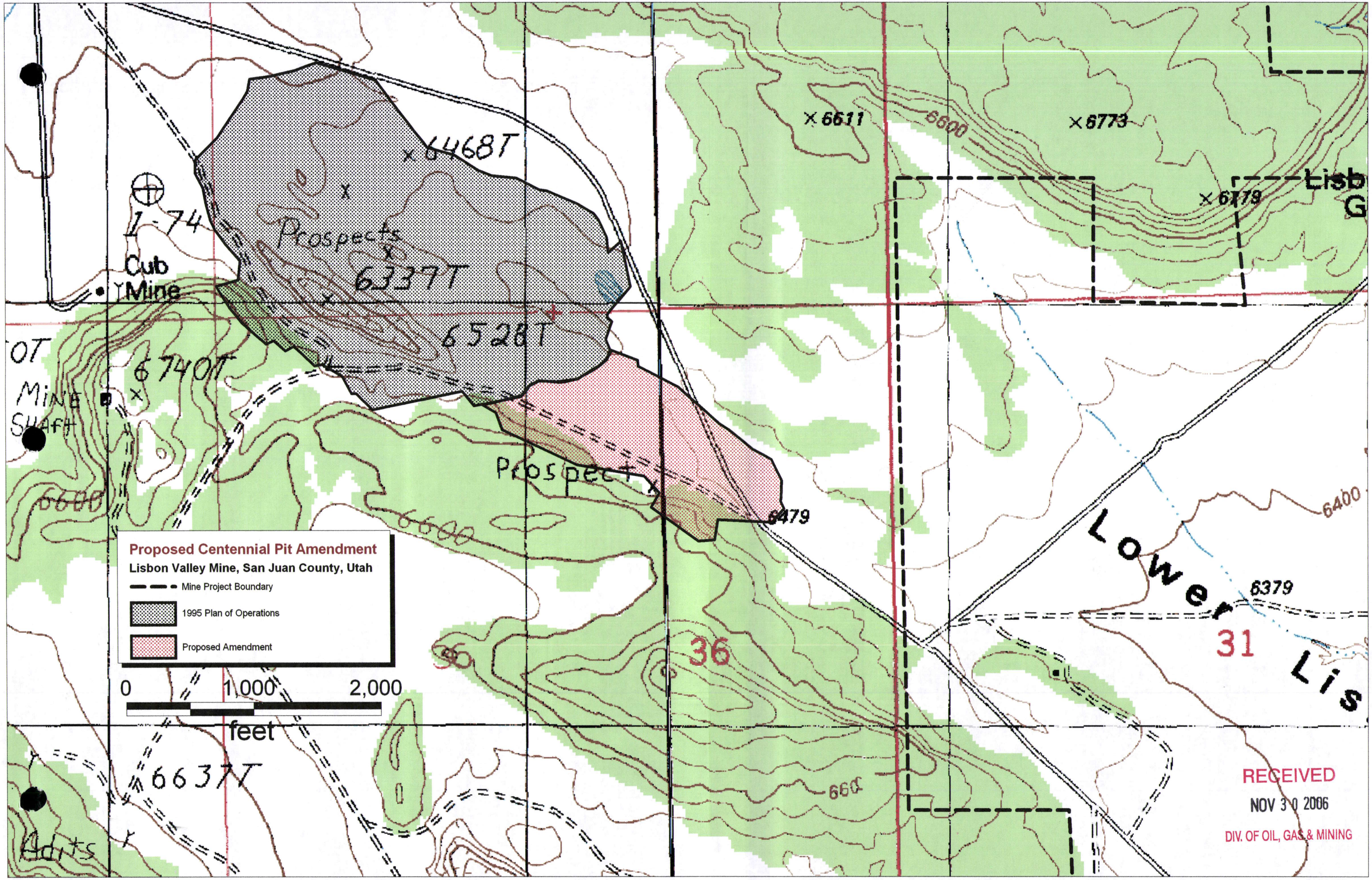
Proposed Centennial Pit Amendment
Lisbon Valley Mine, San Juan County, Utah
Mine Project Boundary
1995 Plan of Operations
Proposed Amendment
0
1,000
2,000
feet
6468T
6337T
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Whetstone Associates

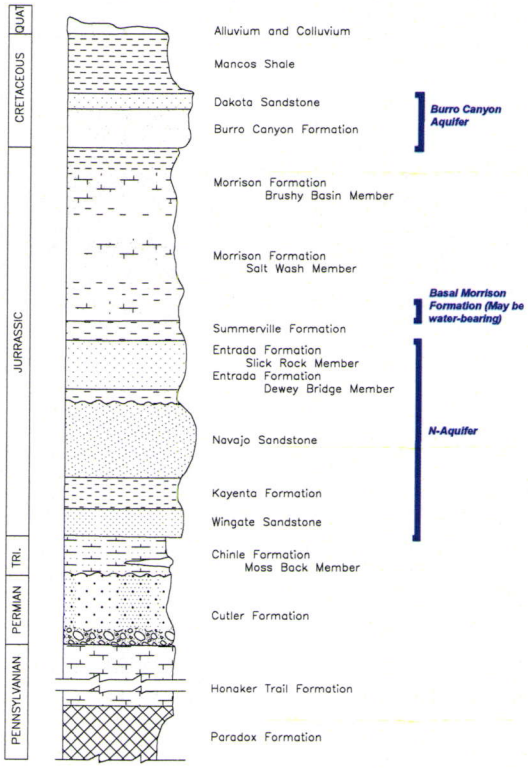
Technical Memorandum

To:	Lantz Indergard, Bob Washnock (LVMC)	**4124F**
From:	Susan Wyman, P.E., P.G.	
Date:	**January 8, 2007**	
Subject:	Groundwater Model Results for Proposed Centennial Pit Expansion	

Lisbon Valley Mining Co (LVMC) proposes to expand the planned Centennial Pit from 116 to 165 acres. The groundwater flow and mass balance model was updated to evaluate the potential effects on water quality in the shallow (Burro Canyon) aquifer and deep (N-) aquifer based on the expanded Centennial Pit geometry. The purpose of this memorandum is to briefly describe the changes in model input parameters and results.

1. HYDROGEOLOGY

Groundwater at the Lisbon Valley Mine primarily occurs in two aquifers, the Burro Canyon aquifer (or D-aquifer) which occurs at depths of less than 500 feet and the Navajo aquifer (or N-aquifer) which occurs below about 850 feet. These two aquifer systems are separated by several hundred feet of low-permeability interbedded shale, siltstone, and silty sandstone (Morrison Formation and Summerville Formation) as shown in Figure 1. An unsaturated zone exists between the upper and lower aquifers, and water levels indicate that strong downward vertical gradients exist.



Incorporated 1/4/08 PBB

Figure 1. Stratigraphic Column Showing Burro Canyon Aquifer and N-aquifer

Whetstone Associates, Inc.
137 W. Ryus St ♦ P.O. Box 1156 ♦ La Veta, Colorado 81055-1156 ♦ Phone 719-742-5155 ♦ Fax 719-742-5776

2. MODELING METHODOLOGY

The numerical spreadsheet model simulates the post-mining water balance and mass balance for the Centennial pit. The model uses a calculated vertical permeability for both the low-permeability materials below the Burro Canyon aquifer and the fracture conduits that are known to exist at the site. The water level, flow, and quality in both the pit and the adjacent aquifer are simulated. The model assesses the effects of the project on both shallow and deep groundwater near the pits. The method is described in detail in the 1998 Annual Update Report (ABC, 1998) and Attachment 3 of the 2005 Annual Hydrogeologic Update Report (Whetstone, 2006).

2.1.1 Flow Model

The water balance model computes the flow into and out of the pit and adjacent shallow aquifer, and tracks surface water inflow, precipitation, horizontal inflow or outflow from a shallow aquifer adjacent to the pit, vertical leakage to the underlying aquifer, and evaporation. These flow components are shown in Figure 2.

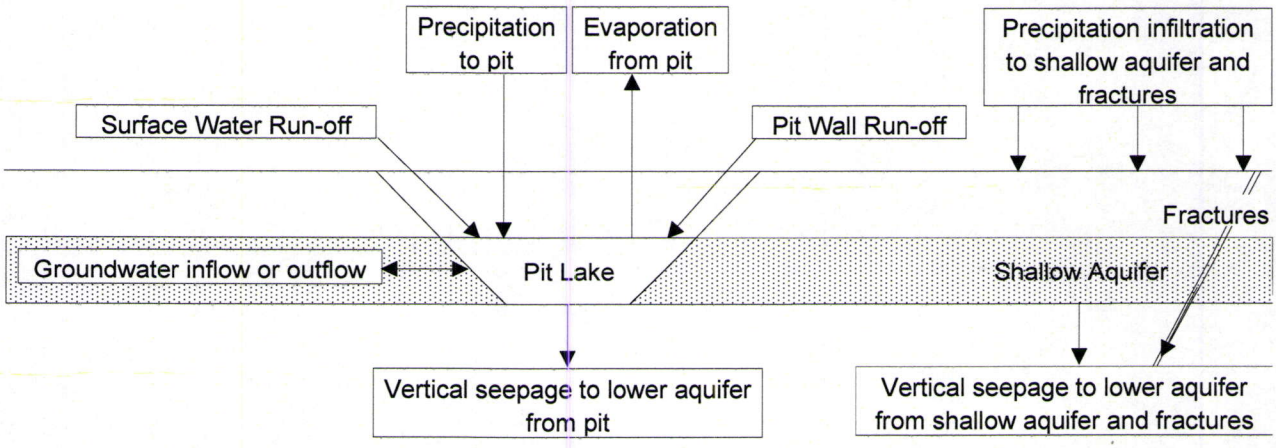


Figure 2. Water Balance Components

The model calculates a head-dependent vertical leakage to the lower aquifer. The driving force for vertical flow is greater with increasing hydraulic heads (water levels) in the pits and shallow aquifer. The model also calculates head-dependent flux to or from the shallow aquifer. Groundwater flow to the pit is a function of the water level in the shallow aquifer. The specific steps for implementation of the water balance model are given in Appendix B of the 1998 Hydrogeologic Update report (ABC, 1998) and in Attachment 3 of the 2005 Annual Hydrogeologic Update Report (Whetstone, 2006).

Pit refilling will begin at the end of mining, when the dewatering pumps in the shallow aquifer are turned off. In the early years, surface water and pit wall runoff to the pits will help to recharge the shallow aquifer. After that time, the net annual flow will be from the shallow aquifer to the pits. As the pit levels increase, their evaporative areas increase. Eventually, the pond evaporation and leakage to the deep aquifer from the pits equals the inflow from runoff and groundwater. The pit pond elevations stabilize at an equilibrium level that balances evaporative and seepage losses against gains from precipitation, runoff, and shallow aquifer flowing to the pit. The final equilibrium water level in pit and shallow aquifer is lower than the pre-mining static water level because the recharge to the shallow aquifer is limited and the evaporative flux is high, relative to the aquifer recharge rate.

2.1.2 Geochemical Model

The geochemical model uses the water balance predicted by the flow model to distribute chemical mass to and from the various system components. The model tracks the flux and total mass in the pit pond, the shallow aquifer, and the deep aquifer. The means by which chemical mass moves between these three "compartments" in the model is described below:

- *Shallow Aquifer and Fractures.* Chemical mass may enter the shallow aquifer and fractures via precipitation infiltration on the aquifer recharge area and by outflow from the pit to groundwater. Chemical mass may exit the shallow aquifer and fractures by vertical leakage to the deep aquifer and by groundwater flow to the pit.
- *Pit Pond.* Chemical mass may enter the pit from influent surface water runoff, pit wall runoff, and shallow aquifer and fracture groundwater inflow. Evaporation removes water from the pit pond, but not chemical mass (therefore the pond has the ability to evapoconcentrate). Chemical mass may exit the pit by vertical leakage through the pit floor to the deep aquifer and outflow to shallow groundwater.
- *Deep Aquifer.* Chemical mass enters the deep aquifer via vertical leakage from the shallow (Burro Canyon) aquifer, from flow in vertical fractures, and from the pit pond. Chemical mass exits the deep aquifer by horizontal or vertical flow out of the aquifer area.

The primary input parameters used in the chemical balance model are the chemical concentrations of the following waters:

1. Groundwater in the "intact" Burro Canyon aquifer,
2. Groundwater in fracture flow,
3. Runoff from surface soils,
4. Runoff from pit walls, and
5. Groundwater in the deep system (N-aquifer).

The geochemical modeling was performed using total dissolved solids (TDS). TDS is representative of the behavior of conservative species (i.e., elements that do not attenuate along the groundwater flow path).

3. CHANGES IN MODEL INPUT FOR CENTENNIAL PIT EXPANSION

3.1 Pit Geometry

The proposed expansion would result in a larger total area of pit wall to capture runoff. Additionally, the pit floor elevation is higher and the lower levels are smaller in the expanded Centennial Pit than for in original pit. This change in shape of the lower benches affects the size and depth of the ultimately pit pool. The model uses linear interpolation (slope-intercept equation) to determine the pit pond area and volume, based on the planned pit geometry (Table 1). The slope-intercept variables are given in Attachment 1.

Table 1. Comparison of Original and Expanded Centennial Pit Geometry

Elevation (ft amsl)	Original Area (acres)	Expanded Area (acres)	Ratio
6080	3.1	1.0	33%
6100	---	3.4	---
6120	11.2	4.3	38%
6140	---	10.7	---
6160	24.2	18.4	76%
6180	---	30.1	---
6200	38.7	43.2	112%
6220	---	49.5	---
6240	56.7	68.8	121%
6260	---	85.5	---
6280	78.5	92.4	118%
Total Area	116	165	142%

3.2 Soil Runoff Areas

The model incorporates runoff from soil surrounding the pit, outside of the excavation and inside of a berm located 50 feet from the edge of the pit. The area providing runoff from soil is 15.5 acres in the expanded model, vs. 11.1 acres in the original Centennial Pit model.

3.3 Pit Wall Runoff Chemistry

Concentrations of dissolved solids in pit wall runoff were calculated based on updated engineering drawings showing the expected rock types exposed in the final pit walls (Figure 3) and meteoric water mobility (MWMT) and synthetic precipitation leaching procedure (SPLP) test results.

Pit wall runoff concentrations are a function of the amount of runoff and the type rock exposed in the final pit wall. To determine the average runoff concentration, it is necessary to determine the percentage of each rock type exposed in the final pit wall and the expected TDS load provided by each rock type. The chemical load provided by each rock type is summed to determine the total chemical load, as described in the following equation:

$$C_T = \sum_{i=1}^{n} \left[C_i \times \frac{A_i}{A_T} \right]$$

where:
- $C_T =$ Total runoff concentration for a given pit
- $\Sigma_i =$ Summation of all rock types (i), from 1 to n
- $n =$ total number of rock types exposed in the final pit wall
- $C_i =$ Concentration in solution running off from a specific rock type (i)
- $A_i =$ Area of the pit wall, in acres, occupied by a specific rock type (i)
- $A_T =$ Total area of the final pit wall, in acres

The area of the pit wall occupied by each rock type is shown in Table 2. The area of the pit walls and relative percentages are calculated for a dry pit, before a pond develops. The percentages of exposed rock types in the pit walls would actually change, as the pit pond covers some of the rocks exposed in the floor and lower levels of the pit.

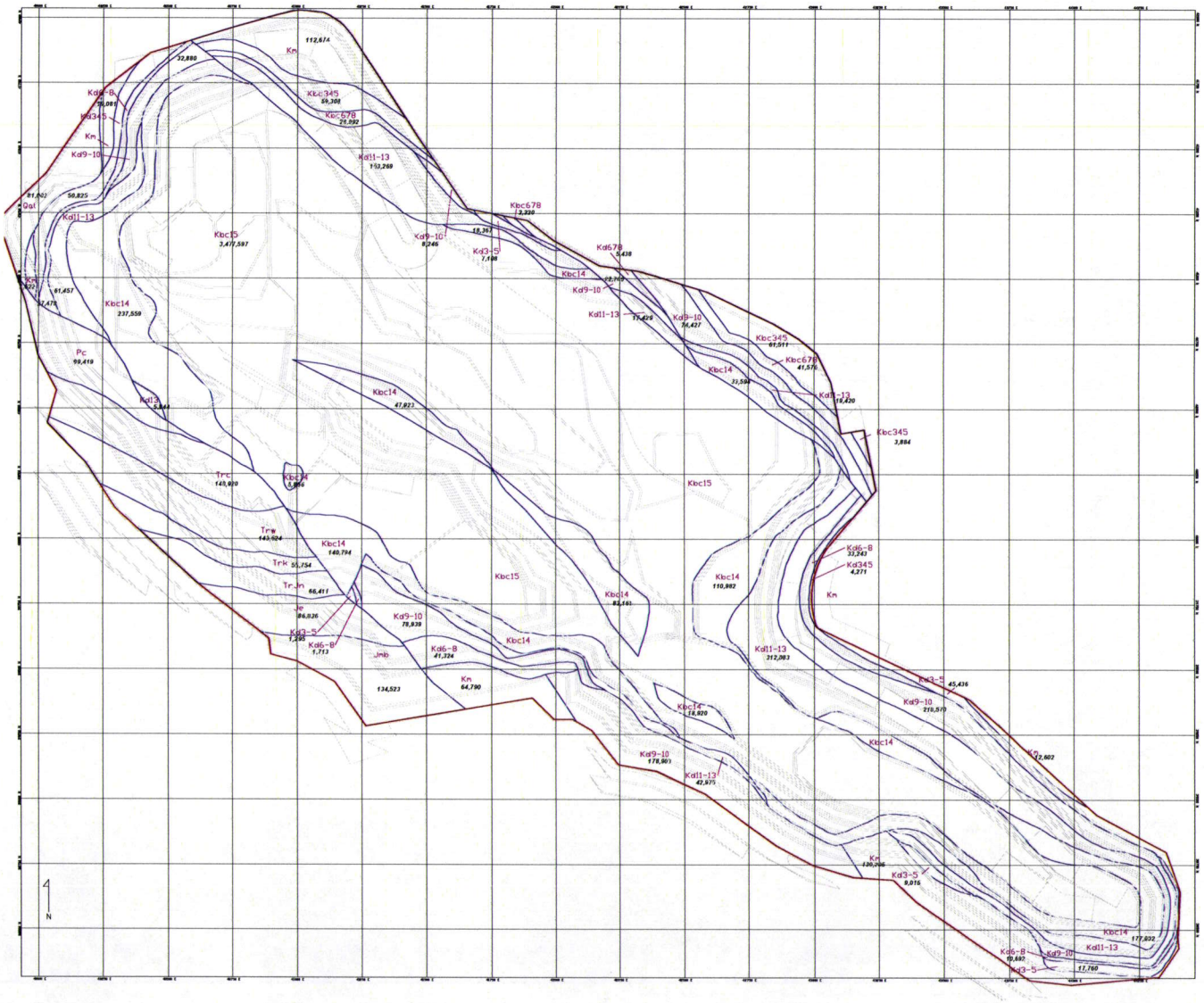


Figure 3. Map of Rock Types to be Exposed in the Expanded Centennial Pit Wall

Table 2. Areas of Rock Types to be Exposed in the Expanded Centennial Pit Wall

Rock Type	Original Centennial Pit (acres)	Expanded Centennial Pit (acres)	Ratio
Qal	0.22	1.86	845%
Km	0.26	8.17	3143%
Kd_{3-5}	2.13	5.77	271%
Kd_{6-8}	2.1	4.42	211%
Kd_{9-13}	10.37	28.17	272%
Kbc_{14}	10.22	20.07	196%
Kbc_{15}	55.9	79.83	143%
Jm	4.64	3.09	67%
Je	0.99	1.99	201%
Jn	1.15	1.52	133%
TRk	1.03	1.28	124%
TRw	2.88	3.29	114%
TRc	2.87	3.42	119%
Pc	3.42	2.28	67%
TOTAL	**98**	**165.2**	169%

Assuming that MWMT/GWMT and SPLP leach tests adequately reproduce leaching behavior of short-duration runoff events, the concentration in runoff from each rock type (C_i) can be estimated using leach test results. These tests are typically performed using water:rock ratios which typically range from 1:1 to as much as 20:1. The leach test analytical results must be scaled to match the expected field conditions, as a function of the water:rock ratio. This concept is described in the following equation:

$$C_i = L_i \times \frac{(w{:}r)_l}{(w{:}r)_f}$$

where:
- C_i = Concentration in solution running off from a specific rock type (i)
- L_i = Leachate concentration of rock type (i), from MWMT/GWMT or SPLP tests
- w = Mass of water used in the leach test
- r = Mass of rock used in the leach test
- $(w{:}r)_l$ = Water:rock ratio used in the laboratory leach test
- $(w{:}r)_f$ = Water:rock ratio predicted for the field

The calculated pit wall runoff rate of 0.74 inches/year (ABC, 1998) and thickness of reacting rock (ABC, 1998) result in a water:rock ratio of 3.5:1. MWMT, GWMT, and SPLP tests that are performed using water:rock ratios of 1:1, 1:1, and 20:1, respectively, are scaled to 3.5:1 to represent the expected concentrations in pit wall runoff.

The area-weighted pit wall runoff concentration for the expanded Centennial Pit (Table 3) is 50% higher than the concentration used in the original model, largely due to greater exposure of Mancos Shale (Km), a large contributor to TDS.

Table 3. Pit Wall Runoff Concentration for Original and Expanded Centennial Pit

Rock Type	TDS Loading Original Pit (mg/L)	TDS Loading Expanded Pit (mg/L)
Qal	0.61	3.06
Km	3.68	68.62
Kd_{3-5}	2.78	4.47
Kd_{6-8}	4.76	5.95
Kd_{9-13}	13.5	21.76
Kbc_{14}	8.5	9.90
Kbc_{15}	72.8	61.68
Jm	3.85	1.52
Je	1.29	1.54
Jn	1.5	1.18
TRk	1.34	0.99
TRw	3.75	2.55
TRc	3.74	2.64
Pc	2.84	1.12
Sum	**124.94**	**186.99**

4. CENTENNIAL PIT WATER BALANCE RESULTS

The results of the water balance model for the expanded Centennial Pit are shown in detail in Attachment 1. The expanded Centennial Pit geometry results in greater runoff into the pit, and a slightly higher pit pool level. The model predicts that water levels stabilize at 40.40 feet above the pit floor, vs. 23.21 and 23.24 feet in previous modeling (ABC, 1998; Whetstone 2006).

