

**Rosemont Copper Project
Response to USFS – Coronado National Forest
Request for Additional Information
FDD-1 Water Balance Plan**

1. Introduction

This memorandum is in response to the USFS request for additional information regarding the Rosemont Copper Project water balance, including groundwater withdrawals in the area of the mine. Detailed water balances for the Rosemont Copper Project are attached to this memorandum to reflect different periods in the life of mine as the heap leach operation is closed and the mine encounters groundwater in the pit or groundwater pumping in the area of the pit is required to control groundwater entering the pit. A summary level water balance for each case is also attached for added clarity.

The cases presented include the first year of the mine when the heap leach facility is in operation and no groundwater is anticipated in the mine; the end of year 1 when initial groundwater in the pit or from pumping near the pit is expected, year 10 when the heap leach facility is no longer in operation and an increase in groundwater is encountered in the pit; and year 19 when the amount of groundwater in the pit is expected to increase to a maximum value. It should be noted that the groundwater withdrawals in the area of the mine has not been fully quantified at this time and additional work is required to confirm the amount of groundwater impacting the mine throughout the life of mine. For the cases presented; however, it was assumed that 100 gallons per minute (gpm) of groundwater is encountered in the mine by the end of the first year, increasing to 324 gpm by year 10, and reaching a maximum of 500 gpm by year 19.

For this exercise, groundwater from the pit is assumed to be impacted water and will be pumped to the process water pond for use as process water in the mill. The impacted pit water will displace fresh water make-up from the fresh water wells in the Santa Cruz Basin west of the Santa Rita Mountain Range. If it can be demonstrated that the groundwater pumping near the pit is not impacted, the groundwater can be pumped to the watershed east of the mine and allowed to continue downstream and re-join the water table northeast of the property. The groundwater in the area of the mine is not required for the Rosemont operation; however, can be utilized in place of fresh water for the operation. The quantity of groundwater is expected to be small in relation to the overall water requirements for the operation.

2. Rosemont Water Systems

As shown on the attached water balances, water systems used in the Rosemont Copper Project consists of a potable water system, a fresh water system, a recycle process water

system, and a fire water system. Fresh water will be supplied from a series of wells located in the basin-fill deposits of the upper Santa Cruz basin, which lies west of the Rosemont Copper Project and the Santa Rita Mountains. Fresh water will be delivered to a one million gallon fresh water and fire water storage tank at the project site by a 20-inch ductile iron pipe line and pumping stations as described in the Mine Plan of Operations dated July 11, 2007. Fresh water will then be distributed to the process facilities from the fresh water storage tank.

2.1. Potable Water System

Fresh water is delivered by gravity from the fresh water tank to a water treatment facility followed by a 10,000 gallon potable water storage tank. Potable water is then distributed to the following users at the volume noted below. Total potable water consumption is 16,320 gallons per day and all water used reports to the sanitary sewer system.

	<u>GPM</u>	<u>Hours / Day</u>	<u>Gallons / Day</u>
Administration Building	3.0	12.00	2,160
Analytical Laboratory	3.5	12.00	2,520
Change Room	20.5	6.00	7,380
Warehouse	0.5	12.00	360
Mine Truck Shop	1.0	12.00	720
Light Vehicle Truck Shop	1.0	12.00	720
SX-EW Control Room	0.5	24.00	720
Mill Control Room	0.5	24.00	720
Primary Crusher	0.5	24.00	720
Plant Safety Showers	20.0	0.25	300
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Total Potable Water	11.3	24	16,320

2.2. Fresh Water System

Fresh water is delivered by gravity from the fresh water storage tank to the various end users at the volumes noted below. Some fresh water is recovered and recycled to process in the grinding and flotation plant. Other fresh water is consumed as evaporation or hold-up in the leach pad. Fresh water is added in the Process Water Pond as make-up for the process water system.

	<u>GPM</u>	<u>Gallons / Day</u>	
Gland Seal Water	713.5	1,027,440	
Cu Flotation	500.0	720,000	
Moly Cleaner Flotation	7.2	10,368	
Process Water Make-Up	1,726.0	2,485,454	
	<u>2,946.7</u>	<u>4,243,262</u>	<u>Recycled to Process</u>
Mill Cooling & Sampling	nil	0	
Concentrate Vacuum Filter Seal Water	nil	0	
Tailings Vacuum Filter Seal Water	nil	0	
Reagents	1.25	1,800	
Heap Leach & SX-EW	380.5	547,968	
Electrowinning	31.6	45,480	
	<u>413.4</u>	<u>595,248</u>	<u>Consumed</u>

2.3. Recycle Process Water System

Recycled water from process reports by gravity to a lined process water pond for recycle. As noted above, fresh water is added to the pond as make-up to complete the water balance around the process. Water reporting to the mine pit from the groundwater and from groundwater control wells near the pit will be pumped to the process water pond and displace some of the required fresh water make-up. Storm water run-off through the process facilities, considered impacted water, will also report to the process water pond. Process water from the process water pond is pumped to a 250,000 gallon head tank and distributed by gravity to the process end users at the volumes noted below. Process water recycles through the process and returns to the process water pond for re-use. Losses in this system are evaporation, moisture hold-up in the concentrate products and mill tailings, and dust control water at the primary crusher and mine haul roads.

