Sandoval County Wholesale Water Supply Utility

Desalination Treatment Facility

Preliminary Engineering Report

Appendix L

Financial Analysis Workbook
Alternative 1 - Brackish Groundwater Desalination
Worst Case for Residuals Handling

Computed Water Rate (per 1,000 gallons)	***$11.76***
Capital Cost (millions)	***$91.2***
Net Present Value (millions)	***$32.3***
Present Value Whole Life Cost (millions)	***$385.7***

Table L-1
Finance and Operational Variables

Finance Information		
Project Loan Finance Period	20	Years
Project Loan Finance Rate	4.50%	Per Year
Debt Service Cover Ratio	1.10	
Debt Service Cover Limit	2.00	years
Present Value Discount Rate	2.00%	
Operation Expenses		
Potable Water Supplied	5	MGD
Electricity		
Electricity First Year Price	$ 0.040	Per KWH
Electricity Price Inflation Rate	3.00%	Per Year
Natural Gas		
Natural Gas First Year Price	$ 0.049	Per MMBTU
Natural Gas Price Inflation Rate	3.00%	Per Year
Treatment Chemicals		
Treatment Chemicals First Year Price		See Chemicals Tab
Cereal Grains Price Inflation Rate	3.00%	Per Year
Arsenic & Radium Waste Disposal		
Disposal First Year Price	$ 467.00	Per Ton
Disposal Price Inflation Rate	3.00%	Per Year
Sodium Sulfate Brine Disposal		
Landfill Disposal First Year Price	$ 75.00	Per Ton
Tip Fee Inflation Rate	3.00%	Per Year
Equipment Maintenance Expenses		
Inflation Rate	3.00%	Per Year
Fixed Office and Maintenance Expenses		
Inflation Rate	3.00%	Per Year
Employees Salaries and Benefits		
Salary and Benefit Inflation Rate	3.00%	Per Year
Revenues		
Potable Water		
Potable Water First Year Expected Price	$ 11.76	Per 1000 Gallons
Potable Water Price Inflation Factor	1.5%	Per Year
Magnesium Carbonate		
Magnesium Carbonate First Year Expected Price	$ -	Per Ton
Magnesium Carbonate Price Inflation Factor	3.00%	Per Year
Salt		
Salt First Year Expected Price	$ -	Per Ton
Salt Price Inflation Factor	3.00%	Per Year
Re-Calcinated Quick Lime		
Quick Lime First Year Expected Price	$ -	Per Ton
Quick Lime Price Inflation Factor	3.00%	Per Year
Depreciation & Taxes		
Straight Line Method		
Salvage Value % at End of 25 Years	0%	
Income Tax Rate	0%	Per Year

Table L-2

Project Cost Estimate

Item	Description	Unit	Qty	Unit Cost	Total
I. Raw Water Wells					
1	Mobilization & Site Preparation	LS	1	$305,000.00	$305,000
2	SWPPP	LS	1	$10,000.00	$10,000
3	Field Office	LS	1	$17,500.00	$17,500
4	Well Head Protection	LS	4	$87,500.00	$350,000
5	Drill 24-inch, install 18-5/8 J55 and seal to 200 feet	LF	800	$678.00	$542,400
6	Drill 17.5-inch, install 13-3/8 J55 to 2000 feet	LF	8,000	$354.00	$2,832,000
7	Drill 12.25-inch, install 9-5/8 J55 to 3500 feet	LF	14,000	$194.00	$2,716,000
8	Drill 8.5-inch, install 6-inch Screen from 3500 - 3800 feet	LF	1,200	$689.00	$826,800
9	Well Development	HR	400	$918.00	$367,200
10	Geophysical Testing	LS	4	$10,000.00	$40,000
11	Rig Development	HR	400	$600.00	$240,000
12	Packer Testing	LS	4	$60,000.00	$240,000
13	Well Disinfection	LS	4	$5,000.00	$20,000
14	Test Pumping	LS	4	$50,000.00	$200,000
15	Pump Development	LS	4	$25,000.00	$100,000
16	Long Term Pump Testing	LS	4	$50,000.00	$200,000
17	Submersible Pump and Installation	LS	4	$150,000.00	$600,000
18	Pitless Adapter	LS	4	$30,000.00	$120,000
19	Power Supply	LS	4	$250,000.00	$1,000,000
20	Instrumentation and Telemetry	LS	4	$25,000.00	$100,000
21	Access Road	LS	4	$100,000.00	$400,000
22	Redevelop Well 6 For Production	LS	1	$1,650,000.00	$1,650,000
	TOTAL Raw Water Wells				**$12,876,900**
II. Raw Water Transmission Piping:					
1	10" DIP Pipeline, installed	LF	10,110	$90.00	$909,900
2	10" Gate Valve Assembly	LS	5	$500.00	$2,500
3	14" DIP Pipeline, installed	LF	5,280	$125.00	$660,000
4	14" Gate Valve Assembly	LS	2	$1,000.00	$2,000
5	Air Release Valve and Vault	LS	5	$1,000.00	$5,000
	TOTAL Raw Water Transmission Piping				**$1,579,400**
III. Water Treatment Plant					
1	Site Work & Grading not including evaporation basins				$400,000
2	Site Yard Piping				$600,000
3	Decarbonation				$525,000
4	CO2 Membrane Seperation				$200,000
5	H2S Asorber				$75,000
6	Chemical Feed- Hypochlorite				$75,000
7	Hypochlorite tanks				$37,500
8	Sodium Hypochlorite Generation System				$250,000
9	Chemical Feed- Ferric				$75,000
10	Ferric Tanks				$50,000
11	Chemical Feed- Polymer				$12,000
12	Mixing Facilities for Sedimentation				$562,500
13	Flocculation Facilities				$281,250
14	Sedimentation-Arsenic and Radionuclides				$937,500
15	Sedimentation Discharge Thickening Facility				$187,500
16	As & Ra Residual Dewatering				$360,000

17	As & Ra Sludge Disposal Equipment				$200,000
18	Lime Feed System- Dry side				$500,000
19	Lime Feed System- Wet side				$75,000
20	Softening Clarifiers				$3,600,000
21	Softening Clarifiers- Discharge thickener				$250,000
22	Lime Sludge dewatering				$2,500,000
24	Lime Disposal Equipment				$100,000
25	Equalization Tank and wet well				$400,000
26	Filter and Ion Exchange Supply Pumps				$150,000
27	Media Filter-				$2,000,000
28	Media Filter Backwash Facilities				$93,750
29	Waste backwash water clarification				$125,000
30	Media Filter Waste Backwash Water Reclamation				$162,500
31	Raw Water Energy Pressure Recovery Device				$200,000
32	Ion Exchange System				$1,250,000
33	IX Regeneration system pump				$37,500
34	IX Regeneration- Acid feed				$37,500
35	pH trim HCl storage and containment				$93,750
36	WAC regen HCL storage				$31,250
37	RO ClP caustic tank				$15,000
38	RO Anti-scalant storage and metering system				$15,000
39	RO Feed Dechlorination System (Bisulfite)				$2,500
40	RO Feed Pump				$1,125,000
41	RO Unit Interstage Booster				$562,500
42	RO Unit				$6,375,000
43	RO chemical cleaning system				$250,000
44	Emergency permeate flush water				$50,000
45	Cooling Towers				$468,750
46	Permeate Heat Exchanger				$187,500
47	Evaporative Loop Pumps				$50,000
48	Mixed Brine Evaporation Ponds				$11,890,000
50	Finished Water Disinfection (Storage and Metering)				$25,000
51	Finished Water Pump Station				$375,000
52	Operations Facility				$600,000
53	Chemical Storage Facility Building				$840,000
54	Process Equipment Building				$1,680,000
55	Facility Electrical				$4,342,650
56	Overall Instrumentation and Control System				$1,000,000
57	Land Procurement				$1,000,000
	Total Water Treatment Plant				**$47,288,400**

IV. Finished Water Transmission Piping:

1	30" Pipeline, installed	LF	500	$185.00	$92,500
2	30" Gate Valve Assembly	LS	1	$25,000.00	$25,000
3	Air Release Valve and Vault	LS	2	$2,500.00	$5,000
4	Finished Water Storage		1	$4,000,000.00	$4,000,000
	Total Finshed Water Transmission Piping				**$4,122,500**
	Construction Total				**$65,867,200**

V. Other Costs

1	Engineering	$3,952,032
2	Construction Administration	$3,952,032
3	Legal	$658,672
4	Bond Counsel	$329,336

5	Underwriters Fee	$1,976,016
6	Official Statement	$658,672
7	Contingency	$4,940,040
8	Environmental Permitting (Air Qaulity, Etc.)	$400,000
9	Interest during Construction	$2,500,000
10	Recovery of Groundwater Exploration Costs	$6,000,000
	Total Other Costs	**$25,366,800**

VI. Total Project Cost	**$91,234,000**
VII. Grant Funding Already Received	**$3,500,000**
VIII. Plant Funding Required	**$87,734,000**
X. Other Startup Cost	
Capitalized Interest (1 Year)	**$3,948,030**
Cash Reserve For Operations	**$150,000**
Chemicals & LIme (3 Month Supply)	**$376,923**
Operating Cash Total	**$4,474,953**
XI. Long Term Loan Requirements	**$92,208,953**