The predicted final water level elevation is 59.6 feet below the present day static water level, as shown in Figure 4. The pit and aquifer take approximately 42 years to refill to 50% of the final level, and approximately 100 years to reach 99% of the final level.

During the first 42 years after mining, the pit recharges the groundwater in the shallow aquifer. After 42 years, the net annual flow is from the aquifer toward the pit. Under the final, quasi-steady-state conditions, groundwater flows from the aquifer to the pit at an average annual rate of 2.1 acre-ft/yr.

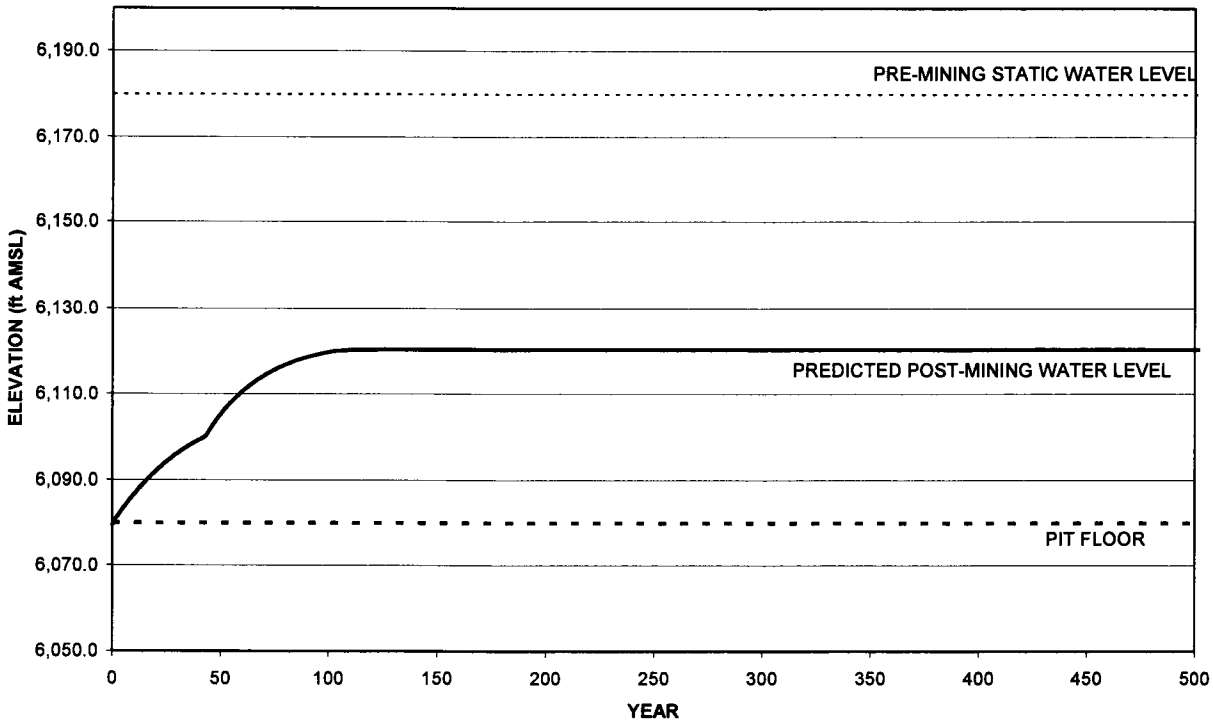


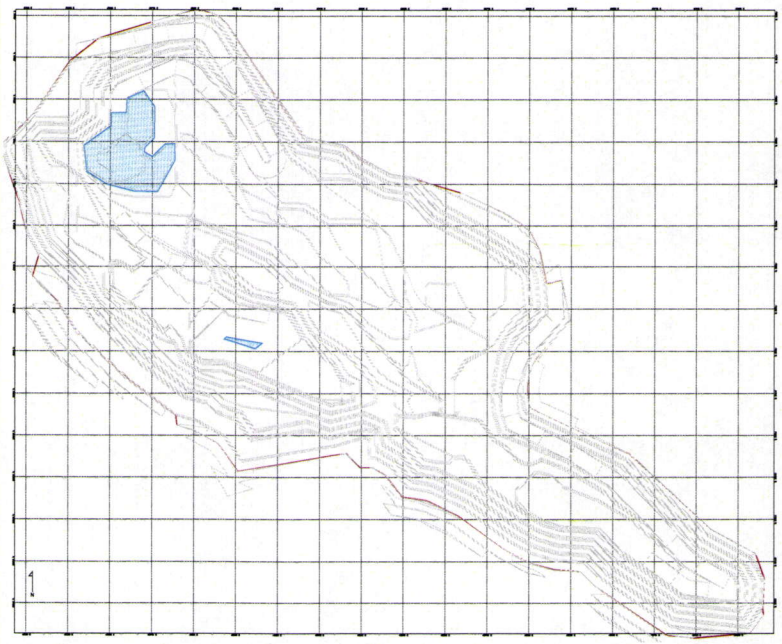
Figure 4. Model Results: Post-Mining Water Levels in the Centennial Pit

The area of the pond, after more than one hundred years of refilling, is shown in Figure 5. The 4.4-acre pond represents a small area relative to the size of the pit and the shallow aquifer. Evaporation from this surface would average 11.0 gpm (17.7 acre-ft/yr). Leakage through fractures to the deep aquifer would be 10.5 gpm (16.95 acre-ft/yr); leakage from the shallow (Burro Canyon) aquifer to the deep aquifer would be 1.1 gpm (1.7 acre-ft/yr); and leakage from the pit to the deep aquifer would be a small fraction of that (0.20 gpm, 0.33 acre-ft/yr). Input data used in the Centennial Pit refilling model, and output for 500 years are given in Attachment 1. The updated water balance results are shown in Table 4.

Table 4. Summary of Water Balance Model Results for the Centennial Pit

Model	CENTENNIAL PIT ABC, 1998a	CENTENNIAL PIT 2005 Annual Update	CENTENNIAL PIT Proposed Expansion
Pre-mining ground elevation (ft)	6,440	6,440	6,440
Original water table elevation (ft)	6,180	6,180	6,180
Final pit floor elevation (ft)	6,060	6,060	6,080
Predicted final water level elevation (ft)	6,083.24	6,083.21	6,120.40
Depth of floor below predicted pond surface (ft)	23.24	23.21	40.40
Pit area (acres)	116	116	165.4
Predicted final pond area (acres)	3.8	3.8	4.4
Pond evaporation	9.4 gpm, 15.22 acre-ft/yr	9.4 gpm, 15.2 acre-ft/yr	11 gpm, 17.7 acre-ft/yr
Pit Wall Run-on	4.3 gpm, 6.9 acre-ft/yr	4.3 gpm, 6.9 acre-ft/yr	6.1 gpm, 9.89 acre-ft/yr
Leakage from intact BC aquifer to N-aquifer	1 gpm, 1.59 acre-ft/yr	1 gpm, 1.58 acre-ft/yr	1.1 gpm, 1.7 acre-ft/yr
Leakage from fractures to N-aquifer	9.8 gpm, 15.86 acre-ft/yr	9.8 gpm, 15.78 acre-ft/yr	10.5 gpm, 16.95 acre-ft/yr
Leakage from pit to N-aquifer	0.16 gpm, 0.26 acre-ft/yr	0.16 gpm, 0.26 acre-ft/yr	0.2 gpm, 0.33 acre-ft/yr

Figure 5. Map of Predicted Post-Mining Centennial Pit Pool Surface Area



4.1.1 Centennial Pit Chemical Balance Results

The chemical balance model for the expanded Centennial Pit is similar to previous modeling. The results indicate that the TDS in the shallow pit pond will increase slowly over time. Immediately after mining, the water quality in the pit will be better than that in the shallow aquifer and in fractures, because the pit will capture relatively clean water from surface runoff. After 42 years, high-TDS water from the Burro Canyon aquifer will begin to flow to the pit (vs. 29 years in the original model). Evaporation from the pit pond surface will begin to concentrate water in the pond, and the TDS will gradually increase until it reaches quasi-steady-state mass flux conditions, which are limited by geochemical equilibria of sulfate minerals under near-neutral pH conditions. The model predicts that 163 years will pass before the TDS in the pit pond reaches 3,000 mg/L (compared to 87 and 90 years in the previous models [ABC, 1998; Whetstone 2006]). The changes in TDS concentration in the pit pond over time are shown in Figure 6.

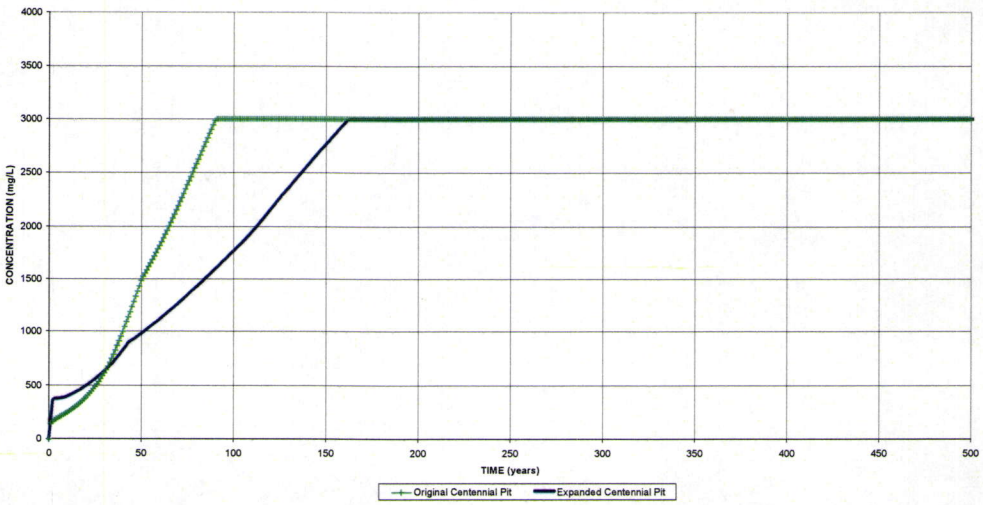


Figure 6. Predicted TDS Concentration in Centennial Pit Pool

The shallow aquifer concentration is, at first, improved over the pre-mining concentration. This occurs because the pit captures relatively clean surface runoff, and recharges the aquifer at a rate that exceeds the net recharge (infiltration minus leakage) from precipitation. Over time, the flow of water reverses, from the aquifer to the pit, and the aquifer stabilizes at its pre-mining background concentration. Because groundwater will flow from the aquifer to the pit after this time, the Centennial Pit will have no impact on groundwater chemistry in the shallow aquifer.

Immediately after mining, and for the first 124[1] years, the water quality in the N-aquifer is improved because the pit captures relatively good quality surface runoff water. This water recharges the shallow aquifer and leaks downward to the N-aquifer, and the total concentration is better than what is currently being delivered to the deep system. As evapoconcentration of the pit pond occurs over time, the quality of water delivered to the N-aquifer decreases. The model predicts that the TDS concentration in the N-aquifer below the Centennial Pit will increase to 724 mg/L from a starting concentration of 683 mg/L (Figure 7). This represents a 6% increase in TDS over pre-mining conditions[2]. For comparison, the previous models predicted final concentration sof 717 and 718 mg/L in the N-aquifer below the Centennial Pit. These chemical changes are very slight, and are within the measured variability in N-aquifer wells at the site.

The geochemical model input parameters and results are given in detail in Attachment 2.

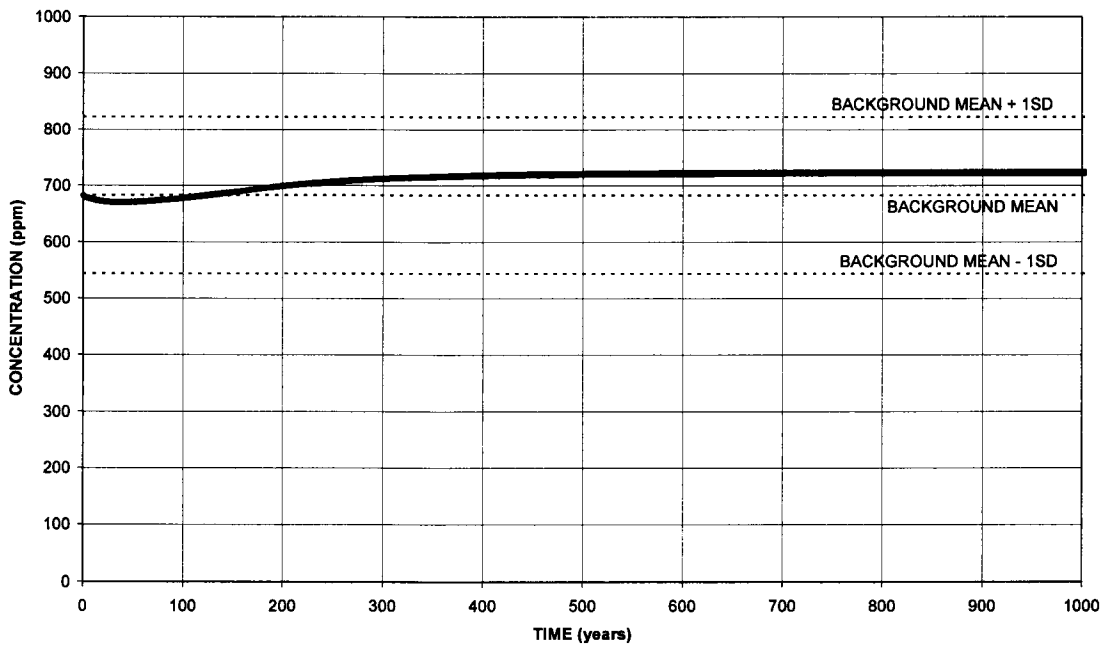


Figure 7. Predicted TDS Concentration in N-aquifer below Centennial Pit

[1] 124 years in expanded pit model, vs. 101 years in the previous model

[2] For consistency, the model results are compared to the mean and standard deviations of TDS concentrations in the N-aquifer used in the 1998 model, which were based on 17 samples with a mean TDS of 683 mg/L and a standard deviation of 140. The model also uses the mean concentration of 683 mg/L as the starting concentration in the N-aquifer. Based on 86 samples collected from N-aquifer wells MW97-7B, MW97-9, MW97-11, MW97-12, and MW97-13 from February 1998 to October 2005, the mean TDS in the N-aquifer is 629 mg/L with a standard deviation of 209.

5. REFERENCES

ABC, 1998a. Annual Update of the Lisbon Valley Hydrogeologic System Evaluation, prepared by Adrian Brown Consultants, Inc. for Summo USA Corporation, Report 1424A/980119. January 1998.

Whetstone Associates, 2006. 2005 Annual Update of the Lisbon Valley Hydrogeologic System Evaluation, prepared for Lisbon Valley Mining Co., Report No. 4124F.060223. February, 2006.

ATTACHMENT 1
WATER BALANCE MODEL
FOR EXPANDED CENTENNIAL PIT

FLOW BALANCE MODEL INPUT DATA

MODEL INFORMATION

Pit Information

Pit name:	Centennial Pit	
Groundwater Catchment area:	253.8 acres	
Total area inside berm:	180.9 acres	
Total area inside pit rim:	165.4 acres	
SW Drainage area:	15.5 acres	
Total pit lake area :	varies as pit fills	

Runoff & Infiltration Rates

Surface Water Runoff rate:	2.3% of precipitation	
Pit Wall Runoff rate:	4.9% of precipitation	
Groundwater Recharge rate:	6.65% of precipitation	=1 inch per year

Elevation Data

Starting Pit WLE:	6080.0 ft	
Pit Floor Elevation:	6080.0 ft	
Remote GW Elevation	6180.0 ft	

Aquifer Data

Burro Canyon Aquifer Porosity	0.05	Estimated based on drainable porosity of siltstone

ANNUAL PROBABILITY-WEIGHTED RUNOFF FOR HAUL ROADS

APPROACH:

The average annual runoff from haul roads can be computed, based on storm freqency, using the SCS. method (USCS TR55)

1.0 Determine the runoff curve number, from TR55 Table 2-2a.
CN = 87 Dirt roads, hydrologic soil type C
Average runoff condition, initial abstraction (I_a) = 0.2S

2.0 Calculate potential maximum retention (S) in inches:
CN = 1000 / (S +10)
S = 1000/CN - 10

3.0 Calculate runoff (Q) in inches:
$Q = (P-0.2S)^2 / (P+0.8S)$

4.0 Apply the annual weighted probability distribution for Q
5.0 Sum the annual contributions per storm event for an overall annual average Q

ASSUMPTIONS:

A. No runoff occurs for precipitation less than 1/2 inch per day
B. The runoff curve number is 87 for dirt roads, hydrologic soil group C
C. Total runoff is equal to the expected runoff for all events up to 100 years, weighted by probability
D. Data for the 2-100 yr storm magnitude/probability from "Appendix D, Lisbon Valley Heap Leach Project Meteorology and Water Management Facilities Design Data, June 1996, prepared for J.D. Welsh and Associates, Inc. by Hydro-Triad, Ltd.
E. Data for the 0.5-1.0 yr storm magnitude/probability extrapolated from Gumbel distribution using logarithmic curve fitting.
F. Haul road soils equate to SCS hydrologic soil group: C
(soils with slow infiltration, fine-textured soils low in organic content.)

RETURN PERIOD (yr)	STORM (inches)	CN	S (inches)	Q (inches)	PROBABILITY	Q ANNUAL (inches)
0.5	0.6	87	1.49	0.05	2	0.101
1	0.9	87	1.49	0.17	1	0.172
2	1.2	87	1.49	0.34	0.5	0.170
5	1.6	87	1.49	0.61	0.2	0.12
10	1.9	87	1.49	0.83	0.1	0.08
25	2.3	87	1.49	1.15	0.04	0.05
50	2.6	87	1.49	1.40	0.02	0.03
100	3	87	1.49	1.74	0.01	0.02

Expected Annual Runoff: 0.74 inches

This constitutes approximately 4.9% of the total annual precipitation of 15.04 inches.

CENTENNIAL PIT FLOW MODEL -- CALCULATION OF VERTICAL FLOW CONDITIONS PRIOR TO MINING

EVALUATION OF FLOW SYSTEM CONDITIONS BEFORE MINING

DATA

Hydrology

Infiltration to the ground surface =	1	inch/yr	
Initial water level in shallow "Burro Canyon" =	6180	feet	
Initial water level in deep "N-aquifer" =	5540	feet	

Geology

Ground surface elevation =	6450	feet	
Base of shallow "Burro Canyon" = pit floor =	6060	feet	
Top of the deep "N-aquifer" =	5600	feet	
Base of the deep "N-aquifer" =	5400	feet	
Thickness of shallow "Burro Canyon" aquifer =	390	feet	Includes all material from surface to base of pit (Bed 1-15)
Thickness of confining layer ("Morrison") =	460	feet	Incorporates Summerville, Morrison, and part of Entrada
Thickness of "N-aquifer" =	200	feet	Actually may be considerably more; this is high K portion

Area

Shallow "Burro Canyon" aquifer recharge area=	255.15	acres	See figure & discussion

Vertical Flow Distribution

Flow in fractures =	91%	of infiltration
Flow in "intact" rock =	9%	of infiltration

EVALUATION

Flow (Steady-State, Pre-mining)

Total recharge to catchment area =	21.3	acre-ft/yr	13.2	gpm
Total flow through fractures =	19.3	acre-ft/yr	12.0	gpm
Total flow through "intact" rock =	1.9	acre-ft/yr	1.2	gpm

Vertical Gradients

Gradient through shallow "Burro Canyon" aquife	0	Unit is assumed to have no significant vertical resistance
Gradient through confining layer ("Morrison") =	1.26	This is the same for fractures and rock
Gradient through deep "N-aquifer" =	0	Unit is assumed to have no significant vertical resistance

Areas

Burro Canyon is assumed to be infinitely permeable for this analysis (compared to the rest of the material)

Assumed percentage of area as fractures =	1.0%	
Assumed percentage of area as rock =	99.0%	

Effective hydraulic conductivities

Hydraulic conductivity of fractures =	6.0	ft/yr	Q = k i A; k = Q / (i A)
Hydraulic conductivity of "intact" rock =	0.0061	ft/yr	Q = k i A; k = Q / (i A)
Equivalent average hydraulic conductivity =	0.0661	ft/yr	Q = k i A; k = Q / (i A) [assumes homogeneous material]

CENTENNIAL PIT VOLUME/AREA/ELEVATION
Susan Wyman, Whetstone Associates, 1/03/07

NOTE: Engineered pit geometry (elevation, area) derived from CAD map of Centennial Pit, expanded (Wilson/Hufford) pit
Pit volume calculated based on 20-foot benches
Linear interpolation derived using slope-intercept equation (y=a+bx)
Assumes constant slope between benches