	GPM	Gallons / Day
SAG/Ball Mill Water	24,191	34,834,896
Rougher Flotation Water	601	864,864
Cu Cleaner Flotation Water	634	912,672
Moly Flotation Water	242	348,048
Moly Cleaner Flotation Water	1	1,440
	25,668	36,961,920 Recycled to Process
Primary Crusher Dust Control	128	184,013
Mine Haul Road Dust Control	625	900,000
Moisture in Copper Concentrate	28	40,552
Moisture in Moly Concentrate	0.4	560
Moisture in Tailings	2,165	3,118,137
	2,947	4,243,262 Loss

2.4. Fire Water System

The lower 300,000 gallon capacity of the fresh water tank is reserved for the fire water system and not accessible to the fresh water system. Fire water is distributed by gravity to a system of hydrants throughout the facility and to the ancillary facility buildings. A foam system is also provided at the solvent extraction settlers. The hydrant system and foam system are each rated at 1,500 gpm and can operate at the same time. The water usage for the fire system is considered rare and carried as zero in the overall plant water balance.

3. Water Balance Summary

The summary water balance for each of the four periods discussed is attached. Impacted storm water run-off through the process facilities has not been quantified for each of the water balances because of the difficulty in predicting the storm events. Impacted storm water run-off through the plant; however, will be contained in the process water pond and will further displace fresh water make-up from the well field. Non-impacted storm water will flow through the facility and is not considered part of the plant water balance.

3.1. First Year of Operation

The water balance described above represents the first year after start-up and is based on the plant operating at design rates with the heap leach and SX-EW facilities in operation and with no pit water or groundwater pumping near the pit. In this case, the average fresh water make-up is approximately 3,371 gpm (4,854,830 gallons per day) or 5,438 acre-ft. per year. All fresh water make-up is from the fresh water wells in the Santa Cruz basin. Preliminary projections indicate that by the end of year one, the mine may encounter about 100 gpm of groundwater in the pit or from groundwater pumping near

the pit. In this case, the groundwater will displace the fresh water make-up, which will reduce to 3,271 gpm or 4,710,930 gallons per day (5,277 acre-ft. per year).