Table L-3
Income Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Gross Revenue	**$ 21,463,203**	**$ 21,873,173**	**$ 22,295,443**	**$ 22,730,380**	**$ 23,178,365**	**$ 23,639,790**	**$ 24,115,058**	**$ 24,604,583**	**$ 25,108,795**	**$ 25,628,132**	**$ 26,163,050**	**$ 26,714,016**	**$ 27,281,510**	**$ 27,866,029**	**$ 27,759,217**	**$ 28,379,334**	**$ 29,018,054**	**$ 29,675,935**	**$ 30,353,553**	**$ 31,051,500**
Potable Water	$ 21,463,203	$ 21,873,173	$ 22,295,443	$ 22,730,380	$ 23,178,365	$ 23,639,790	$ 24,115,058	$ 24,604,583	$ 25,108,795	$ 25,628,132	$ 26,163,050	$ 26,714,016	$ 27,281,510	$ 27,866,029	$ 27,759,217	$ 28,379,334	$ 29,018,054	$ 29,675,935	$ 30,353,553	$ 31,051,500
Magnesium Carbonate	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Salt	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Re-Calcinated Quick Lime	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cost of Goods Sold	**$ 12,086,343**	**$ 12,448,933**	**$ 12,822,401**	**$ 13,207,073**	**$ 13,603,285**	**$ 14,011,384**	**$ 14,431,725**	**$ 14,864,677**	**$ 15,310,617**	**$ 15,769,936**	**$ 16,243,034**	**$ 16,730,325**	**$ 17,232,235**	**$ 17,749,202**	**$ 18,281,678**	**$ 18,830,128**	**$ 19,395,032**	**$ 19,976,883**	**$ 20,576,189**	**$ 21,193,475**
Electricity	$ 1,582,422	$ 1,629,895	$ 1,678,792	$ 1,729,155	$ 1,781,030	$ 1,834,461	$ 1,889,495	$ 1,946,180	$ 2,004,565	$ 2,064,702	$ 2,126,643	$ 2,190,442	$ 2,256,156	$ 2,323,840	$ 2,393,556	$ 2,465,362	$ 2,539,323	$ 2,615,503	$ 2,693,968	$ 2,774,787
Natural Gas	$ 10,417	$ 10,730	$ 11,052	$ 11,383	$ 11,725	$ 12,077	$ 12,439	$ 12,812	$ 13,196	$ 13,592	$ 14,000	$ 14,420	$ 14,853	$ 15,298	$ 15,757	$ 16,230	$ 16,717	$ 17,218	$ 17,735	$ 18,267
Treatment Chemicals	$ 1,130,770	$ 1,164,693	$ 1,199,634	$ 1,235,623	$ 1,272,692	$ 1,310,872	$ 1,350,199	$ 1,390,704	$ 1,432,426	$ 1,475,398	$ 1,519,660	$ 1,565,250	$ 1,612,208	$ 1,660,574	$ 1,710,391	$ 1,761,703	$ 1,814,554	$ 1,868,991	$ 1,925,060	$ 1,982,812
Arsenic & Radium Disposal	$ 614,129	$ 632,553	$ 651,529	$ 671,075	$ 691,207	$ 711,944	$ 733,302	$ 755,301	$ 777,960	$ 801,299	$ 825,338	$ 850,098	$ 875,601	$ 901,869	$ 928,925	$ 956,793	$ 985,497	$ 1,015,062	$ 1,045,513	$ 1,076,879
Brine Disposal	$ 6,758,186	$ 6,960,931	$ 7,169,759	$ 7,384,852	$ 7,606,397	$ 7,834,589	$ 8,069,627	$ 8,311,716	$ 8,561,067	$ 8,817,899	$ 9,082,436	$ 9,354,909	$ 9,635,557	$ 9,924,623	$ 10,222,362	$ 10,529,033	$ 10,844,904	$ 11,170,251	$ 11,505,358	$ 11,850,519
Lime Disposal	$ 469,800	$ 483,894	$ 498,411	$ 513,363	$ 528,764	$ 544,627	$ 560,966	$ 577,795	$ 595,129	$ 612,983	$ 631,372	$ 650,313	$ 669,823	$ 689,917	$ 710,615	$ 731,933	$ 753,891	$ 776,508	$ 799,803	$ 823,798
Magnesium Disposal	$ 203,275	$ 209,373	$ 215,654	$ 222,124	$ 228,787	$ 235,651	$ 242,720	$ 250,002	$ 257,502	$ 265,227	$ 273,184	$ 281,379	$ 289,821	$ 298,516	$ 307,471	$ 316,695	$ 326,196	$ 335,982	$ 346,061	$ 356,443
Equipment Maintenance & Replacement	$ 1,317,344	$ 1,356,864	$ 1,397,570	$ 1,439,497	$ 1,482,682	$ 1,527,163	$ 1,572,978	$ 1,620,167	$ 1,668,772	$ 1,718,835	$ 1,770,400	$ 1,823,512	$ 1,878,218	$ 1,934,564	$ 1,992,601	$ 2,052,379	$ 2,113,950	$ 2,177,369	$ 2,242,690	$ 2,309,971
Operating Expenses	**$ 1,579,325**	**$ 1,626,705**	**$ 1,675,506**	**$ 1,725,771**	**$ 1,777,544**	**$ 1,830,871**	**$ 1,885,797**	**$ 1,942,371**	**$ 2,000,642**	**$ 2,060,661**	**$ 2,122,481**	**$ 2,186,155**	**$ 2,251,740**	**$ 2,319,292**	**$ 2,388,871**	**$ 2,460,537**	**$ 2,534,353**	**$ 2,610,384**	**$ 2,688,695**	**$ 2,769,356**
Personnel Wages & Benefits	$ 1,246,000	$ 1,283,380	$ 1,321,881	$ 1,361,538	$ 1,402,384	$ 1,444,455	$ 1,487,789	$ 1,532,423	$ 1,578,396	$ 1,625,747	$ 1,674,520	$ 1,724,755	$ 1,776,498	$ 1,829,793	$ 1,884,687	$ 1,941,227	$ 1,999,464	$ 2,059,448	$ 2,121,232	$ 2,184,869
Fixed Maintenance For Operations	$ 333,325	$ 343,325	$ 353,624	$ 364,233	$ 375,160	$ 386,415	$ 398,007	$ 409,948	$ 422,246	$ 434,914	$ 447,961	$ 461,400	$ 475,242	$ 489,499	$ 504,184	$ 519,309	$ 534,889	$ 550,935	$ 567,464	$ 584,487
Operating Earnings	**$ 7,797,536**	**$ 7,797,536**	**$ 7,797,536**	**$ 7,797,536**	**$ 7,797,536**	**$ 7,797,536**	**$ 7,797,536**	**$ 7,797,536**	**$ 7,797,536**	**$ 7,797,536**	**$ 7,797,536**	**$ 7,797,536**	**$ 7,797,536**	**$ 7,797,536**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**
Debt Service	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**	**$ 7,088,669**
Principal Payment	$ 2,939,266	$ 3,071,533	$ 3,209,752	$ 3,354,191	$ 3,505,129	$ 3,662,860	$ 3,827,689	$ 3,999,935	$ 4,179,932	$ 4,368,029	$ 4,564,590	$ 4,769,997	$ 4,984,646	$ 5,208,956	$ 5,443,359	$ 5,688,310	$ 5,944,284	$ 6,211,776	$ 6,491,306	$ 6,783,415
Interest Expense	$ 4,149,403	$ 4,017,136	$ 3,878,917	$ 3,734,478	$ 3,583,540	$ 3,425,809	$ 3,260,980	$ 3,088,734	$ 2,908,737	$ 2,720,640	$ 2,524,079	$ 2,318,672	$ 2,104,022	$ 1,879,713	$ 1,645,310	$ 1,400,359	$ 1,144,385	$ 876,892	$ 597,362	$ 305,254
Excess Revenue	**$ 708,867**	**$ 708,867**	**$ 708,867**	**$ 708,867**	**$ 708,867**	**$ 708,867**	**$ 708,867**	**$ 708,867**	**$ 708,867**	**$ 708,867**	**$ 708,867**	**$ 708,867**	**$ 708,867**	**$ 708,867**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (0)**	**$ -**
Reserve Account	**$4,474,953.33**	**$5,183,820.21**	**$5,892,687.09**	**$6,601,553.97**	**$7,310,420.86**	**$8,019,287.74**	**$8,728,154.62**	**$9,437,021.50**	**$10,145,888.38**	**$10,854,755.26**	**$11,563,622.14**	**$12,272,489.02**	**$12,981,355.90**	**$13,690,222.78**	**$14,399,089.66**	**$14,399,089.66**	**$14,399,089.66**	**$14,399,089.66**	**$14,399,089.66**	**$14,399,089.66**
Debt Service Coverage	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.00	1.00	1.00	1.00	1.00	1.00