CENTENNIAL PIT ELEVATION, AREA, AND VOLUME											
ENGINEERED PIT GEOMETRY			LINEAR INTERPOLATION OF AREA			INTERPOLATION: ELEVATION V VOL			INTERPOLATION: VOL V ELEVATION		
ELEVATION (feet amsl)	PIT AREA (acres)	PIT VOLUME (acre-ft)	a Area	b Area	Check	a Elev	b Elev	Check	a Elev	b Elev	Check
6079.5	0	0	-12738.818	2.10	0	6079.5	1.90897	6079.5	-3185	1	0
6080	1.0	0	-725.916	0.12	1.0	6079.9	0.44576	6080	-13639	2	0
6100	3.4	45	-256.822	0.04	3.4	6088.3	0.25869	6100	-23535	4	45
6120	4.3	122	-1958.663	0.32	4.3	6103.7	0.13334	6120	-45776	7	122
6140	10.7	272	-2335.905	0.38	10.7	6121.2	0.06883	6140	-88936	15	272
6160	18.4	563	-3588.268	0.59	18.4	6136.7	0.04131	6160	-148545	24	563
6180	30.1	1,047	-4042.984	0.66	30.1	6151.4	0.02728	6180	-225458	37	1047
6200	43.2	1,780	-1892.049	0.31	43.2	6161.6	0.02157	6200	-285674	46	1780
6220	49.5	2,707	-5966.813	0.97	49.5	6174.2	0.01690	6220	-365252	59	2707
6240	68.8	3,891	-5122.608	0.83	68.8	6189.6	0.01296	6240	-477523	77	3891
6260	85.5	5,434	-2093.922	0.35	85.5	6198.9	0.01124	6260	-551397	89	5434
6280	92.4	7,213	-5966.813	0.97		6174.2	0.01690				
6300	108.3										
6320	113.8										

CENTENNIAL PIT SHALLOW AQUIFER VOLUME/AREA/ELEVATION
Susan Wyman, Whetstone Associates, 1/03/07

NOTE: Engineered pit geometry (elevation, area) derived from CAD map of Centennial Pit, expanded (Wilson/Hufford) pit
Pit volume calculated based on 20-foot benches
Linear interpolation derived using slope-intercept equation (y=a+bx)
Assumes constant slope between benches

SHALLOW AQUIFER SURROUNDING CENTENNIAL PIT --- ELEVATION, AREA, AND VOLUME											
ENGINEERED PIT GEOMETRY			CORRESPONDING AQUIFER GEOMETRY			INTERPOLATION: ELEVATION V VOL			INTERPOLATION: VOL V ELEVATION		
ELEVATION (feet amsl)	PIT AREA (acres)	PIT VOLUME (acre-ft)	AQUIFER AREA (acres)	AQUIFER VOLUME (acre-ft)	TOTAL VOLUME (acre-ft)	a Elev	b Elev	Check	a Elev	b Elev	Check
6079.5	0	0	253.8	0	0	6079.5	0.07582	6079.5	-80187	13.2	0
6080	1.0	0	252.8	6	7	6079.5	0.06886	6080	-88290	14.5	7
6100	3.4	45	250.4	252	297	6032.5	0.22735	6100	-26534	4.4	297
6120	4.3	122	249.5	263	385	6067.6	0.13615	6120	-44565	7.3	385
6140	10.7	272	243.1	259	532	6102.5	0.07057	6140	-86471	14.2	532
6160	18.4	563	235.5	252	815	6125.6	0.04219	6160	-145201	23.7	815
6180	30.1	1,047	223.8	242	1,289	6144.2	0.02777	6180	-221215	36.0	1289
6200	43.2	1,780	210.6	229	2,009	6156.2	0.02181	6200	-282233	45.8	2009
6220	49.5	2,707	204.4	219	2,926	6170.0	0.01710	6220	-360893	58.5	2926
6240	68.8	3,891	185.0	206	4,096	6186.3	0.01312	6240	-471496	76.2	4096
6260	85.5	5,434	168.4	187	5,621	6196.4	0.01132	6260	-547225	88.3	5621
6280	92.4	7,213	161.4	174	7,387	6170.0	0.01710		-360893	58.5	
6300	108.3										
6320	113.8										

WATER BALANCE FOR CENTENNI[illegible] AND SURROUNDING AQUIFER

TIME	PIT GEOMETRY				AQUIFER SYSTEM						FLOW IN					FLOW OUT				RESULTS				
Current Year	Total Volume in shallow system (acre-ft)	Pit Lake Elevation (feet)	Pit Lake Area (acres)	Pit Wall Area (acres)	Groundwater Infiltration Area (acres)	Head gradient through "Morrison"	Infiltration to Groundwater (acre-ft)	Leakage through Fractures (acre-ft)	Leakage through "Intact" Burro Canyon (acre-ft)	Total Shallow Aquifer Leakage to Deep Aquifer (acre-ft)	Groundwater Input to Shallow System (acre-ft)	Surface Water Inflow (acre-ft)	Wall Runoff to Pit (acre-ft)	Direct Precipitation (acre-ft)	Total Volume in Shallow System to date (acre-ft)	Maximum Vertical Leakage out of Pit Floor (acre-ft)	Volume after Leakage (acre-ft)	Potential Evaporation (acre-ft)	Actual Evaporation (acre-ft)	Volume at end of timestep (acre-ft)	Water Elevation at end of timestep (ft)	Ground-water flow from aquifer to pit (acre-ft)	Pit Volume (acre-ft)	Aquifer Volume (acre-ft)
0	0.0	6,079.5	0.0	165.4	253.8	1.042	21.2	15.9	1.59	17.49	3.67	0.45	10.17	0.00	14.28	0.0000	14.3	0.00	0.00	14.3	6,080.5	-9.17	1.4	12.8
1	14.3	6,080.5	1.1	164.3	252.7	1.045	21.1	15.9	1.59	17.45	3.61	0.45	10.10	1.39	29.84	0.0767	29.8	4.45	4.45	25.3	6,081.3	-5.72	3.2	22.2
2	25.3	6,081.3	1.2	164.2	252.6	1.046	21.1	15.9	1.59	17.47	3.58	0.45	10.09	1.51	40.95	0.0831	40.9	4.81	4.81	36.1	6,082.0	-5.50	4.8	31.2
3	36.1	6,082.0	1.3	164.1	252.6	1.048	21.0	15.9	1.59	17.49	3.55	0.45	10.09	1.62	51.77	0.0894	51.7	5.16	5.16	46.5	6,082.7	-5.29	6.4	40.1
4	46.5	6,082.7	1.4	164.0	252.5	1.049	21.0	15.9	1.59	17.51	3.53	0.45	10.08	1.73	62.31	0.0955	62.2	5.51	5.51	56.7	6,083.5	-5.08	8.0	48.7
5	56.7	6,083.5	1.5	164.0	252.4	1.051	21.0	15.9	1.59	17.53	3.50	0.45	10.08	1.83	72.56	0.1014	72.5	5.84	5.84	66.6	6,084.1	-4.88	9.5	57.1
6	66.6	6,084.1	1.5	163.9	252.3	1.052	21.0	16.0	1.60	17.55	3.48	0.45	10.07	1.93	82.55	0.1073	82.4	6.17	6.17	76.3	6,084.8	-4.69	11.0	65.2
7	76.3	6,084.8	1.6	163.8	252.2	1.054	21.0	16.0	1.60	17.57	3.45	0.45	10.07	2.03	92.27	0.1129	92.2	6.49	6.49	85.7	6,085.4	-4.50	12.5	73.2
8	85.7	6,085.4	1.7	163.7	252.1	1.055	21.0	16.0	1.60	17.59	3.43	0.45	10.06	2.13	101.74	0.1185	101.6	6.80	6.80	94.8	6,086.1	-4.31	13.9	80.9
9	94.8	6,086.1	1.8	163.6	252.1	1.057	21.0	16.0	1.60	17.60	3.40	0.45	10.06	2.23	110.96	0.1239	110.8	7.10	7.10	103.7	6,086.7	-4.13	15.3	88.5
10	103.7	6,086.7	1.8	163.6	252.0	1.058	21.0	16.0	1.60	17.62	3.38	0.45	10.05	2.32	119.94	0.1292	119.8	7.39	7.39	112.4	6,087.3	-3.96	16.6	95.8
11	112.4	6,087.3	1.9	163.5	251.9	1.059	21.0	16.0	1.60	17.64	3.36	0.45	10.05	2.41	128.68	0.1343	128.5	7.68	7.68	120.9	6,087.9	-3.79	17.9	102.9
12	120.9	6,087.9	2.0	163.4	251.9	1.061	21.0	16.0	1.60	17.65	3.33	0.45	10.04	2.49	137.19	0.1394	137.0	7.96	7.96	129.1	6,088.4	-3.62	19.2	109.9
13	129.1	6,088.4	2.1	163.4	251.8	1.062	21.0	16.1	1.61	17.67	3.31	0.45	10.04	2.58	145.47	0.1443	145.3	8.23	8.23	137.1	6,089.0	-3.46	20.4	116.7
14	137.1	6,089.0	2.1	163.3	251.7	1.063	21.0	16.1	1.61	17.68	3.29	0.45	10.03	2.66	153.54	0.1491	153.4	8.49	8.49	144.9	6,089.5	-3.30	21.6	123.3
15	144.9	6,089.5	2.2	163.2	251.7	1.064	21.0	16.1	1.61	17.70	3.27	0.45	10.03	2.74	161.39	0.1538	161.2	8.75	8.75	152.5	6,090.0	-3.15	22.8	129.7
16	152.5	6,090.0	2.2	163.2	251.6	1.065	21.0	16.1	1.61	17.71	3.25	0.45	10.03	2.82	169.04	0.1583	168.9	9.00	9.00	159.9	6,090.6	-3.00	23.9	135.9
17	159.9	6,090.6	2.3	163.1	251.5	1.066	21.0	16.1	1.61	17.73	3.23	0.45	10.02	2.90	176.49	0.1628	176.3	9.24	9.24	167.1	6,091.1	-2.85	25.1	142.0
18	167.1	6,091.1	2.4	163.0	251.5	1.068	21.0	16.1	1.61	17.74	3.21	0.45	10.02	2.97	183.74	0.1671	183.6	9.48	9.48	174.1	6,091.5	-2.71	26.1	148.0
19	174.1	6,091.5	2.4	163.0	251.4	1.069	21.0	16.1	1.61	17.76	3.20	0.45	10.02	3.04	190.80	0.1714	190.6	9.71	9.71	180.9	6,092.0	-2.57	27.2	153.7
20	180.9	6,092.0	2.5	162.9	251.4	1.070	20.9	16.2	1.62	17.77	3.18	0.45	10.01	3.11	197.67	0.1755	197.5	9.94	9.94	187.6	6,092.5	-2.44	28.2	159.3
21	187.6	6,092.5	2.5	162.9	251.3	1.071	20.9	16.2	1.62	17.78	3.16	0.45	10.01	3.18	204.36	0.1796	204.2	10.16	10.16	194.0	6,092.9	-2.31	29.2	164.8
22	194.0	6,092.9	2.6	162.8	251.3	1.072	20.9	16.2	1.62	17.79	3.14	0.45	10.01	3.25	210.88	0.1835	210.7	10.37	10.37	200.3	6,093.3	-2.18	30.2	170.1
23	200.3	6,093.3	2.6	162.8	251.2	1.072	20.9	16.2	1.62	17.81	3.13	0.45	10.00	3.31	217.23	0.1873	217.0	10.58	10.58	206.5	6,093.8	-2.06	31.1	175.3
24	206.5	6,093.8	2.7	162.7	251.1	1.073	20.9	16.2	1.62	17.82	3.11	0.45	10.00	3.38	223.40	0.1911	223.2	10.78	10.78	212.4	6,094.2	-1.94	32.1	180.4
25	212.4	6,094.2	2.7	162.7	251.1	1.074	20.9	16.2	1.62	17.83	3.10	0.45	10.00	3.44	229.42	0.1947	229.2	10.98	10.98	218.2	6,094.6	-1.82	33.0	185.3
26	218.2	6,094.6	2.8	162.6	251.1	1.075	20.9	16.2	1.62	17.84	3.08	0.45	9.99	3.50	235.28	0.1983	235.1	11.17	11.17	223.9	6,095.0	-1.71	33.8	190.1
27	223.9	6,095.0	2.8	162.6	251.0	1.076	20.9	16.2	1.62	17.85	3.07	0.45	9.99	3.56	240.98	0.2017	240.8	11.35	11.35	229.4	6,095.3	-1.59	34.7	194.7
28	229.4	6,095.3	2.9	162.5	251.0	1.077	20.9	16.2	1.62	17.86	3.05	0.45	9.99	3.61	246.53	0.2051	246.3	11.54	11.54	234.8	6,095.7	-1.49	35.5	199.3
29	234.8	6,095.7	2.9	162.5	250.9	1.078	20.9	16.2	1.62	17.87	3.04	0.45	9.99	3.67	251.94	0.2084	251.7	11.71	11.71	240.0	6,096.1	-1.38	36.3	203.7
30	240.0	6,096.1	3.0	162.4	250.9	1.078	20.9	16.3	1.63	17.88	3.03	0.45	9.98	3.72	257.20	0.2117	257.0	11.89	11.89	245.1	6,096.4	-1.28	37.1	208.0
31	245.1	6,096.4	3.0	162.4	250.8	1.079	20.9	16.3	1.63	17.89	3.01	0.45	9.98	3.78	262.33	0.2148	262.1	12.05	12.05	250.1	6,096.8	-1.18	37.9	212.2
32	250.1	6,096.8	3.1	162.4	250.8	1.080	20.9	16.3	1.63	17.90	3.00	0.45	9.98	3.83	267.32	0.2178	267.1	12.22	12.22	254.9	6,097.1	-1.08	38.6	216.3
33	254.9	6,097.1	3.1	162.3	250.7	1.081	20.9	16.3	1.63	17.91	2.99	0.45	9.98	3.88	272.18	0.2208	272.0	12.38	12.38	259.6	6,097.4	-0.98	39.3	220.2
34	259.6	6,097.4	3.1	162.3	250.7	1.081	20.9	16.3	1.63	17.92	2.97	0.45	9.97	3.93	276.91	0.2237	276.7	12.53	12.53	264.2	6,097.7	-0.89	40.0	224.1
35	264.2	6,097.7	3.2	162.2	250.7	1.082	20.9	16.3	1.63	17.93	2.96	0.45	9.97	3.97	281.51	0.2266	281.3	12.68	12.68	268.6	6,098.0	-0.80	40.7	227.9
36	268.6	6,098.0	3.2	162.2	250.6	1.083	20.9	16.3	1.63	17.93	2.95	0.45	9.97	4.02	286.00	0.2293	285.8	12.83	12.83	272.9	6,098.3	-0.71	41.4	231.5
37	272.9	6,098.3	3.2	162.2	250.6	1.083	20.9	16.3	1.63	17.94	2.94	0.45	9.97	4.06	290.37	0.2320	290.1	12.97	12.97	277.2	6,098.6	-0.63	42.1	235.1
38	277.2	6,098.6	3.3	162.1	250.6	1.084	20.9	16.3	1.63	17.95	2.93	0.45	9.96	4.11	294.62	0.2347	294.4	13.11	13.11	281.3	6,098.9	-0.55	42.7	238.6
39	281.3	6,098.9	3.3	162.1	250.5	1.085	20.9	16.3	1.63	17.96	2.92	0.45	9.96	4.15	298.76	0.2372	298.5	13.25	13.25	285.3	6,099.2	-0.47	43.3	242.0
40	285.3	6,099.2	3.3	162.1	250.5	1.085	20.9	16.3	1.63	17.97	2.91	0.45	9.96	4.19	302.79	0.2397	302.5	13.38	13.38	289.2	6,099.5	-0.39	43.9	245.3
41	289.2	6,099.5	3.4	162.0	250.5	1.086	20.9	16.3	1.63	17.97	2.90	0.45	9.96	4.23	306.71	0.2421	306.5	13.51	13.51	293.0	6,099.7	-0.31	44.5	248.5
42	293.0	6,099.7	3.4	162.0	250.4	1.086	20.9	16.3	1.63	17.98	2.89	0.45	9.96	4.27	310.54	0.2445	310.3	13.63	13.63	296.7	6,100.0	-0.23	45.1	251.6
43	296.7	6,100.0	3.4	162.0	250.4	1.087	20.9	16.4	1.64	17.99	2.88	0.45	9.95	4.31	314.26	0.2468	314.0	13.75	13.75	300.3	6,100.7	2.19	48.0	252.3
44	300.3	6,100.7	3.5	161.9	250.4	1.089	20.9	16.4	1.64	18.01	2.85	0.45	9.95	4.35	317.87	0.2497	317.6	13.89	13.89	303.7	6,101.5	2.46	51.1	252.7
45	303.7	6,101.5	3.5	161.9	250.3	1.090	20.9	16.4	1.64	18.04	2.82	0.45	9.95	4.40	321.35	0.2525	321.1	14.03	14.03	307.1	6,102.3	2.45	54.0	253.0
46	307.1	6,102.3	3.5	161.9	250.3	1.092	20.9	16.4	1.64	18.06	2.79	0.45	9.95	4.44	324.70	0.2553	324.4	14.16	14.16	310.3	6,103.0	2.43	56.9	253.4
47	310.3	6,103.0	3.6	161.8	250.3	1.094	20.9	16.4	1.64	18.09	2.77	0.45	9.95	4.48	327.93	0.2579	327.7	14.28	14.28	313.4	6,103.8	2.42	59.6	253.8
48	313.4	6,103.8	3.6	161.8	250.2	1.095	20.9	16.5	1.65	18.11	2.74	0.45	9.94	4.51	331.04	0.2605	330.8	14.41	14.41	316.4	6,104.4	2.40	62.3	254.1
49	316.4	6,104.4	3.6	161.8	250.2	1.097	20.9	16.5	1.65	18.13	2.72	0.45	9.94	4.55	334.04	0.2630	333.8	14.52	14.52	319.3	6,105.1	2.39	64.8	254.4
50	319.3	6,105.1	3.7	161.8	250.2	1.098	20.8	16.5	1.65	18.16	2.69	0.45	9.94	4.59	336.92	0.2654	336.7	14.64	14.64	322.0	6,105.7	2.38	67.3	254.7
51	322.0	6,105.7	3.7	161.7	250.2	1.099	20.8	16.5	1.65	18.18	2.67	0.45	9.94	4.62	339.70	0.2677	339.4	14.74	14.74	324.7	6,106.3	2.37	69.7	255.0
52	324.7	6,106.3	3.7	161.7	250.1	1.101	20.8	16.5	1.65	18.20	2.65	0.45	9.94	4.65	342.38	0.2699	342.1	14.85	14.85	327.3	6,106.9	2.36	71.9	255.3
53	327.3	6,106.9	3.7	161.7	250.1	1.102	20.8	16.6	1.66	18.22	2.63	0.45	9.94	4.68	344.96	0.2720	344.7	14.95	14.95	329.7	6,107.5	2.35	74.1	255.6
54	329.7	6,107.5	3.8	161.7	250.1	1.103	20.8	16.6	1.66	18.24	2.60	0.45	9.93	4.71	347.45	0.2741	347.2	15.05	15.05	332.1	6,108.1	2.34	76.3	255.9
55	332.1	6,108.1	3.8	161.6	250.1	1.104	20.8	16.6	1.66	18.25	2.58	0.45	9.93	4.74	349.84	0.2761	349.6	15.14	15.14	334.4	6,108.6	2.33	78.3	256.1
56	334.4	6,108.6	3.8	161.6	250.0	1.106	20.8	16.6	1.66	18.27	2.57	0.45	9.93	4.77	352.15	0.2780	351.9	15.23	15.23	336.6	6,109.1	2.32	80.3	256.4
57	336.6	6,109.1	3.8	161.6	250.0	1.107	20.8	16.6	1.66	18.29	2.55	0.45	9.93	4.80	354.37	0.2799	354.1	15.32	15.32	338.8	6,109.6	2.31	82.2	256.6
58	338.8	6,109.6	3.8	161.6	250.0	1.108	20.8	16.6	1.66	18.30	2.53	0.45	9.93	4.83	356.51	0.2817	356.2	15.40	15.40	340.8	6,110.0	2.30	84.0	256.9
59	340.8	6,110.0	3.9	161.5	250.0	1.109	20.8	16.7	1.67	18.32	2.51	0.45	9.93	4.85	358.58	0.2834	358.3	15.48	15.48	342.8	6,110.5	2.29	85.7	257.1
60	342.8	6,110.5	3.9	161.5	250.0	1.110	20.8	16.7	1.67	18.33	2.50	0.45	9.93	4.88	360.56	0.2851	360.3	15.56	15.56	344.7	6,110.9	2.28	87.4	257.3
61	344.7	6,110.9	3.9	161.5	249.9	1.111	20.8	16.7	1.67	18.35	2.48	0.45	9.93	4.90	362.48	0.2867	362.2	15.63	15.63	346.6	6,111.4	2.27	89.1	257.5
62	346.6	6,111.4	3.9	161.5	249.9	1.112	20.8	16.7	1.67	18.36	2.46	0.45	9.92	4.92	364.32	0.2883	364.0	15.71	15.71	348.3	6,111.8	2.26	90.6	257.7
63	348.3	6,111.8	3.9	161.5	249.9	1.113	20.8	16.7	1.67	18.38	2.45	0.45	9.92	4.94	366.09	0.2898	365.8	15.77	15.77	350.0	6,112.2	2.26	92.1	257.9
64	350.0	6,112.2	4.0	161.5	249.9	1.113	20.8	16.7	1.67	18.39	2.44	0.45	9.92	4.96	367.81	0.2912	367.5	15.84	15.84	351.7	6,112.5	2.25	93.6	258.1
65	351.7	6,112.5	4.0	161.4	249.9	1.114	20.8	16.7	1.67	18.40	2.42	0.45	9.92	4.98	369.45	0.2926	369.2	15.91	15.91	353.3	6,112.9	2.24	95.0	258.3
66	353.3	6,112.9	4.0	161.4	249.9	1.115	20.8	16.7	1.67	18.41	2.41	0.45	9.92	5.00	371.04	0.2940	370.7	15.97	15.97	354.8	6,113.3	2.24	96.4	258.4
67	354.8	6,113.3	4.0	161.4	249.8	1.116	20.8	16.7	1.67	18.42	2.40	0.45	9.92	5.02	372.57	0.2953	372.3	16.03	16.03	356.2	6,113.6	2.23	97.7	258.6
68	356.2	6,113.6	4.0	161.4	249.8	1.116	20.8	16.8	1.68	18.43	2.38	0.45	9.92	5.04	374.04	0.2965	373.7	16.09	16.09	357.7	6,113.9	2.22	98.9	258.8