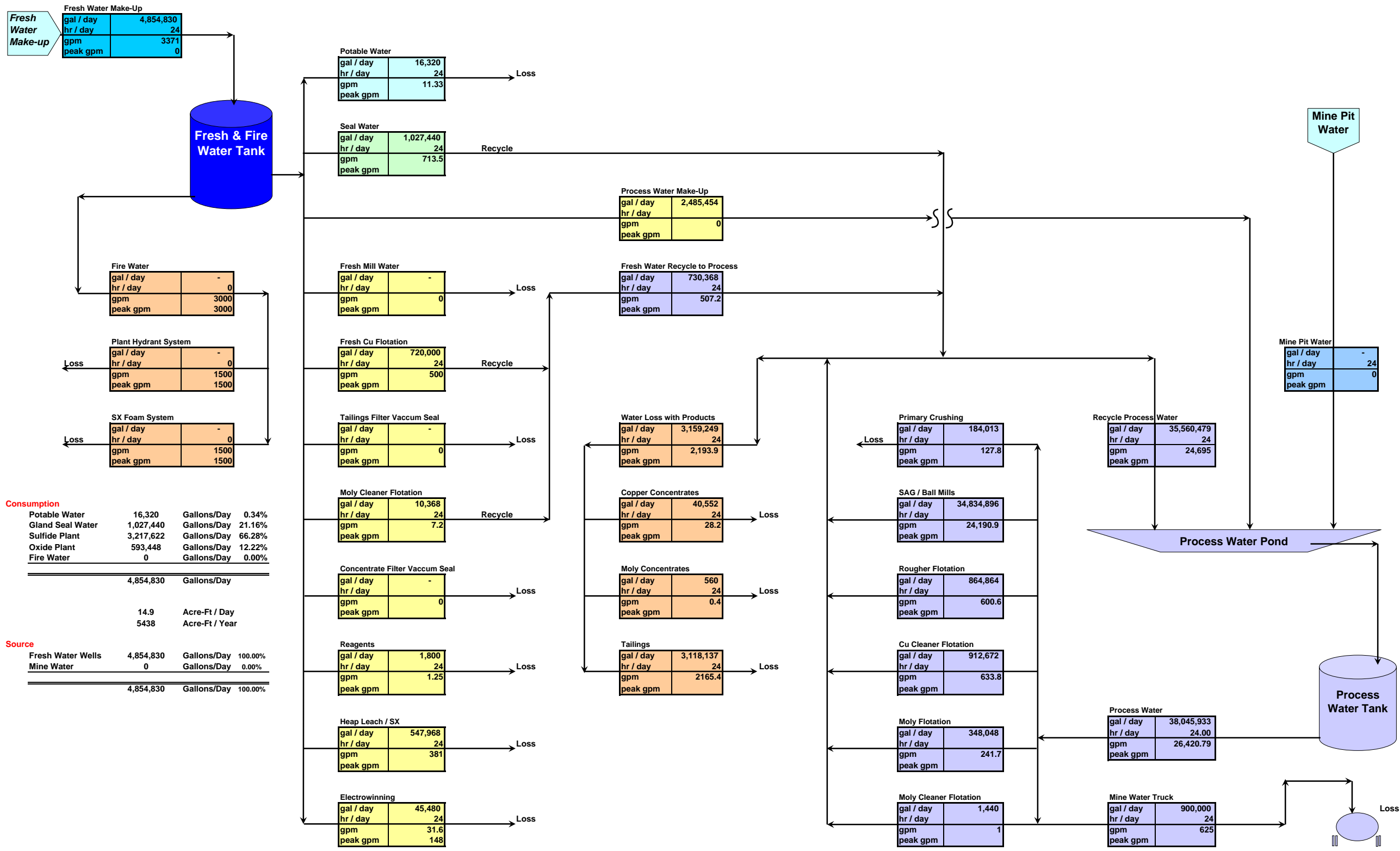
3.2. Year Ten of Operation

Nearly all the oxide material will be placed on the heap leach pad by the end of year six. The final rinse and drain down of the heap leach pad will extend the operation of the SX-EW facility until about year 7 or year 8. By year 10, the oxide plant will shut down, reducing the fresh water requirements by about 400 gpm or about 493,500 gallons per day. The mine, at this time, is assumed to encounter about 324 gpm of groundwater in the pit or from groundwater pumping near the pit and the pit water will be pumped to the process water pond to displace fresh water make-up to the system. In this case, the average fresh water make-up for the operation would be approximately 3,794,822 gallons per day (2,635 gpm) or about 4,251 acre-ft. per year. About 89.0% of this make-up requirement will be provided from the fresh water wells and the balance (11.0%) will be from the groundwater encountered in or near the pit.

3.3. Year Nineteen of Operation

Groundwater impacting the pit is expected to increase in the latter years as the pit develops. By year 19, the mine is assumed to encounter approximately 500 gpm of groundwater in the pit or from groundwater pumping near the pit. In this case, the average fresh water make-up for the facility would still be approximately 3,541,382 gallons per day (2,459 gpm) or 3,967 acre-ft. per year. About 83.1% of this make-up requirement will be provided from the fresh water wells and the balance (16.9%) will be from the groundwater encountered in or near the pit.

YEAR 1
HEAP LEACH IN OPERATION / NO MINE WATER



Consumption

Potable Water	16,320	Gallons/Day	0.34%
Gland Seal Water	1,027,440	Gallons/Day	21.16%
Sulfide Plant	3,217,622	Gallons/Day	66.28%
Oxide Plant	593,448	Gallons/Day	12.22%
Fire Water	0	Gallons/Day	0.00%
Total	4,854,830	Gallons/Day	

	14.9	Acre-Ft / Day
	5438	Acre-Ft / Year

Source

Fresh Water Wells	4,854,830	Gallons/Day	100.00%
Mine Water	0	Gallons/Day	0.00%
Total	4,854,830	Gallons/Day	100.00%