Table L-4
Project Revenue

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Potable Water	GallonsDay	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
	Price ($/K Gallons)	$ 11.76	$ 11.99	$ 12.22	$ 12.46	$ 12.70	$ 12.95	$ 13.21	$ 13.48	$ 13.76	$ 14.04	$ 14.34	$ 14.64	$ 14.95	$ 15.27	$ 15.21	$ 15.55	$ 15.90	$ 16.26	$ 16.63	$ 17.01
	Revenue	$ 21,463,203	$ 21,873,173	$ 22,295,443	$ 22,730,380	$ 23,178,365	$ 23,639,790	$ 24,115,058	$ 24,604,583	$ 25,108,795	$ 25,628,132	$ 26,163,050	$ 26,714,016	$ 27,281,510	$ 27,866,029	$ 27,759,217	$ 28,379,334	$ 29,018,054	$ 29,675,935	$ 30,353,553	$ 31,051,500
Magnesium Carbonate	Tons/Year	2,710	2,710	2,710	2,710	2,710	2,710	2,710	2,710	2,710	2,710	2,710	2,710	2,710	2,710	2,710	2,710	2,710	2,710	2,710	2,710
	Price ($/Ton)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Salt	Tons/Year	44,006	44,006	44,006	44,006	44,006	44,006	44,006	44,006	44,006	44,006	44,006	44,006	44,006	44,006	44,006	44,006	44,006	44,006	44,006	44,006
	Price ($/Ton)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Re-Calcinated Quick Lime	Tons/Year	6,264	6,264	6,264	6,264	6,264	6,264	6,264	6,264	6,264	6,264	6,264	6,264	6,264	6,264	6,264	6,264	6,264	6,264	6,264	6,264
	Price ($/Ton)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Revenue		**$ 21,463,203**	**$ 21,873,173**	**$ 22,295,443**	**$ 22,730,380**	**$ 23,178,365**	**$ 23,639,790**	**$ 24,115,058**	**$ 24,604,583**	**$ 25,108,795**	**$ 25,628,132**	**$ 26,163,050**	**$ 26,714,016**	**$ 27,281,510**	**$ 27,866,029**	**$ 27,759,217**	**$ 28,379,334**	**$ 29,018,054**	**$ 29,675,935**	**$ 30,353,553**	**$ 31,051,500**

Table of Contents

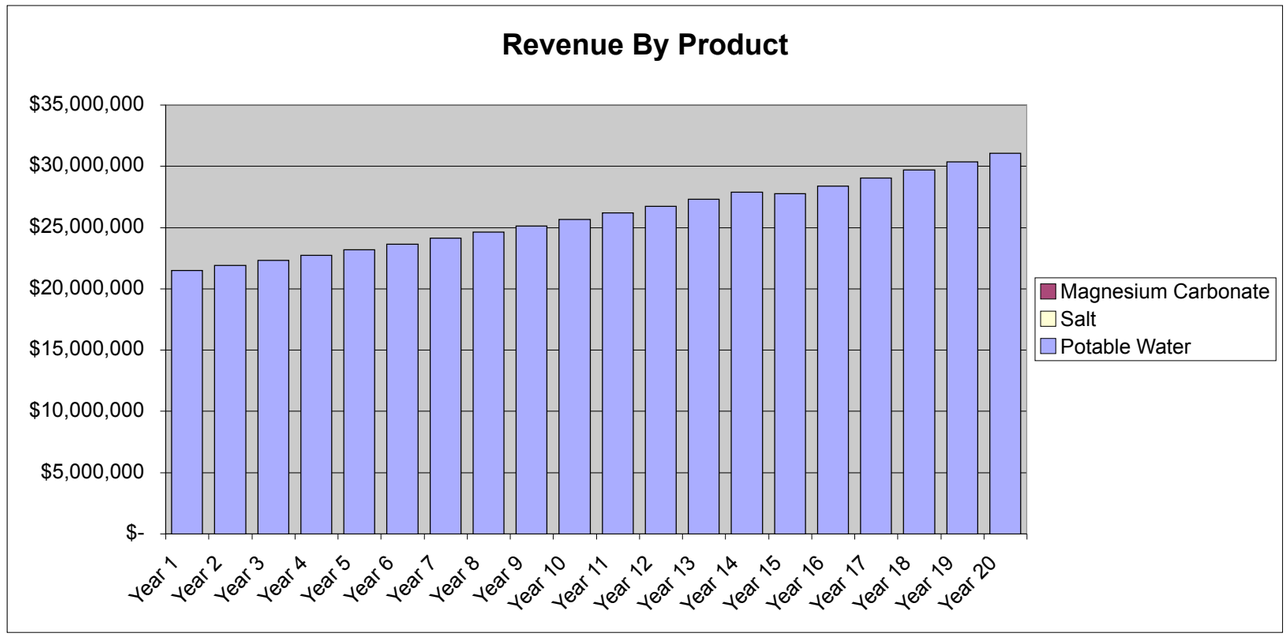

Table of Contents

Table L-5
Cost of Goods Sold

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Electricity	KWH Annually	39,560,555	39,560,555	39,560,555	39,560,555	39,560,555	39,560,555	39,560,555	39,560,555	39,560,555	39,560,555	39,560,555	39,560,555	39,560,555	39,560,555	39,560,555	39,560,555	39,560,555	39,560,555	39,560,555	39,560,555
	Price ($/KWH)	$ 0.04	0.0412	0.042436	0.04370908	0.045020352	0.046370963	0.047762092	0.049194955	0.050670803	0.052190927	0.053756655	0.055369355	0.057030435	0.058741349	0.060503589	0.062318697	0.064188258	0.066113905	0.068097322	0.070140242
	Cost	$ 1,582,422	$ 1,629,895	$ 1,678,792	$ 1,729,155	$ 1,781,030	$ 1,834,461	$ 1,889,495	$ 1,946,180	$ 2,004,565	$ 2,064,702	$ 2,126,643	$ 2,190,442	$ 2,256,156	$ 2,323,840	$ 2,393,556	$ 2,465,362	$ 2,539,323	$ 2,615,503	$ 2,693,968	$ 2,774,787
Natural Gas	MMBTU Annually	210,920	210,920	210,920	210,920	210,920	210,920	210,920	210,920	210,920	210,920	210,920	210,920	210,920	210,920	210,920	210,920	210,920	210,920	210,920	210,920
	Price ($/MMBTU)	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.06	$ 0.06	$ 0.06	$ 0.06	$ 0.06	$ 0.06	$ 0.07	$ 0.07	$ 0.07	$ 0.07	$ 0.07	$ 0.08	$ 0.08	$ 0.08	$ 0.08	$ 0.09
	Cost	$ 10,417	$ 10,730	$ 11,052	$ 11,383	$ 11,725	$ 12,077	$ 12,439	$ 12,812	$ 13,196	$ 13,592	$ 14,000	$ 14,420	$ 14,853	$ 15,298	$ 15,757	$ 16,230	$ 16,717	$ 17,218	$ 17,735	$ 18,267
Treatment Chemicals	Cost	$ 1,130,770	$ 1,164,693	$ 1,199,634	$ 1,235,623	$ 1,272,692	$ 1,310,872	$ 1,350,199	$ 1,390,704	$ 1,432,426	$ 1,475,398	$ 1,519,660	$ 1,565,250	$ 1,612,208	$ 1,660,574	$ 1,710,391	$ 1,761,703	$ 1,814,554	$ 1,868,991	$ 1,925,060	$ 1,982,812
Arsenic & Radium Disposal	Tons/Year	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315
	Price ($/Ton)	$ 467.00	$ 481.01	$ 495.44	$ 510.30	$ 525.61	$ 541.38	$ 557.62	$ 574.35	$ 591.58	$ 609.33	$ 627.61	$ 646.44	$ 665.83	$ 685.81	$ 706.38	$ 727.57	$ 749.40	$ 771.88	$ 795.04	$ 818.89
	Cost	$ 614,129	$ 632,553	$ 651,529	$ 671,075	$ 691,207	$ 711,944	$ 733,302	$ 755,301	$ 777,960	$ 801,299	$ 825,338	$ 850,098	$ 875,601	$ 901,869	$ 928,925	$ 956,793	$ 985,497	$ 1,015,062	$ 1,045,513	$ 1,076,879
Mixed Brine Disposal	Tons Per Year	90,109	90,109	90,109	90,109	90,109	90,109	90,109	90,109	90,109	90,109	90,109	90,109	90,109	90,109	90,109	90,109	90,109	90,109	90,109	90,109
	Price ($/Ton)	$ 75.00	$ 77.25	$ 79.57	$ 81.95	$ 84.41	$ 86.95	$ 89.55	$ 92.24	$ 95.01	$ 97.86	$ 100.79	$ 103.82	$ 106.93	$ 110.14	$ 113.44	$ 116.85	$ 120.35	$ 123.96	$ 127.68	$ 131.51
	Cost	$ 6,758,186	$ 6,960,931	$ 7,169,759	$ 7,384,852	$ 7,606,397	$ 7,834,589	$ 8,069,627	$ 8,311,716	$ 8,561,067	$ 8,817,899	$ 9,082,436	$ 9,354,909	$ 9,635,557	$ 9,924,623	$ 10,222,362	$ 10,529,033	$ 10,844,904	$ 11,170,251	$ 11,505,358	$ 11,850,519
Excess Lime Disposal	Tons Per Year	6,264.0	6,264.0	6,264.0	6,264.0	6,264.0	6,264.0	6,264.0	6,264.0	6,264.0	6,264.0	6,264.0	6,264.0	6,264.0	6,264.0	6,264.0	6,264.0	6,264.0	6,264.0	6,264.0	6,264.0
	Price ($/Ton)	$ 75.00	$ 77.25	$ 79.57	$ 81.95	$ 84.41	$ 86.95	$ 89.55	$ 92.24	$ 95.01	$ 97.86	$ 100.79	$ 103.82	$ 106.93	$ 110.14	$ 113.44	$ 116.85	$ 120.35	$ 123.96	$ 127.68	$ 131.51
	Cost	$ 469,800	$ 483,894	$ 498,411	$ 513,363	$ 528,764	$ 544,627	$ 560,966	$ 577,795	$ 595,129	$ 612,983	$ 631,372	$ 650,313	$ 669,823	$ 689,917	$ 710,615	$ 731,933	$ 753,891	$ 776,508	$ 799,803	$ 823,798
Excess Magnesium Disposal	Tons Per Year	2,710.3	2,710.3	2,710.3	2,710.3	2,710.3	2,710.3	2,710.3	2,710.3	2,710.3	2,710.3	2,710.3	2,710.3	2,710.3	2,710.3	2,710.3	2,710.3	2,710.3	2,710.3	2,710.3	2,710.3
	Price ($/Ton)	$ 75.00	$ 77.25	$ 79.57	$ 81.95	$ 84.41	$ 86.95	$ 89.55	$ 92.24	$ 95.01	$ 97.86	$ 100.79	$ 103.82	$ 106.93	$ 110.14	$ 113.44	$ 116.85	$ 120.35	$ 123.96	$ 127.68	$ 131.51
	Cost	$ 203,275	$ 209,373	$ 215,654	$ 222,124	$ 228,787	$ 235,651	$ 242,720	$ 250,002	$ 257,502	$ 265,227	$ 273,184	$ 281,379	$ 289,821	$ 298,516	$ 307,471	$ 316,695	$ 326,196	$ 335,982	$ 346,061	$ 356,443
Equipment Maintenance & Replacement	Cost	$ 1,317,344	$ 1,356,864	$ 1,397,570	$ 1,439,497	$ 1,482,682	$ 1,527,163	$ 1,572,978	$ 1,620,167	$ 1,668,772	$ 1,718,835	$ 1,770,400	$ 1,823,512	$ 1,878,218	$ 1,934,564	$ 1,992,601	$ 2,052,379	$ 2,113,950	$ 2,177,369	$ 2,242,690	$ 2,309,971
Total Cost of Goods Sold		**$ 12,086,343**	**$ 12,448,933**	**$ 12,822,401**	**$ 13,207,073**	**$ 13,603,285**	**$ 14,011,384**	**$ 14,431,725**	**$ 14,864,677**	**$ 15,310,617**	**$ 15,769,936**	**$ 16,243,034**	**$ 16,730,325**	**$ 17,232,235**	**$ 17,749,202**	**$ 18,281,678**	**$ 18,830,128**	**$ 19,395,032**	**$ 19,976,883**	**$ 20,576,189**	**$ 21,193,475**