TIME	PIT GEOMETRY				AQUIFER SYSTEM						FLOW IN					FLOW OUT				RESULTS				
Current Year	Total Volume in shallow system (acre-ft)	Pit Lake Elevation (feet)	Pit Lake Area (acres)	Pit Wall Area (acres)	Groundwater Infiltration Area (acres)	Head gradient through "Morrison"	Infiltration to Groundwater (acre-ft)	Leakage through Fractures (acre-ft)	Leakage through "Intact" Burro Canyon (acre-ft)	Total Shallow Aquifer Leakage to Deep Aquifer (acre-ft)	Groundwater Input to Shallow System (acre-ft)	Surface Water Inflow (acre-ft)	Wall Runoff to Pit (acre-ft)	Direct Precipitation (acre-ft)	Total Volume in Shallow System to date (acre-ft)	Maximum Vertical Leakage out of Pit Floor (acre-ft)	Volume after Leakage (acre-ft)	Potential Evaporation (acre-ft)	Actual Evaporation (acre-ft)	Volume at end of timestep (acre-ft)	Water Elevation at end of timestep (ft)	Ground-water flow from aquifer to pit (acre-ft)	Pit Volume (acre-ft)	Aquifer Volume (acre-ft)
69	357.7	6,113.9	4.0	161.4	249.8	1.117	20.8	16.8	1.68	18.45	2.37	0.45	9.92	5.06	375.46	0.2978	375.2	16.14	16.14	359.0	6,114.2	2.22	100.1	258.9
70	359.0	6,114.2	4.0	161.4	249.8	1.118	20.8	16.8	1.68	18.46	2.36	0.45	9.92	5.07	376.83	0.2989	376.5	16.19	16.19	360.3	6,114.5	2.21	101.3	259.1
71	360.3	6,114.5	4.1	161.4	249.8	1.119	20.8	16.8	1.68	18.47	2.35	0.45	9.92	5.09	378.14	0.3000	377.8	16.25	16.25	361.6	6,114.8	2.21	102.4	259.2
72	361.6	6,114.8	4.1	161.3	249.8	1.119	20.8	16.8	1.68	18.47	2.34	0.45	9.92	5.11	379.41	0.3011	379.1	16.30	16.30	362.8	6,115.1	2.20	103.5	259.3
73	362.8	6,115.1	4.1	161.3	249.8	1.120	20.8	16.8	1.68	18.48	2.33	0.45	9.91	5.12	380.63	0.3022	380.3	16.34	16.34	364.0	6,115.4	2.20	104.5	259.5
74	364.0	6,115.4	4.1	161.3	249.7	1.120	20.8	16.8	1.68	18.49	2.32	0.45	9.91	5.14	381.81	0.3032	381.5	16.39	16.39	365.1	6,115.6	2.19	105.5	259.6
75	365.1	6,115.6	4.1	161.3	249.7	1.121	20.8	16.8	1.68	18.50	2.31	0.45	9.91	5.15	382.94	0.3042	382.6	16.43	16.43	366.2	6,115.9	2.19	106.5	259.7
76	366.2	6,115.9	4.1	161.3	249.7	1.121	20.8	16.8	1.68	18.51	2.30	0.45	9.91	5.16	384.04	0.3051	383.7	16.48	16.48	367.3	6,116.1	2.18	107.4	259.8
77	367.3	6,116.1	4.1	161.3	249.7	1.122	20.8	16.8	1.68	18.52	2.29	0.45	9.91	5.18	385.09	0.3060	384.8	16.52	16.52	368.3	6,116.3	2.18	108.3	259.9
78	368.3	6,116.3	4.1	161.3	249.7	1.122	20.8	16.8	1.68	18.52	2.28	0.45	9.91	5.19	386.10	0.3069	385.8	16.56	16.56	369.2	6,116.6	2.17	109.2	260.1
79	369.2	6,116.6	4.1	161.3	249.7	1.123	20.8	16.8	1.68	18.53	2.28	0.45	9.91	5.20	387.08	0.3077	386.8	16.59	16.59	370.2	6,116.8	2.17	110.0	260.2
80	370.2	6,116.8	4.2	161.3	249.7	1.123	20.8	16.9	1.69	18.54	2.27	0.45	9.91	5.21	388.02	0.3085	387.7	16.63	16.63	371.1	6,117.0	2.17	110.8	260.3
81	371.1	6,117.0	4.2	161.2	249.7	1.124	20.8	16.9	1.69	18.55	2.26	0.45	9.91	5.22	388.92	0.3093	388.6	16.67	16.67	371.9	6,117.2	2.16	111.6	260.4
82	371.9	6,117.2	4.2	161.2	249.7	1.124	20.8	16.9	1.69	18.55	2.25	0.45	9.91	5.23	389.80	0.3101	389.5	16.70	16.70	372.8	6,117.4	2.16	112.3	260.5
83	372.8	6,117.4	4.2	161.2	249.7	1.125	20.8	16.9	1.69	18.56	2.25	0.45	9.91	5.24	390.64	0.3108	390.3	16.73	16.73	373.6	6,117.6	2.16	113.0	260.5
84	373.6	6,117.6	4.2	161.2	249.7	1.125	20.8	16.9	1.69	18.56	2.24	0.45	9.91	5.25	391.45	0.3115	391.1	16.77	16.77	374.4	6,117.7	2.15	113.7	260.6
85	374.4	6,117.7	4.2	161.2	249.6	1.126	20.8	16.9	1.69	18.57	2.23	0.45	9.91	5.26	392.23	0.3122	391.9	16.80	16.80	375.1	6,117.9	2.15	114.4	260.7
86	375.1	6,117.9	4.2	161.2	249.6	1.126	20.8	16.9	1.69	18.58	2.23	0.45	9.91	5.27	392.98	0.3128	392.7	16.83	16.83	375.8	6,118.1	2.15	115.0	260.8
87	375.8	6,118.1	4.2	161.2	249.6	1.126	20.8	16.9	1.69	18.58	2.22	0.45	9.91	5.28	393.70	0.3134	393.4	16.85	16.85	376.5	6,118.2	2.14	115.7	260.9
88	376.5	6,118.2	4.2	161.2	249.6	1.127	20.8	16.9	1.69	18.59	2.21	0.45	9.91	5.29	394.40	0.3140	394.1	16.88	16.88	377.2	6,118.4	2.14	116.2	261.0
89	377.2	6,118.4	4.2	161.2	249.6	1.127	20.8	16.9	1.69	18.59	2.21	0.45	9.91	5.30	395.07	0.3146	394.8	16.91	16.91	377.8	6,118.5	2.14	116.8	261.0
90	377.8	6,118.5	4.2	161.2	249.6	1.127	20.8	16.9	1.69	18.60	2.20	0.45	9.91	5.31	395.72	0.3152	395.4	16.93	16.93	378.5	6,118.7	2.13	117.4	261.1
91	378.5	6,118.7	4.2	161.2	249.6	1.128	20.8	16.9	1.69	18.60	2.20	0.45	9.90	5.31	396.34	0.3157	396.0	16.96	16.96	379.1	6,118.8	2.13	117.9	261.2
92	379.1	6,118.8	4.2	161.2	249.6	1.128	20.8	16.9	1.69	18.61	2.19	0.45	9.90	5.32	396.94	0.3162	396.6	16.98	16.98	379.6	6,119.0	2.13	118.4	261.2
93	379.6	6,119.0	4.2	161.2	249.6	1.128	20.8	16.9	1.69	18.61	2.19	0.45	9.90	5.33	397.52	0.3167	397.2	17.00	17.00	380.2	6,119.1	2.13	118.9	261.3
94	380.2	6,119.1	4.3	161.2	249.6	1.128	20.8	16.9	1.69	18.61	2.18	0.45	9.90	5.33	398.08	0.3172	397.8	17.02	17.02	380.7	6,119.2	2.12	119.4	261.4
95	380.7	6,119.2	4.3	161.2	249.6	1.129	20.8	16.9	1.69	18.62	2.18	0.45	9.90	5.34	398.61	0.3177	398.3	17.05	17.05	381.2	6,119.3	2.12	119.8	261.4
96	381.2	6,119.3	4.3	161.1	249.6	1.129	20.8	16.9	1.69	18.62	2.18	0.45	9.90	5.35	399.13	0.3181	398.8	17.07	17.07	381.7	6,119.4	2.12	120.3	261.5
97	381.7	6,119.4	4.3	161.1	249.6	1.129	20.8	16.9	1.69	18.63	2.17	0.45	9.90	5.35	399.63	0.3186	399.3	17.08	17.08	382.2	6,119.5	2.12	120.7	261.5
98	382.2	6,119.5	4.3	161.1	249.6	1.129	20.8	16.9	1.69	18.63	2.17	0.45	9.90	5.36	400.11	0.3190	399.8	17.10	17.10	382.7	6,119.7	2.12	121.1	261.6
99	382.7	6,119.7	4.3	161.1	249.6	1.130	20.8	16.9	1.69	18.63	2.16	0.45	9.90	5.36	400.57	0.3194	400.2	17.12	17.12	383.1	6,119.8	2.11	121.5	261.6
100	383.1	6,119.8	4.3	161.1	249.6	1.130	20.8	16.9	1.69	18.64	2.16	0.45	9.90	5.37	401.01	0.3198	400.7	17.14	17.14	383.6	6,119.9	2.11	121.9	261.7
101	383.6	6,119.9	4.3	161.1	249.6	1.130	20.8	16.9	1.69	18.64	2.16	0.45	9.90	5.38	401.44	0.3201	401.1	17.16	17.16	384.0	6,119.9	2.11	122.2	261.7
102	384.0	6,119.9	4.3	161.1	249.6	1.130	20.8	16.9	1.69	18.64	2.15	0.45	9.90	5.38	401.86	0.3205	401.5	17.17	17.17	384.4	6,120.0	2.13	122.6	261.7
103	384.4	6,120.0	4.3	161.1	249.5	1.130	20.8	16.9	1.69	18.64	2.15	0.45	9.90	5.39	402.26	0.3213	401.9	17.21	17.21	384.7	6,120.1	2.16	123.0	261.7
104	384.7	6,120.1	4.3	161.1	249.5	1.131	20.8	17.0	1.70	18.65	2.15	0.45	9.90	5.41	402.64	0.3225	402.3	17.27	17.27	385.0	6,120.1	2.15	123.3	261.7
105	385.0	6,120.1	4.3	161.1	249.5	1.131	20.8	17.0	1.70	18.65	2.15	0.45	9.90	5.43	402.98	0.3236	402.7	17.33	17.33	385.3	6,120.2	2.15	123.6	261.7
106	385.3	6,120.2	4.3	161.1	249.5	1.131	20.8	17.0	1.70	18.65	2.15	0.45	9.90	5.45	403.27	0.3245	402.9	17.38	17.38	385.6	6,120.2	2.15	123.8	261.7
107	385.6	6,120.2	4.4	161.1	249.5	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.90	5.46	403.52	0.3253	403.2	17.42	17.42	385.8	6,120.2	2.15	124.0	261.7
108	385.8	6,120.2	4.4	161.1	249.5	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.90	5.47	403.74	0.3260	403.4	17.46	17.46	386.0	6,120.2	2.15	124.2	261.7
109	386.0	6,120.2	4.4	161.0	249.5	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.90	5.48	403.93	0.3266	403.6	17.49	17.49	386.1	6,120.3	2.14	124.4	261.7
110	386.1	6,120.3	4.4	161.0	249.5	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.90	5.49	404.09	0.3271	403.8	17.51	17.51	386.3	6,120.3	2.14	124.5	261.7
111	386.3	6,120.3	4.4	161.0	249.5	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.90	5.50	404.24	0.3275	403.9	17.54	17.54	386.4	6,120.3	2.14	124.7	261.7
112	386.4	6,120.3	4.4	161.0	249.5	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.90	5.50	404.36	0.3279	404.0	17.56	17.56	386.5	6,120.3	2.14	124.8	261.7
113	386.5	6,120.3	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.90	5.51	404.47	0.3283	404.1	17.58	17.58	386.6	6,120.3	2.14	124.9	261.7
114	386.6	6,120.3	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.90	5.51	404.56	0.3286	404.2	17.59	17.59	386.6	6,120.3	2.14	124.9	261.7
115	386.6	6,120.3	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.52	404.65	0.3289	404.3	17.61	17.61	386.7	6,120.3	2.14	125.0	261.7
116	386.7	6,120.3	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.52	404.72	0.3291	404.4	17.62	17.62	386.8	6,120.3	2.14	125.1	261.7
117	386.8	6,120.3	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.52	404.78	0.3293	404.5	17.63	17.63	386.8	6,120.4	2.14	125.1	261.7
118	386.8	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.53	404.84	0.3295	404.5	17.64	17.64	386.9	6,120.4	2.14	125.2	261.7
119	386.9	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.53	404.88	0.3296	404.6	17.65	17.65	386.9	6,120.4	2.14	125.2	261.7
120	386.9	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.53	404.92	0.3297	404.6	17.65	17.65	386.9	6,120.4	2.14	125.2	261.7
121	386.9	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.53	404.96	0.3298	404.6	17.66	17.66	387.0	6,120.4	2.14	125.3	261.7
122	387.0	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.53	404.99	0.3299	404.7	17.66	17.66	387.0	6,120.4	2.14	125.3	261.7
123	387.0	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.02	0.3300	404.7	17.67	17.67	387.0	6,120.4	2.14	125.3	261.7
124	387.0	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.04	0.3301	404.7	17.67	17.67	387.0	6,120.4	2.14	125.3	261.7
125	387.0	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.06	0.3302	404.7	17.68	17.68	387.1	6,120.4	2.14	125.3	261.7
126	387.1	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.08	0.3302	404.7	17.68	17.68	387.1	6,120.4	2.14	125.4	261.7
127	387.1	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.09	0.3303	404.8	17.68	17.68	387.1	6,120.4	2.14	125.4	261.7
128	387.1	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.11	0.3303	404.8	17.68	17.68	387.1	6,120.4	2.14	125.4	261.7
129	387.1	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.12	0.3304	404.8	17.68	17.68	387.1	6,120.4	2.14	125.4	261.7
130	387.1	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.13	0.3304	404.8	17.69	17.69	387.1	6,120.4	2.14	125.4	261.7
131	387.1	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.14	0.3304	404.8	17.69	17.69	387.1	6,120.4	2.14	125.4	261.7
132	387.1	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.15	0.3304	404.8	17.69	17.69	387.1	6,120.4	2.14	125.4	261.7
133	387.1	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.15	0.3305	404.8	17.69	17.69	387.1	6,120.4	2.14	125.4	261.7
134	387.1	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.16	0.3305	404.8	17.69	17.69	387.1	6,120.4	2.14	125.4	261.7
135	387.1	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.16	0.3305	404.8	17.69	17.69	387.1	6,120.4	2.14	125.4	261.7
136	387.1	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.17	0.3305	404.8	17.69	17.69	387.1	6,120.4	2.14	125.4	261.7
137	387.1	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.17	0.3305	404.8	17.69	17.69	387.1	6,120.4	2.14	125.4	261.7

TIME	PIT GEOMETRY				AQUIFER SYSTEM						FLOW IN					FLOW OUT				RESULTS				
Current Year	Total Volume in shallow system (acre-ft)	Pit Lake Elevation (feet)	Pit Lake Area (acres)	Pit Wall Area (acres)	Groundwater Infiltration Area (acres)	Head gradient through "Morrison"	Infiltration to Groundwater (acre-ft)	Leakage through Fractures (acre-ft)	Leakage through "Intact" Burro Canyon (acre-ft)	Total Shallow Aquifer Leakage to Deep Aquifer (acre-ft)	Groundwater Input to Shallow System (acre-ft)	Surface Water Inflow (acre-ft)	Wall Runoff to Pit (acre-ft)	Direct Precipitation (acre-ft)	Total Volume in Shallow System to date (acre-ft)	Maximum Vertical Leakage out of Pit Floor (acre-ft)	Volume after Leakage (acre-ft)	Potential Evaporation (acre-ft)	Actual Evaporation (acre-ft)	Volume at end of timestep (acre-ft)	Water Elevation at end of timestep (ft)	Ground-water flow from aquifer to pit (acre-ft)	Pit Volume (acre-ft)	Aquifer Volume (acre-ft)
138	387.1	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.18	0.3305	404.8	17.69	17.69	387.2	6,120.4	2.14	125.4	261.7
139	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.18	0.3305	404.8	17.69	17.69	387.2	6,120.4	2.14	125.4	261.7
140	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.18	0.3305	404.8	17.69	17.69	387.2	6,120.4	2.14	125.4	261.7
141	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.18	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
142	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.18	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
143	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.19	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
144	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.19	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
145	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.19	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
146	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.54	405.19	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
147	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.19	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
148	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.19	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
149	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.19	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
150	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.19	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
151	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.19	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
152	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.19	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
153	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.19	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
154	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.19	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
155	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
156	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
157	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
158	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
159	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
160	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
161	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
162	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
163	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
164	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
165	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
166	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
167	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
168	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
169	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
170	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
171	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
172	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
173	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
174	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
175	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
176	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
177	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
178	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
179	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
180	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
181	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
182	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
183	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
184	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
185	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
186	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
187	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
188	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
189	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
190	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
191	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
192	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
193	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
194	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
195	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
196	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
197	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
198	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
199	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
200	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
201	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
202	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
203	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
204	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
205	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
206	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7

WATER BALANCE FOR CENTENNI[illegible]T AND SURROUNDING AQUIFER

TIME	PIT GEOMETRY				AQUIFER SYSTEM						FLOW IN					FLOW OUT				RESULTS				
Current Year	Total Volume in shallow system (acre-ft)	Pit Lake Elevation (feet)	Pit Lake Area (acres)	Pit Wall Area (acres)	Groundwater Infiltration Area (acres)	Head gradient through "Morrison"	Infiltration to Groundwater (acre-ft)	Leakage through Fractures (acre-ft)	Leakage through "Intact" Burro Canyon (acre-ft)	Total Shallow Aquifer Leakage to Deep Aquifer (acre-ft)	Groundwater Input to Shallow System (acre-ft)	Surface Water Inflow (acre-ft)	Wall Runoff to Pit (acre-ft)	Direct Precipitation (acre-ft)	Total Volume in Shallow System to date (acre-ft)	Maximum Vertical Leakage out of Pit Floor (acre-ft)	Volume after Leakage (acre-ft)	Potential Evaporation (acre-ft)	Actual Evaporation (acre-ft)	Volume at end of timestep (acre-ft)	Water Elevation at end of timestep (ft)	Ground-water flow from aquifer to pit (acre-ft)	Pit Volume (acre-ft)	Aquifer Volume (acre-ft)
207	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
208	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
209	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
210	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
211	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
212	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
213	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
214	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
215	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
216	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
217	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
218	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
219	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
220	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
221	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
222	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
223	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
224	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
225	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
226	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
227	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
228	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
229	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
230	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
231	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
232	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
233	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
234	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
235	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
236	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
237	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
238	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
239	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
240	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
241	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
242	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
243	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
244	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
245	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
246	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
247	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
248	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
249	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
250	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
251	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
252	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
253	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
254	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
255	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
256	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
257	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
258	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
259	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
260	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
261	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
262	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
263	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
264	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
265	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
266	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
267	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
268	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
269	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
270	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
271	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
272	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
273	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
274	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
275	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7

TIME	PIT GEOMETRY				AQUIFER SYSTEM						FLOW IN					FLOW OUT				RESULTS				
Current Year	Total Volume in shallow system (acre-ft)	Pit Lake Elevation (feet)	Pit Lake Area (acres)	Pit Wall Area (acres)	Groundwater Infiltration Area (acres)	Head gradient through "Morrison"	Infiltration to Groundwater (acre-ft)	Leakage through Fractures (acre-ft)	Leakage through "Intact" Burro Canyon (acre-ft)	Total Shallow Aquifer Leakage to Deep Aquifer (acre-ft)	Groundwater Input to Shallow System (acre-ft)	Surface Water Inflow (acre-ft)	Wall Runoff to Pit (acre-ft)	Direct Precipitation (acre-ft)	Total Volume in Shallow System to date (acre-ft)	Maximum Vertical Leakage out of Pit Floor (acre-ft)	Volume after Leakage (acre-ft)	Potential Evaporation (acre-ft)	Actual Evaporation (acre-ft)	Volume at end of timestep (acre-ft)	Water Elevation at end of timestep (ft)	Ground-water flow from aquifer to pit (acre-ft)	Pit Volume (acre-ft)	Aquifer Volume (acre-ft)
276	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
277	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
278	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
279	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
280	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
281	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
282	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
283	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
284	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
285	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
286	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
287	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
288	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
289	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
290	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
291	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
292	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
293	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
294	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
295	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
296	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
297	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
298	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
299	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
300	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
301	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
302	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
303	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
304	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
305	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
306	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
307	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
308	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
309	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
310	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
311	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
312	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
313	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
314	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
315	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
316	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
317	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
318	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
319	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
320	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
321	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
322	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
323	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
324	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
325	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
326	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
327	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
328	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
329	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
330	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
331	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
332	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
333	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
334	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
335	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
336	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
337	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
338	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
339	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
340	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
341	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
342	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
343	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
344	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7