Fresh Water Make-up

gal / day	4,854,830
hr / day	24
gpm	3371
peak gpm	0

Potable Water

gal / day	16,320
hr / day	24
gpm	11.33
peak gpm	0

Seal Water

gal / day	1,027,440
hr / day	24
gpm	713.5
peak gpm	0

Process Water Make-Up

gal / day	2,485,454
hr / day	24
gpm	0
peak gpm	0

Fresh Water Recycle to Process

gal / day	730,368
hr / day	24
gpm	507.2
peak gpm	0

Fresh Mill Water

gal / day	-
hr / day	0
gpm	0
peak gpm	0

Fresh Cu Flotation

gal / day	720,000
hr / day	24
gpm	500
peak gpm	0

Tailings Filter Vacuum Seal

gal / day	-
hr / day	0
gpm	0
peak gpm	0

Water Loss with Products

gal / day	3,159,249
hr / day	24
gpm	2,193.9
peak gpm	0

Primary Crushing

gal / day	184,013
hr / day	24
gpm	127.8
peak gpm	0

Recycle Process Water

gal / day	35,560,479
hr / day	24
gpm	24,695
peak gpm	0

Moly Cleaner Flotation

gal / day	10,368
hr / day	24
gpm	7.2
peak gpm	0

Copper Concentrates

gal / day	40,552
hr / day	24
gpm	28.2
peak gpm	0

SAG / Ball Mills

gal / day	34,834,896
hr / day	24
gpm	24,190.9
peak gpm	0

Concentrate Filter Vacuum Seal

gal / day	-
hr / day	0
gpm	0
peak gpm	0

Moly Concentrates

gal / day	560
hr / day	24
gpm	0.4
peak gpm	0

Rougher Flotation

gal / day	864,864
hr / day	24
gpm	600.6
peak gpm	0

Reagents

gal / day	1,800
hr / day	24
gpm	1.25
peak gpm	0

Tailings

gal / day	3,118,137
hr / day	24
gpm	2165.4
peak gpm	0

Cu Cleaner Flotation

gal / day	912,672
hr / day	24
gpm	633.8
peak gpm	0

Heap Leach / SX

gal / day	547,968
hr / day	24
gpm	381
peak gpm	0

Moly Flotation

gal / day	348,048