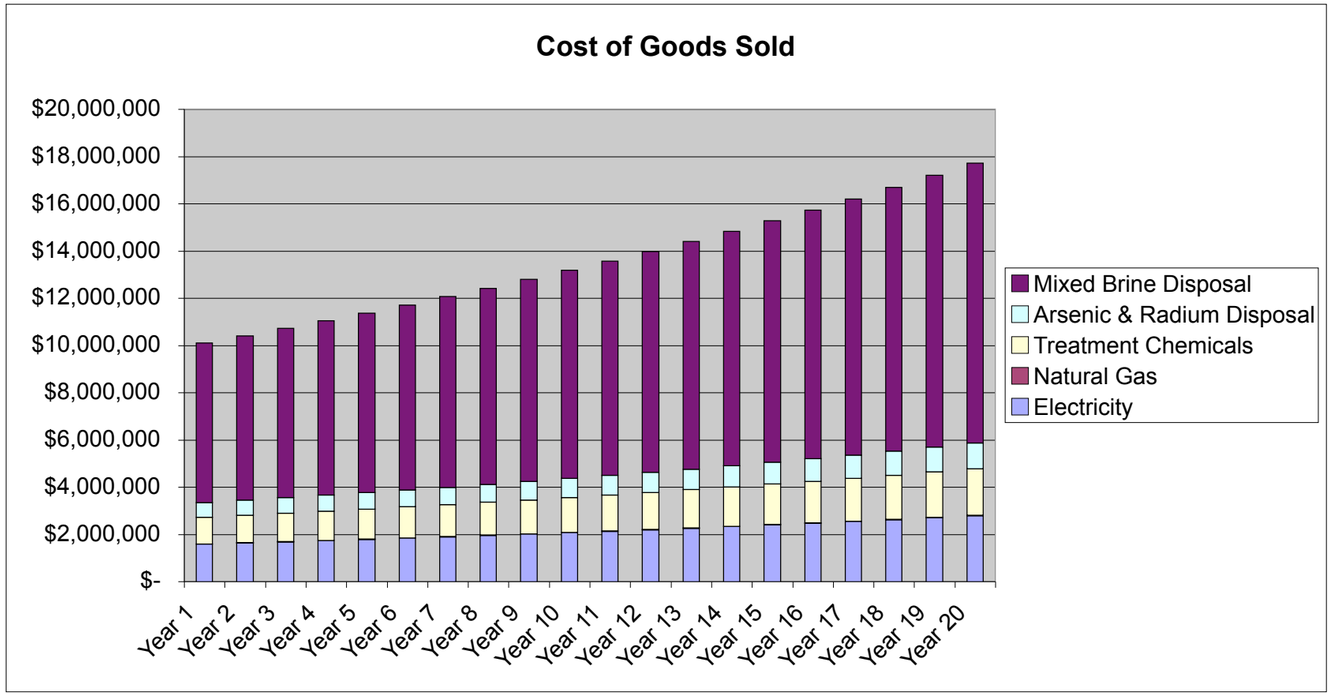

Table L-6
Long Term Loan

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 112	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Loan Amount Upon Plant Start Up	$ 92,208,953	Beginning Principal Balance	$ 92,208,953.33	$ 89,269,687.43	$ 86,198,154.56	$ 82,988,402.71	$ 79,634,212.03	$ 76,129,082.76	$ 72,466,222.68	$ 68,638,533.90	$ 64,638,599.12	$ 60,458,667.28	$ 56,090,638.50	$ 51,526,048.43	$ 46,756,051.80	$ 41,771,405.33	$ 36,562,449.77	$ 31,119,091.20	$ 25,430,781.50	$ 19,486,497.86	$ 13,274,721.46	$ 6,783,415.12
Annual Payment	($7,088,668.80)	Yearly Interest	$ 4,149,402.90	$ 4,017,135.93	$ 3,878,916.96	$ 3,734,478.12	$ 3,583,539.54	$ 3,425,808.72	$ 3,260,980.02	$ 3,088,734.03	$ 2,908,736.96	$ 2,720,640.03	$ 2,524,078.73	$ 2,318,672.18	$ 2,104,022.33	$ 1,879,713.24	$ 1,645,310.24	$ 1,400,359.10	$ 1,144,385.17	$ 876,892.40	$ 597,362.47	$ 305,253.68
		Payment Towards Principal	$2,939,265.90	$3,071,532.87	$3,209,751.85	$3,354,190.68	$3,505,129.26	$3,662,860.08	$3,827,688.78	$3,999,934.78	$4,179,931.84	$4,368,028.78	$4,564,590.07	$4,769,996.63	$4,984,646.47	$5,208,955.56	$5,443,358.56	$5,688,309.70	$5,944,283.64	$6,211,776.40	$6,491,306.34	$6,783,415.12
Loan Finance Rate	4.5%	Ending Principal Balance	$ 89,269,687.43	$ 86,198,154.56	$ 82,988,402.71	$ 79,634,212.03	$ 76,129,082.76	$ 72,466,222.68	$ 68,638,533.90	$ 64,638,599.12	$ 60,458,667.28	$ 56,090,638.50	$ 51,526,048.43	$ 46,756,051.80	$ 41,771,405.33	$ 36,562,449.77	$ 31,119,091.20	$ 25,430,781.50	$ 19,486,497.86	$ 13,274,721.46	$ 6,783,415.12	$ (0.00)