TIME	PIT GEOMETRY				AQUIFER SYSTEM						FLOW IN					FLOW OUT				RESULTS				
Current Year	Total Volume in shallow system (acre-ft)	Pit Lake Elevation (feet)	Pit Lake Area (acres)	Pit Wall Area (acres)	Groundwater Infiltration Area (acres)	Head gradient through "Morrison"	Infiltration to Groundwater (acre-ft)	Leakage through Fractures (acre-ft)	Leakage through "Intact" Burro Canyon (acre-ft)	Total Shallow Aquifer Leakage to Deep Aquifer (acre-ft)	Groundwater Input to Shallow System (acre-ft)	Surface Water Inflow (acre-ft)	Wall Runoff to Pit (acre-ft)	Direct Precipitation (acre-ft)	Total Volume in Shallow System to date (acre-ft)	Maximum Vertical Leakage out of Pit Floor (acre-ft)	Volume after Leakage (acre-ft)	Potential Evaporation (acre-ft)	Actual Evaporation (acre-ft)	Volume at end of timestep (acre-ft)	Water Elevation at end of timestep (ft)	Ground-water flow from aquifer to pit (acre-ft)	Pit Volume (acre-ft)	Aquifer Volume (acre-ft)
345	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
346	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
347	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
348	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
349	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
350	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
351	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
352	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
353	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
354	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
355	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
356	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
357	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
358	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
359	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
360	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
361	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
362	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
363	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
364	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
365	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
366	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
367	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
368	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
369	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
370	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
371	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
372	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
373	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
374	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
375	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
376	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
377	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
378	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
379	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
380	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
381	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
382	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
383	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
384	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
385	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
386	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
387	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
388	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
389	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
390	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
391	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
392	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
393	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
394	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
395	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
396	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
397	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
398	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
399	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
400	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
401	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
402	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
403	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
404	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
405	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
406	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
407	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
408	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
409	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
410	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
411	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
412	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
413	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7

TIME	PIT GEOMETRY				AQUIFER SYSTEM						FLOW IN					FLOW OUT				RESULTS				
Current Year	Total Volume in shallow system (acre-ft)	Pit Lake Elevation (feet)	Pit Lake Area (acres)	Pit Wall Area (acres)	Groundwater Infiltration Area (acres)	Head gradient through "Morrison"	Infiltration to Groundwater (acre-ft)	Leakage through Fractures (acre-ft)	Leakage through "Intact" Burro Canyon (acre-ft)	Total Shallow Aquifer Leakage to Deep Aquifer (acre-ft)	Groundwater Input to Shallow System (acre-ft)	Surface Water Inflow (acre-ft)	Wall Runoff to Pit (acre-ft)	Direct Precipitation (acre-ft)	Total Volume in Shallow System to date (acre-ft)	Maximum Vertical Leakage out of Pit Floor (acre-ft)	Volume after Leakage (acre-ft)	Potential Evaporation (acre-ft)	Actual Evaporation (acre-ft)	Volume at end of timestep (acre-ft)	Water Elevation at end of timestep (ft)	Ground-water flow from aquifer to pit (acre-ft)	Pit Volume (acre-ft)	Aquifer Volume (acre-ft)
414	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
415	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
416	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
417	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
418	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
419	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
420	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
421	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
422	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
423	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
424	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
425	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
426	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
427	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
428	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
429	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
430	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
431	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
432	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
433	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
434	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
435	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
436	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
437	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
438	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
439	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
440	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
441	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
442	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
443	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
444	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
445	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
446	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
447	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
448	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
449	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
450	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
451	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
452	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
453	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
454	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
455	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
456	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
457	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
458	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
459	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
460	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
461	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
462	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
463	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
464	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
465	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
466	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
467	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
468	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
469	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
470	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
471	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
472	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
473	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
474	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
475	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
476	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
477	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
478	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
479	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
480	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
481	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
482	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7

WATER BALANCE FOR CENTENNIAL PIT AND SURROUNDING AQUIFER

TIME	PIT GEOMETRY				AQUIFER SYSTEM						FLOW IN					FLOW OUT				RESULTS				
Current Year	Total Volume in shallow system (acre-ft)	Pit Lake Elevation (feet)	Pit Lake Area (acres)	Pit Wall Area (acres)	Groundwater Infiltration Area (acres)	Head gradient through "Morrison"	Infiltration to Groundwater (acre-ft)	Leakage through Fractures (acre-ft)	Leakage through "Intact" Burro Canyon (acre-ft)	Total Shallow Aquifer Leakage to Deep Aquifer (acre-ft)	Groundwater Input to Shallow System (acre-ft)	Surface Water Inflow (acre-ft)	Wall Runoff to Pit (acre-ft)	Direct Precipitation (acre-ft)	Total Volume in Shallow System to date (acre-ft)	Maximum Vertical Leakage out of Pit Floor (acre-ft)	Volume after Leakage (acre-ft)	Potential Evaporation (acre-ft)	Actual Evaporation (acre-ft)	Volume at end of timestep (acre-ft)	Water Elevation at end of timestep (ft)	Ground-water flow from aquifer to pit (acre-ft)	Pit Volume (acre-ft)	Aquifer Volume (acre-ft)
483	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
484	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
485	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
486	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
487	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
488	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
489	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
490	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
491	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
492	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
493	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
494	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
495	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
496	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
497	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
498	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
499	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7
500	387.2	6,120.4	4.4	161.0	249.4	1.131	20.8	17.0	1.70	18.65	2.14	0.45	9.89	5.55	405.20	0.3306	404.9	17.70	17.70	387.2	6,120.4	2.14	125.5	261.7

ATTACHMENT 2
CHEMICAL BALANCE MODEL
FOR EXPANDED CENTENNIAL PIT

INPUT DATA TO GEOCHEMICAL MODEL
CENTENNIAL PIT

GEOCHEMICAL MODEL INPUT

Component Chemistry

Constituent:	TDS
Concentration in "Burro Canyon":	2039 mg/L
Concentration in Fracture Flow:	448 mg/L
Concentration in Pit Wall Runoff (Maximum):	187 mg/L
Concentration in Surface Water Runoff:	150 mg/L
Concentration in N-aquifer:	683 mg/L

Vertical Flow Distribution

Flow in fractures =	85% of infiltration
Flow in "intact" rock =	15% of infiltration

Deep Aquifer Conditions

Area:	253.8 acres
Thickness:	200 feet
Porosity:	0.05 percent

Geochemical Constraints

TDS Limit in pit:	3000 mg/L

CHEMICAL BALANCE MODEL RESULTS FOR N-AQUIFER BELOW CENTENNIAL PIT

TIME	INITIAL DEEP AQUIFER CONDITIONS			INPUT TO DEEP AQUIFER									OUTPUT FROM DEEP AQUIFER		FINAL DEEP AQUIFER CONDITIONS		
Current Year	Initial Water in Deep Aquifer (tons)	Initial Chemical Mass in Deep Aquifer (tons)	Initial Concentration in Deep Aquifer (ppm)	Flow to Deep Aquifer from Shallow Aquifer Leakage (tons)	Concentration in Shallow Aquifer (ppm)	Chemical Mass to Deep Aquifer from Shallow Aquifer Leakage (tons)	Concentration in Pit (ppm)	Flow to Deep Aquifer from Pit via Vertical Leakage (tons)	Chemical Mass to Deep Aquifer from Pit via Vertical Leakage (tons)	Sum of Water in Deep Aquifer (tons)	Mass in Deep Aquifer (tons)	Concentration Deep Aquifer (ppm)	Groundwater Flow from Deep Aquifer (tons)	Chemical Mass out from Deep Aquifer via Groundwater Flow (tons)	Final Water in Deep Aquifer (tons)	Final Chemical Mass in Deep Aquifer (tons)	Final Concentration in Deep Aquifer (ppm)
0.00	3,449,883	2,356	683.00	23,768	683	16.2	0.0	0.0	0.0000	3,473,650	2,373	683	23,768	16.23	3,449,883	2,356	683
1.00	3,449,883	2,356	683.00	23,714	328	7.8	185.4	104.2	0.0193	3,473,701	2,364	681	23,819	16.21	3,449,883	2,348	681
2.00	3,449,883	2,348	680.56	23,743	629	14.9	364.9	112.9	0.0412	3,473,739	2,363	680	23,856	16.23	3,449,883	2,347	680
3.00	3,449,883	2,347	680.19	23,771	595	14.1	379.9	121.4	0.0461	3,473,776	2,361	680	23,893	16.24	3,449,883	2,345	680
4.00	3,449,883	2,345	679.60	23,799	595	14.2	380.5	129.7	0.0494	3,473,811	2,359	679	23,929	16.25	3,449,883	2,342	679
5.00	3,449,883	2,342	679.01	23,825	598	14.2	380.5	137.8	0.0524	3,473,846	2,357	678	23,963	16.26	3,449,883	2,341	678
6.00	3,449,883	2,341	678.44	23,851	601	14.3	382.0	145.8	0.0557	3,473,880	2,355	678	23,997	16.27	3,449,883	2,339	678
7.00	3,449,883	2,339	677.90	23,877	604	14.4	385.0	153.5	0.0591	3,473,913	2,353	677	24,030	16.28	3,449,883	2,337	677
8.0	3,449,883	2,337	677.38	23,901	608	14.5	389.4	161.0	0.0627	3,473,945	2,351	677	24,062	16.29	3,449,883	2,335	677
9.0	3,449,883	2,335	676.89	23,925	611	14.6	394.8	168.4	0.0665	3,473,976	2,350	676	24,093	16.30	3,449,883	2,334	676
10.0	3,449,883	2,334	676.42	23,948	613	14.7	401.2	175.6	0.0704	3,474,007	2,348	676	24,124	16.31	3,449,883	2,332	676
11.0	3,449,883	2,332	675.97	23,971	616	14.8	408.3	182.6	0.0745	3,474,036	2,347	675	24,153	16.32	3,449,883	2,331	676
12.0	3,449,883	2,331	675.54	23,993	619	14.9	416.1	189.4	0.0788	3,474,065	2,345	675	24,182	16.33	3,449,883	2,329	675
13.0	3,449,883	2,329	675.14	24,014	622	14.9	424.5	196.1	0.0832	3,474,093	2,344	675	24,210	16.33	3,449,883	2,328	675
14.0	3,449,883	2,328	674.76	24,035	624	15.0	433.4	202.6	0.0878	3,474,121	2,343	674	24,238	16.34	3,449,883	2,327	674
15.0	3,449,883	2,327	674.39	24,055	627	15.1	442.9	209.0	0.0926	3,474,147	2,342	674	24,264	16.35	3,449,883	2,325	674
16.0	3,449,883	2,325	674.05	24,075	630	15.2	452.8	215.2	0.0974	3,474,173	2,340	674	24,290	16.36	3,449,883	2,324	674
17.0	3,449,883	2,324	673.73	24,094	632	15.2	463.2	221.2	0.1025	3,474,198	2,339	673	24,315	16.37	3,449,883	2,323	673
18.0	3,449,883	2,323	673.43	24,113	634	15.3	474.0	227.2	0.1077	3,474,223	2,338	673	24,340	16.38	3,449,883	2,322	673
19.0	3,449,883	2,322	673.15	24,131	637	15.4	485.3	232.9	0.1130	3,474,247	2,338	673	24,364	16.39	3,449,883	2,321	673
20.0	3,449,883	2,321	672.88	24,149	639	15.4	497.0	238.5	0.1185	3,474,270	2,337	673	24,387	16.40	3,449,883	2,321	673
21.0	3,449,883	2,321	672.64	24,166	641	15.5	509.1	244.0	0.1242	3,474,293	2,336	672	24,410	16.41	3,449,883	2,320	672
22.0	3,449,883	2,320	672.41	24,183	644	15.6	521.6	249.4	0.1301	3,474,315	2,335	672	24,432	16.42	3,449,883	2,319	672
23.0	3,449,883	2,319	672.20	24,199	646	15.6	534.6	254.6	0.1361	3,474,336	2,334	672	24,454	16.43	3,449,883	2,318	672
24.0	3,449,883	2,318	672.00	24,215	648	15.7	547.9	259.7	0.1423	3,474,357	2,334	672	24,474	16.44	3,449,883	2,318	672
25.0	3,449,883	2,318	671.83	24,230	650	15.7	561.8	264.6	0.1487	3,474,378	2,333	672	24,495	16.45	3,449,883	2,317	672
26.0	3,449,883	2,317	671.67	24,245	652	15.8	576.0	269.5	0.1552	3,474,397	2,333	671	24,515	16.46	3,449,883	2,317	672
27.0	3,449,883	2,317	671.52	24,260	654	15.9	590.7	274.2	0.1620	3,474,417	2,332	671	24,534	16.47	3,449,883	2,316	671
28.0	3,449,883	2,316	671.39	24,274	656	15.9	605.8	278.8	0.1689	3,474,436	2,332	671	24,553	16.48	3,449,883	2,316	671
29.0	3,449,883	2,316	671.28	24,288	657	16.0	621.4	283.3	0.1760	3,474,454	2,332	671	24,571	16.49	3,449,883	2,315	671
30.0	3,449,883	2,315	671.18	24,301	659	16.0	637.5	287.6	0.1834	3,474,472	2,331	671	24,589	16.50	3,449,883	2,315	671
31.0	3,449,883	2,315	671.09	24,314	661	16.1	654.0	291.9	0.1909	3,474,489	2,331	671	24,606	16.51	3,449,883	2,315	671
32.0	3,449,883	2,315	671.02	24,327	662	16.1	671.0	296.1	0.1987	3,474,506	2,331	671	24,623	16.52	3,449,883	2,315	671
33.0	3,449,883	2,315	670.96	24,340	664	16.2	688.5	300.1	0.2066	3,474,523	2,331	671	24,640	16.53	3,449,883	2,315	671
34.0	3,449,883	2,315	670.91	24,352	665	16.2	706.6	304.1	0.2148	3,474,539	2,331	671	24,656	16.54	3,449,883	2,314	671
35.0	3,449,883	2,314	670.87	24,363	667	16.2	725.1	307.9	0.2233	3,474,554	2,330	671	24,671	16.55	3,449,883	2,314	671
36.0	3,449,883	2,314	670.85	24,375	668	16.3	744.2	311.7	0.2319	3,474,569	2,330	671	24,687	16.56	3,449,883	2,314	671
37.0	3,449,883	2,314	670.84	24,386	669	16.3	763.8	315.3	0.2409	3,474,584	2,330	671	24,701	16.57	3,449,883	2,314	671
38.0	3,449,883	2,314	670.83	24,397	670	16.4	784.0	318.9	0.2500	3,474,599	2,330	671	24,716	16.58	3,449,883	2,314	671
39.0	3,449,883	2,314	670.84	24,407	671	16.4	804.8	322.4	0.2594	3,474,613	2,330	671	24,730	16.59	3,449,883	2,314	671
40.0	3,449,883	2,314	670.86	24,418	673	16.4	826.1	325.8	0.2691	3,474,626	2,331	671	24,743	16.60	3,449,883	2,314	671
41.0	3,449,883	2,314	670.89	24,428	673	16.5	848.1	329.1	0.2791	3,474,640	2,331	671	24,757	16.61	3,449,883	2,315	671
42.0	3,449,883	2,315	670.92	24,437	674	16.5	870.6	332.3	0.2893	3,474,653	2,331	671	24,770	16.62	3,449,883	2,315	671
43.0	3,449,883	2,315	670.97	24,447	675	16.5	893.9	335.4	0.2998	3,474,665	2,331	671	24,782	16.63	3,449,883	2,315	671
44.0	3,449,883	2,315	671.02	24,481	676	16.5	906.1	339.3	0.3075	3,474,703	2,331	671	24,820	16.65	3,449,883	2,315	671
45.0	3,449,883	2,315	671.08	24,516	676	16.6	917.4	343.2	0.3149	3,474,742	2,331	671	24,860	16.68	3,449,883	2,315	671
46.0	3,449,883	2,315	671.14	24,551	677	16.6	929.1	346.9	0.3224	3,474,780	2,332	671	24,898	16.71	3,449,883	2,316	671
47.0	3,449,883	2,316	671.21	24,584	677	16.7	941.2	350.5	0.3299	3,474,817	2,332	671	24,934	16.73	3,449,883	2,316	671
48.0	3,449,883	2,316	671.28	24,616	678	16.7	953.5	354.0	0.3376	3,474,852	2,332	671	24,970	16.76	3,449,883	2,316	671
49.0	3,449,883	2,316	671.36	24,646	678	16.7	966.1	357.4	0.3453	3,474,886	2,332	671	25,004	16.78	3,449,883	2,316	671
50.0	3,449,883	2,316	671.44	24,676	679	16.7	978.9	360.6	0.3530	3,474,919	2,333	671	25,036	16.81	3,449,883	2,317	672
51.0	3,449,883	2,317	671.52	24,704	679	16.8	991.9	363.8	0.3608	3,474,951	2,333	671	25,068	16.83	3,449,883	2,317	672
52.0	3,449,883	2,317	671.61	24,731	679	16.8	1,005.1	366.8	0.3687	3,474,981	2,333	671	25,098	16.85	3,449,883	2,317	672
53.0	3,449,883	2,317	671.70	24,758	680	16.8	1,018.5	369.7	0.3766	3,475,010	2,334	672	25,127	16.88	3,449,883	2,318	672
54.0	3,449,883	2,318	671.80	24,783	680	16.8	1,032.1	372.5	0.3845	3,475,038	2,334	672	25,156	16.90	3,449,883	2,318	672
55.0	3,449,883	2,318	671.89	24,808	680	16.9	1,045.8	375.3	0.3924	3,475,066	2,334	672	25,183	16.92	3,449,883	2,318	672
56.0	3,449,883	2,318	672.00	24,831	680	16.9	1,059.6	377.9	0.4004	3,475,092	2,335	672	25,209	16.94	3,449,883	2,319	672
57.0	3,449,883	2,319	672.10	24,854	681	16.9	1,073.7	380.4	0.4084	3,475,117	2,335	672	25,234	16.96	3,449,883	2,319	672
58.0	3,449,883	2,319	672.21	24,876	681	16.9	1,087.8	382.9	0.4165	3,475,141	2,336	672	25,258	16.98	3,449,883	2,319	672
59.0	3,449,883	2,319	672.31	24,897	681	17.0	1,102.1	385.2	0.4245	3,475,165	2,336	672	25,282	16.99	3,449,883	2,320	672
60.0	3,449,883	2,320	672.43	24,917	681	17.0	1,116.5	387.5	0.4326	3,475,187	2,336	672	25,304	17.01	3,449,883	2,320	673
61.0	3,449,883	2,320	672.54	24,936	681	17.0	1,131.0	389.7	0.4408	3,475,209	2,337	672	25,326	17.03	3,449,883	2,321	673
62.0	3,449,883	2,321	672.66	24,955	681	17.0	1,145.7	391.8	0.4489	3,475,230	2,337	673	25,347	17.05	3,449,883	2,321	673
63.0	3,449,883	2,321	672.77	24,973	682	17.0	1,160.5	393.9	0.4570	3,475,250	2,338	673	25,367	17.06	3,449,883	2,321	673
64.0	3,449,883	2,321	672.89	24,991	682	17.0	1,175.3	395.8	0.4652	3,475,269	2,338	673	25,386	17.08	3,449,883	2,322	673