hr / day	24
gpm	241.7
peak gpm	0

Process Water

gal / day	38,045,933
hr / day	24.00
gpm	26,420.79
peak gpm	0

Electrowinning

gal / day	45,480
hr / day	24
gpm	31.6
peak gpm	148

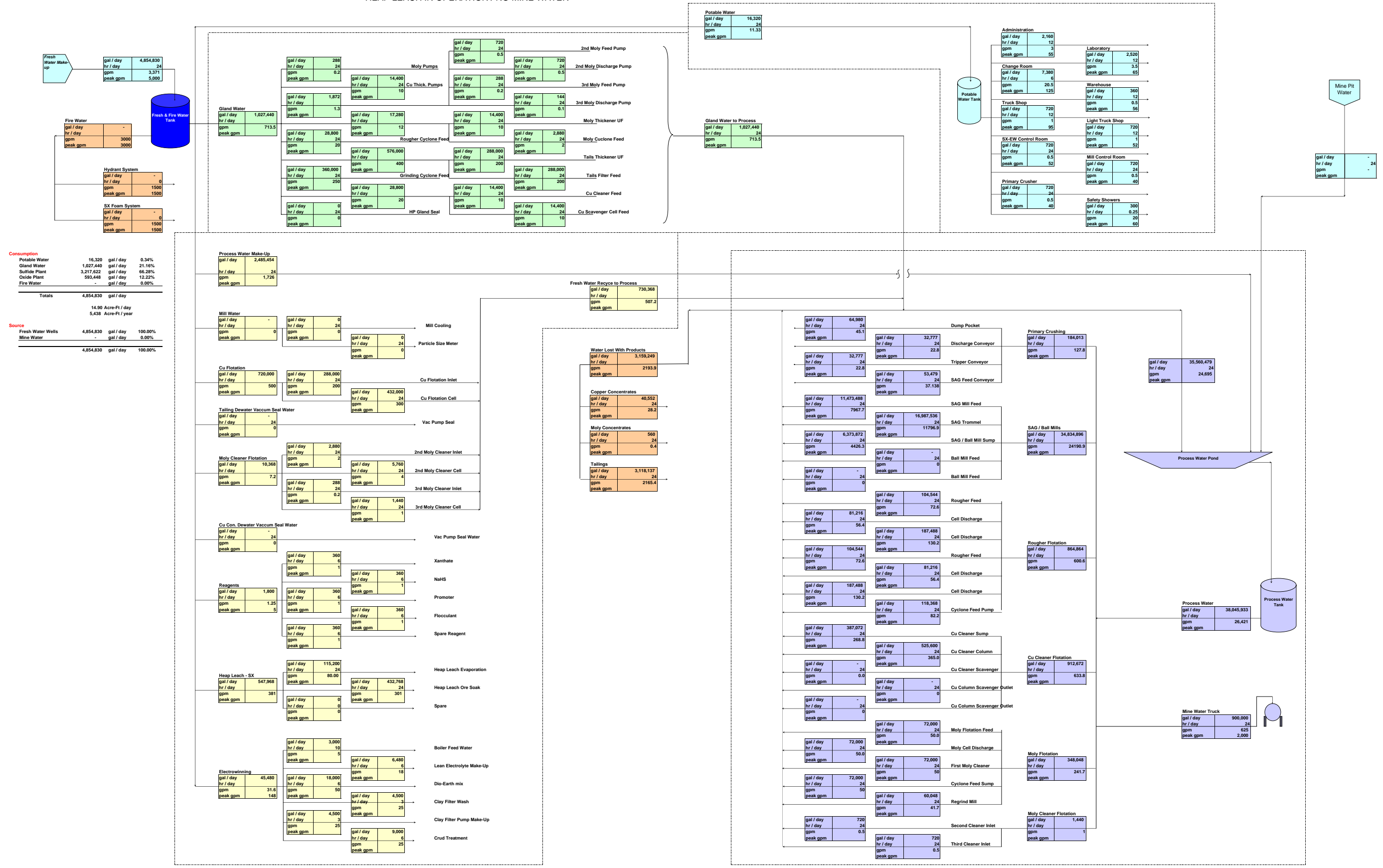
Moly Cleaner Flotation

gal / day	1,440
hr / day	24
gpm	1
peak gpm	0

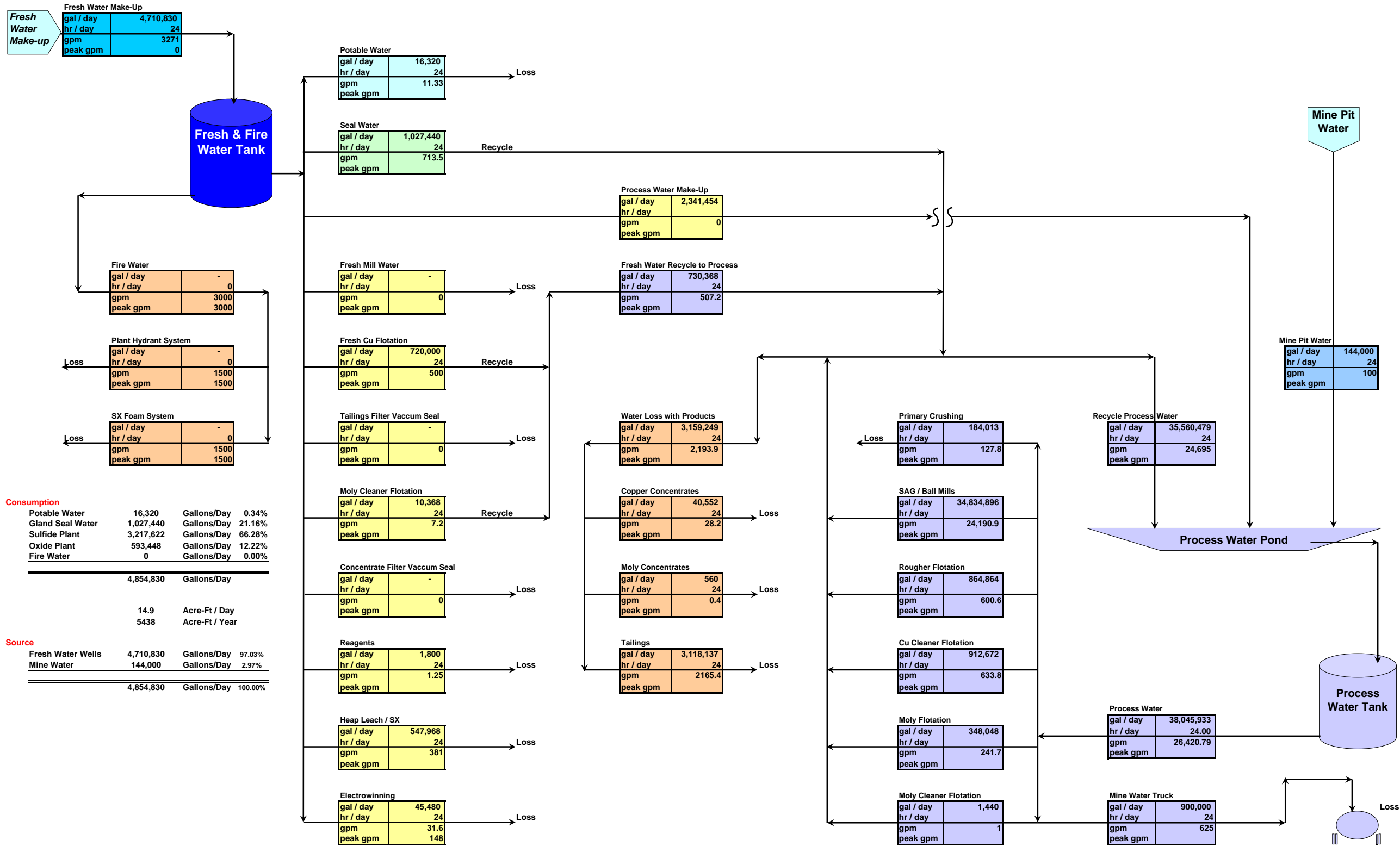
Mine Water Truck

gal / day	900,000
hr / day	24
gpm	625
peak gpm	0

YEAR 1
HEAP LEACH IN OPERATION / NO MINE WATER



END OF YEAR 1
HEAP LEACH IN OPERATION / INITIAL MINE WATER



Consumption

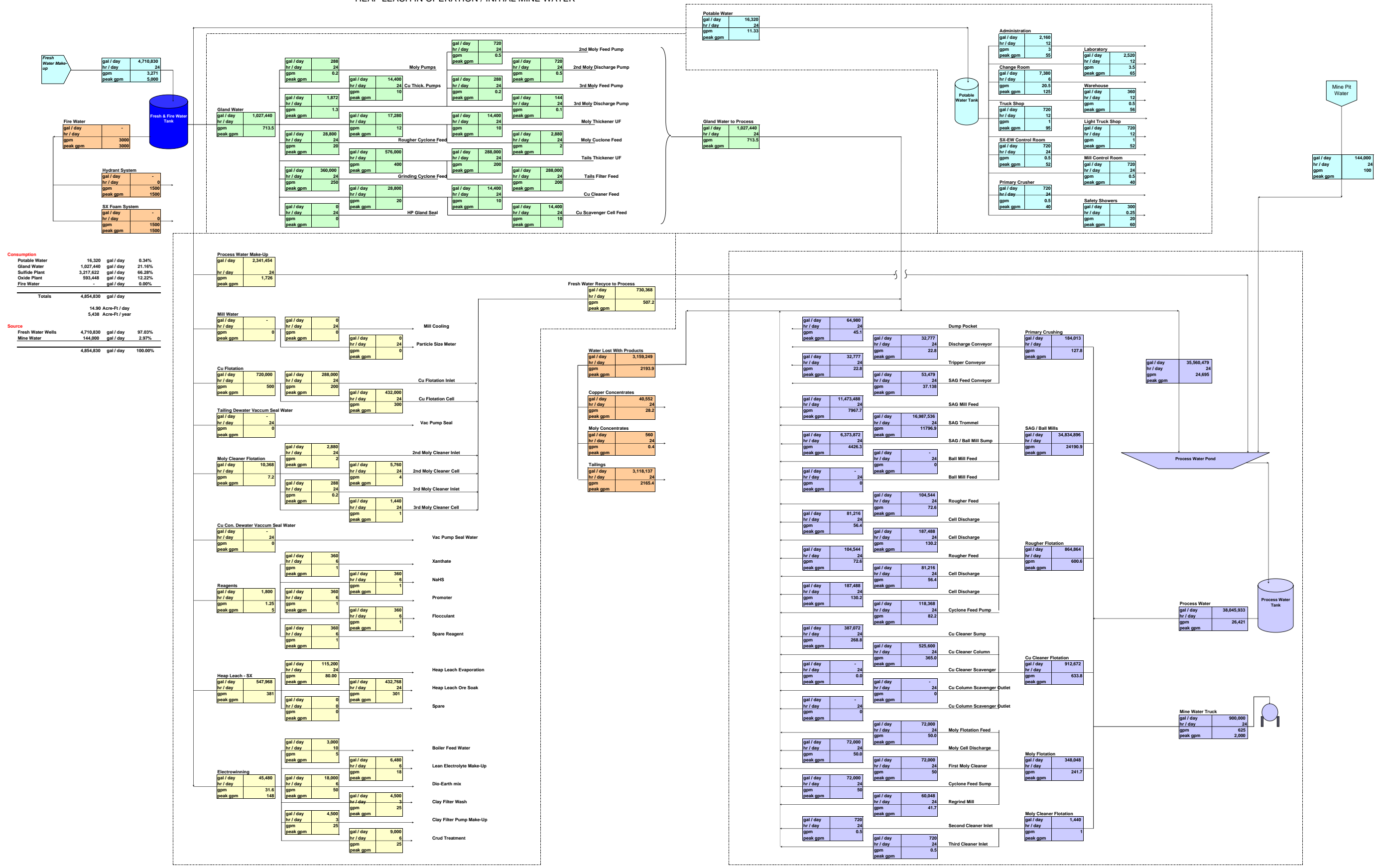
Potable Water	16,320	Gallons/Day	0.34%
Gland Seal Water	1,027,440	Gallons/Day	21.16%
Sulfide Plant	3,217,622	Gallons/Day	66.28%
Oxide Plant	593,448	Gallons/Day	12.22%
Fire Water	0	Gallons/Day	0.00%