Table of Contents

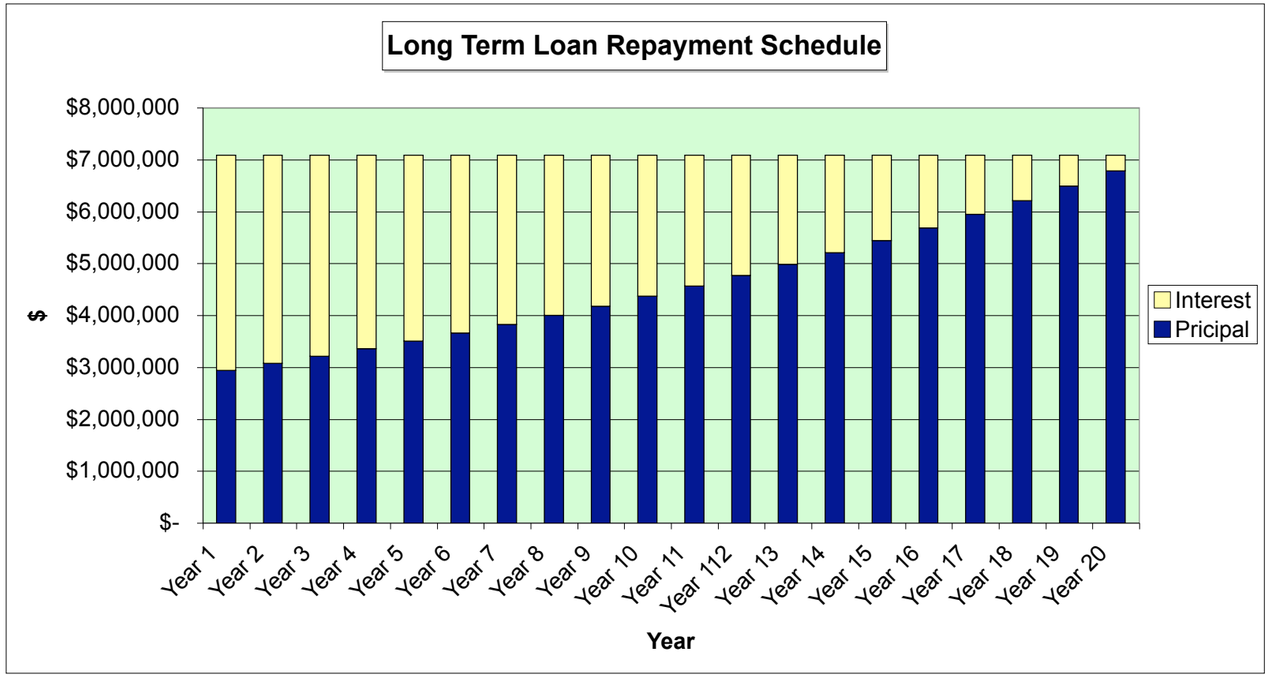

Table L-7
Maintenance Costs

Category	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Auditing	$ 6,000.00	$ 6,180.00	$ 6,365.40	$ 6,556.36	$ 6,753.05	$ 6,955.64	$ 7,164.31	$ 7,379.24	$ 7,600.62	$ 7,828.64	$ 8,063.50	$ 8,305.40	$ 8,554.57	$ 8,811.20	$ 9,075.54	$ 9,347.80	$ 9,628.24	$ 9,917.09	$ 10,214.60	$ 10,521.04
Architect & Eng	$ 35,000.00	$ 36,050.00	$ 37,131.50	$ 38,245.45	$ 39,392.81	$ 40,574.59	$ 41,791.83	$ 43,045.59	$ 44,336.95	$ 45,667.06	$ 47,037.07	$ 48,448.19	$ 49,901.63	$ 51,398.68	$ 52,940.64	$ 54,528.86	$ 56,164.73	$ 57,849.67	$ 59,585.16	$ 61,372.71
Other Prof	$ 35,000.00	$ 36,050.00	$ 37,131.50	$ 38,245.45	$ 39,392.81	$ 40,574.59	$ 41,791.83	$ 43,045.59	$ 44,336.95	$ 45,667.06	$ 47,037.07	$ 48,448.19	$ 49,901.63	$ 51,398.68	$ 52,940.64	$ 54,528.86	$ 56,164.73	$ 57,849.67	$ 59,585.16	$ 61,372.71
Telephone	$ 3,650.00	$ 3,759.50	$ 3,872.29	$ 3,988.45	$ 4,108.11	$ 4,231.35	$ 4,358.29	$ 4,489.04	$ 4,623.71	$ 4,762.42	$ 4,905.29	$ 5,052.45	$ 5,204.03	$ 5,360.15	$ 5,520.95	$ 5,686.58	$ 5,857.18	$ 6,032.89	$ 6,213.88	$ 6,400.30
Postage	$ 6,000.00	$ 6,180.00	$ 6,365.40	$ 6,556.36	$ 6,753.05	$ 6,955.64	$ 7,164.31	$ 7,379.24	$ 7,600.62	$ 7,828.64	$ 8,063.50	$ 8,305.40	$ 8,554.57	$ 8,811.20	$ 9,075.54	$ 9,347.80	$ 9,628.24	$ 9,917.09	$ 10,214.60	$ 10,521.04
Advertising	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Insurance-LIAB	$ 55,000.00	$ 56,650.00	$ 58,349.50	$ 60,099.99	$ 61,902.98	$ 63,760.07	$ 65,672.88	$ 67,643.06	$ 69,672.35	$ 71,762.53	$ 73,915.40	$ 76,132.86	$ 78,416.85	$ 80,769.35	$ 83,192.43	$ 85,688.21	$ 88,258.85	$ 90,906.62	$ 93,633.82	$ 96,442.83
Travel Training & Dues	$ 325.00	$ 334.75	$ 344.79	$ 355.14	$ 365.79	$ 376.76	$ 388.07	$ 399.71	$ 411.70	$ 424.05	$ 436.77	$ 449.88	$ 463.37	$ 477.27	$ 491.59	$ 506.34	$ 521.53	$ 537.18	$ 553.29	$ 569.89
Printing	$ 3,000.00	$ 3,090.00	$ 3,182.70	$ 3,278.18	$ 3,376.53	$ 3,477.82	$ 3,582.16	$ 3,689.62	$ 3,800.31	$ 3,914.32	$ 4,031.75	$ 4,152.70	$ 4,277.28	$ 4,405.60	$ 4,537.77	$ 4,673.90	$ 4,814.12	$ 4,958.54	$ 5,107.30	$ 5,260.52
Building Repairs	$ 1,500.00	$ 1,545.00	$ 1,591.35	$ 1,639.09	$ 1,688.26	$ 1,738.91	$ 1,791.08	$ 1,844.81	$ 1,900.16	$ 1,957.16	$ 2,015.87	$ 2,076.35	$ 2,138.64	$ 2,202.80	$ 2,268.88	$ 2,336.95	$ 2,407.06	$ 2,479.27	$ 2,553.65	$ 2,630.26
Lab Fees	$ 30,000.00	$ 30,900.00	$ 31,827.00	$ 32,781.81	$ 33,765.26	$ 34,778.22	$ 35,821.57	$ 36,896.22	$ 38,003.10	$ 39,143.20	$ 40,317.49	$ 41,527.02	$ 42,772.83	$ 44,056.01	$ 45,377.69	$ 46,739.02	$ 48,141.19	$ 49,585.43	$ 51,072.99	$ 52,605.18
Shop Allocation	$ 3,500.00	$ 3,605.00	$ 3,713.15	$ 3,824.54	$ 3,939.28	$ 4,057.46	$ 4,179.18	$ 4,304.56	$ 4,433.70	$ 4,566.71	$ 4,703.71	$ 4,844.82	$ 4,990.16	$ 5,139.87	$ 5,294.06	$ 5,452.89	$ 5,616.47	$ 5,784.97	$ 5,958.52	$ 6,137.27
Vehicle Repair	$ 3,000.00	$ 3,090.00	$ 3,182.70	$ 3,278.18	$ 3,376.53	$ 3,477.82	$ 3,582.16	$ 3,689.62	$ 3,800.31	$ 3,914.32	$ 4,031.75	$ 4,152.70	$ 4,277.28	$ 4,405.60	$ 4,537.77	$ 4,673.90	$ 4,814.12	$ 4,958.54	$ 5,107.30	$ 5,260.52
Communication Equipment Repair	$ 1,200.00	$ 1,236.00	$ 1,273.08	$ 1,311.27	$ 1,350.61	$ 1,391.13	$ 1,432.86	$ 1,475.85	$ 1,520.12	$ 1,565.73	$ 1,612.70	$ 1,661.08	$ 1,710.91	$ 1,762.24	$ 1,815.11	$ 1,869.56	$ 1,925.65	$ 1,983.42	$ 2,042.92	$ 2,104.21
Other Repair	$ 15,000.00	$ 15,450.00	$ 15,913.50	$ 16,390.91	$ 16,882.63	$ 17,389.11	$ 17,910.78	$ 18,448.11	$ 19,001.55	$ 19,571.60	$ 20,158.75	$ 20,763.51	$ 21,386.41	$ 22,028.01	$ 22,688.85	$ 23,369.51	$ 24,070.60	$ 24,792.71	$ 25,536.50	$ 26,302.59
Other Contractual	$ 5,000.00	$ 5,150.00	$ 5,304.50	$ 5,463.64	$ 5,627.54	$ 5,796.37	$ 5,970.26	$ 6,149.37	$ 6,333.85	$ 6,523.87	$ 6,719.58	$ 6,921.17	$ 7,128.80	$ 7,342.67	$ 7,562.95	$ 7,789.84	$ 8,023.53	$ 8,264.24	$ 8,512.17	$ 8,767.53
Office Supply	$ 2,500.00	$ 2,575.00	$ 2,652.25	$ 2,731.82	$ 2,813.77	$ 2,898.19	$ 2,985.13	$ 3,074.68	$ 3,166.93	$ 3,261.93	$ 3,359.79	$ 3,460.58	$ 3,564.40	$ 3,671.33	$ 3,781.47	$ 3,894.92	$ 4,011.77	$ 4,132.12	$ 4,256.08	$ 4,383.77
Rock	$ 5,000.00	$ 5,150.00	$ 5,304.50	$ 5,463.64	$ 5,627.54	$ 5,796.37	$ 5,970.26	$ 6,149.37	$ 6,333.85	$ 6,523.87	$ 6,719.58	$ 6,921.17	$ 7,128.80	$ 7,342.67	$ 7,562.95	$ 7,789.84	$ 8,023.53	$ 8,264.24	$ 8,512.17	$ 8,767.53
Asphalt	$ 1,000.00	$ 1,030.00	$ 1,060.90	$ 1,092.73	$ 1,125.51	$ 1,159.27	$ 1,194.05	$ 1,229.87	$ 1,266.77	$ 1,304.77	$ 1,343.92	$ 1,384.23	$ 1,425.76	$ 1,468.53	$ 1,512.59	$ 1,557.97	$ 1,604.71	$ 1,652.85	$ 1,702.43	$ 1,753.51
Concrete	$ 3,500.00	$ 3,605.00	$ 3,713.15	$ 3,824.54	$ 3,939.28	$ 4,057.46	$ 4,179.18	$ 4,304.56	$ 4,433.70	$ 4,566.71	$ 4,703.71	$ 4,844.82	$ 4,990.16	$ 5,139.87	$ 5,294.06	$ 5,452.89	$ 5,616.47	$ 5,784.97	$ 5,958.52	$ 6,137.27
Cleaning & Sanitary	$ 3,600.00	$ 3,708.00	$ 3,819.24	$ 3,933.82	$ 4,051.83	$ 4,173.39	$ 4,298.59	$ 4,427.55	$ 4,560.37	$ 4,697.18	$ 4,838.10	$ 4,983.24	$ 5,132.74	$ 5,286.72	$ 5,445.32	$ 5,608.68	$ 5,776.94	$ 5,950.25	$ 6,128.76	$ 6,312.62