CHEMICAL BALANCE MODEL RESULTS FOR N-AQUIFER BELOW CENTENNIAL PIT

TIME	INITIAL DEEP AQUIFER CONDITIONS			INPUT TO DEEP AQUIFER									OUTPUT FROM DEEP AQUIFER		FINAL DEEP AQUIFER CONDITIONS		
Current Year	Initial Water in Deep Aquifer (tons)	Initial Chemical Mass in Deep Aquifer (tons)	Initial Concentration in Deep Aquifer (ppm)	Flow to Deep Aquifer from Shallow Aquifer Leakage (tons)	Concentration in Shallow Aquifer (ppm)	Chemical Mass to Deep Aquifer from Shallow Aquifer Leakage (tons)	Concentration in Pit (ppm)	Flow to Deep Aquifer from Pit via Vertical Leakage (tons)	Chemical Mass to Deep Aquifer from Pit via Vertical Leakage (tons)	Sum of Water in Deep Aquifer (tons)	Mass in Deep Aquifer (tons)	Concentration Deep Aquifer (ppm)	Groundwater Flow from Deep Aquifer (tons)	Chemical Mass out from Deep Aquifer via Groundwater Flow (tons)	Final Water in Deep Aquifer (tons)	Final Chemical Mass in Deep Aquifer (tons)	Final Concentration in Deep Aquifer (ppm)
65.0	3,449,883	2,322	673.02	25,007	682	17.0	1,190.3	397.7	0.4734	3,475,288	2,338	673	25,405	17.09	3,449,883	2,322	673
66.0	3,449,883	2,322	673.14	25,024	682	17.1	1,205.4	399.6	0.4816	3,475,306	2,339	673	25,423	17.11	3,449,883	2,323	673
67.0	3,449,883	2,323	673.27	25,039	682	17.1	1,220.6	401.3	0.4899	3,475,323	2,339	673	25,440	17.12	3,449,883	2,323	673
68.0	3,449,883	2,323	673.39	25,054	682	17.1	1,235.9	403.0	0.4981	3,475,340	2,340	673	25,457	17.14	3,449,883	2,324	674
69.0	3,449,883	2,324	673.52	25,069	682	17.1	1,251.3	404.7	0.5064	3,475,356	2,340	673	25,473	17.15	3,449,883	2,324	674
70.0	3,449,883	2,324	673.66	25,082	682	17.1	1,266.8	406.3	0.5147	3,475,372	2,341	673	25,489	17.17	3,449,883	2,324	674
71.0	3,449,883	2,324	673.79	25,096	682	17.1	1,282.4	407.8	0.5229	3,475,386	2,341	674	25,504	17.18	3,449,883	2,325	674
72.0	3,449,883	2,325	673.92	25,109	682	17.1	1,298.1	409.3	0.5313	3,475,401	2,342	674	25,518	17.19	3,449,883	2,325	674
73.0	3,449,883	2,325	674.06	25,121	682	17.1	1,313.8	410.7	0.5396	3,475,415	2,342	674	25,532	17.21	3,449,883	2,326	674
74.0	3,449,883	2,326	674.20	25,133	682	17.2	1,329.7	412.1	0.5479	3,475,428	2,343	674	25,545	17.22	3,449,883	2,326	674
75.0	3,449,883	2,326	674.34	25,145	682	17.2	1,345.6	413.4	0.5563	3,475,441	2,343	674	25,558	17.23	3,449,883	2,327	674
76.0	3,449,883	2,327	674.48	25,156	683	17.2	1,361.7	414.6	0.5646	3,475,453	2,343	674	25,570	17.24	3,449,883	2,327	675
77.0	3,449,883	2,327	674.62	25,167	683	17.2	1,377.8	415.9	0.5730	3,475,465	2,344	674	25,582	17.25	3,449,883	2,328	675
78.0	3,449,883	2,328	674.76	25,177	683	17.2	1,393.9	417.1	0.5814	3,475,477	2,344	675	25,594	17.26	3,449,883	2,328	675
79.0	3,449,883	2,328	674.91	25,187	683	17.2	1,410.2	418.2	0.5897	3,475,488	2,345	675	25,605	17.28	3,449,883	2,329	675
80.0	3,449,883	2,329	675.06	25,196	683	17.2	1,426.5	419.3	0.5981	3,475,498	2,345	675	25,616	17.29	3,449,883	2,329	675
81.0	3,449,883	2,329	675.21	25,206	683	17.2	1,442.9	420.4	0.6065	3,475,509	2,346	675	25,626	17.30	3,449,883	2,330	675
82.0	3,449,883	2,330	675.36	25,214	683	17.2	1,459.4	421.4	0.6150	3,475,519	2,346	675	25,636	17.31	3,449,883	2,330	676
83.0	3,449,883	2,330	675.51	25,223	683	17.2	1,475.9	422.4	0.6234	3,475,528	2,347	675	25,645	17.32	3,449,883	2,331	676
84.0	3,449,883	2,331	675.66	25,231	683	17.2	1,492.5	423.3	0.6318	3,475,537	2,348	675	25,654	17.33	3,449,883	2,331	676
85.0	3,449,883	2,331	675.81	25,239	683	17.2	1,509.2	424.2	0.6403	3,475,546	2,348	676	25,663	17.34	3,449,883	2,332	676
86.0	3,449,883	2,332	675.97	25,247	683	17.2	1,525.9	425.1	0.6487	3,475,555	2,349	676	25,672	17.35	3,449,883	2,333	676
87.0	3,449,883	2,333	676.12	25,254	683	17.2	1,542.7	426.0	0.6571	3,475,563	2,349	676	25,680	17.36	3,449,883	2,333	676
88.0	3,449,883	2,333	676.28	25,261	683	17.2	1,559.6	426.8	0.6656	3,475,571	2,350	676	25,688	17.37	3,449,883	2,334	676
89.0	3,449,883	2,334	676.44	25,268	683	17.3	1,576.5	427.6	0.6741	3,475,578	2,350	676	25,696	17.38	3,449,883	2,334	677
90.0	3,449,883	2,334	676.60	25,275	683	17.3	1,593.4	428.3	0.6825	3,475,586	2,351	676	25,703	17.38	3,449,883	2,335	677
91.0	3,449,883	2,335	676.76	25,281	683	17.3	1,610.4	429.1	0.6910	3,475,593	2,351	677	25,710	17.39	3,449,883	2,335	677
92.0	3,449,883	2,335	676.92	25,287	683	17.3	1,627.5	429.8	0.6995	3,475,600	2,352	677	25,717	17.40	3,449,883	2,336	677
93.0	3,449,883	2,336	677.09	25,293	683	17.3	1,644.6	430.5	0.7080	3,475,606	2,352	677	25,723	17.41	3,449,883	2,336	677
94.0	3,449,883	2,336	677.25	25,299	683	17.3	1,661.8	431.1	0.7164	3,475,612	2,353	677	25,730	17.42	3,449,883	2,337	677
95.0	3,449,883	2,337	677.42	25,304	683	17.3	1,679.0	431.8	0.7249	3,475,619	2,354	677	25,736	17.43	3,449,883	2,338	678
96.0	3,449,883	2,338	677.59	25,309	683	17.3	1,696.3	432.4	0.7334	3,475,624	2,354	677	25,742	17.44	3,449,883	2,338	678
97.0	3,449,883	2,338	677.76	25,314	683	17.3	1,713.6	433.0	0.7419	3,475,630	2,355	677	25,747	17.44	3,449,883	2,339	678
98.0	3,449,883	2,339	677.93	25,319	683	17.3	1,730.9	433.5	0.7504	3,475,635	2,355	678	25,753	17.45	3,449,883	2,339	678
99.0	3,449,883	2,339	678.10	25,324	683	17.3	1,748.3	434.1	0.7589	3,475,641	2,356	678	25,758	17.46	3,449,883	2,340	678
100.0	3,449,883	2,340	678.27	25,328	683	17.3	1,765.7	434.6	0.7674	3,475,646	2,356	678	25,763	17.47	3,449,883	2,341	678.4
101.0	3,449,883	2,341	678.44	25,333	683	17.3	1,783.2	435.1	0.7759	3,475,651	2,357	678	25,768	17.47	3,449,883	2,341	678.6
102.0	3,449,883	2,341	678.62	25,337	683	17.3	1,800.7	435.6	0.7843	3,475,655	2,358	678	25,773	17.48	3,449,883	2,342	678.8
103.0	3,449,883	2,342	678.79	25,340	683	17.3	1,818.0	436.6	0.7938	3,475,659	2,358	679	25,776	17.49	3,449,883	2,342	679.0
104.0	3,449,883	2,342	678.97	25,340	683	17.3	1,835.3	438.3	0.8044	3,475,661	2,359	679	25,779	17.50	3,449,883	2,343	679
105.0	3,449,883	2,343	679.15	25,341	683	17.3	1,853.2	439.7	0.8149	3,475,664	2,359	679	25,781	17.50	3,449,883	2,344	679
106.0	3,449,883	2,344	679.33	25,342	683	17.3	1,871.6	441.0	0.8253	3,475,665	2,360	679	25,783	17.51	3,449,883	2,344	680
107.0	3,449,883	2,344	679.51	25,342	683	17.3	1,890.4	442.1	0.8357	3,475,667	2,361	679	25,784	17.51	3,449,883	2,345	680
108.0	3,449,883	2,345	679.69	25,343	683	17.3	1,909.5	443.0	0.8459	3,475,668	2,361	679	25,786	17.52	3,449,883	2,345	680
109.0	3,449,883	2,345	679.88	25,343	683	17.3	1,928.9	443.8	0.8561	3,475,670	2,362	680	25,787	17.52	3,449,883	2,346	680
110.0	3,449,883	2,346	680.06	25,343	683	17.3	1,948.5	444.5	0.8662	3,475,671	2,363	680	25,788	17.53	3,449,883	2,347	680
111.0	3,449,883	2,347	680.25	25,344	683	17.3	1,968.4	445.2	0.8762	3,475,672	2,363	680	25,789	17.53	3,449,883	2,347	680
112.0	3,449,883	2,347	680.44	25,344	683	17.3	1,988.4	445.7	0.8862	3,475,672	2,364	680	25,790	17.54	3,449,883	2,348	681
113.0	3,449,883	2,348	680.63	25,344	683	17.3	2,008.6	446.2	0.8962	3,475,673	2,364	680	25,790	17.55	3,449,883	2,349	681
114.0	3,449,883	2,349	680.82	25,344	683	17.3	2,028.9	446.6	0.9061	3,475,674	2,365	680	25,791	17.55	3,449,883	2,349	681
115.0	3,449,883	2,349	681.01	25,345	683	17.3	2,049.4	446.9	0.9159	3,475,674	2,366	681	25,791	17.56	3,449,883	2,350	681
116.0	3,449,883	2,350	681.21	25,345	683	17.3	2,069.9	447.2	0.9257	3,475,675	2,366	681	25,792	17.56	3,449,883	2,351	681
117.0	3,449,883	2,351	681.40	25,345	683	17.3	2,090.4	447.5	0.9355	3,475,675	2,367	681	25,792	17.57	3,449,883	2,351	682
118.0	3,449,883	2,351	681.60	25,345	683	17.3	2,111.1	447.7	0.9452	3,475,675	2,368	681	25,793	17.57	3,449,883	2,352	682
119.0	3,449,883	2,352	681.80	25,345	683	17.3	2,131.7	448.0	0.9549	3,475,676	2,368	681	25,793	17.58	3,449,883	2,353	682
120.0	3,449,883	2,353	682.00	25,345	683	17.3	2,152.4	448.1	0.9646	3,475,676	2,369	682	25,793	17.58	3,449,883	2,354	682
121.0	3,449,883	2,354	682.20	25,345	683	17.3	2,173.1	448.3	0.9742	3,475,676	2,370	682	25,793	17.59	3,449,883	2,354	682
122.0	3,449,883	2,354	682.40	25,345	683	17.3	2,193.9	448.4	0.9838	3,475,676	2,371	682	25,794	17.59	3,449,883	2,355	683
123.0	3,449,883	2,355	682.60	25,345	683	17.3	2,214.6	448.5	0.9933	3,475,677	2,371	682	25,794	17.60	3,449,883	2,356	683
124.0	3,449,883	2,356	682.81	25,345	683	17.3	2,235.3	448.6	1.0028	3,475,677	2,372	682	25,794	17.60	3,449,883	2,356	683
125.0	3,449,883	2,356	683.01	25,345	683	17.3	2,256.0	448.7	1.0123	3,475,677	2,373	683	25,794	17.61	3,449,883	2,357	683
126.0	3,449,883	2,357	683.22	25,345	683	17.3	2,276.7	448.8	1.0218	3,475,677	2,373	683	25,794	17.61	3,449,883	2,358	683
127.0	3,449,883	2,358	683.43	25,345	683	17.3	2,297.4	448.9	1.0312	3,475,677	2,374	683	25,794	17.62	3,449,883	2,358	684
128.0	3,449,883	2,358	683.64	25,345	683	17.3	2,318.0	448.9	1.0406	3,475,677	2,375	683	25,794	17.62	3,449,883	2,359	684
129.0	3,449,883	2,359	683.85	25,345	683	17.3	2,338.7	449.0	1.0500	3,475,677	2,375	683	25,794	17.63	3,449,883	2,360	684
130.0	3,449,883	2,360	684.06	25,346	683	17.3	2,359.2	449.0	1.0593	3,475,677	2,376	684	25,795	17.63	3,449,883	2,361	684

CHEMICAL BALANCE MODEL RESULTS FOR N-AQUIFER BELOW CENTENNIAL PIT

TIME	INITIAL DEEP AQUIFER CONDITIONS			INPUT TO DEEP AQUIFER									OUTPUT FROM DEEP AQUIFER		FINAL DEEP AQUIFER CONDITIONS		
Current Year	Initial Water in Deep Aquifer (tons)	Initial Chemical Mass in Deep Aquifer (tons)	Initial Concentration in Deep Aquifer (ppm)	Flow to Deep Aquifer from Shallow Aquifer Leakage (tons)	Concentration in Shallow Aquifer (ppm)	Chemical Mass to Deep Aquifer from Shallow Aquifer Leakage (tons)	Concentration in Pit (ppm)	Flow to Deep Aquifer from Pit via Vertical Leakage (tons)	Chemical Mass to Deep Aquifer from Pit via Vertical Leakage (tons)	Sum of Water in Deep Aquifer (tons)	Mass in Deep Aquifer (tons)	Concentration Deep Aquifer (ppm)	Groundwater Flow from Deep Aquifer (tons)	Chemical Mass out from Deep Aquifer via Groundwater Flow (tons)	Final Water in Deep Aquifer (tons)	Final Chemical Mass in Deep Aquifer (tons)	Final Concentration in Deep Aquifer (ppm)
131.0	3,449,883	2,361	684.28	25,346	683	17.3	2,379.8	449.1	1.0687	3,475,677	2,377	684	25,795	17.64	3,449,883	2,361	684
132.0	3,449,883	2,361	684.49	25,346	683	17.3	2,400.3	449.1	1.0780	3,475,677	2,378	684	25,795	17.65	3,449,883	2,362	685
133.0	3,449,883	2,362	684.71	25,346	683	17.3	2,420.8	449.1	1.0872	3,475,677	2,378	684	25,795	17.65	3,449,883	2,363	685
134.0	3,449,883	2,363	684.92	25,346	683	17.3	2,441.2	449.1	1.0965	3,475,678	2,379	685	25,795	17.66	3,449,883	2,364	685
135.0	3,449,883	2,364	685.14	25,346	683	17.3	2,461.6	449.2	1.1057	3,475,678	2,380	685	25,795	17.66	3,449,883	2,364	685
136.0	3,449,883	2,364	685.36	25,346	683	17.3	2,482.0	449.2	1.1149	3,475,678	2,381	685	25,795	17.67	3,449,883	2,365	686
137.0	3,449,883	2,365	685.58	25,346	683	17.3	2,502.3	449.2	1.1240	3,475,678	2,381	685	25,795	17.67	3,449,883	2,366	686
138.0	3,449,883	2,366	685.80	25,346	683	17.3	2,522.6	449.2	1.1332	3,475,678	2,382	685	25,795	17.68	3,449,883	2,367	686
139.0	3,449,883	2,367	686.02	25,346	683	17.3	2,542.8	449.2	1.1423	3,475,678	2,383	686	25,795	17.68	3,449,883	2,367	686
140.0	3,449,883	2,367	686.24	25,346	683	17.3	2,562.9	449.2	1.1514	3,475,678	2,384	686	25,795	17.69	3,449,883	2,368	686
141.0	3,449,883	2,368	686.47	25,346	683	17.3	2,583.1	449.2	1.1604	3,475,678	2,384	686	25,795	17.70	3,449,883	2,369	687
142.0	3,449,883	2,369	686.69	25,346	683	17.3	2,603.1	449.3	1.1695	3,475,678	2,385	686	25,795	17.70	3,449,883	2,370	687
143.0	3,449,883	2,370	686.92	25,346	683	17.3	2,623.2	449.3	1.1785	3,475,678	2,386	686	25,795	17.71	3,449,883	2,371	687
144.0	3,449,883	2,371	687.15	25,346	683	17.3	2,643.1	449.3	1.1875	3,475,678	2,387	687	25,795	17.71	3,449,883	2,371	687
145.0	3,449,883	2,371	687.37	25,346	683	17.3	2,663.1	449.3	1.1965	3,475,678	2,387	687	25,795	17.72	3,449,883	2,372	688
146.0	3,449,883	2,372	687.60	25,346	683	17.3	2,682.9	449.3	1.2054	3,475,678	2,388	687	25,795	17.72	3,449,883	2,373	688
147.0	3,449,883	2,373	687.83	25,346	683	17.3	2,702.8	449.3	1.2143	3,475,678	2,389	687	25,795	17.73	3,449,883	2,374	688
148.0	3,449,883	2,374	688.06	25,346	683	17.3	2,722.6	449.3	1.2232	3,475,678	2,390	688	25,795	17.74	3,449,883	2,375	688
149.0	3,449,883	2,375	688.29	25,346	683	17.3	2,742.3	449.3	1.2321	3,475,678	2,391	688	25,795	17.74	3,449,883	2,375	689
150.0	3,449,883	2,375	688.53	25,346	683	17.3	2,762.0	449.3	1.2409	3,475,678	2,391	688	25,795	17.75	3,449,883	2,376	689
151.0	3,449,883	2,376	688.76	25,346	683	17.3	2,781.6	449.3	1.2498	3,475,678	2,392	688	25,795	17.75	3,449,883	2,377	689
152.0	3,449,883	2,377	688.99	25,346	683	17.3	2,801.2	449.3	1.2586	3,475,678	2,393	688	25,795	17.76	3,449,883	2,378	689
153.0	3,449,883	2,378	689.23	25,346	683	17.3	2,820.7	449.3	1.2673	3,475,678	2,394	689	25,795	17.77	3,449,883	2,379	689
154.0	3,449,883	2,379	689.46	25,346	683	17.3	2,840.2	449.3	1.2761	3,475,678	2,395	689	25,795	17.77	3,449,883	2,379	690
155.0	3,449,883	2,379	689.70	25,346	683	17.3	2,859.6	449.3	1.2848	3,475,678	2,395	689	25,795	17.78	3,449,883	2,380	690
156.0	3,449,883	2,380	689.94	25,346	683	17.3	2,879.0	449.3	1.2935	3,475,678	2,396	689	25,795	17.78	3,449,883	2,381	690
157.0	3,449,883	2,381	690.17	25,346	683	17.3	2,898.3	449.3	1.3022	3,475,678	2,397	690	25,795	17.79	3,449,883	2,382	690
158.0	3,449,883	2,382	690.41	25,346	683	17.3	2,917.6	449.3	1.3109	3,475,678	2,398	690	25,795	17.80	3,449,883	2,383	691
159.0	3,449,883	2,383	690.65	25,346	683	17.3	2,936.8	449.3	1.3195	3,475,678	2,399	690	25,795	17.80	3,449,883	2,384	691
160.0	3,449,883	2,384	690.89	25,346	683	17.3	2,956.0	449.3	1.3281	3,475,678	2,399	690	25,795	17.81	3,449,883	2,384	691
161.0	3,449,883	2,384	691.13	25,346	683	17.3	2,975.1	449.3	1.3367	3,475,678	2,400	691	25,795	17.81	3,449,883	2,385	691
162.0	3,449,883	2,385	691.38	25,346	683	17.3	2,994.1	449.3	1.3453	3,475,678	2,401	691	25,795	17.82	3,449,883	2,386	692
163.0	3,449,883	2,386	691.62	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,402	691	25,795	17.83	3,449,883	2,387	692
164.0	3,449,883	2,387	691.86	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,403	691	25,795	17.83	3,449,883	2,388	692
165.0	3,449,883	2,388	692.10	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,404	692	25,795	17.84	3,449,883	2,388	692
166.0	3,449,883	2,388	692.34	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,404	692	25,795	17.84	3,449,883	2,389	693
167.0	3,449,883	2,389	692.57	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,405	692	25,795	17.85	3,449,883	2,390	693
168.0	3,449,883	2,390	692.81	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,406	692	25,795	17.86	3,449,883	2,391	693
169.0	3,449,883	2,391	693.04	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,407	692	25,795	17.86	3,449,883	2,392	693
170.0	3,449,883	2,392	693.27	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,408	693	25,795	17.87	3,449,883	2,392	694
171.0	3,449,883	2,392	693.50	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,408	693	25,795	17.87	3,449,883	2,393	694
172.0	3,449,883	2,393	693.73	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,409	693	25,795	17.88	3,449,883	2,394	694
173.0	3,449,883	2,394	693.95	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,410	693	25,795	17.89	3,449,883	2,395	694
174.0	3,449,883	2,395	694.18	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,411	694	25,795	17.89	3,449,883	2,396	694
175.0	3,449,883	2,396	694.40	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,412	694	25,795	17.90	3,449,883	2,396	695
176.0	3,449,883	2,396	694.62	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,412	694	25,795	17.90	3,449,883	2,397	695
177.0	3,449,883	2,397	694.84	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,413	694	25,795	17.91	3,449,883	2,398	695
178.0	3,449,883	2,398	695.06	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,414	694	25,795	17.91	3,449,883	2,399	695
179.0	3,449,883	2,399	695.27	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,415	695	25,795	17.92	3,449,883	2,399	695
180.0	3,449,883	2,399	695.49	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,415	695	25,795	17.93	3,449,883	2,400	696
181.0	3,449,883	2,400	695.70	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,416	695	25,795	17.93	3,449,883	2,401	696
182.0	3,449,883	2,401	695.91	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,417	695	25,795	17.94	3,449,883	2,402	696
183.0	3,449,883	2,402	696.12	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,417	696	25,795	17.94	3,449,883	2,402	696
184.0	3,449,883	2,402	696.33	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,418	696	25,795	17.95	3,449,883	2,403	697
185.0	3,449,883	2,403	696.54	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,419	696	25,795	17.95	3,449,883	2,404	697
186.0	3,449,883	2,404	696.74	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,420	696	25,795	17.96	3,449,883	2,404	697
187.0	3,449,883	2,404	696.94	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,420	696	25,795	17.96	3,449,883	2,405	697
188.0	3,449,883	2,405	697.15	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,421	697	25,795	17.97	3,449,883	2,406	697
189.0	3,449,883	2,406	697.35	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,422	697	25,795	17.97	3,449,883	2,406	698
190.0	3,449,883	2,406	697.55	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,422	697	25,795	17.98	3,449,883	2,407	698
191.0	3,449,883	2,407	697.74	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,423	697	25,795	17.98	3,449,883	2,408	698
192.0	3,449,883	2,408	697.94	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,424	697	25,795	17.99	3,449,883	2,408	698
193.0	3,449,883	2,408	698.13	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,424	698	25,795	17.99	3,449,883	2,409	698
194.0	3,449,883	2,409	698.33	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,425	698	25,795	18.00	3,449,883	2,410	699
195.0	3,449,883	2,410	698.52	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,426	698	25,795	18.00	3,449,883	2,410	699
196.0	3,449,883	2,410	698.71	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,426	698	25,795	18.01	3,449,883	2,411	699