4,854,830		Gallons/Day
14.9		Acre-Ft / Day
5438		Acre-Ft / Year

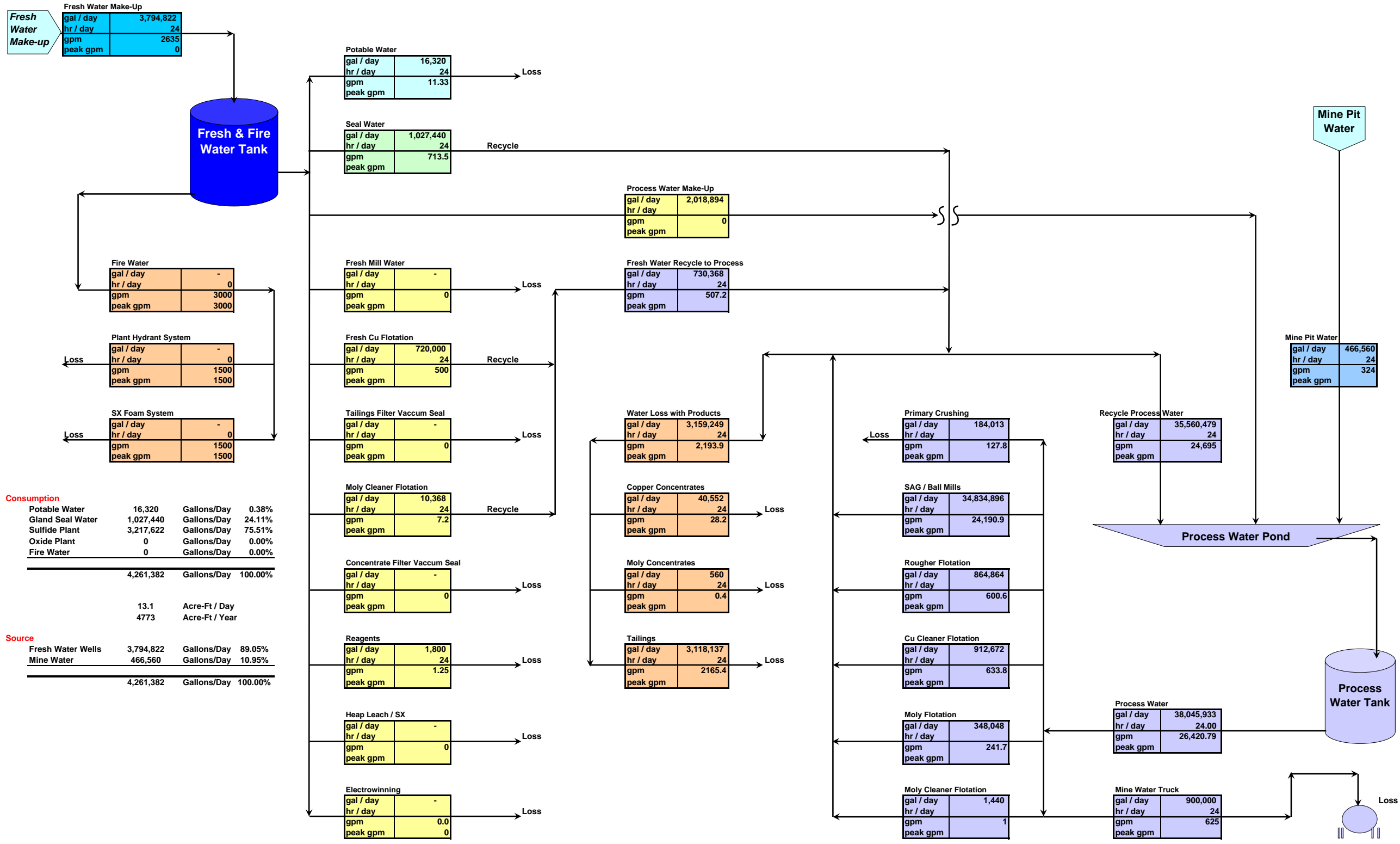
Source

Fresh Water Wells	4,710,830	Gallons/Day	97.03%
Mine Water	144,000	Gallons/Day	2.97%
4,854,830		Gallons/Day	100.00%

END OF YEAR 1 HEAP LEACH IN OPERATION / INITIAL MINE WATER



YEAR 10
HEAP LEACH CLOSED / INCREASED MINE WATER



Consumption

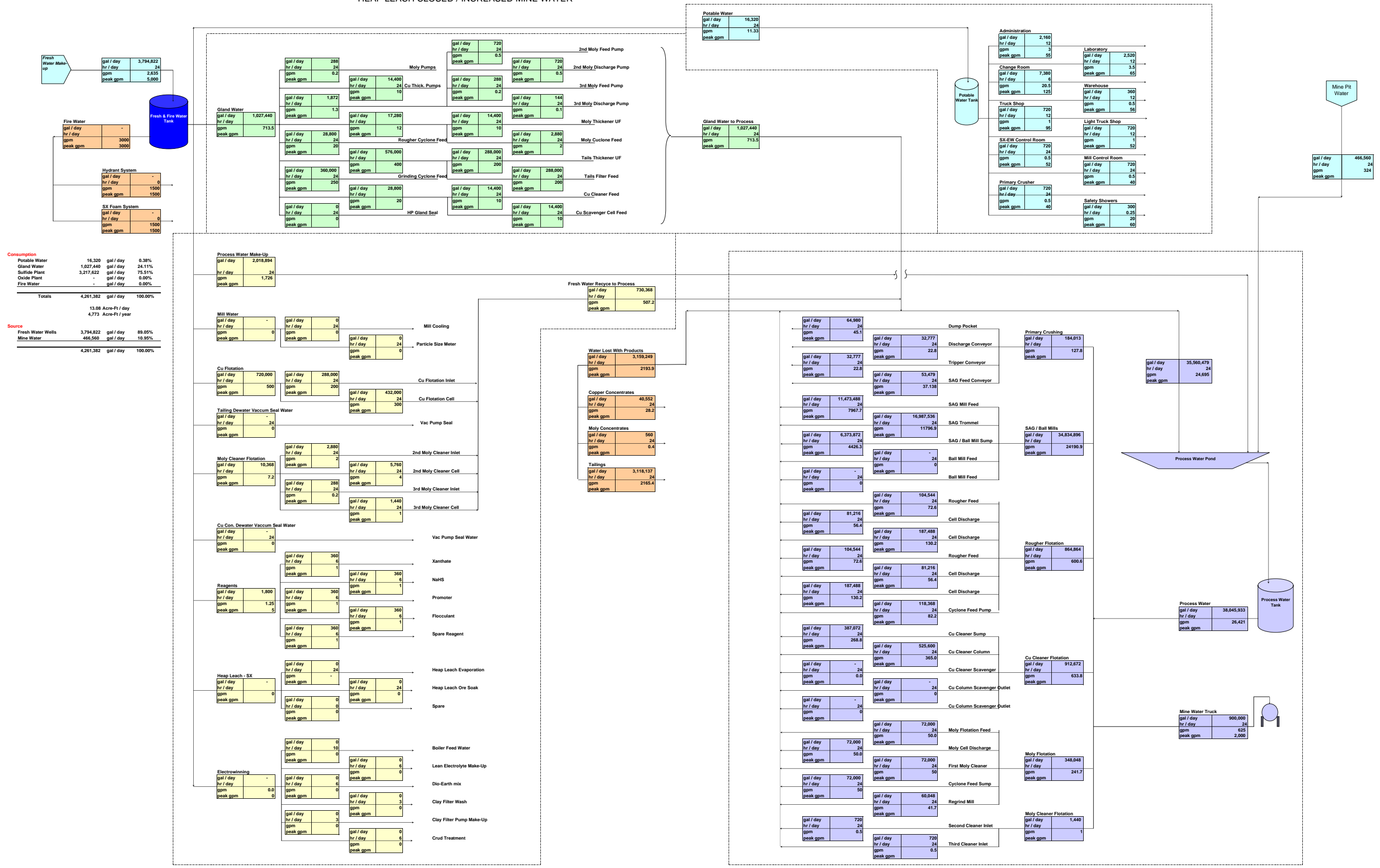
Potable Water	16,320	Gallons/Day	0.38%
Gland Seal Water	1,027,440	Gallons/Day	24.11%
Sulfide Plant	3,217,622	Gallons/Day	75.51%
Oxide Plant	0	Gallons/Day	0.00%
Fire Water	0	Gallons/Day	0.00%
Total	4,261,382	Gallons/Day	100.00%