Bldg Maint Supplies	$ 1,500.00	$ 1,545.00	$ 1,591.35	$ 1,639.09	$ 1,688.26	$ 1,738.91	$ 1,791.08	$ 1,844.81	$ 1,900.16	$ 1,957.16	$ 2,015.87	$ 2,076.35	$ 2,138.64	$ 2,202.80	$ 2,268.88	$ 2,336.95	$ 2,407.06	$ 2,479.27	$ 2,553.65	$ 2,630.26
Photo Supplies		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Uniform/Access	$ 9,800.00	$ 10,094.00	$ 10,396.82	$ 10,708.72	$ 11,029.99	$ 11,360.89	$ 11,701.71	$ 12,052.76	$ 12,414.35	$ 12,786.78	$ 13,170.38	$ 13,565.49	$ 13,972.46	$ 14,391.63	$ 14,823.38	$ 15,268.08	$ 15,726.12	$ 16,197.91	$ 16,683.84	$ 17,184.36
Books/Subscriptions	$ 500.00	$ 515.00	$ 530.45	$ 546.36	$ 562.75	$ 579.64	$ 597.03	$ 614.94	$ 633.39	$ 652.39	$ 671.96	$ 692.12	$ 712.88	$ 734.27	$ 756.29	$ 778.98	$ 802.35	$ 826.42	$ 851.22	$ 876.75
Motor Fuel	$ 6,000.00	$ 6,180.00	$ 6,365.40	$ 6,556.36	$ 6,753.05	$ 6,955.64	$ 7,164.31	$ 7,379.24	$ 7,600.62	$ 7,828.64	$ 8,063.50	$ 8,305.40	$ 8,554.57	$ 8,811.20	$ 9,075.54	$ 9,347.80	$ 9,628.24	$ 9,917.09	$ 10,214.60	$ 10,521.04
Motor Oil	$ 500.00	$ 515.00	$ 530.45	$ 546.36	$ 562.75	$ 579.64	$ 597.03	$ 614.94	$ 633.39	$ 652.39	$ 671.96	$ 692.12	$ 712.88	$ 734.27	$ 756.29	$ 778.98	$ 802.35	$ 826.42	$ 851.22	$ 876.75
Lubricants	$ 1,000.00	$ 1,030.00	$ 1,060.90	$ 1,092.73	$ 1,125.51	$ 1,159.27	$ 1,194.05	$ 1,229.87	$ 1,266.77	$ 1,304.77	$ 1,343.92	$ 1,384.23	$ 1,425.76	$ 1,468.53	$ 1,512.59	$ 1,557.97	$ 1,604.71	$ 1,652.85	$ 1,702.43	$ 1,753.51
Lumber/Wood Supp	$ 850.00	$ 875.50	$ 901.77	$ 928.82	$ 956.68	$ 985.38	$ 1,014.94	$ 1,045.39	$ 1,076.75	$ 1,109.06	$ 1,142.33	$ 1,176.60	$ 1,211.90	$ 1,248.25	$ 1,285.70	$ 1,324.27	$ 1,364.00	$ 1,404.92	$ 1,447.07	$ 1,490.48
Steel/metal Supp	$ 350.00	$ 360.50	$ 371.32	$ 382.45	$ 393.93	$ 405.75	$ 417.92	$ 430.46	$ 443.37	$ 456.67	$ 470.37	$ 484.48	$ 499.02	$ 513.99	$ 529.41	$ 545.29	$ 561.65	$ 578.50	$ 595.85	$ 613.73
Laboratory Supplies	$ 5,500.00	$ 5,665.00	$ 5,834.95	$ 6,010.00	$ 6,190.30	$ 6,376.01	$ 6,567.29	$ 6,764.31	$ 6,967.24	$ 7,176.25	$ 7,391.54	$ 7,613.29	$ 7,841.68	$ 8,076.94	$ 8,319.24	$ 8,568.82	$ 8,825.89	$ 9,090.66	$ 9,363.38	$ 9,644.28
Welding Supp	$ 350.00	$ 360.50	$ 371.32	$ 382.45	$ 393.93	$ 405.75	$ 417.92	$ 430.46	$ 443.37	$ 456.67	$ 470.37	$ 484.48	$ 499.02	$ 513.99	$ 529.41	$ 545.29	$ 561.65	$ 578.50	$ 595.85	$ 613.73
Misc Hardware	$ 1,500.00	$ 1,545.00	$ 1,591.35	$ 1,639.09	$ 1,688.26	$ 1,738.91	$ 1,791.08	$ 1,844.81	$ 1,900.16	$ 1,957.16	$ 2,015.87	$ 2,076.35	$ 2,138.64	$ 2,202.80	$ 2,268.88	$ 2,336.95	$ 2,407.06	$ 2,479.27	$ 2,553.65	$ 2,630.26
Other Commodities	$ 4,000.00	$ 4,120.00	$ 4,243.60	$ 4,370.91	$ 4,502.04	$ 4,637.10	$ 4,776.21	$ 4,919.50	$ 5,067.08	$ 5,219.09	$ 5,375.67	$ 5,536.94	$ 5,703.04	$ 5,874.13	$ 6,050.36	$ 6,231.87	$ 6,418.83	$ 6,611.39	$ 6,809.73	$ 7,014.02
Agents Fees	$ 3,500.00	$ 3,605.00	$ 3,713.15	$ 3,824.54	$ 3,939.28	$ 4,057.46	$ 4,179.18	$ 4,304.56	$ 4,433.70	$ 4,566.71	$ 4,703.71	$ 4,844.82	$ 4,990.16	$ 5,139.87	$ 5,294.06	$ 5,452.89	$ 5,616.47	$ 5,784.97	$ 5,958.52	$ 6,137.27
Bldg & Fixed Equip	$ 12,000.00	$ 12,360.00	$ 12,730.80	$ 13,112.72	$ 13,506.11	$ 13,911.29	$ 14,328.63	$ 14,758.49	$ 15,201.24	$ 15,657.28	$ 16,127.00	$ 16,610.81	$ 17,109.13	$ 17,622.40	$ 18,151.08	$ 18,695.61	$ 19,256.48	$ 19,834.17	$ 20,429.20	$ 21,042.07
Vehicles	$ 2,000.00	$ 2,060.00	$ 2,121.80	$ 2,185.45	$ 2,251.02	$ 2,318.55	$ 2,388.10	$ 2,459.75	$ 2,533.54	$ 2,609.55	$ 2,687.83	$ 2,768.47	$ 2,851.52	$ 2,937.07	$ 3,025.18	$ 3,115.93	$ 3,209.41	$ 3,305.70	$ 3,404.87	$ 3,507.01
Construction Equip	$ 3,000.00	$ 3,090.00	$ 3,182.70	$ 3,278.18	$ 3,376.53	$ 3,477.82	$ 3,582.16	$ 3,689.62	$ 3,800.31	$ 3,914.32	$ 4,031.75	$ 4,152.70	$ 4,277.28	$ 4,405.60	$ 4,537.77	$ 4,673.90	$ 4,814.12	$ 4,958.54	$ 5,107.30	$ 5,260.52
Office Equip	$ 2,000.00	$ 2,060.00	$ 2,121.80	$ 2,185.45	$ 2,251.02	$ 2,318.55	$ 2,388.10	$ 2,459.75	$ 2,533.54	$ 2,609.55	$ 2,687.83	$ 2,768.47	$ 2,851.52	$ 2,937.07	$ 3,025.18	$ 3,115.93	$ 3,209.41	$ 3,305.70	$ 3,404.87	$ 3,507.01
Communication Equip	$ 200.00	$ 206.00	$ 212.18	$ 218.55	$ 225.10	$ 231.85	$ 238.81	$ 245.97	$ 253.35	$ 260.95	$ 268.78	$ 276.85	$ 285.15	$ 293.71	$ 302.52	$ 311.59	$ 320.94	$ 330.57	$ 340.49	$ 350.70
Pipeline Repairs	$ 25,000.00	$ 25,750.00	$ 26,522.50	$ 27,318.18	$ 28,137.72	$ 28,981.85	$ 29,851.31	$ 30,746.85	$ 31,669.25	$ 32,619.33	$ 33,597.91	$ 34,605.85	$ 35,644.02	$ 36,713.34	$ 37,814.74	$ 38,949.19	$ 40,117.66	$ 41,321.19	$ 42,560.83	$ 43,837.65
Misc. Equip	$ 35,000.00	$ 36,050.00	$ 37,131.50	$ 38,245.45	$ 39,392.81	$ 40,574.59	$ 41,791.83	$ 43,045.59	$ 44,336.95	$ 45,667.06	$ 47,037.07	$ 48,448.19	$ 49,901.63	$ 51,398.68	$ 52,940.64	$ 54,528.86	$ 56,164.73	$ 57,849.67	$ 59,585.16	$ 61,372.71
		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Totals	**$ 333,325.00**	**$ 343,324.75**	**$ 353,624.49**	**$ 364,233.23**	**$ 375,160.22**	**$ 386,415.03**	**$ 398,007.48**	**$ 409,947.71**	**$ 422,246.14**	**$ 434,913.52**	**$ 447,960.93**	**$ 461,399.75**	**$ 475,241.75**	**$ 489,499.00**	**$ 504,183.97**	**$ 519,309.49**	**$ 534,888.77**	**$ 550,935.44**	**$ 567,463.50**	**$ 584,487.41**