CHEMICAL BALANCE MODEL RESULTS FOR N-AQUIFER BELOW CENTENNIAL PIT

TIME	INITIAL DEEP AQUIFER CONDITIONS			INPUT TO DEEP AQUIFER									OUTPUT FROM DEEP AQUIFER		FINAL DEEP AQUIFER CONDITIONS		
Current Year	Initial Water in Deep Aquifer (tons)	Initial Chemical Mass in Deep Aquifer (tons)	Initial Concentration in Deep Aquifer (ppm)	Flow to Deep Aquifer from Shallow Aquifer Leakage (tons)	Concentration in Shallow Aquifer (ppm)	Chemical Mass to Deep Aquifer from Shallow Aquifer Leakage (tons)	Concentration in Pit (ppm)	Flow to Deep Aquifer from Pit via Vertical Leakage (tons)	Chemical Mass to Deep Aquifer from Pit via Vertical Leakage (tons)	Sum of Water in Deep Aquifer (tons)	Mass in Deep Aquifer (tons)	Concentration Deep Aquifer (ppm)	Groundwater Flow from Deep Aquifer (tons)	Chemical Mass out from Deep Aquifer via Groundwater Flow (tons)	Final Water in Deep Aquifer (tons)	Final Chemical Mass in Deep Aquifer (tons)	Final Concentration in Deep Aquifer (ppm)
197.0	3,449,883	2,411	698.90	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,427	698	25,795	18.01	3,449,883	2,412	699
198.0	3,449,883	2,412	699.08	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,428	698	25,795	18.02	3,449,883	2,412	699
199.0	3,449,883	2,412	699.27	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,428	699	25,795	18.02	3,449,883	2,413	699
200.0	3,449,883	2,413	699.45	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,429	699	25,795	18.03	3,449,883	2,414	700
201.0	3,449,883	2,414	699.64	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,430	699	25,795	18.03	3,449,883	2,414	700
202.0	3,449,883	2,414	699.82	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,430	699	25,795	18.04	3,449,883	2,415	700
203.0	3,449,883	2,415	700.00	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,431	699	25,795	18.04	3,449,883	2,416	700
204.0	3,449,883	2,416	700.18	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,432	700	25,795	18.05	3,449,883	2,416	700
205.0	3,449,883	2,416	700.36	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,432	700	25,795	18.05	3,449,883	2,417	701
206.0	3,449,883	2,417	700.53	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,433	700	25,795	18.05	3,449,883	2,417	701
207.0	3,449,883	2,417	700.71	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,433	700	25,795	18.06	3,449,883	2,418	701
208.0	3,449,883	2,418	700.88	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,434	700	25,795	18.06	3,449,883	2,419	701
209.0	3,449,883	2,419	701.06	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,435	700	25,795	18.07	3,449,883	2,419	701
210.0	3,449,883	2,419	701.23	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,435	701	25,795	18.07	3,449,883	2,420	701
211.0	3,449,883	2,420	701.40	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,436	701	25,795	18.08	3,449,883	2,420	702
212.0	3,449,883	2,420	701.57	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,436	701	25,795	18.08	3,449,883	2,421	702
213.0	3,449,883	2,421	701.73	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,437	701	25,795	18.09	3,449,883	2,421	702
214.0	3,449,883	2,421	701.90	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,437	701	25,795	18.09	3,449,883	2,422	702
215.0	3,449,883	2,422	702.07	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,438	701	25,795	18.09	3,449,883	2,423	702
216.0	3,449,883	2,423	702.23	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,439	702	25,795	18.10	3,449,883	2,423	702
217.0	3,449,883	2,423	702.39	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,439	702	25,795	18.10	3,449,883	2,424	703
218.0	3,449,883	2,424	702.55	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,440	702	25,795	18.11	3,449,883	2,424	703
219.0	3,449,883	2,424	702.71	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,440	702	25,795	18.11	3,449,883	2,425	703
220.0	3,449,883	2,425	702.87	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,441	702	25,795	18.11	3,449,883	2,425	703
221.0	3,449,883	2,425	703.03	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,441	702	25,795	18.12	3,449,883	2,426	703
222.0	3,449,883	2,426	703.19	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,442	703	25,795	18.12	3,449,883	2,426	703
223.0	3,449,883	2,426	703.34	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,442	703	25,795	18.13	3,449,883	2,427	703
224.0	3,449,883	2,427	703.50	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,443	703	25,795	18.13	3,449,883	2,428	704
225.0	3,449,883	2,428	703.65	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,443	703	25,795	18.13	3,449,883	2,428	704
226.0	3,449,883	2,428	703.80	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,444	703	25,795	18.14	3,449,883	2,429	704
227.0	3,449,883	2,429	703.95	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,445	703	25,795	18.14	3,449,883	2,429	704
228.0	3,449,883	2,429	704.10	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,445	703	25,795	18.15	3,449,883	2,430	704
229.0	3,449,883	2,430	704.25	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,446	704	25,795	18.15	3,449,883	2,430	704
230.0	3,449,883	2,430	704.40	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,446	704	25,795	18.15	3,449,883	2,431	705
231.0	3,449,883	2,431	704.55	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,447	704	25,795	18.16	3,449,883	2,431	705
232.0	3,449,883	2,431	704.69	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,447	704	25,795	18.16	3,449,883	2,432	705
233.0	3,449,883	2,432	704.84	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,448	704	25,795	18.16	3,449,883	2,432	705
234.0	3,449,883	2,432	704.98	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,448	704	25,795	18.17	3,449,883	2,433	705
235.0	3,449,883	2,433	705.12	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,449	704	25,795	18.17	3,449,883	2,433	705
236.0	3,449,883	2,433	705.26	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,449	705	25,795	18.18	3,449,883	2,434	705
237.0	3,449,883	2,434	705.40	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,450	705	25,795	18.18	3,449,883	2,434	706
238.0	3,449,883	2,434	705.54	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,450	705	25,795	18.18	3,449,883	2,435	706
239.0	3,449,883	2,435	705.68	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,450	705	25,795	18.19	3,449,883	2,435	706
240.0	3,449,883	2,435	705.82	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,451	705	25,795	18.19	3,449,883	2,435	706
241.0	3,449,883	2,435	705.95	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,451	705	25,795	18.19	3,449,883	2,436	706
242.0	3,449,883	2,436	706.09	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,452	705	25,795	18.20	3,449,883	2,436	706
243.0	3,449,883	2,436	706.22	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,452	706	25,795	18.20	3,449,883	2,437	706
244.0	3,449,883	2,437	706.36	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,453	706	25,795	18.20	3,449,883	2,437	706
245.0	3,449,883	2,437	706.49	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,453	706	25,795	18.21	3,449,883	2,438	707
246.0	3,449,883	2,438	706.62	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,454	706	25,795	18.21	3,449,883	2,438	707
247.0	3,449,883	2,438	706.75	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,454	706	25,795	18.21	3,449,883	2,439	707
248.0	3,449,883	2,439	706.88	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,455	706	25,795	18.22	3,449,883	2,439	707
249.0	3,449,883	2,439	707.01	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,455	706	25,795	18.22	3,449,883	2,440	707
250.0	3,449,883	2,440	707.13	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,455	706	25,795	18.22	3,449,883	2,440	707
251.0	3,449,883	2,440	707.26	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,456	707	25,795	18.23	3,449,883	2,440	707
252.0	3,449,883	2,440	707.38	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,456	707	25,795	18.23	3,449,883	2,441	708
253.0	3,449,883	2,441	707.51	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,457	707	25,795	18.23	3,449,883	2,441	708
254.0	3,449,883	2,441	707.63	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,457	707	25,795	18.24	3,449,883	2,442	708
255.0	3,449,883	2,442	707.76	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,458	707	25,795	18.24	3,449,883	2,442	708
256.0	3,449,883	2,442	707.88	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,458	707	25,795	18.24	3,449,883	2,443	708
257.0	3,449,883	2,443	708.00	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,458	707	25,795	18.25	3,449,883	2,443	708
258.0	3,449,883	2,443	708.12	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,459	707	25,795	18.25	3,449,883	2,443	708
259.0	3,449,883	2,443	708.24	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,459	708	25,795	18.25	3,449,883	2,444	708
260.0	3,449,883	2,444	708.35	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,460	708	25,795	18.25	3,449,883	2,444	708
261.0	3,449,883	2,444	708.47	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,460	708	25,795	18.26	3,449,883	2,445	709
262.0	3,449,883	2,445	708.59	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,461	708	25,795	18.26	3,449,883	2,445	709

CHEMICAL BALANCE MODEL RESULTS FOR N-AQUIFER BELOW CENTENNIAL PIT

TIME	INITIAL DEEP AQUIFER CONDITIONS			INPUT TO DEEP AQUIFER									OUTPUT FROM DEEP AQUIFER		FINAL DEEP AQUIFER CONDITIONS		
Current Year	Initial Water in Deep Aquifer (tons)	Initial Chemical Mass in Deep Aquifer (tons)	Initial Concentration in Deep Aquifer (ppm)	Flow to Deep Aquifer from Shallow Aquifer Leakage (tons)	Concentration in Shallow Aquifer (ppm)	Chemical Mass to Deep Aquifer from Shallow Aquifer Leakage (tons)	Concentration in Pit (ppm)	Flow to Deep Aquifer from Pit via Vertical Leakage (tons)	Chemical Mass to Deep Aquifer from Pit via Vertical Leakage (tons)	Sum of Water in Deep Aquifer (tons)	Mass in Deep Aquifer (tons)	Concentration Deep Aquifer (ppm)	Groundwater Flow from Deep Aquifer (tons)	Chemical Mass out from Deep Aquifer via Groundwater Flow (tons)	Final Water in Deep Aquifer (tons)	Final Chemical Mass in Deep Aquifer (tons)	Final Concentration in Deep Aquifer (ppm)
263.0	3,449,883	2,445	708.70	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,461	708	25,795	18.26	3,449,883	2,445	709
264.0	3,449,883	2,445	708.82	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,461	708	25,795	18.27	3,449,883	2,446	709
265.0	3,449,883	2,446	708.93	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,462	708	25,795	18.27	3,449,883	2,446	709
266.0	3,449,883	2,446	709.04	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,462	708	25,795	18.27	3,449,883	2,447	709
267.0	3,449,883	2,447	709.16	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,462	708	25,795	18.28	3,449,883	2,447	709
268.0	3,449,883	2,447	709.27	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,463	709	25,795	18.28	3,449,883	2,447	709
269.0	3,449,883	2,447	709.38	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,463	709	25,795	18.28	3,449,883	2,448	709
270.0	3,449,883	2,448	709.49	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,464	709	25,795	18.28	3,449,883	2,448	710
271.0	3,449,883	2,448	709.60	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,464	709	25,795	18.29	3,449,883	2,448	710
272.0	3,449,883	2,448	709.70	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,464	709	25,795	18.29	3,449,883	2,449	710
273.0	3,449,883	2,449	709.81	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,465	709	25,795	18.29	3,449,883	2,449	710
274.0	3,449,883	2,449	709.92	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,465	709	25,795	18.29	3,449,883	2,449	710
275.0	3,449,883	2,449	710.02	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,465	709	25,795	18.30	3,449,883	2,450	710
276.0	3,449,883	2,450	710.13	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,466	709	25,795	18.30	3,449,883	2,450	710
277.0	3,449,883	2,450	710.23	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,466	710	25,795	18.30	3,449,883	2,451	710
278.0	3,449,883	2,451	710.34	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,467	710	25,795	18.31	3,449,883	2,451	710
279.0	3,449,883	2,451	710.44	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,467	710	25,795	18.31	3,449,883	2,451	711
280.0	3,449,883	2,451	710.54	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,467	710	25,795	18.31	3,449,883	2,452	711
281.0	3,449,883	2,452	710.64	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,468	710	25,795	18.31	3,449,883	2,452	711
282.0	3,449,883	2,452	710.74	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,468	710	25,795	18.32	3,449,883	2,452	711
283.0	3,449,883	2,452	710.84	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,468	710	25,795	18.32	3,449,883	2,453	711
284.0	3,449,883	2,453	710.94	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,469	710	25,795	18.32	3,449,883	2,453	711
285.0	3,449,883	2,453	711.04	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,469	710	25,795	18.32	3,449,883	2,453	711
286.0	3,449,883	2,453	711.14	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,469	710	25,795	18.33	3,449,883	2,454	711
287.0	3,449,883	2,454	711.23	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,470	711	25,795	18.33	3,449,883	2,454	711
288.0	3,449,883	2,454	711.33	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,470	711	25,795	18.33	3,449,883	2,454	711
289.0	3,449,883	2,454	711.42	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,470	711	25,795	18.33	3,449,883	2,455	712
290.0	3,449,883	2,455	711.52	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,471	711	25,795	18.34	3,449,883	2,455	712
291.0	3,449,883	2,455	711.61	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,471	711	25,795	18.34	3,449,883	2,455	712
292.0	3,449,883	2,455	711.70	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,471	711	25,795	18.34	3,449,883	2,456	712
293.0	3,449,883	2,456	711.80	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,472	711	25,795	18.34	3,449,883	2,456	712
294.0	3,449,883	2,456	711.89	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,472	711	25,795	18.35	3,449,883	2,456	712
295.0	3,449,883	2,456	711.98	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,472	711	25,795	18.35	3,449,883	2,457	712
296.0	3,449,883	2,457	712.07	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,473	711	25,795	18.35	3,449,883	2,457	712
297.0	3,449,883	2,457	712.16	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,473	711	25,795	18.35	3,449,883	2,457	712
298.0	3,449,883	2,457	712.25	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,473	712	25,795	18.35	3,449,883	2,457	712
299.0	3,449,883	2,457	712.34	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,473	712	25,795	18.36	3,449,883	2,458	712
300.0	3,449,883	2,458	712.42	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,474	712	25,795	18.36	3,449,883	2,458	713
301.0	3,449,883	2,458	712.51	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,474	712	25,795	18.36	3,449,883	2,458	713
302.0	3,449,883	2,458	712.60	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,474	712	25,795	18.36	3,449,883	2,459	713
303.0	3,449,883	2,459	712.68	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,475	712	25,795	18.37	3,449,883	2,459	713
304.0	3,449,883	2,459	712.77	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,475	712	25,795	18.37	3,449,883	2,459	713
305.0	3,449,883	2,459	712.85	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,475	712	25,795	18.37	3,449,883	2,460	713
306.0	3,449,883	2,460	712.94	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,476	712	25,795	18.37	3,449,883	2,460	713
307.0	3,449,883	2,460	713.02	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,476	712	25,795	18.37	3,449,883	2,460	713
308.0	3,449,883	2,460	713.10	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,476	712	25,795	18.38	3,449,883	2,460	713
309.0	3,449,883	2,460	713.18	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,476	712	25,795	18.38	3,449,883	2,461	713
310.0	3,449,883	2,461	713.27	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,477	713	25,795	18.38	3,449,883	2,461	713
311.0	3,449,883	2,461	713.35	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,477	713	25,795	18.38	3,449,883	2,461	713
312.0	3,449,883	2,461	713.43	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,477	713	25,795	18.38	3,449,883	2,462	714
313.0	3,449,883	2,462	713.51	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,477	713	25,795	18.39	3,449,883	2,462	714
314.0	3,449,883	2,462	713.58	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,478	713	25,795	18.39	3,449,883	2,462	714
315.0	3,449,883	2,462	713.66	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,478	713	25,795	18.39	3,449,883	2,462	714
316.0	3,449,883	2,462	713.74	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,478	713	25,795	18.39	3,449,883	2,463	714
317.0	3,449,883	2,463	713.82	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,479	713	25,795	18.39	3,449,883	2,463	714
318.0	3,449,883	2,463	713.89	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,479	713	25,795	18.40	3,449,883	2,463	714
319.0	3,449,883	2,463	713.97	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,479	713	25,795	18.40	3,449,883	2,463	714
320.0	3,449,883	2,463	714.05	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,479	713	25,795	18.40	3,449,883	2,464	714
321.0	3,449,883	2,464	714.12	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,480	713	25,795	18.40	3,449,883	2,464	714
322.0	3,449,883	2,464	714.20	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,480	713	25,795	18.40	3,449,883	2,464	714
323.0	3,449,883	2,464	714.27	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,480	714	25,795	18.41	3,449,883	2,464	714
324.0	3,449,883	2,464	714.34	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,480	714	25,795	18.41	3,449,883	2,465	714
325.0	3,449,883	2,465	714.42	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,481	714	25,795	18.41	3,449,883	2,465	714
326.0	3,449,883	2,465	714.49	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,481	714	25,795	18.41	3,449,883	2,465	715
327.0	3,449,883	2,465	714.56	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,481	714	25,795	18.41	3,449,883	2,465	715
328.0	3,449,883	2,465	714.63	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,481	714	25,795	18.42	3,449,883	2,466	715