	13.1	Acre-Ft / Day
	4773	Acre-Ft / Year

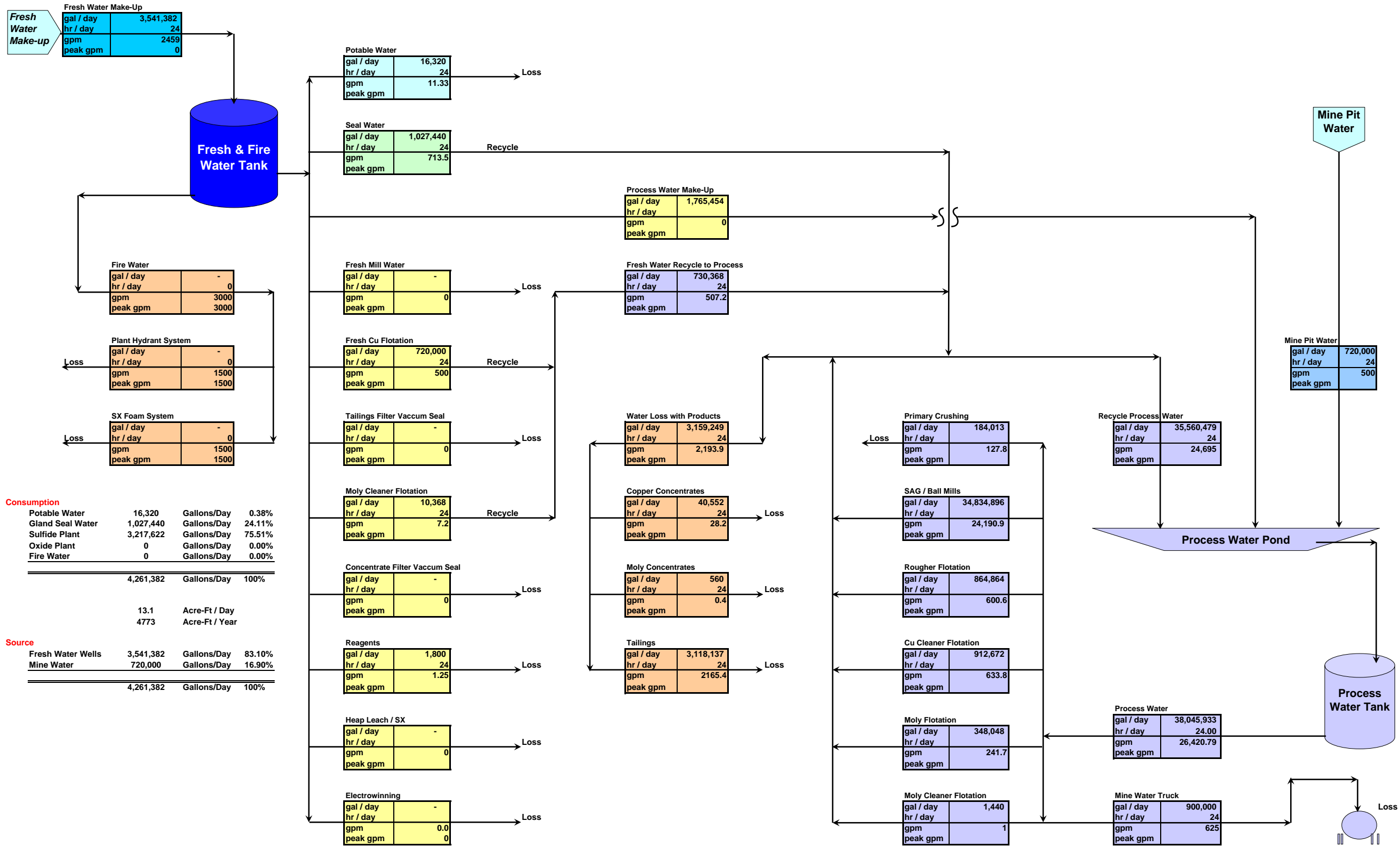
Source

Fresh Water Wells	3,794,822	Gallons/Day	89.05%
Mine Water	466,560	Gallons/Day	10.95%
Total	4,261,382	Gallons/Day	100.00%

YEAR 10
HEAP LEACH CLOSED / INCREASED MINE WATER



YEAR19
HEAP LEACH CLOSED / MAXIMUM MINE WATER



Consumption

Item	gal / day	hr / day	gpm	peak gpm
Potable Water	16,320	24	11.33	
Gland Seal Water	1,027,440	24	713.5	
Sulfide Plant	3,217,622	24	2459	0
Oxide Plant	0	0	0	0
Fire Water	0	0	0	0

4,261,382		Gallons/Day	100%
13.1		Acre-Ft / Day	
4773		Acre-Ft / Year	

Source

Item	gal / day	hr / day	gpm	peak gpm
Fresh Water Wells	3,541,382	24	2459	0
Mine Water	720,000	24	500	

4,261,382		Gallons/Day	100%
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YEAR 19
HEAP LEACH CLOSED / MAXIMUM MINE WATER