Table L-8
Plant Personnel Costs

Position Description	# of Employees	Average Starting Salary	Benefit Adjustment Factor	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Plant Manager	1	$ 90,000.00	40%	$ 126,000.00	$ 129,780.00	$ 133,673.40	$ 137,683.60	$ 141,814.11	$ 146,068.53	$ 150,450.59	$ 154,964.11	$ 159,613.03	$ 164,401.42	$ 169,333.46	$ 174,413.47	$ 179,645.87	$ 185,035.25	$ 190,586.31	$ 196,303.89	$ 202,193.01	$ 208,258.80	$ 214,506.57	$ 220,941.76
Shift Supervisor	4	$ 60,000.00	40%	$ 336,000.00	$ 346,080.00	$ 356,462.40	$ 367,156.27	$ 378,170.96	$ 389,516.09	$ 401,201.57	$ 413,237.62	$ 425,634.75	$ 438,403.79	$ 451,555.90	$ 465,102.58	$ 479,055.66	$ 493,427.33	$ 508,230.15	$ 523,477.05	$ 539,181.36	$ 555,356.80	$ 572,017.51	$ 589,178.03
Operators	10	$ 40,000.00	40%	$ 560,000.00	$ 576,800.00	$ 594,104.00	$ 611,927.12	$ 630,284.93	$ 649,193.48	$ 668,669.29	$ 688,729.36	$ 709,391.25	$ 730,672.98	$ 752,593.17	$ 775,170.97	$ 798,426.10	$ 822,378.88	$ 847,050.25	$ 872,461.75	$ 898,635.61	$ 925,594.67	$ 953,362.51	$ 981,963.39
Maintenance Technicians	2	$ 55,000.00	40%	$ 154,000.00	$ 158,620.00	$ 163,378.60	$ 168,279.96	$ 173,328.36	$ 178,528.21	$ 183,884.05	$ 189,400.58	$ 195,082.59	$ 200,935.07	$ 206,963.12	$ 213,172.02	$ 219,567.18	$ 226,154.19	$ 232,938.82	$ 239,926.98	$ 247,124.79	$ 254,538.54	$ 262,174.69	$ 270,039.93
Accounting	1	$ 50,000.00	40%	$ 70,000.00	$ 72,100.00	$ 74,263.00	$ 76,490.89	$ 78,785.62	$ 81,149.19	$ 83,583.66	$ 86,091.17	$ 88,673.91	$ 91,334.12	$ 94,074.15	$ 96,896.37	$ 99,803.26	$ 102,797.36	$ 105,881.28	$ 109,057.72	$ 112,329.45	$ 115,699.33	$ 119,170.31	$ 122,745.42
				$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				$ -																			
Totals				**$ 1,246,000.00**	**$ 1,283,380.00**	**$ 1,321,881.40**	**$ 1,361,537.84**	**$ 1,402,383.98**	**$ 1,444,455.50**	**$ 1,487,789.16**	**$ 1,532,422.84**	**$ 1,578,395.52**	**$ 1,625,747.39**	**$ 1,674,519.81**	**$ 1,724,755.40**	**$ 1,776,498.07**	**$ 1,829,793.01**	**$ 1,884,686.80**	**$ 1,941,227.40**	**$ 1,999,464.22**	**$ 2,059,448.15**	**$ 2,121,231.59**	**$ 2,184,868.54**
Annual Inflation Factor	3%																						

Table of Contents

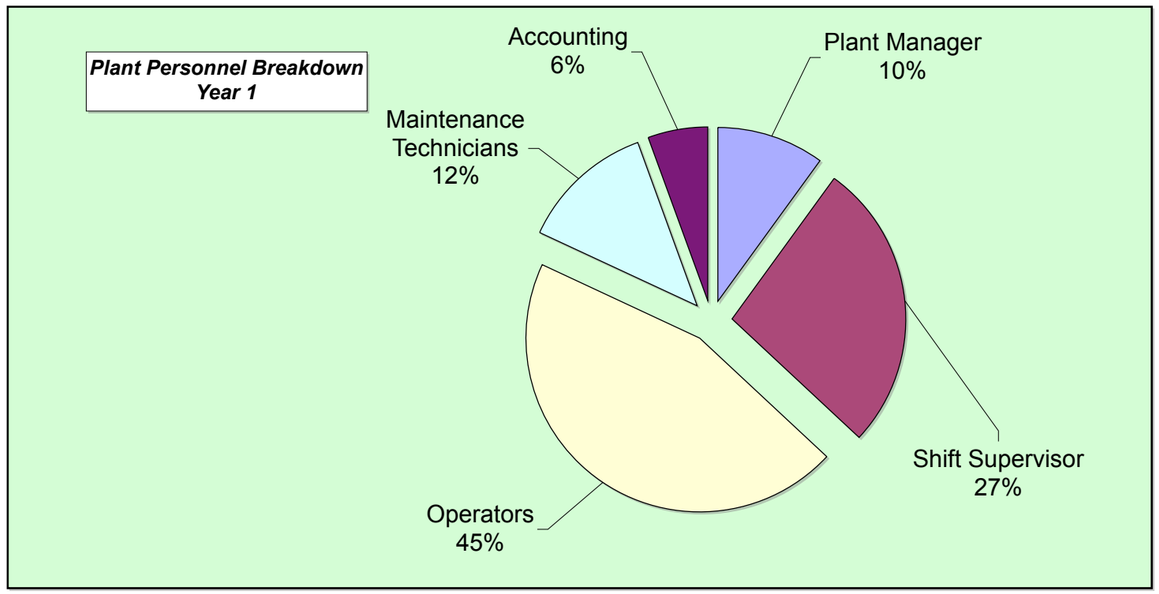

Table L-9

Chemical Consumption and Cost

Treatment Chemical	Dosage (Per Day)	Units	First Year Price ($/Unit)	Daily Cost	First Year Annual Cost
Sodium Hypochlorite (12% Solution)	100	lbs (or gal)	$ -	$ -	$ -
Ferric Chloride Injection[1]	5000	lbs	$ 0.15	$ 750.00	$ 273,750.00
As Lamella Plate Clarifier Polymer	50	lbs	$ 0.50	$ 25.00	$ 9,125.00
Quicklime outsourced supply[2]	0.0	tons	$ 80.00	$ -	$ -
Hydrochloric Acid (40% Solution) Pre-filter pH	3300	gal	$ 0.40	$ 1,320.00	$ 481,800.00
Granular Media Filter Polymer	50	lbs	$ 0.50	$ 25.00	$ 9,125.00
Hydrochloric Acid for IX-WAC Regen	790	gal	$ 0.40	$ 316.00	$ 115,340.00
Anti-Scalent for 1st Pass RO	210	lbs	$ 3.00	$ 630.00	$ 229,950.00
Treated Water Sodium Hypochlorite (12% Solution)	80	lbs (or gal)	$ -	$ -	$ -
Treated Water Lime	800	lbs	$ 0.04	$ 32.00	$ 11,680.00
Treated Water CO_2[3]	800	lbs	$ -	$ -	$ -
Total Chemical Cost					**$ 1,130,770.00**

1. The ferric dosage accounts for iron concentrations in the raw water.
2. Outsourced quick lime is not anticipated to be required due to the excess produced in the re-calcination process.
3. It is proposed that the treated water CO_2 be provided by the CO2 collected in the de-carbonation towers.