CHEMICAL BALANCE MODEL RESULTS FOR N-AQUIFER BELOW CENTENNIAL PIT

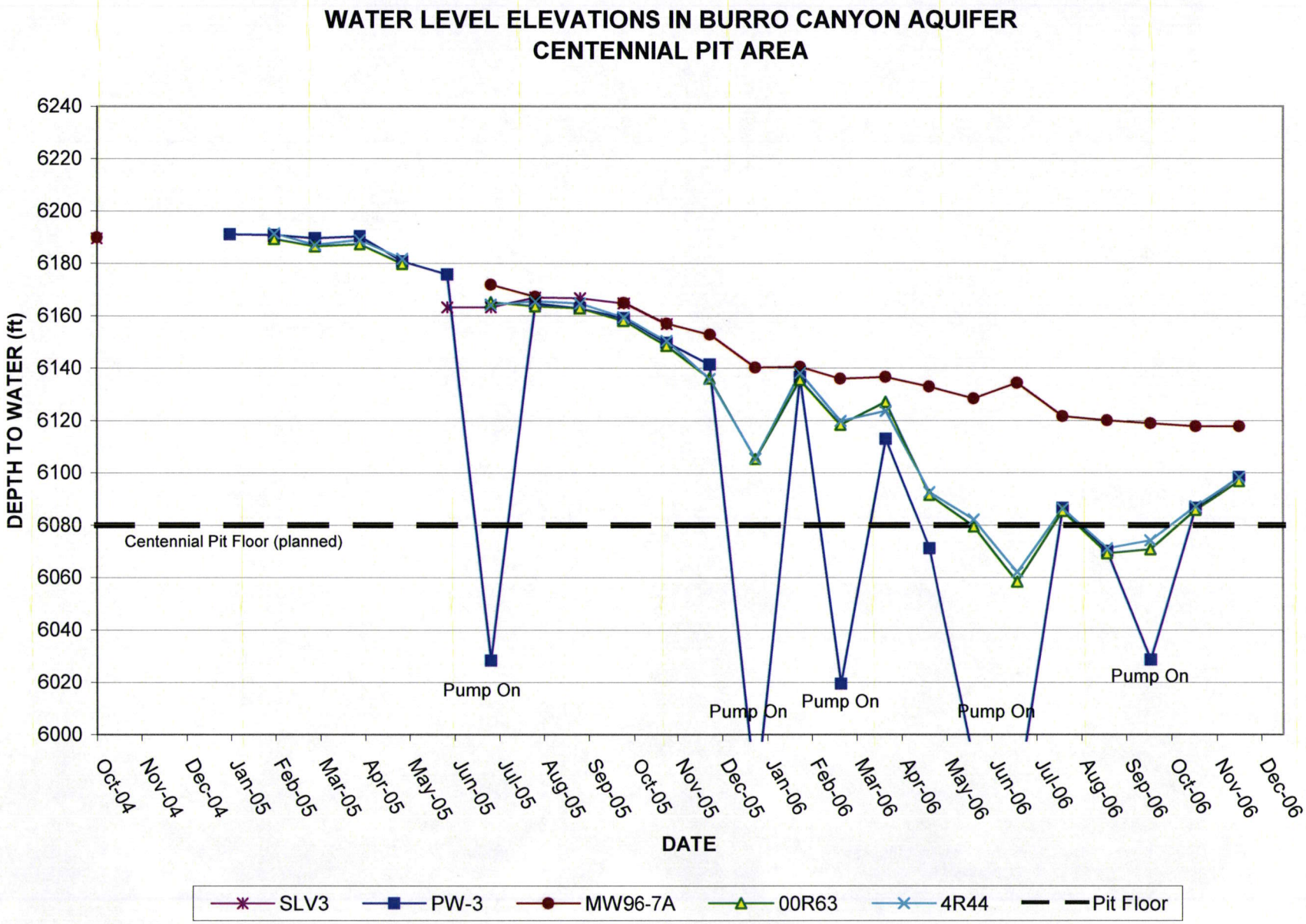
TIME	INITIAL DEEP AQUIFER CONDITIONS			INPUT TO DEEP AQUIFER									OUTPUT FROM DEEP AQUIFER		FINAL DEEP AQUIFER CONDITIONS		
Current Year	Initial Water in Deep Aquifer (tons)	Initial Chemical Mass in Deep Aquifer (tons)	Initial Concentration in Deep Aquifer (ppm)	Flow to Deep Aquifer from Shallow Aquifer Leakage (tons)	Concentration in Shallow Aquifer (ppm)	Chemical Mass to Deep Aquifer from Shallow Aquifer Leakage (tons)	Concentration in Pit (ppm)	Flow to Deep Aquifer from Pit via Vertical Leakage (tons)	Chemical Mass to Deep Aquifer from Pit via Vertical Leakage (tons)	Sum of Water in Deep Aquifer (tons)	Mass in Deep Aquifer (tons)	Concentration Deep Aquifer (ppm)	Groundwater Flow from Deep Aquifer (tons)	Chemical Mass out from Deep Aquifer via Groundwater Flow (tons)	Final Water in Deep Aquifer (tons)	Final Chemical Mass in Deep Aquifer (tons)	Final Concentration in Deep Aquifer (ppm)
329.0	3,449,883	2,466	714.70	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,482	714	25,795	18.42	3,449,883	2,466	715
330.0	3,449,883	2,466	714.77	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,482	714	25,795	18.42	3,449,883	2,466	715
331.0	3,449,883	2,466	714.84	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,482	714	25,795	18.42	3,449,883	2,466	715
332.0	3,449,883	2,466	714.91	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,482	714	25,795	18.42	3,449,883	2,467	715
333.0	3,449,883	2,467	714.98	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,483	714	25,795	18.42	3,449,883	2,467	715
334.0	3,449,883	2,467	715.05	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,483	714	25,795	18.43	3,449,883	2,467	715
335.0	3,449,883	2,467	715.11	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,483	714	25,795	18.43	3,449,883	2,467	715
336.0	3,449,883	2,467	715.18	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,483	714	25,795	18.43	3,449,883	2,468	715
337.0	3,449,883	2,468	715.25	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,483	715	25,795	18.43	3,449,883	2,468	715
338.0	3,449,883	2,468	715.31	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,484	715	25,795	18.43	3,449,883	2,468	715
339.0	3,449,883	2,468	715.38	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,484	715	25,795	18.43	3,449,883	2,468	715
340.0	3,449,883	2,468	715.44	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,484	715	25,795	18.44	3,449,883	2,468	716
341.0	3,449,883	2,468	715.51	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,484	715	25,795	18.44	3,449,883	2,469	716
342.0	3,449,883	2,469	715.57	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,485	715	25,795	18.44	3,449,883	2,469	716
343.0	3,449,883	2,469	715.64	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,485	715	25,795	18.44	3,449,883	2,469	716
344.0	3,449,883	2,469	715.70	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,485	715	25,795	18.44	3,449,883	2,469	716
345.0	3,449,883	2,469	715.76	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,485	715	25,795	18.44	3,449,883	2,470	716
346.0	3,449,883	2,470	715.82	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,485	715	25,795	18.45	3,449,883	2,470	716
347.0	3,449,883	2,470	715.89	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,486	715	25,795	18.45	3,449,883	2,470	716
348.0	3,449,883	2,470	715.95	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,486	715	25,795	18.45	3,449,883	2,470	716
349.0	3,449,883	2,470	716.01	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,486	715	25,795	18.45	3,449,883	2,470	716
350.0	3,449,883	2,470	716.07	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,486	715	25,795	18.45	3,449,883	2,471	716
351.0	3,449,883	2,471	716.13	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,487	715	25,795	18.45	3,449,883	2,471	716
352.0	3,449,883	2,471	716.19	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,487	715	25,795	18.46	3,449,883	2,471	716
353.0	3,449,883	2,471	716.25	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,487	716	25,795	18.46	3,449,883	2,471	716
354.0	3,449,883	2,471	716.31	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,487	716	25,795	18.46	3,449,883	2,472	716
355.0	3,449,883	2,471	716.36	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,487	716	25,795	18.46	3,449,883	2,472	716
356.0	3,449,883	2,472	716.42	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,488	716	25,795	18.46	3,449,883	2,472	717
357.0	3,449,883	2,472	716.48	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,488	716	25,795	18.46	3,449,883	2,472	717
358.0	3,449,883	2,472	716.54	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,488	716	25,795	18.47	3,449,883	2,472	717
359.0	3,449,883	2,472	716.59	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,488	716	25,795	18.47	3,449,883	2,473	717
360.0	3,449,883	2,472	716.65	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,489	716	25,795	18.47	3,449,883	2,473	717
361.0	3,449,883	2,473	716.70	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,489	716	25,795	18.47	3,449,883	2,473	717
362.0	3,449,883	2,473	716.76	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,489	716	25,795	18.47	3,449,883	2,473	717
363.0	3,449,883	2,473	716.81	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,489	716	25,795	18.47	3,449,883	2,473	717
364.0	3,449,883	2,473	716.87	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,489	716	25,795	18.47	3,449,883	2,473	717
365.0	3,449,883	2,473	716.92	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,489	716	25,795	18.47	3,449,883	2,473	717
366.0	3,449,883	2,473	716.98	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,489	716	25,795	18.48	3,449,883	2,474	717
367.0	3,449,883	2,474	717.03	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,490	716	25,795	18.48	3,449,883	2,474	717
368.0	3,449,883	2,474	717.08	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,490	716	25,795	18.48	3,449,883	2,474	717
369.0	3,449,883	2,474	717.14	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,490	716	25,795	18.48	3,449,883	2,474	717
370.0	3,449,883	2,474	717.19	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,490	716	25,795	18.48	3,449,883	2,474	717
371.0	3,449,883	2,474	717.24	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,490	717	25,795	18.48	3,449,883	2,475	717
372.0	3,449,883	2,475	717.29	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,491	717	25,795	18.48	3,449,883	2,475	717
373.0	3,449,883	2,475	717.34	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,491	717	25,795	18.48	3,449,883	2,475	717
374.0	3,449,883	2,475	717.39	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,491	717	25,795	18.49	3,449,883	2,475	717
375.0	3,449,883	2,475	717.44	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,491	717	25,795	18.49	3,449,883	2,475	717
376.0	3,449,883	2,475	717.49	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,491	717	25,795	18.49	3,449,883	2,475	718
377.0	3,449,883	2,475	717.54	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,491	717	25,795	18.49	3,449,883	2,476	718
378.0	3,449,883	2,476	717.59	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,492	717	25,795	18.49	3,449,883	2,476	718
379.0	3,449,883	2,476	717.64	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,492	717	25,795	18.49	3,449,883	2,476	718
380.0	3,449,883	2,476	717.69	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,492	717	25,795	18.49	3,449,883	2,476	718
381.0	3,449,883	2,476	717.73	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,492	717	25,795	18.50	3,449,883	2,476	718
382.0	3,449,883	2,476	717.78	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,492	717	25,795	18.50	3,449,883	2,476	718
383.0	3,449,883	2,476	717.83	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,492	717	25,795	18.50	3,449,883	2,477	718
384.0	3,449,883	2,477	717.88	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,493	717	25,795	18.50	3,449,883	2,477	718
385.0	3,449,883	2,477	717.92	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,493	717	25,795	18.50	3,449,883	2,477	718
386.0	3,449,883	2,477	717.97	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,493	717	25,795	18.50	3,449,883	2,477	718
387.0	3,449,883	2,477	718.02	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,493	717	25,795	18.50	3,449,883	2,477	718
388.0	3,449,883	2,477	718.06	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,493	717	25,795	18.50	3,449,883	2,477	718
389.0	3,449,883	2,477	718.11	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,493	717	25,795	18.50	3,449,883	2,478	718
390.0	3,449,883	2,478	718.15	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,493	717	25,795	18.51	3,449,883	2,478	718
391.0	3,449,883	2,478	718.20	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,494	717	25,795	18.51	3,449,883	2,478	718
392.0	3,449,883	2,478	718.24	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,494	718	25,795	18.51	3,449,883	2,478	718
393.0	3,449,883	2,478	718.28	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,494	718	25,795	18.51	3,449,883	2,478	718
394.0	3,449,883	2,478	718.33	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,494	718	25,795	18.51	3,449,883	2,478	718

CHEMICAL BALANCE MODEL RESULTS FOR N-AQUIFER BELOW CENTENNIAL PIT

TIME	INITIAL DEEP AQUIFER CONDITIONS			INPUT TO DEEP AQUIFER									OUTPUT FROM DEEP AQUIFER		FINAL DEEP AQUIFER CONDITIONS		
Current Year	Initial Water in Deep Aquifer (tons)	Initial Chemical Mass in Deep Aquifer (tons)	Initial Concentration in Deep Aquifer (ppm)	Flow to Deep Aquifer from Shallow Aquifer Leakage (tons)	Concentration in Shallow Aquifer (ppm)	Chemical Mass to Deep Aquifer from Shallow Aquifer Leakage (tons)	Concentration in Pit (ppm)	Flow to Deep Aquifer from Pit via Vertical Leakage (tons)	Chemical Mass to Deep Aquifer from Pit via Vertical Leakage (tons)	Sum of Water in Deep Aquifer (tons)	Mass in Deep Aquifer (tons)	Concentration Deep Aquifer (ppm)	Groundwater Flow from Deep Aquifer (tons)	Chemical Mass out from Deep Aquifer via Groundwater Flow (tons)	Final Water in Deep Aquifer (tons)	Final Chemical Mass in Deep Aquifer (tons)	Final Concentration in Deep Aquifer (ppm)
395.0	3,449,883	2,478	718.37	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,494	718	25,795	18.51	3,449,883	2,478	718
396.0	3,449,883	2,478	718.41	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,494	718	25,795	18.51	3,449,883	2,479	718
397.0	3,449,883	2,479	718.46	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,495	718	25,795	18.51	3,449,883	2,479	718
398.0	3,449,883	2,479	718.50	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,495	718	25,795	18.51	3,449,883	2,479	719
399.0	3,449,883	2,479	718.54	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,495	718	25,795	18.52	3,449,883	2,479	719
400.0	3,449,883	2,479	718.58	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,495	718	25,795	18.52	3,449,883	2,479	719
401.0	3,449,883	2,479	718.62	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,495	718	25,795	18.52	3,449,883	2,479	719
402.0	3,449,883	2,479	718.66	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,495	718	25,795	18.52	3,449,883	2,479	719
403.0	3,449,883	2,479	718.70	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,495	718	25,795	18.52	3,449,883	2,480	719
404.0	3,449,883	2,480	718.74	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,496	718	25,795	18.52	3,449,883	2,480	719
405.0	3,449,883	2,480	718.78	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,496	718	25,795	18.52	3,449,883	2,480	719
406.0	3,449,883	2,480	718.82	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,496	718	25,795	18.52	3,449,883	2,480	719
407.0	3,449,883	2,480	718.86	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,496	718	25,795	18.52	3,449,883	2,480	719
408.0	3,449,883	2,480	718.90	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,496	718	25,795	18.52	3,449,883	2,480	719
409.0	3,449,883	2,480	718.94	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,496	718	25,795	18.53	3,449,883	2,480	719
410.0	3,449,883	2,480	718.98	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,496	718	25,795	18.53	3,449,883	2,481	719
411.0	3,449,883	2,481	719.02	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,496	718	25,795	18.53	3,449,883	2,481	719
412.0	3,449,883	2,481	719.06	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,497	718	25,795	18.53	3,449,883	2,481	719
413.0	3,449,883	2,481	719.09	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,497	718	25,795	18.53	3,449,883	2,481	719
414.0	3,449,883	2,481	719.13	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,497	718	25,795	18.53	3,449,883	2,481	719
415.0	3,449,883	2,481	719.17	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,497	718	25,795	18.53	3,449,883	2,481	719
416.0	3,449,883	2,481	719.21	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,497	718	25,795	18.53	3,449,883	2,481	719
417.0	3,449,883	2,481	719.24	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,497	718	25,795	18.53	3,449,883	2,481	719
418.0	3,449,883	2,481	719.28	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,497	719	25,795	18.53	3,449,883	2,482	719
419.0	3,449,883	2,482	719.32	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,498	719	25,795	18.54	3,449,883	2,482	719
420.0	3,449,883	2,482	719.35	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,498	719	25,795	18.54	3,449,883	2,482	719
421.0	3,449,883	2,482	719.39	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,498	719	25,795	18.54	3,449,883	2,482	719
422.0	3,449,883	2,482	719.42	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,498	719	25,795	18.54	3,449,883	2,482	719
423.0	3,449,883	2,482	719.46	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,498	719	25,795	18.54	3,449,883	2,482	719
424.0	3,449,883	2,482	719.49	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,498	719	25,795	18.54	3,449,883	2,482	720
425.0	3,449,883	2,482	719.53	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,498	719	25,795	18.54	3,449,883	2,482	720
426.0	3,449,883	2,482	719.56	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,498	719	25,795	18.54	3,449,883	2,483	720
427.0	3,449,883	2,483	719.60	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,498	719	25,795	18.54	3,449,883	2,483	720
428.0	3,449,883	2,483	719.63	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,499	719	25,795	18.54	3,449,883	2,483	720
429.0	3,449,883	2,483	719.66	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,499	719	25,795	18.54	3,449,883	2,483	720
430.0	3,449,883	2,483	719.70	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,499	719	25,795	18.55	3,449,883	2,483	720
431.0	3,449,883	2,483	719.73	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,499	719	25,795	18.55	3,449,883	2,483	720
432.0	3,449,883	2,483	719.76	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,499	719	25,795	18.55	3,449,883	2,483	720
433.0	3,449,883	2,483	719.79	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,499	719	25,795	18.55	3,449,883	2,483	720
434.0	3,449,883	2,483	719.83	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,499	719	25,795	18.55	3,449,883	2,483	720
435.0	3,449,883	2,483	719.86	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,499	719	25,795	18.55	3,449,883	2,484	720
436.0	3,449,883	2,484	719.89	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,500	719	25,795	18.55	3,449,883	2,484	720
437.0	3,449,883	2,484	719.92	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,500	719	25,795	18.55	3,449,883	2,484	720
438.0	3,449,883	2,484	719.95	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,500	719	25,795	18.55	3,449,883	2,484	720
439.0	3,449,883	2,484	719.98	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,500	719	25,795	18.55	3,449,883	2,484	720
440.0	3,449,883	2,484	720.02	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,500	719	25,795	18.55	3,449,883	2,484	720
441.0	3,449,883	2,484	720.05	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,500	719	25,795	18.55	3,449,883	2,484	720
442.0	3,449,883	2,484	720.08	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,500	719	25,795	18.55	3,449,883	2,484	720
443.0	3,449,883	2,484	720.11	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,500	719	25,795	18.56	3,449,883	2,484	720
444.0	3,449,883	2,484	720.14	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,500	719	25,795	18.56	3,449,883	2,484	720
445.0	3,449,883	2,484	720.17	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,500	719	25,795	18.56	3,449,883	2,485	720
446.0	3,449,883	2,485	720.20	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,501	719	25,795	18.56	3,449,883	2,485	720
447.0	3,449,883	2,485	720.23	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,501	719	25,795	18.56	3,449,883	2,485	720
448.0	3,449,883	2,485	720.25	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,501	720	25,795	18.56	3,449,883	2,485	720
449.0	3,449,883	2,485	720.28	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,501	720	25,795	18.56	3,449,883	2,485	720
450.0	3,449,883	2,485	720.31	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,501	720	25,795	18.56	3,449,883	2,485	720
451.0	3,449,883	2,485	720.34	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,501	720	25,795	18.56	3,449,883	2,485	720
452.0	3,449,883	2,485	720.37	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,501	720	25,795	18.56	3,449,883	2,485	720
453.0	3,449,883	2,485	720.40	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,501	720	25,795	18.56	3,449,883	2,485	720
454.0	3,449,883	2,485	720.42	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,501	720	25,795	18.56	3,449,883	2,485	720
455.0	3,449,883	2,485	720.45	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,501	720	25,795	18.56	3,449,883	2,486	720
456.0	3,449,883	2,486	720.48	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,502	720	25,795	18.57	3,449,883	2,486	721
457.0	3,449,883	2,486	720.51	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,502	720	25,795	18.57	3,449,883	2,486	721
458.0	3,449,883	2,486	720.53	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,502	720	25,795	18.57	3,449,883	2,486	721
459.0	3,449,883	2,486	720.56	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,502	720	25,795	18.57	3,449,883	2,486	721
460.0	3,449,883	2,486	720.59	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,502	720	25,795	18.57	3,449,883	2,486	721

CHEMICAL BALANCE MODEL RESULTS FOR N-AQUIFER BELOW CENTENNIAL PIT

TIME	INITIAL DEEP AQUIFER CONDITIONS			INPUT TO DEEP AQUIFER									OUTPUT FROM DEEP AQUIFER		FINAL DEEP AQUIFER CONDITIONS		
Current Year	Initial Water in Deep Aquifer (tons)	Initial Chemical Mass in Deep Aquifer (tons)	Initial Concentration in Deep Aquifer (ppm)	Flow to Deep Aquifer from Shallow Aquifer Leakage (tons)	Concentration in Shallow Aquifer (ppm)	Chemical Mass to Deep Aquifer from Shallow Aquifer Leakage (tons)	Concentration in Pit (ppm)	Flow to Deep Aquifer from Pit via Vertical Leakage (tons)	Chemical Mass to Deep Aquifer from Pit via Vertical Leakage (tons)	Sum of Water in Deep Aquifer (tons)	Mass in Deep Aquifer (tons)	Concentration Deep Aquifer (ppm)	Groundwater Flow from Deep Aquifer (tons)	Chemical Mass out from Deep Aquifer via Groundwater Flow (tons)	Final Water in Deep Aquifer (tons)	Final Chemical Mass in Deep Aquifer (tons)	Final Concentration in Deep Aquifer (ppm)
461.0	3,449,883	2,486	720.61	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,502	720	25,795	18.57	3,449,883	2,486	721
462.0	3,449,883	2,486	720.64	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,502	720	25,795	18.57	3,449,883	2,486	721
463.0	3,449,883	2,486	720.67	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,502	720	25,795	18.57	3,449,883	2,486	721
464.0	3,449,883	2,486	720.69	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,502	720	25,795	18.57	3,449,883	2,486	721
465.0	3,449,883	2,486	720.72	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,502	720	25,795	18.57	3,449,883	2,486	721
466.0	3,449,883	2,486	720.74	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,502	720	25,795	18.57	3,449,883	2,487	721
467.0	3,449,883	2,487	720.77	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,503	720	25,795	18.57	3,449,883	2,487	721
468.0	3,449,883	2,487	720.79	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,503	720	25,795	18.57	3,449,883	2,487	721
469.0	3,449,883	2,487	720.82	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,503	720	25,795	18.57	3,449,883	2,487	721
470.0	3,449,883	2,487	720.84	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,503	720	25,795	18.57	3,449,883	2,487	721
471.0	3,449,883	2,487	720.87	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,503	720	25,795	18.58	3,449,883	2,487	721
472.0	3,449,883	2,487	720.89	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,503	720	25,795	18.58	3,449,883	2,487	721
473.0	3,449,883	2,487	720.92	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,503	720	25,795	18.58	3,449,883	2,487	721
474.0	3,449,883	2,487	720.94	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,503	720	25,795	18.58	3,449,883	2,487	721
475.0	3,449,883	2,487	720.96	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,503	720	25,795	18.58	3,449,883	2,487	721
476.0	3,449,883	2,487	720.99	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,503	720	25,795	18.58	3,449,883	2,487	721
477.0	3,449,883	2,487	721.01	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,503	720	25,795	18.58	3,449,883	2,487	721
478.0	3,449,883	2,487	721.03	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,503	720	25,795	18.58	3,449,883	2,488	721
479.0	3,449,883	2,488	721.06	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,504	720	25,795	18.58	3,449,883	2,488	721
480.0	3,449,883	2,488	721.08	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,504	720	25,795	18.58	3,449,883	2,488	721
481.0	3,449,883	2,488	721.10	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,504	720	25,795	18.58	3,449,883	2,488	721
482.0	3,449,883	2,488	721.13	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,504	720	25,795	18.58	3,449,883	2,488	721
483.0	3,449,883	2,488	721.15	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,504	720	25,795	18.58	3,449,883	2,488	721
484.0	3,449,883	2,488	721.17	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,504	720	25,795	18.58	3,449,883	2,488	721
485.0	3,449,883	2,488	721.19	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,504	720	25,795	18.58	3,449,883	2,488	721
486.0	3,449,883	2,488	721.21	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,504	720	25,795	18.58	3,449,883	2,488	721
487.0	3,449,883	2,488	721.24	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,504	720	25,795	18.58	3,449,883	2,488	721
488.0	3,449,883	2,488	721.26	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,504	720	25,795	18.59	3,449,883	2,488	721
489.0	3,449,883	2,488	721.28	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,504	721	25,795	18.59	3,449,883	2,488	721
490.0	3,449,883	2,488	721.30	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,504	721	25,795	18.59	3,449,883	2,488	721
491.0	3,449,883	2,488	721.32	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,504	721	25,795	18.59	3,449,883	2,489	721
492.0	3,449,883	2,489	721.34	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,505	721	25,795	18.59	3,449,883	2,489	721
493.0	3,449,883	2,489	721.36	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,505	721	25,795	18.59	3,449,883	2,489	721
494.0	3,449,883	2,489	721.38	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,505	721	25,795	18.59	3,449,883	2,489	721
495.0	3,449,883	2,489	721.40	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,505	721	25,795	18.59	3,449,883	2,489	721
496.0	3,449,883	2,489	721.42	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,505	721	25,795	18.59	3,449,883	2,489	721
497.0	3,449,883	2,489	721.44	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,505	721	25,795	18.59	3,449,883	2,489	721
498.0	3,449,883	2,489	721.46	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,505	721	25,795	18.59	3,449,883	2,489	721
499.0	3,449,883	2,489	721.48	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,505	721	25,795	18.59	3,449,883	2,489	722
500.0	3,449,883	2,489	721.50	25,346	683	17.3	3,000.0	449.3	1.3479	3,475,678	2,505	721	25,795	18.59	3,449,883	2,489	722


WATER LEVEL ELEVATIONS IN BURRO CANYON AQUIFER
CENTENNIAL PIT AREA
DEPTH TO WATER (ft)
6240
6220
6200
6180
6160
6140
6120
6100
6080
6060
6040
6020
6000
Centennial Pit Floor (planned)
Pump On
Pump On
Pump On
Pump On
Pump On
Oct-04
Nov-04
Dec-04
Jan-05
Feb-05
Mar-05
Apr-05
May-05
Jun-05
Jul-05
Aug-05
Sep-05
Oct-05
Nov-05
Dec-05
Jan-06
Feb-06
Mar-06
Apr-06
May-06
Jun-06
Jul-06
Aug-06
Sep-06
Oct-06
Nov-06
Dec-06
DATE
SLV3
PW-3
MW96-7A
00R63
4R44
Pit Floor

This page is a reference page used to track documents internally for the Division of Oil, Gas and Mining

Mine Permit Number M0370088 Mine Name Lisbon Valley
Operator Lisbon Valley Mining Co LLC Date August 23, 1996
TO _____ FROM _____

__CONFIDENTIAL __BOND CLOSURE __LARGE MAPS X EXPANDABLE
__MULTIPUL DOCUMENT TRACKING SHEET __NEW APPROVED NOI
__AMENDMENT _OTHER _____

Description YEAR-Record Number

__NOI X Incoming __Outgoing __Internal __Superceded

Proposed Plan of Operations
Attachment A
2 Binders.

___NOI __Incoming __Outgoing __Internal __Superceded

__NOI __Incoming __Outgoing __Internal __Superceded

__NOI __Incoming __Outgoing __Internal __Superceded

__TEXT/ 81/2 X 11 MAP PAGES __11 X 17 MAPS __LARGE MAP

COMMENTS: _____

CC: _____