Table L-10

Electrical Consumption

Process Component	Operating KW	Hours Per Day	Annual KWH
Energy Recovery if Artesion Well Pressure	0	24	0
Well pumps	268.1	24	2,348,801
Decarbonation	22.3	24	195,348
Chemical Feed- Hypochlorite	0.746	24	6,535
Hypo Generation System	18.3	24	160,308
Chemical Feed- Ferric	0.746	24	6,535
Chemical Feed- Polymer	0.746	24	6,535
Mixing facilities for Sedimentation	11.2	24	98,112
Sedimentation Discharge Thickening Facility	2.24	24	19,622
Lime Sludge dewatering	22.4	24	196,224
Lime Recalcination	239	24	2,093,640
Filter and Ion Exchange Supply Pumps	83.9	24	734,964
RO Feed Pump	940	24	8,234,400
RO Unit Interstage Booster	454	24	3,977,040
RO chemical cleaning system	22.4	0.5	4,088
Emergency permeate flush water	11.2	1	4,088
Permeate Heat Exchanger	179.04	24	1,568,390
Evaporative Loop Pumps	37.3	24	326,748
Brine Concentration System			15,855,740
Finished Water Pump Station	210	24	1,839,600
Other Misc. Processes and Equipment			1,883,836
Electricity Consumed			**39,560,555**
Equivalent MW			4.52

Table L-11

Natural Gas Consumption

Treatment Process	MMBTU Required Daily	MMBTU Required Annually
Recalcination Process	430	156,804
Crystallization Process	148	54,116
Total MMBTU Required	**578**	**210,920**

Table L-12

Residual Product Mass Balance Calculations

Re-Calcination Process		
Raw Water Calcium and Magnesium		
Raw Water Flow	4610	gpm
	6.638	MGD
Calcium Concentration	450	mg/l
Calcium Dry Tons Per Day	12.5	tons/day
Magnesium Concentration	97	mg/l
Magnesium Dry Tons Per Day	2.7	tons/day
Quicklime (Calcium Oxide) Feed		
Softening Clarifier Feed Flow	4600	gpm
	6.624	MGD
Calcium Oxide Dosage	1100	mg/l
Calcium Oxide Dry Tons Per Day	**30.4**	**tons/day**
Calcium Oxide Dry Tons Per Year	11,090	tons/year
Calcium Dry Tons Per Day	21.7	tons/day
Lime Sludge @ 35% solids		
Lime Sludge Flow	30	gpm
	0.043	MGD
Alkalinity (as CaCO3) concentration	521,002	mg/l
Alkalinity (as CaCO3) dry tons	94	tons/day
Bicarbonate (as CACO3) concentration	50,031	mg/l
Bicarbonate (as CACO3) dry tons	9	tons/day
Carbonate (as CACO3) concentration	204,723	mg/l
Carbonate (as CACO3) dry tons	37	tons/day
Calcium concentration	188,599	mg/l
Calcium dry tons	34	tons/day
Magnesium concentration	10,752	mg/l
Magnesium dry tons	2	tons/day
Iron concentration	40	mg/l
Iron dry tons	14	lbs/day
Total Sludge dry solids	156,000	lbs/day
Clarifier Calcium pass through		
Clarifier Discharge Flow	3,893	gpm
	5.606	MGD
Calcium Concentration	27	mg/l
Calcium Dry Tons Per Day	0.6	tons/day
Calcination - Calcium Oxide Production		
Feed Flow = Lime Sludge Discharge	30	gpm
	0.0432	MGD
Calcium Concentration	188,599	mg/l
Calcium Dry Tons Per Day	34.0	tons
Calcium Oxide Dry Tons Per Day	**47.5**	**tons**
Solids Content in Finished Product	90%	
Calcium Oxide Tons Per Day	53	tons

Excess Calcium Oxide Produced		
Softener Inlet conc. less Lime Sludge conc.	17	tons
Calcination - Magnesium Carbonate Production		
Magnesium Concentration	10752	mg/l
Magnesium Dry Tons Per Day	1.9	tons
Magnesium Carbonate Dry Tons Per Day	6.7	tons
Solids Content in Finished Product	90%	
Magnesium Carbonate Tons Per Day	7.4	tons
Crystallization Process		
Feed Flow = RO Brine Reject	870	gpm
	1.253	MGD
Sodium Chloride Calculations		
Chloride Concentration	14,000	Mg/l
Chloride Dry Tons Per Day	73	Tons
Sodium Chloride Dry Tons Per Day total	121	Tons
Solids Content in Finished Product	100%	
Sodium Chloride Tons Per Day	121	Tons
Sodium Chloride Tons Per Year	44,006	Tons
Sodium Sulfate Calculations		
Sulfate Concentration	19,500	Mg/l
Sulfate Dry Tons Per Day	102	Tons
Sodium Sulfate Dry Tons Per Day	126	Tons
Solids Content in Finished Product From Ponds	100%	
Sodium Sulfate Tons Per Day After Concentrator	126	Tons
Sodium Sulfate Tons Per Year	46,103	Tons
Tons of Sodium Sulfate After Concentrator	92,207	Annually

Arsenic Sludge		
Clarifier Discharge	0.6	gpm
Volume of Sludge per year	315,360	gal/yr
Weight of Sludge per year	1,315	tons/yr

Carbon Dioxide		
Raw Water Flow	4610	gpm
	6.638	MGD
Carbon dioxide concentration	450	mg/l
carbon dioxide total available (tons/day)	12.5	tons/day

Table L-13

RO Brine Reject Disposal Option Evaluation

Item	Description	Components	Sodium Sulfate	Sodium Chloride	Estimated Capital Cost	Annual Debt Service	Annual Maintenance	Electrical Consumption (KWH)	Electrical Cost ($.10/KWH)	Disposal Amount (Tons)	Disposal Cost ($/Ton)	Disposal Cost	Revenue Tons	Revenue ($/Ton)	Annual Operating Costs	Annual Revenue	Total Annual Cost
1	Nano-Filtration, With Concentrator For Sodium Sulfate to Evaporation Ponds, and Concentrator / Crystallizer for Sodium Chloride to Salt	Nano-Filtration, 435 gpm Concentrator (2 ea), 40 gpm Crystallizer, 200 Acre Evaporation Ponds	Evaporation Pond	Salt Product to Market	$22,245,000	$1,500,181	$1,112,250	31,527,697	$1,261,108	46,103	$40	$1,844,132	$44,006	$90	$4,217,490	($3,960,525)	$1,757,146
2	Nano-Filtration, With Sodium Sulfate to Injection Well, and Concentrator / Crystallizer for Sodium Chloride to Salt	Nano-Filtration, 435 gpm Concentrator, 40 gpm Crystallizer, 2-435 gpm Injection Wells	Injection Well	Salt Product to Market	$17,050,000	$1,149,835	$852,500	31,711,480	$951,344			$0	$44,006	$90	$1,803,844	($3,960,525)	($1,006,846)
3	Nano-Filtration, With Sodium Sulfate to Injection Well, and Concentrator for Sodium Chloride to Evaporation Pond	Nano-Filtration, 200 acre Evaporation Ponds, 2-435 gpm Injection Wells	Injection Well	Evaporation Pond	$32,225,000	$2,173,223	$1,611,250	63,090	$0	44,006	$40	$1,760,234			$3,371,484	$0	$5,544,706
4	All RO Brine to Concentrator Then to Evaporation Ponds	870 gpm Concentrator, 200 Acre Evaporation Pond	Evaporation Pond	Evaporation Pond	$13,445,000	$906,718	$672,250	15,017,697	$0	90,109	$40	$3,604,366			$4,276,616	$0	$5,183,333
5	All RO Brine to Evaporation Ponds	400 Acre Evaporation Pond	Evaporation Pond	Evaporation Pond	$11,890,000	$801,850	$594,500	35,393	$1,748	90,109	$40	$3,604,366			$4,200,614	$0	$5,002,464
6	All Brine to Injection Wells	4-435 gpm Injection Wells	Injection Well	Injection Well	$14,000,000	$944,146	$700,000	402,960	$12,089			$0			$712,089	$0	$1,656,235

Option	Installed Price	Source	Estimated Annual Energy Consumption (KWH)
Nano Filtration	$ 2,500,000.00	From CDM	10,000
Concentrator (870 gpm)	$ 7,500,000.00	From Altela	15,000,000
Concentrator (435 gpm)	$ 4,500,000.00	60% of 400 Price	7,500,000
80 gpm Crystallizer (80 gpm sized for Flow From 870 gpm Concentrator)	$ 8,000,000.00	From Ge	48,000,000
40 gpm Crystallizer (Estimated 40 gpm flow from 435 gpm concentrator)	$ 4,800,000.00	60% of 400 Price	24,000,000
Injection Well 870 GPM	$ 3,500,000.00	From Doug Schwarm	402,960
Injection Well 435 GPM	$ 2,625,000.00	75% of 400 Price	201,480
400 Acre Evaporation Ponds ($5000/Acre & $1.25/Foot for Liner/Grading)	$ 11,890,000.00	Comparison From CDM El Paso Plant	35,393
400 Acre Evaporation Ponds ($5000/Acre & $1.25/Foot for Liner/Grading)	$ 5,945,000.00	Comparison From CDM El Paso Plant	17,697